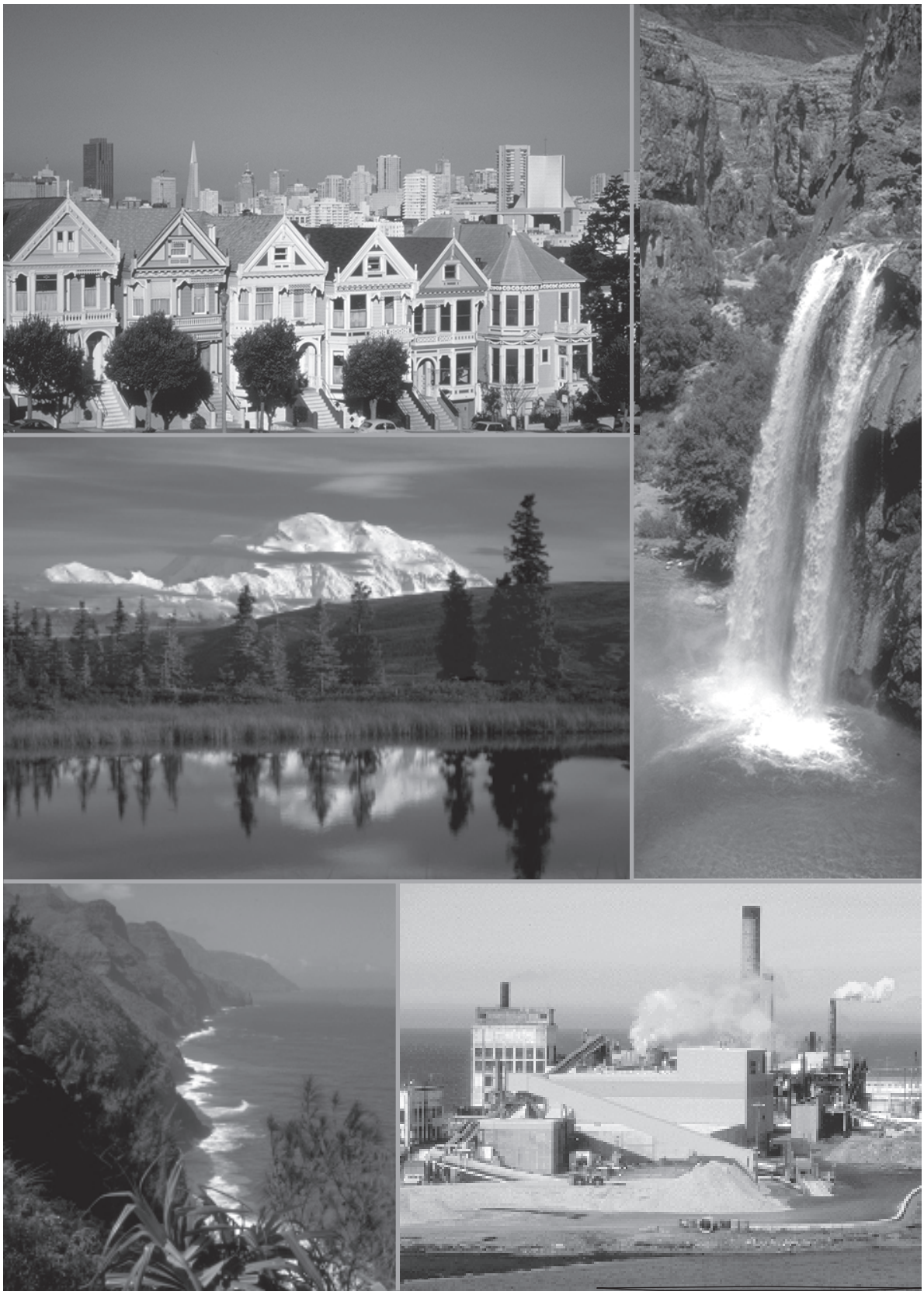
United States
Environmental Protection
Agency

Office of Environmental
Information
(2810)

EPA 260-R-01-001
April 2001

1999 Toxics Release Inventory

Public Data Release



Public Access to the Toxics Release Inventory (TRI)

TRI Data Products

Data Product	Point of Access	Contact Information
1999 TRI Executive Summary (reference EPA 260-S-01-001) 1999 TRI Public Data Release Report (reference EPA 260-R-01-001) 1999 State Fact Sheets Report (reference EPA 260-F-01-001)	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
	U.S. EPA Toxics Release Inventory (TRI) Website — 1999 Data Release	http://www.epa.gov/tri/tri99
1999 State Data Files in Dbase format	U.S. EPA Toxics Release Inventory (TRI) Website	http://www.epa.gov/tri/tri99
Chemicals in Your Community (reference EPA 550-K-99-001)	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 1999 data release page	http://www.epa.gov/tri/ http://www.epa.gov/tri/tri99/
U.S. EPA 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/trisearch.html
TOXNET®the National Library of Medicine's (NLM) Toxicology Data Network, provides free access to TRI data	http://toxnet.nlm.nih.gov/

1999 Toxics Release Inventory Public Data Release

U.S. Environmental Protection Agency

Office of Environmental Information (2810)

Washington, D.C. 20460

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Background

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

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

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

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

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

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

1999 Data Release

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

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

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

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

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

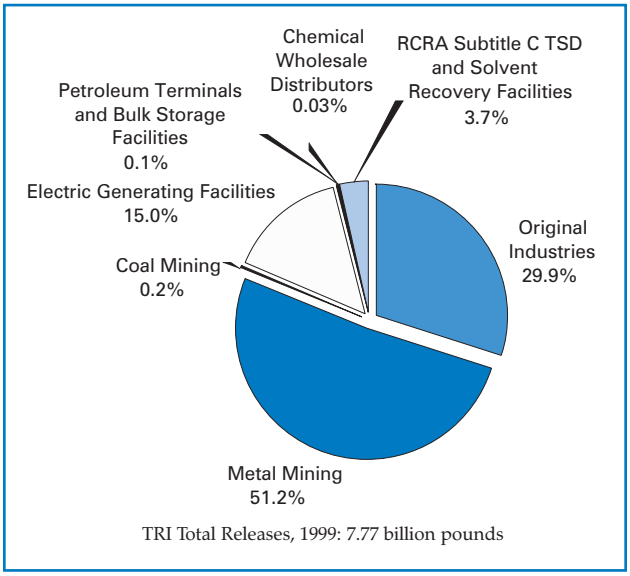
Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

*Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's total releases for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total releases for manganese compounds from 5,584,900 pounds to below 500 pounds. The effect of the revisions is to change the rank for the original industries in Pennsylvania to 3 and in Ohio to 2, as noted in this table.

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

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

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.
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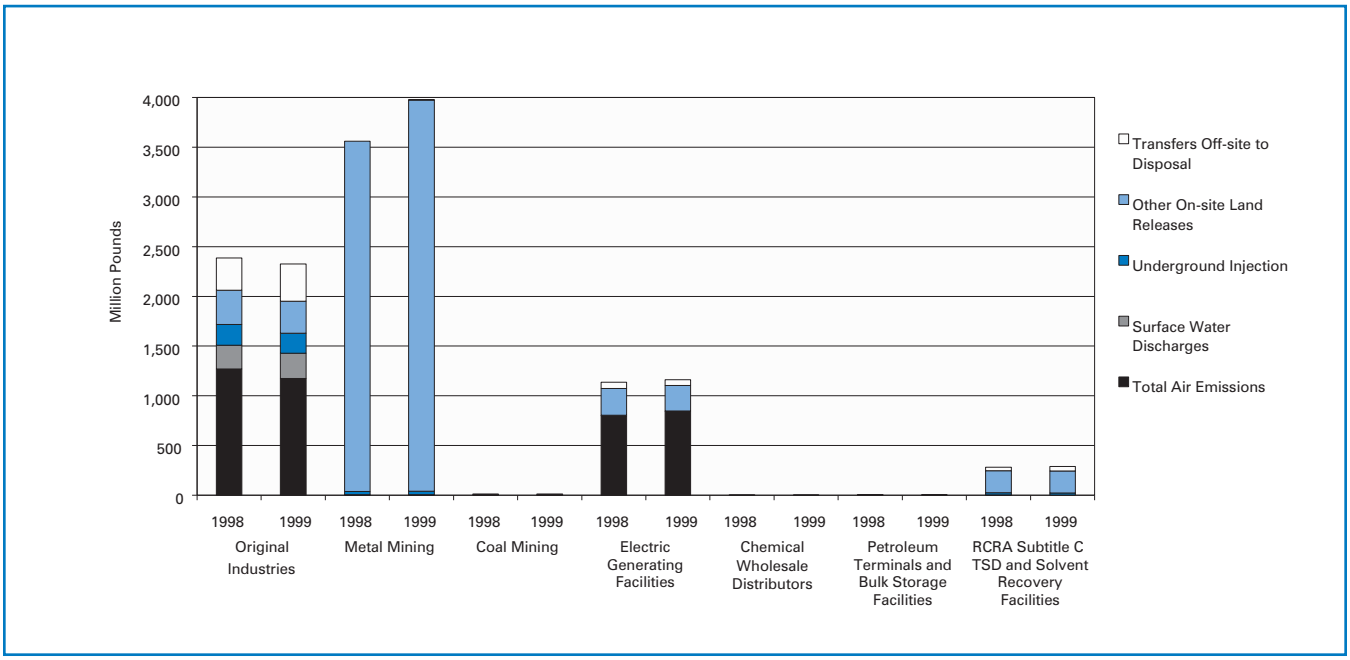
Figure E-2. TRI Total Releases, Original and New Industries, 1998–1999



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

Waste Management Data, 1998–1999

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

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

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

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

Note: Data are from Section 8 of Form R.
Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.
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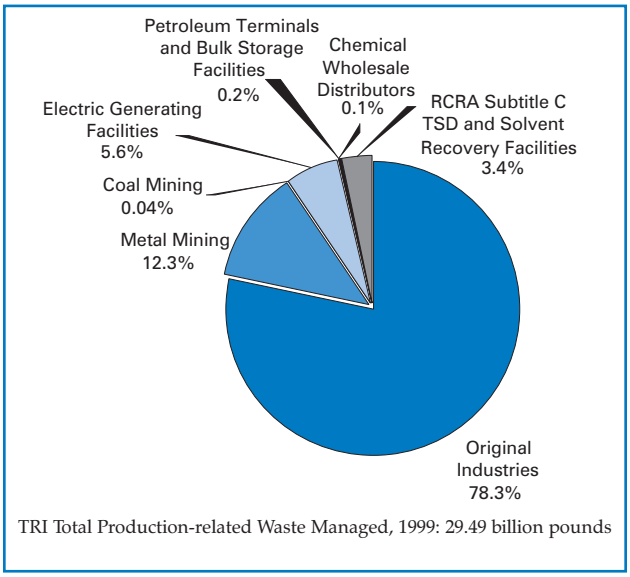
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.

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



Note: Data are from Section 8 of Form R.

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

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

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

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

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

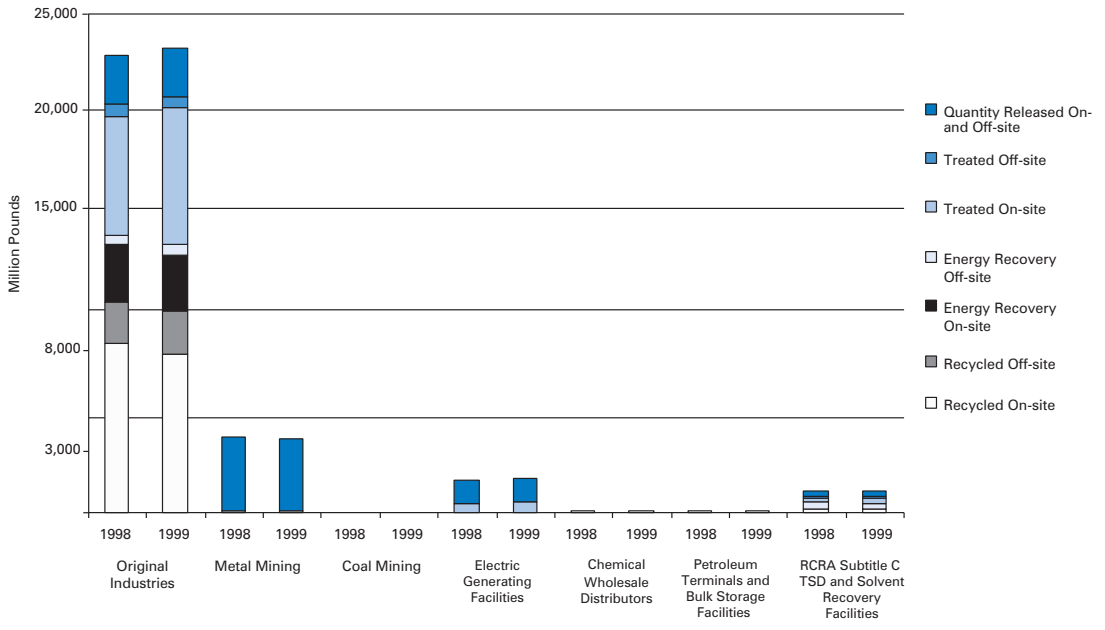
The largest increases in off-site releases occurred in solidification/stabilization of metals, an increase of 110.0 million pounds or (372 percent) and in off-site underground injection, an increase of 11.1 million pounds (or 128 percent). The category of off-site release with the largest decrease, on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

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

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

Note: Data are from Section 8 of Form R for 1998 and 1999.
Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.

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



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

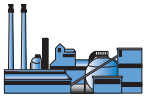


Table E-6. Comparison of TRI On-site and Off-site Releases, Original Industries, 1988, 1995 and 1998–1999

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

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

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

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

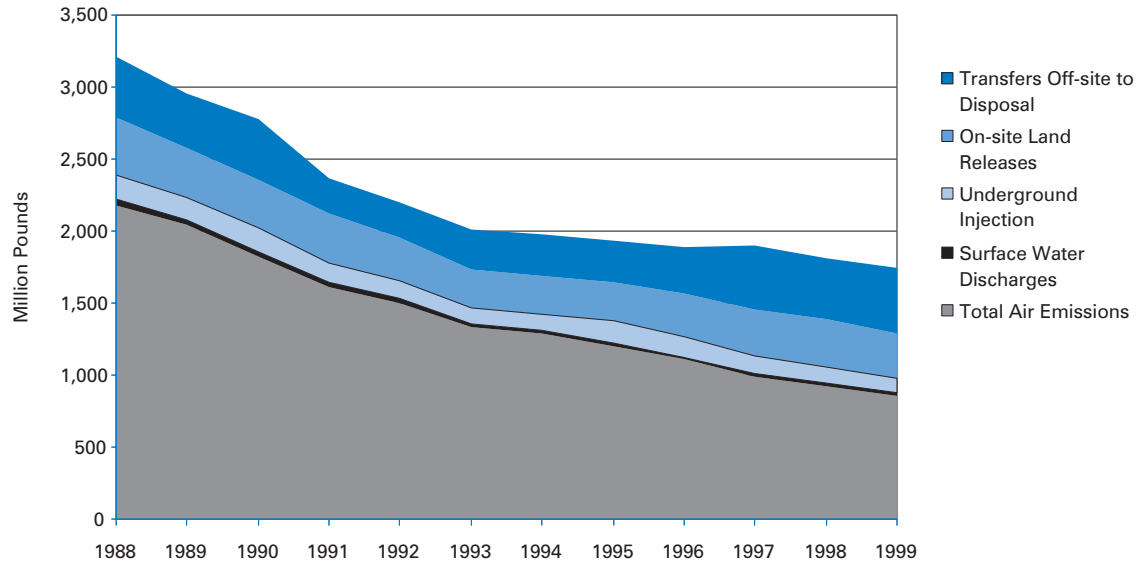
[b] Beginning in reporting year 1997, transfers to solidification/stabilization of metals and metal compounds (waste treatment code M41) are reported separately from transfers to solidification/stabilization of non-metal TRI chemicals (waste treatment code M40). Because this treatment method prepares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

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

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

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

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

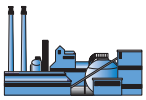


Note: Does not include delisted chemicals, chemicals added in 1990, 1991, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid and sulfuric acid. **On-site Releases** are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases**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

Understanding the Uses, Scope and Limits of TRI Data

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

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



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

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

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

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

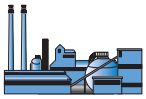
Accessing the TRI Data

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

Chapter 1

Toxics Release Inventory Reporting and the 1999 Public Data Release

Chapter 1



Toxics Release Inventory Reporting and the 1999 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 and used at the identified facilities, and the annual amounts of these chemicals released (in routine operations and in 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 recycled, combusted for energy recovery, and treated on- and off-site. This waste management data has strengthened TRI as a tool for providing information on facilities' handling of TRI chemicals as well as for analyzing progress in reducing releases.

The TRI Program has been a tremendously successful program and the results speak loudly for themselves. The industries that have reported to TRI since its inception have reduced their on- and off-site releases of TRI chemicals by 45.5 percent or 1.46 billion pounds (for chemicals reportable in all years). Governments—federal, state, and local—have used the TRI to set priorities, measure progress, and target areas of special and immediate concern. The public, our most important customer, has used the TRI data to understand their local environment, to participate in local and national debates about the choices being made that affect their health and the health of their children and, ultimately, to exert their influence on the outcome of these debates.

Since TRI began in 1987, the program has grown. In particular, 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, the number of reportable chemicals has nearly doubled,

and EPA has lowered the reporting thresholds for certain persistent, bioaccumulative toxic (PBT) chemicals and added others to the section 313 chemical list.

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. The program will never be static and will never be "finished." As new chemicals of concern are identified, they will be added. Sectors that appear to contribute significantly 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.

1999 Public Data Release

This 1999 Toxics Release Inventory Public Data Release provides a detailed view of the information collected through TRI. This volume summarizes data collected for calendar year 1999, along with changes since 1998, 1995, 1991, and 1988. The companion volume, 1999 TRI Public Data Release: State Fact Sheets, supplies TRI data in greater detail for each state and territory. The online TRI Explorer, a new 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.

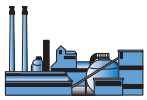
The *1999 Toxics Release Inventory Public Data Release* contains five chapters plus an executive summary. This chapter provides background information, important factors, and assumptions that need to be considered when using TRI data. Chapter 2 gives an overview of on- and off-site releases, management of TRI chemicals in waste, and transfers off-site for further waste management for 1998 and 1999. Chapter 3 summarizes data for 1995 to 1999. Data are analyzed at both the national and state level. Progress is also measured in the original TRI release and transfer categories since 1988, as well as in waste management data since 1991. Chapter 4 examines 1998 and 1999 reporting by the seven new industries, with comparisons to TRI reporting by all industries. Chapter 5 examines data reported by the original TRI industries, analyzing release and waste management data for 1999 and for 1995 to 1999. Chapter 5 also summarizes changes in on- and off-site releases since 1988 and in waste management data since 1991.

Appendix A provides data for all reportable chemicals. Appendix B provides data for metals and metal compounds. Appendix C provides information for those TRI chemicals that have been designated as OSHA carcinogens.

TRI Reporting

Since 1987, facilities in the manufacturing sector have been required to report to TRI. Federal facilities were required to report beginning in reporting year 1994. In 1998, seven industries whose activities are related to manufacturing (for example, in supplying services to that sector) were added (see **Who Must Report?** below).

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 1999 included more than 600 chemicals and 28 chemical categories. Each facility submits a TRI reporting form for each TRI chemical it has manufactured, processed, or otherwise used during 1999 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 in Standard Industrial Classification (SIC) primary codes 20 to 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 classification. 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 (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).

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.

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 (including disposed of), both on- and off-site, and cat-

Box 1–1. Who Must Report to TRI?

A facility must report to TRI if it:

- Conducts manufacturing operations within SIC codes 20 through 39 and, beginning in the 1998 reporting year, if it is in one of the following industries: metal mining, coal mining, electrical utilities, RCRA Subtitle C hazardous waste treatment and disposal facilities, chemical distributors, petroleum terminals, and solvent recovery services. Also, federal facilities must report to TRI regardless of their SIC code classification.
- Employs 10 or more full-time employee equivalents.
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year.

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

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

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

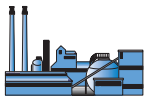
Industrial facilities often conduct interrelated operations that result in products or services which are classified in different SIC codes. In general, TRI forms with multiple SIC codes are analyzed in Chapter 5. (Box 5-2 explains the treatment of multiple codes.) If, however, a facility reported for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

astrophic or other one-time releases (Section 8 of Form R). To some extent, data in Sections 5, 6, and 7 of Form R and those in Section 8 represent a different view of similar 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 treat-



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 the year,
- Types of activities conducted at the facility involving the toxic chemical, and
- Source reduction activities.

ment 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 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 Other Waste Management: Data Analyzed in the *1999 TRI Public Data Release***, 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 file a much shorter certification statement, Form A.

Form R

The Form R is the 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. EPA provides the reporting forms with instructions and technical guidance on how to calculate toxic chemical releases or emissions 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 in this report.

If the facility does not exceed the total production-related amount of 500 pounds, and does not manufacture, process, or otherwise use more than 1 million pounds of the listed chemical, the facility does not have to file a Form R. Instead of filing a Form R detailing its releases and waste management activities, the facility can submit a certification statement (Form A). Form A certifies that the facility met the conditions outlined above for the listed chemical, but does not require reporting of any amounts of the toxic chemical released or otherwise managed as waste.

What Are the Benefits and Limitations of the Data?

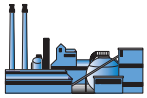
Benefits

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 toxic chemical releases.

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 with the 1998 reporting year, and expanded coverage of persistent, bioaccumulative toxic (PBT) chemicals through lower reporting thresholds and addition of certain 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. When TRI data for reporting year 2000 are made public, communities will have available for the first time additional information on releases and other waste management of PBT chemicals that pose potential threats to human health and the environment.

TRI has focused public and industry attention on the billions of pounds of toxic materials that are released directly into our air, our land and our water, injected underground, recycled, burned for energy recovery, or otherwise treated. Actions to strengthen the TRI Program over the years have given the public a much better picture of potential toxic chemical risks in their communities, while industry and government have better data for identifying opportunities and measuring successes in preventing pollution.

Limitations

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 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 chemical reporting thresholds expand the information TRI will collect, but only for a subset of the TRI chemicals. Thus, while the TRI includes 84,068 reports from 22,639 facilities for 1999, the 7.77 billion pounds of on- and off-site releases reported represent only a portion of all toxic chemical releases nationwide.

The Toxics Release Inventory data do 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.

Furthermore, facilities report estimated data to TRI, and the program does not mandate that they monitor their releases. Various estimation techniques are used when monitoring data are not available, and EPA has published estimation guidance for the regulated community. Variations between facilities can result from the use of different estimation 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 1999 or prior years.

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. Furthermore, 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.

TRI IN PERSPECTIVE

When Congress passed the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), 300-plus chemicals and chemical categories were included in the "TRI Chemical List" and only 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 of 1990 expanded 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 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 other chemicals that may have potential adverse impacts on our environment. Towards that end, the Agency has pursued an expansion strategy that has enlarged the boundaries of TRI in several directions.

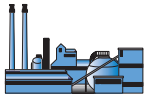
Chemical Expansion

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

[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.



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 disposal 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. Guidance documents for these industries are available from EPA's Web site at http://www.epa.gov/tri.

Persistent, Bioaccumulative Toxic Chemicals (PBTs)

Beginning in reporting year 2000, lower reporting thresholds apply to TRI facilities that manufacture, process, or otherwise use certain persistent, bioaccumulative toxic (PBT) chemicals . Also, additional PBT chemicals that TRI has not previously covered have been added to the section 313 chemical list. These new reporting requirements were issued in October, 1999 (64 FR 58666).

PBT chemicals include substances such as mercury and polychlorinated biphenyls (PCBs), already on the TRI list, and dioxin, which is among the chemicals added for

2000. 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 they 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 need to be captured by the TRI Right-to-Know Program.

In the October 1999 PBT chemical rulemaking, EPA created three separate thresholds for the PBT chemicals: 10 pounds for certain highly persistent, bioaccumulative toxic chemicals, 100 pounds for other PBT chemicals, and a special threshold of 0.1 grams for dioxin and dioxin-like compounds. Under the existing thresholds of 25,000 pounds for the manufacture and processing of a listed chemical and 10,000 pounds for otherwise using a listed chemical, TRI facilities reported very few releases or waste management of the PBT chemicals.

In addition to the chemical category of dioxin and dioxin-like compounds (a total of 17 substances), six individual 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 chemicals already on the TRI list: aldrin, chlordane, heptachlor, hexachlorobenzene, isodrin, methoxychlor, pendimethalin, polycyclic aromatic compounds, polychlorinated biphenyls, toxaphene, trifluralin, mercury and mercury compounds.

In a separate action, as part of the October 29, 1999 rulemaking, EPA added vanadium (except when contained in alloys) and vanadium compounds. These are not PBT chemicals.

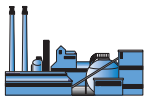
TRI Releases and Other Waste Management: Data Analyzed in 1999 TRI Public Data Report

What to Consider When Using TRI Data

Users of TRI information should be aware that TRI data reflect releases and other waste management of chemicals, not whether (or how much) 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 of the chemical, the fate of the chemical, and the amount and length 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.



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

- **Toxicity of the Chemical**: TRI chemicals vary widely in their ability to produce toxic effects. Some high-volume releases of less-toxic chemicals 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 is 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.

- 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

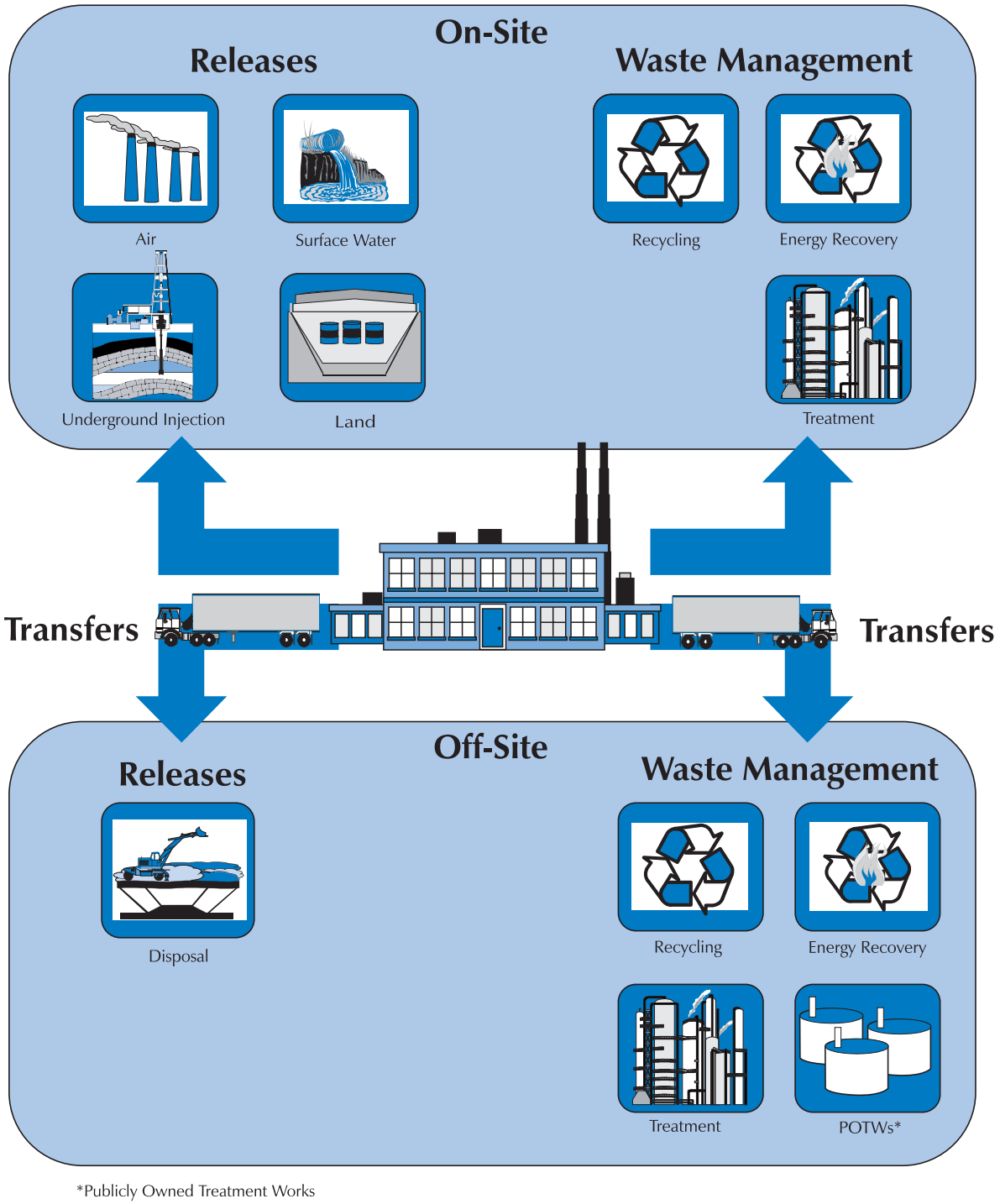
- **Potential degradation or persistence of the chemical in the environment.** Exposure to a chemical is dependent upon the chemical being available. The longer the chemical remains unchanged in the environment, the greater the potential for exposure. Sunlight, heat, or microorganisms may or may not 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 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.
- Injection of toxic chemicals into properly designed and constructed Class I wells will result in substantially lower exposure potential than more direct forms of environmental release. These wells are designed to entomb liquid wastes for at least 10,000 years.

- **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 disposal, 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 percent to 99 percent 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 disposal, 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.

Figure 1–1. Information Collected Under TRI



*Publicly Owned Treatment Works

On- and Off-site Releases

Figure 1–1 illustrates on-site and off-site releases, on-site waste management activities, and transfers off-site for further 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.

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.

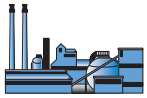
Surface Water Discharges. Releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff, are also reportable 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 industrial, municipal, and manufacturing wells inject fluids into deep, confined, and isolated formations below potable water supplies.
- Class II oil- and gas-related wells re-inject produced fluids for disposal, enhanced recovery of oil, or hydrocarbon storage.
- Class III wells are associated with the solution mining of minerals.
- Class IV wells may inject hazardous or radioactive fluids directly or indirectly into USDW, only if the injection is part of an authorized CERCLA/RCRA clean-up operation.
- Class V wells, which include all types of injection wells that do not fall under I–IV, may inject only if they do not endanger USDW, public health, or the environment. Class V wells are, generally, shallow drainage wells, such as floor drains connected to dry wells or drain fields.

Beginning with the 1996 reporting year, facilities separately report amounts injected into Class I wells and into all other wells.

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), land treatment/application farming (in which a waste containing a listed chemical is applied to or incorporated into soil), surface impoundments (which are uncovered holding areas used to volatilize and/or settle waste materials), and other land disposal methods (such as waste piles) or releases to land (such as 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.



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. Toxic chemicals in waste that are transferred off-site for disposal generally are either released to land at an off-site facility or are injected underground. (See discussion of on-site releases to land and 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 Compounds. Transfers of metals and metal 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 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 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 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 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 compound which is stabilized in preparation for disposal.

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

(continued)

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

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

Recycling

M20 Solvents/Organics Recovery
M24 Metals Recovery
M26 Other Reuse or Recovery
M28 Acid Regeneration
M93 Transfer to Waste Broker—Recycling

Energy Recovery

M56 Energy Recovery
M92 Transfer to Waste Broker–Energy Recovery

Treatment

M40 Solidification/Stabilization
M50 Incineration/Thermal Treatment
M54 Incineration/Insignificant Fuel Value
M61 Wastewater Treatment (Excluding POTWs)
M69 Other Waste Treatment
M95 Transfer to Waste Broker–Waste Treatment

Disposal

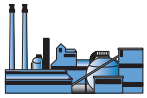
M10 Storage Only
M41 Solidification/Stabilization–Metals and Metal Compounds only
M62 Wastewater Treatment (Excluding POTWs) — Metals and Metal Compounds only
M71 Underground Injection
M72 Landfill/Disposal Surface Impoundment
M73 Land Treatment
M79 Other Land Disposal
M90 Other Off-site Management
M94 Transfers to Waste Broker–Disposal
M99 Unknown

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 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 compounds should be reported in Section 8.1 of the Form R. This includes those quantities of metals and metal 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 Compounds in This Report

Off-site releases (transfers to disposal) in tables in this report include the quantities of metals and metal 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 compounds that were reported correctly in Section 6.2. For the years prior to 1997 (presented in Chapter 3), EPA has also included the quantities of metals and metal 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 metals compounds reported as discharges to POTWs in Section 6.1 of the Form R.

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

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 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 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 newly added industries. Only the on-site releases from the TSD facilities are included in such analyses. In the *1999 TRI Public Data Release,* this applies to tables presented in Chapters 2 and 4.

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 has been 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:

(continued)

Box 1-8. Duplication of Off-site Transfers to Disposal *(continued)*

Off-site Transfer M Code	Section 5 Checked for Recipient TRI Facilities Based on Matching Chemical or, if Metal, Metal plus Metal 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 compounds reported under codes M40 and M61.

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

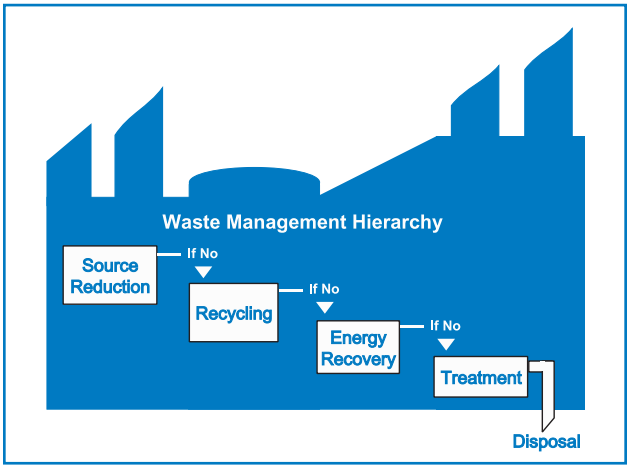
Box 1–8 describes EPA's methodology for avoiding duplication of amounts analyzed in off-site releases (transfers to disposal) that are also reported as on-site releases by facilities that received such transfers. This potential for duplication arises now that RCRA subtitle C hazardous waste treatment and disposal facilities also report to TRI. The methodology applies to analyses that include data from the newly reporting industries.

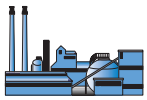
Waste Management

The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the quantities of TRI chemicals they manage in waste, both on- and off-site. The Pollution Prevention Act 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

Figure 1-2. Waste Management Hierarchy





of waste and helps conserve energy and natural resources. Where source reduction and recycling are not feasible, 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 waste management. Facilities report these data as estimates for the reporting year (1999) and the previous year (1998) and as projections for the two

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 percent 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 percent of the benzene, the facility would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as released).

(continued)

Box 1-9. An Explanation of Waste Management Information *(continued)*

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 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 compounds) less any amount(s) associated with non-routine events.

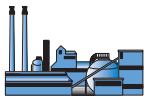
Released to the Environment Due to One-time Events. This amount is referred to as non-production-related waste and is the quantity released to the environment or sent off-site for recycling, energy recovery, treatment, or disposal due to one-time events not associated with routine production practices. 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. This separation is important in assessing progress in source reduction at facilities.

following years (2000 and 2001). The PPA requires this data projection to encourage facilities to consider their future waste generation, opportunities for source reduction, and potential improvement in waste management 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 percent 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 percent) 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.

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.

1995–1999

In addition to the industry expansion undertaken in 1998, EPA has made a few changes during the 1995–1999 period to the list of chemicals that must be reported. 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. On November 30, 1994, 286 chemicals and chemical categories were added to the TRI chemical list based on their high or moderately high toxicity characteristics. This addition raised the number of chemicals and chemical categories reporting to TRI to more than 600. Of the 286 chemicals, 20 were diisocyanates and 19 were polycylic aromatic compounds. Since 1995, EPA has deleted three chemicals from the TRI list, including phosphoric acid in 1999. These chemicals are excluded from analyses of the 1995–1999 data. The reporting by new industries is also excluded from the 1998 and 1999 data for analyses covering the 1995–1999 period.

In reporting year 1997, TRI began distinguishing metals and metal compounds from other listed chemicals in certain types of off-site transfers. Specifically, metals and metal compounds transferred off-site to solidification/stabilization, to wastewater treatment (excluding POTWs), and to POTWs are also classified as off-site releases. (See Boxes 1–5 through 1–7.) Although this categorization was new in 1997, comparable transfers of metals and metal compounds in previous years can be identified by the waste treatment codes that applied in those years. Tables in this book present such data.

1991–1999

Waste management information added to TRI by the Pollution Prevention Act of 1990 has been collected since 1991. Chemicals added to TRI in EPA's chemical expansion initiative were first reportable in 1994 and a few other chemicals were added in 1995. All of these substances are excluded from analyses of the 1991–1999 data. Reporting requirements for ammonia, hydrochloric acid, and sulfuric acid have changed since

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 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.

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).

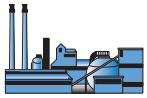
Transfers Off-site to Recycling. Toxic chemicals in waste that are sent off-site for the purposes of recycling are generally recovered by a variety of recycling methods, including solvent recovery and metals recovery. The choice of the recycling method depends on the toxic chemical being sent for recycling. 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 varying degrees of 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 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."



1991 and are also excluded. The reporting by new industries is also excluded from the 1998 and 1999 data for analyses covering the 1991–1999 period.

1988–1999

Analyses for the period 1988 to 1999 exclude chemicals added to TRI since 1988 and those for which reporting requirements have changed over that time. Also, reporting by new industries is excluded from the 1998 and 1999 data for analyses covering the 1988–1999 period. Additional considerations also apply to analyses of TRI data for 1988 to 1999, including:

- In 1989, the reporting thresholds for manufacture and processing of TRI chemicals was 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 1999 include only the transfer types that were reportable in 1988.
- Reporting of amounts injected underground into Class I wells separately from amounts injected 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 to 1999.

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 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 Pollution Prevention Act of 1990 (PPA) 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.

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 waste 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

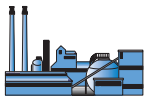
Changes in estimation or calculation techniques can cause a change in the amount reported without a corresponding change in actual quantities released or otherwise managed as waste.

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 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.

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 **(202-260-1531)** can provide assistance in accessing and using the TRI data. On-line services include the TRI Explorer, EPA's Envirofacts, and the National Library of Medicine's TOXNET system.

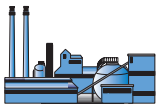
To request copies of TRI and EPCRA documents or to obtain further information about the program, contact the toll-free Emergency Planning and Community Right-to-Know Information Hotline at **1-800-424-9346.** TRI information is also available on the TRI Web site at **www.epa.gov/tri.**

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 *1999 TRI Public Data Release: State Fact Sheets,* and on the TRI web site.

Chapter 2

Toxics Release Inventory Data Overview, 1998 and 1999

Chapter 2



Toxics Release Inventory Data Overview, 1998 and 1999

This chapter provides a broad overview of TRI data for 1998 and 1999. Detailed analyses of the 20 industries in the manufacturing sector that have been required to report to TRI since the program began in 1987 (the "original" industries) appear in Chapters 3 and 5. These original industries are in Standard Industrial Classification (SIC) codes 20 to 39. (For information on SIC codes and their use in TRI, see Box 1–1 in Chapter 1.)

The seven industries that were required to report to TRI for the first time in 1998—the "new" industries—are analyzed in Chapter 4. Also in Chapter 4 is a separate analysis of reporting by federal facilities.

For definitions of types of releases and waste management activities, and for important information on factors to be considered when using TRI data, see Chapter 1.

TRI Data for Original and New Industries, 1998 and 1999

As shown in Table 2–1, in 1999, 20,698 facilities in the original industries submitted 69,471 TRI forms (both Forms R and Forms A). In 1999, 1,941 facilities in the new industries submitted 14,597 forms. Although these industries constituted only 8.6 percent of all TRI facilities reporting, they submitted 17.4 percent of the TRI forms. (In 1998, the new facilities accounted for 8.5 percent of all TRI facilities and 17.6 percent of all forms.) The numbers of facilities reporting and of forms submitted were slightly lower, by 2 to 3 percent, in 1999 than in 1998, for both original and new industries and for TRI industries as a whole.

On- and Off-site Releases

On- and off-site releases in 1999 for all TRI industries totaled 7.77 billion pounds, an increase from 7.38 billion pounds in 1998, or 5.3 percent. From 1998 to 1999, total releases by the new industries increased by 9.0 percent, from 5.00 billion pounds to 5.45 billion pounds. Total releases by original industries, on the other hand, decreased from 1998 to 1999 by 2.5 percent, from 2.39 billion pounds to 2.33 billion pounds.

On-site releases from all TRI industries grew from 6.96 billion pounds in 1998 to 7.29 billion pounds in 1999, an increase of 4.8 percent. The original industries' on-site releases fell by 5.3 percent, from 2.06 billion pounds in 1998 to 1.95 billion pounds in

Table 2–1. TRI On-site and Off-site Releases, Original and New Industries, 1998–1999

	Original Industries			New Industries			All TRI Industries		
	1998 Number	1999 Number	Change 1998–1999 Percent	1998 Number	1999 Number	Change 1998–1999 Percent	1998 Number	1999 Number	Change 1998–1999 Percent
Total Facilities	21,334	20,698	–3.1	1,988	1,941	–2.4	23,322	22,639	–3.0
Total Forms	70,975	69,471	–2.1	15,142	14,597	–3.7	86,117	84,068	–2.4
Form Rs	60,641	59,265	–2.3	12,492	12,124	–3.0	73,133	71,389	–2.4
Form As	10,334	10,206	–1.2	2,650	2,473	–7.2	12,984	12,679	–2.4
	Pounds	Pounds	Percent	Pounds	Pounds	Percent	Pounds	Pounds	Percent
On-site Releases									
Total Air Emissions	1,270,193,503	1,175,054,932	–7.5	811,010,244	854,309,491	5.3	2,081,203,747	2,029,364,423	–2.5
Fugitive Air Emissions	294,971,535	270,765,473	–8.2	6,968,039	7,546,743	8.3	301,939,574	278,312,216	–7.8
Point Source Air Emissions	975,221,968	904,289,459	–7.3	804,042,205	846,762,748	5.3	1,779,264,173	1,751,052,207	–1.6
Surface Water Discharges	238,483,036	253,591,816	6.3	7,553,237	5,289,960	–30.0	246,036,273	258,881,776	5.2
Underground Injection	209,711,433	199,547,803	–4.8	56,708,764	58,097,341	2.4	266,420,197	257,645,144	–3.3
Class I Wells	209,531,530	199,398,335	–4.8	23,536,771	22,861,227	–2.9	233,068,301	222,259,562	–4.6
Class II–V Wells	179,903	149,468	–16.9	33,171,993	35,236,114	6.2	33,351,896	35,385,582	6.1
On-site Land Releases	343,781,378	323,667,851	–5.9	4,022,499,616	4,423,054,923	10.0	4,366,280,994	4,746,722,774	8.7
RCRA Subtitle C Landfills	13,792,720	12,440,355	–9.8	208,597,751	208,055,567	–0.3	222,390,471	220,495,922	–0.9
Other On-site Landfills	100,142,596	86,002,777	–14.1	167,773,997	157,900,439	–5.9	267,916,593	243,903,216	–9.0
Land Treatment	8,154,812	8,961,222	9.9	1,313,197	1,864,462	42.0	9,468,009	10,825,684	14.3
Surface Impoundments	81,151,225	73,771,878	–9.1	1,338,519,185	1,157,407,580	–13.5	1,419,670,410	1,231,179,458	–13.3
Other Disposal	140,540,025	142,491,619	1.4	2,306,295,486	2,897,826,875	25.6	2,446,835,511	3,040,318,494	24.3
Total On-site Releases	**2,062,169,350**	**1,951,862,402**	**-5.3**	**4,897,771,861**	**5,340,751,715**	**9.0**	**6,959,941,211**	**7,292,614,117**	**4.8**
Off-site Releases									
Storage Only[a]	6,052,516	6,283,205	3.8	2,716,688	789,462	–70.9	8,769,204	7,072,667	–19.3
Solidification/Stabilization[b] Metals and Metal Compounds Only	42,773,352	53,081,746	24.1	5,631,223	5,955,229	5.8	48,404,575	59,036,975	22.0
Wastewater Treatment (excluding POTWs)[c] Metals and Metal Compounds Only	3,772,346	6,488,311	72.0	115,300	185,525	60.9	3,887,646	6,673,836	71.7
Transfers to POTWs[d] Metals and Metal Compounds Only	3,009,214	3,345,324	11.2	419,223	58,383	–86.1	3,428,437	3,403,707	–0.7
Underground injection	7,566,290	20,792,445	174.8	335,745	2,763,898	723.2	7,902,035	23,556,343	198.1
Landfills/Surface Impoundments	215,995,597	215,936,934	0.0	68,149,933	62,872,238	–7.7	284,145,530	278,809,172	–1.9
Land Treatment	1,396,685	4,239,385	203.5	487,775	598,919	22.8	1,884,460	4,838,304	156.7
Other Land Disposal	15,616,540	15,821,423	1.3	12,041,927	10,865,562	–9.8	27,658,467	26,686,985	–3.5
Other Off-site Management	10,303,490	34,046,804	230.4	8,809,908	17,642,367	100.3	19,113,398	51,689,171	170.4
Transfers to Waste Broker for Disposal	14,087,152	11,146,540	–20.9	884,192	2,506,673	183.5	14,971,344	13,653,213	–8.8
Unknown[e]	3,486,757	3,465,479	–0.6	468,765	537,602	14.7	3,955,522	4,003,081	1.2
Total Off-site Releases (Transfers Off-site to Disposal)	**324,059,939**	**374,647,596**	**15.6**	**100,060,679**	**104,775,858**	**4.7**	**424,120,618**	**479,423,454**	**13.0**
Total On-site and Off-site Releases	**2,386,229,289**	**2,326,509,998**	**-2.5**	**4,997,832,540**	**5,445,527,573**	**9.0**	**7,384,061,829**	**7,772,037,571**	**5.3**

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

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

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

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

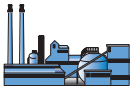
[a]Storage only (disposal code M10) indicates that the toxic chemical is sent off-site for storage because there is no known disposal method. Amounts reported as transferred to storage only are included as a form of disposal (off-site release). See Box 1–5.

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

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

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



1999, while the new industries' on-site releases increased by 9.0 percent, from 4.90 billion pounds to 5.34 billion pounds. This increase is accounted for by reporting by one facility in Utah. This metal mining facility retired a leach pad in 1999 and, therefore, had a large one-year increase of 505 million pounds reported in the other disposal category of on-site land releases.

A 10.0 percent rise in on-site land releases, from 4.02 billion pounds to 4.42 billion pounds, and a 5.3 percent rise in total air emissions, from 811.0 million pounds to 854.3 million pounds, accounted for much of the increase in the new industries' on-site releases. Surface water discharges by the new industries dropped by 30.0 percent, but the quantities involved were relatively small—5.3 million pounds in 1999, down from 7.6 million pounds in 1998. For the original industries, all the main categories of releases declined in quantity, except for surface water discharges which increased by 6.3 percent. The largest, air emissions, fell from 1.27 billion pounds in 1998 to 1.18 billion pounds in 1999, a decrease of 7.5 percent.

Off-site releases (transfers off-site to disposal) for TRI industries rose 13.0 percent, from 424.1 million pounds in 1998 to 479.4 million pounds in 1999. Off-site releases reported by both original industries and the new industries increased from 1998 to 1999.

The original industries reported off-site releases of 324.1 million pounds in 1998 and 374.6 million pounds in 1999, a 15.6 percent increase. The main categories in which the original industries reported increases were underground injection, from 7.6 million pounds to 20.8 million pounds (174.8 percent); solidification/stabilization, from 42.8 million pounds to 53.1 million pounds (24.1 percent); land treatment, from 1.4 million pounds to 4.2 million pounds (203.5 percent); and wastewater treatment, excluding publicly owned treatment works (POTWs), from 3.8 million pounds to 6.5 million pounds (72.0 percent). The only category of releases by the original industries to register a decrease was transfers to waste brokers for disposal, from 14.1 million pounds to 11.1 million pounds, a decline of 20.9 percent.

Total off-site releases from facilities in the new industries rose from 100.1 million pounds in 1998 to 104.8 million pounds in 1999, a 4.7 percent increase. The largest increase was in the category other off-site management, from 8.8 million pounds to 17.6 million pounds, a rise of 100.3 percent. The absolute increases for off-site underground injection and transfers to waste brokers for disposal were lower, but because the 1998 amounts were small, percentage growth was substantial. Off-site underground injection rose from about 336,000 pounds to 2.8 million pounds (723.2 percent). Transfers to waste brokers increased from about 884,000 pounds to 2.5 million pounds (183.5 percent).

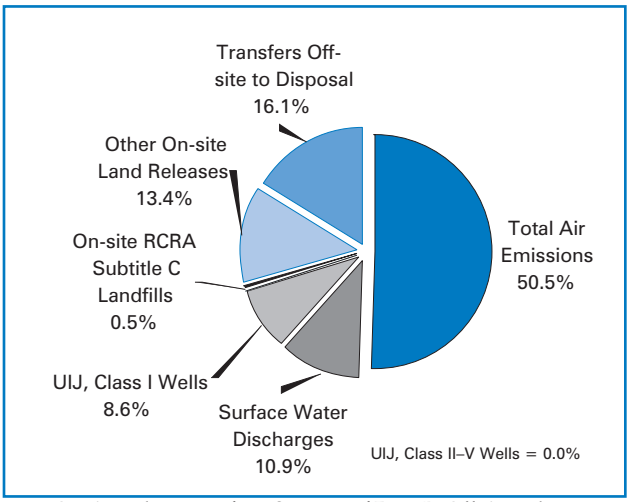
Three categories of off-site releases by the new industries showed decreases of more than a million pounds. The amount sent to landfills and surface impoundments fell from 68.1 million pounds in 1998 to 62.9 million pounds in 1999, a decrease of 7.7 percent. Releases to other land disposal declined from 12.0 million pounds to 10.9 million pounds (9.8 percent). Releases to storage fell from 2.7 million pounds to less than 800,000 million pounds (70.9 percent).

Transfers to landfills/surface impoundments constituted the largest type of off-site release for both original and new industries. Facilities in the new industries reported 62.9 million pounds in this category in 1999, or 1.2 percent of total releases from the new industry group. In 1999, the original industries sent 215.9 million pounds, or 9.3 percent of their total releases, to off-site landfills and surface impoundments.

Most of the new industries' releases were on-site to land (4.42 billion pounds in 1999), and, as discussed in Chapter 4, the bulk of these on-site land releases were reported by the metal mining industry. Much of this amount is reporting on toxic chemicals in mining waste rock by this industry. In 1999, on-site land releases (including the two categories other on-site land releases and on-site RCRA Subtitle C landfills) accounted for 13.9 percent of the original TRI industries' total releases (see Figure 2–1). The corresponding figure for the new industries in 1999 was 81.2 percent (see Figure 2–2). The new industries accounted for 93.2 percent of all TRI on-site land releases in 1999. (This group's on-site releases accounted for 73.2 percent of total on-site releases by all TRI industries.)

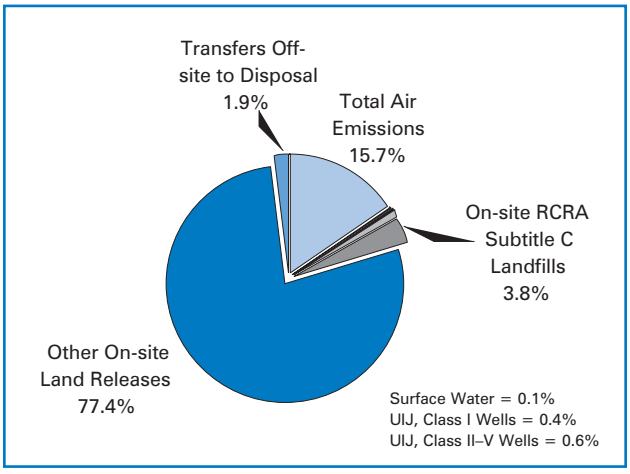
The large proportion of on-site land releases by the new industries substantially influences the distribution of other release types. For example, Figures 2–1 and 2–2 show that in 1999 air emissions accounted for 50.5 percent of total releases by the original industries but for only 15.7 percent of total releases by the new industries. As noted in Chapter 4, electric utilities reported by far the greatest part of the new industries' air emissions. Similarly, transfers off-site to disposal accounted for 16.1 per-

Figure 2-1. Distribution of TRI On-site and Off-site Releases, Original Industries, 1999

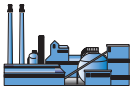


Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.
UIJ = Underground Injection

Figure 2-2. Distribution of TRI On-site and Off-site Releases, New Industries, 1999



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.
UIJ = Underground Injection



Box 2–1. Duplication of Off-site Transfers to Disposal, 1998 and 1999

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 facilities 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, including the new 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 1998 and 1999 and how much is omitted from tables that present total releases for all TRI industries in this chapter and in Chapter 4.

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 Compound
	Pounds	Pounds	Pounds	
Duplication of Off-site Transfers to Disposal, 1998				
M10	8,769,324	3,520,834	120	5.5.4
M41*	143,083,648	132,394,969	94,679,073	5.5.1 A and B
M62*	4,084,840	2,745,648	197,194	5.5.1 A and B, 5.5.3 and 5.3
M71	12,492,253	10,485,816	4,590,218	5.4
M72	307,704,844	50,461,459	23,559,314	5.5.1 A and B, 5.5.3
M73	1,884,460	75,603	0	5.5.2
M79	27,672,169	9,021,530	13,702	5.5.4
M90	19,734,548	3,516,045	621,150	All Section 5
M99	4,226,315	2,051,217	270,793	All Section 5
Total	529,652,401	214,273,121	123,931,564	
Number of Form Rs	73,133	7,882	2,721	
Duplication of Off-site Transfers to Disposal, 1999				
M10	7,075,644	2,471,310	2,977	5.5.4
M41*	146,657,648	137,285,948	87,620,673	5.5.1 A and B
M62*	6,782,135	2,347,947	108,299	5.5.1 A and B, 5.5.3 and 5.3
M71	32,641,556	29,811,365	9,085,213	5.4
M72	299,664,864	41,525,922	20,855,692	5.5.1 A and B, 5.5.3
M73	4,838,304	33,973	0	5.5.2
M79	26,708,665	7,511,811	21,680	5.5.4
M90	51,773,270	2,756,092	84,099	All Section 5
M99	4,180,375	2,375,368	177,294	All Section 5
Total	580,322,461	226,119,736	117,955,927	
Number of Form Rs	71,389	7,855	2,743	

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

cent of the original industries' releases but for only 1.9 percent of total releases by the new industries.

Starting in 1998, hazardous waste treatment and disposal facilities in SIC code 4953 were required to report to TRI. The result is that 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 2–1 shows how much of the off-site transfers to disposal were also reported as on-site releases in 1998 and 1999.

Waste Management Data

Quantities of TRI Chemicals in Waste

Table 2–2 compares the quantities of TRI chemicals in waste for original and new industries for 1998 and 1999. Total production-related waste for all TRI industries in 1999 was 29.49 billion pounds, an increase of 0.7 percent from 1998.

The original industries reported production-related waste totaling 23.10 billion pounds in 1999, up from 22.78 billion pounds in 1998, an increase of 1.4 percent. Of the 1999 total for original industries, 10.3

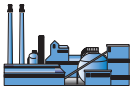
Table 2-2. Quantities of TRI Chemicals in Waste by Waste Management Activity, Original and New Industries, 1998–1999

Waste Management Activity	Original Industries			New Industries			All TRI Industries		
	1998	1999	Change 1998-1999	1998	1999	Change 1998-1999	1998	1999	Change 1998-1999
	Pounds	Pounds	Percent	Pounds	Pounds	Percent	Pounds	Pounds	Percent
Recycled On-site	8,407,381,641	7,839,852,848	–6.8	204,380,355	198,496,815	–2.9	8,611,761,996	8,038,349,663	–6.7
Recycled Off-site	2,071,439,013	2,134,897,467	3.1	37,327,609	35,157,658	–5.8	2,108,766,622	2,170,055,125	2.9
Energy Recovery On-site	2,827,695,743	2,806,098,993	–0.8	11,399,201	10,762,603	–5.6	2,839,094,944	2,816,861,596	–0.8
Energy Recovery Off-site	487,588,775	511,631,406	4.9	413,103,773	267,664,335	–35.2	900,692,548	779,295,741	–13.5
Treated On-site	5,913,717,613	6,850,326,119	15.8	629,209,581	754,327,458	19.9	6,542,927,194	7,604,653,577	16.2
Treated Off-site	592,216,295	571,669,556	–3.5	90,988,751	72,630,384	–20.2	683,205,046	644,299,940	–5.7
Quantity Released On- and Off-site	2,475,386,574	2,384,303,476	–3.7	5,118,407,472	5,056,288,914	–1.2	7,593,794,046	7,440,592,390	–2.0
Total Production-related Waste	**22,775,425,654**	**23,098,779,865**	**1.4**	**6,504,816,742**	**6,395,328,167**	**-1.7**	**29,280,242,396**	**29,494,108,032**	**0.7**
Non-Production-related Waste	26,311,489	305,727,127	1,062.0	1,613,324	506,658,122	31,304.6	27,924,813	812,385,249	2,809.2

Note: Data are from Section 8 of Form R for 1998 and 1999.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

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



percent (2.38 billion pounds) consisted of quantities released on- and off-site.

For the new industries, production-related waste amounted to 6.40 billion pounds in 1999, a decrease of 1.7 percent from 1998. Of the 1999 total for new industries, 79.1 percent (5.06 billion pounds) was released on- and off-site.

The amount of production-related waste recycled on-site for all TRI industries decreased by 6.7 percent between 1998 and 1999, from 8.61 billion pounds to 8.04 billion pounds. The quantity recycled on-site by the original industries declined by 6.8 percent, but that group's 7.84 billion pounds still accounted for 97.5 percent of total on-site recycling in 1999. The new industries reported 198.5 million pounds of on-site recycling in 1999, 2.9 percent lower than in 1998. The original industries managed 33.9 percent of their production-related waste through on-site recycling; for the new industries, the share was 3.1 percent.

For off-site recycling, too, the original industries, with 2.13 billion pounds, accounted for the bulk of the 2.17 billion pounds for all TRI industries. The original industries' quantity of waste recycled off-site rose by 3.1 percent, and total off-site recycling by all TRI industries increased by 2.9 percent. The new industries recycled off-site 35.2 million pounds; the amount recycled declined by 5.8 percent between 1998 and 1999. Off-site recycling accounted for 9.2 percent of waste management by the original industries in 1999; for the new industries, the share was about 0.6 percent.

On-site energy recovery for the original industries and for all TRI industries declined slightly between 1998 and 1999, by 0.8 percent in each case. The amount sent to energy recovery by the original industries decreased from 2.83 billion pounds to 2.81 billion pounds. The new industries reported a 5.6 percent decline in on-site energy recovery, but the decrease (from 11.4 million pounds to 10.8 million pounds) had little effect on the TRI total. The original industries managed 12.1 percent of their production-related waste through on-site energy recovery. The new industries managed only about 0.2 percent of their waste by this method.

Off-site energy recovery for TRI industries as a whole fell from 900.7 million pounds in 1998 to 779.3 million pounds in 1999, a decrease of 13.5 percent. A 35.2 percent drop in off-site energy recovery by the new industries (from 413.1 million pounds to 267.7 million pounds) more than offset a 4.9 percent increase for the original industries, from 487.6 million pounds to 511.6 million pounds. The new industries accounted for 34.3 percent of the TRI total for off-site energy recovery, sharply down from the 1998 share, 45.9 percent. For both groups, off-site energy recovery accounted for a small proportion of waste managed—about 2 percent for the original industries and 4 percent for the new industries.

On-site treatment for all TRI industries rose by 16.2 percent, from 6.54 billion pounds to 7.60 billion pounds. Both the original and the new industries reported increases in this category, by 15.8 percent and 19.9 percent, respectively. For the original industries, the increase was from 5.91 billion pounds in 1998 to 6.85 billion pounds in 1999; for the new industries, it was from 629.2 million pounds to 754.3 million pounds. The original industries managed almost 30 percent of their production-relat-

ed waste through on-site treatment. For the new industries, the share was about 11.8 percent.

Off-site treatment declined across the board—by 5.7 percent for all TRI industries, by 3.5 percent for the original industries, and by 20.2 percent for the new industries. The quantity treated off-site for all TRI industries was 683.2 million pounds in 1998 and 644.3 million pounds in 1999. The share managed by this method was small: less than 3 percent for the original industries and about 1 percent for the new industries.

The largest waste management category for the new industries, and the only one for which the new industries reported a larger amount than did the original industries, was quantity released on- and off-site. The total quantity released on- and off-site for all TRI industries in 1999 was 7.44 billion pounds, a decline of 2.0 percent from the 1998 total of 7.59 billion pounds. The original industries reported 2.38 billion pounds released on- and off-site, a 3.7 percent decrease from 2.48 billion pounds in 1998. For the new industries, the 1999 amount was 5.06 billion pounds, down by 1.2 percent from 5.12 billion pounds in 1998. The new industries' on- and off-site releases constituted 68.0 percent of total on- and off-site releases for all TRI industries. As noted above, on- and off-site releases accounted for almost 80 percent of the new industries' production-related waste. The quantity released on- and off-site accounted for 10.3 percent of the original industries' total production-related waste. Non-production-related waste is overstated in this report for all years. Those forms indicating NA for non-production-related waste were assigned one pound erroneously. The total amount overstated is about 4,500 pounds for each year.

Transfers Off-site for Further Waste Management/Disposal

As shown in Table 2–3, transfers off-site for further waste management and disposal in 1999 totaled 4.10 billion pounds for all TRI industries, of which 3.64 billion pounds were reported by the original TRI industries and 464.9 million pounds by the new industries. The figure for the original industries was a 3.6 percent increase over the 3.51 billion pounds reported in 1998. The new industries' 1999 transfers were 28.2 percent lower than in 1998, when the amount was 647.7 million pounds.

Recycling accounted for 57.1 percent (2.08 billion pounds) of off-site transfers by the original industries in 1999, about the same share as in 1998. The amount sent for recycling rose from 2.01 billion pounds in 1998 to 2.08 billion pounds in 1999, an increase of 3.4 percent. That increase offset a 3.7 percent decrease in transfers to recycling by the new industries, and the TRI total rose 3.3 percent, from 2.04 billion pounds to 2.11 billion pounds.

In 1998 most of the new industries' transfers were to energy recovery (430.2 million pounds or 66.4 percent of all the group's transfers); in 1999, energy recovery accounted for 56.6 percent, and the amount had fallen to 263.1 million pounds, a decrease of 38.8 percent. Although transfers to energy recovery by the original industries rose 6.5 percent, from 483.2 million pounds to 514.4 million pounds, the drop in the new industries' transfers in this category meant a decline of 14.9 percent for all TRI industries, from 913.3 million pounds to 777.5 million pounds.

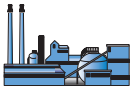


Table 2-3. TRI Off-site Transfers for Further Waste Management/Disposal, Original and New Industries, 1998–1999

Type of Transfer	Original Industries			New Industries			All TRI Industries		
	1998 Pounds	1999 Pounds	Change 1998-1999 Percent	1998 Pounds	1999 Pounds	Change 1998-1999 Percent	1998 Pounds	1999 Pounds	Change 1998-1999 Percent
Transfers to Recycling	2,007,189,584	2,075,254,609	3.4	37,769,396	36,366,325	–3.7	2,044,958,980	2,111,620,934	3.3
Transfers to Energy Recovery	483,159,533	514,397,272	6.5	430,181,326	263,137,159	–38.8	913,340,859	777,534,431	–14.9
Transfers to Treatment	252,642,579	240,886,196	–4.7	71,988,800	52,228,279	–27.4	324,631,379	293,114,475	–9.7
Transfers to POTWs	328,348,688	322,267,961	–1.9	2,047,567	2,096,322	2.4	330,396,255	324,364,283	–1.8
Metals and Metal Compounds	3,009,214	3,345,324	11.2	419,223	58,383	–86.1	3,428,437	3,403,707	–0.7
Non-metal TRI Chemicals	325,339,474	318,922,637	–2.0	1,628,344	2,037,939	25.2	326,967,818	320,960,576	–1.8
Other Off-site Transfers*	648,856	308,270	–52.5	10,320	553,773	5,266.0	659,176	862,043	30.8
Other Transfers Off-site to Disposal**	438,959,755	483,494,678	10.1	105,663,990	110,480,996	4.6	544,623,745	593,975,674	9.1
Total Transfers Off-site for Further Waste Management/Disposal	**3,510,948,995**	**3,636,608,986**	**3.6**	**647,661,399**	**464,862,854**	**-28.2**	**4,158,610,394**	**4,101,471,840**	**-1.4**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's other transfers off-site to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising other transfers off-site to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal compounds.

Transfers to treatment fell for both groups, by 4.7 percent for the original industries and by 27.4 percent for the new industries. The TRI total decreased from 324.6 million pounds to 293.1 million pounds, a decline of 9.7 percent. The new industries accounted for 17.8 percent (52.2 million pounds) of wastes sent to treatment by TRI industries, a decrease from 22.2 percent in 1998. Transfers to POTWs also fell for TRI industries as a whole, by 1.8 percent. The new industries reported a 2.4 percent increase in their relatively small quantity of transfers to POTWs, to 2.1 million pounds in 1999, but the larger transfers by the original industries declined by 1.9 percent, from 328.3 million pounds in 1998 to 322.3 million pounds in 1999. Within the category of new industry transfers to POTWs, transfers of metals and metal compounds dropped by 86.1 percent, and those of nonmetals rose by 25.2 percent. On the other hand, within the category of original industry transfers to POTWs, transfers of metals and metal compounds increased by 11.2 percent, and those of nonmetals decreased by 2.0 percent.

Other transfers off-site to disposal rose for both groups, from 439.0 million pounds to 483.5 million pounds for the original industries, an increase of 10.1 percent, and from 105.7 million pounds to 110.5 million pounds for the new industries (4.6 percent). The total for all TRI industries rose 9.1 percent, from 544.6 million pounds to 594.0 million pounds. The new industries accounted for 18.6 percent of other transfers to disposal, down from 19.4 percent in 1998.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

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. TRI facilities (both original and new

industries) projected a reduction in total production-related waste to 29.01 billion pounds by 2001, from 29.49 billion pounds in 1999, a projected decrease of 1.7 percent (see Table 2–4). The original industries, however, expected their total to increase by 1.4 percent, from 23.10 billion pounds in 1999 to 23.42 billion pounds in 1999. The new industries expected their total production-related waste to decrease by 12.7 percent, from 6.40 billion pounds in 1999 to 5.58 billion pounds in 2001. The expected decreases would reduce the new industries' proportion of total production-related waste from 21.7 percent in 1999 to a projected 19.2 percent in 2001.

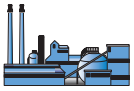
Quantities released on- and off-site are expected to decrease, for both original and new industries and for TRI industries as a whole. Releases on- and off-site represent the least-desirable option under the waste management hierarchy described in **Waste Management** in Chapter 1. The projected decrease of 11.6 percent in such releases—from 7.44 billion pounds in 1999 to 6.58 billion pounds in 2001 for all TRI industries—therefore represents a positive develop-

Table 2-4. Current Year and Projected Quantities of TRI Chemicals in Waste, Original and New Industries, 1999-2001

Waste Management Activity	Original Industries			New Industries		
	1999 Pounds	2000 Pounds	2001 Pounds	1999 Pounds	2000 Pounds	2001 Pounds
Recycled On-site	7,839,852,848	7,813,877,076	8,488,898,837	198,496,815	193,850,040	193,458,146
Recycled Off-site	2,134,897,467	2,123,946,416	2,159,583,461	35,157,658	32,579,155	29,862,573
Energy Recovery On-site	2,806,098,993	2,798,226,054	2,901,923,158	10,762,603	5,234,611	5,252,671
Energy Recovery Off-site	511,631,406	490,326,952	508,060,464	267,664,335	222,350,235	224,605,934
Treated On-site	6,850,326,119	6,465,227,785	6,559,499,666	754,327,458	763,242,958	732,082,011
Treated Off-site	571,669,556	535,158,963	543,776,497	72,630,384	64,921,430	78,596,620
Quantity Released On- and Off-site	2,384,303,476	2,277,326,241	2,261,450,905	5,056,288,914	4,625,585,250	4,319,500,294
Total Production-related Waste	**23,098,779,865**	**22,504,089,487**	**23,423,192,988**	**6,395,328,167**	**5,907,763,679**	**5,583,358,249**

Waste Management Activity	All TRI Industries			Projected Change 1999-2001		
	1999 Pounds	2000 Pounds	2001 Pounds	Original Industries Percent	New Industries Percent	All Industries Percent
Recycled On-site	8,038,349,663	8,007,727,116	8,682,356,983	8.3	–2.5	8.0
Recycled Off-site	2,170,055,125	2,156,525,571	2,189,446,034	1.2	–15.1	0.9
Energy Recovery On-site	2,816,861,596	2,803,460,665	2,907,175,829	3.4	–51.2	3.2
Energy Recovery Off-site	779,295,741	712,677,187	732,666,398	–0.7	–16.1	–6.0
Treated On-site	7,604,653,577	7,228,470,743	7,291,581,677	–4.2	–2.9	–4.1
Treated Off-site	644,299,940	600,080,393	622,373,117	–4.9	8.2	–3.4
Quantity Released On- and Off-site	7,440,592,390	6,902,911,491	6,580,951,199	–5.2	–14.6	–11.6
Total Production-related Waste	**29,494,108,032**	**28,411,853,166**	**29,006,551,237**	**1.4**	**-12.7**	**-1.7**

Note: Current year (1999) and projected (2000 and 2001) amounts are from Section 8 of Form R for 1999.
Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.



ment in TRI facilities' waste management. For new industries the expected decrease would be 14.6 percent and for original industries 5.2 percent.

Economic Overview, by Industry

TRI data present significant information about toxic chemicals that are released on- and off-site, managed in waste on- and off-site, and transferred off-site for further waste management. TRI data do, however, have limitations, as discussed in Chapter 1. One limitation is that TRI data do not distinguish the industry-specific factors that influence the chemicals, amounts, types of releases, and other waste management, including transfers, reported by facilities. For the new TRI industries, the 1998 TRI Public Data Release (EPA 745-R-00-007, September 2000) supplied information about some of these factors, such as industry-specific processes that involve toxic chemicals. The 1996 TRI Public Data Release, in two volumes (EPA 745-R-98-005, May 1998, and EPA 745-R-98-018, December 1998), provided similar information for the original TRI industries.

Basic economic information provides another tool for identifying certain industry characteristics. Table 2–5 presents two economic measures—employment, and the dollar value of sales, receipts, shipments, or revenue—that suggest the relative size of the new industries. Economic analyses use data on the value of production (sales, receipts, shipments, or revenue) as one way of indicating the size of industrial sectors, in as much as no direct comparison can be drawn among the products and services of the sectors. The economic data in Table 2–5 are from the 1997 Economic Census, the latest consistent data available across all TRI industries, original and new.

Table 2–5 also provides total production-related waste managed, as reported by TRI facilities for 1999, to allow approximate comparisons with the economic activity of the industry sectors. The last column of the table shows the ratio of total production-related waste managed to production value (sales, receipts, shipments, or revenue). This ratio permits a comparison of the 1999 reported TRI quantities for each industry with that industry's production level for 1997. Relating TRI quantities to the dollar value of each industry's products provides one measure of the differences in waste production between different sectors independent of economic activity.

As shown in Table 2–5, metal mines reporting to TRI managed 395,774 pounds of total production-related waste for each $1 million of shipments. This was the largest ratio among the new TRI industries. Hazardous waste treatment and disposal and solvent recovery services (treated as a single category for the purpose of this analysis) managed 352,874 pounds of total production-related waste per $1 million of receipts, the second-highest ratio, and electrical utilities ranked third, with 34,174 pounds per $1 million.

Table 2-5. Employees and Sales (1997) and Total Production-related Waste (1999), by Industry

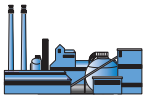
US SIC Code[a]	NAICS Code[a]	Industry Sector	Paid Employees, 1997	Sales, Receipts, Shipments or Revenue, 1997	TRI Total Production-related Waste Managed, 1999	Waste Managed per Sales, Receipts, Shipments or Revenue
			Number	($000)	Pounds	Pounds per $1,000,000
10		Metal Mining[b]	36,884	9,166,095	3,627,697,962	395,774
1021	212234	Copper Ores				
1031	212231	Lead and Zinc Ores				
1041	212221	Gold Ores				
1044	212222	Silver Ores				
1061		Ferroalloy Ores, exc. Vanadium (included in 109920)				
1099	109920	Misc. metal ores, n.e.c.				
12		Coal Mining[c]	87,793	23,377,137	12,153,738	520
1221	212111	Bituminous Coal and Lignite Surface Mining				
1222	212112	Bituminous Coal Underground Mining				
1231	212113	Anthracite Mining				
5169	4226	Chemical and Allied Products Wholesale	165,768	128,923,496	39,792,919	309
5171	42271	Petroleum Bulk Stations and Terminals[d]	137,829	267,625,942	48,715,577	182
	221112	Fossil Fuel Electric Power Generation	93,765	48,324,008	1,651,402,311	34,174
4911 (part)		Electric Services (electric power generation by fossil fuels)				
4931 (part)		Electric and Other Services Combined (electric power generation by fossil fuels)				
4939 (part)		Combination utilities n.e.c. (electric power generation by fossil fuels)				
4953 (part) 7389 (part)	562211	Hazardous Waste Treatment and Disposal and Solvent Recovery Services	17,816	2,877,982	1,015,565,660	352,874
20–39		Manufacturing Industries	17,633,977	3,964,788,992	23,037,403,159	5,810

Note: Paid Employees and Sales, Receipts, Shipments or Revenue from U.S. Census Bureau, 1997 Economic Census http://www.census.gov/epcd/www/econ97.html [accessed June 4, 2000]. These data are preliminary and are subject to change; includes only establishments with payroll. Data are in current dollars and have not been adjusted for inflation.
Total Production-related Waste Managed from Section 8 (total of 8.1 through 8.7, Column B) of TRI Form for 1999. **Total Production-related Waste Managed** in this table does not include forms reporting more than one 2-digit SIC code and forms reporting SIC codes outside the 20–39 range.
[a] 1997 Economic Census data were collected and published using the 1997 North American Industry Classification System (NAICS). Data presented here with the 1987 Standard Industrial Classification (SIC) Codes, used by TRI, follow the U.S. Census Bureau crosswalk between the two systems.
[b] Economic data for SIC code 10, metal mining, include activities not covered by TRI (processing or otherwise use of TRI chemical in mining overburden).
[c] Economic data for SIC code 12, coal mining, include extraction activities not covered by TRI.
[d] 1997 Economic Census data revised March 2000.

Chapter 3

1999 TRI Data and 1995–1999 Trends (Original Industries Only)

Chapter 3



1999 TRI Data and 1995–1999 Trends (Original Industries Only)

INTRODUCTION

This chapter summarizes information reported by facilities in the original TRI industries (manufacturing facilities in SIC codes 20–39 and federal facilities) for calendar year 1999 and examines trends in the data for 1995 to 1999. It provides an overview that includes TRI data for facilities' on- and off-site releases, and other waste management, including transfers to off-site locations for further management. Data are summarized for the nation and by state. Also presented is a summary view of 1988–1999 data for TRI's release and original transfer categories.

Analyses in this chapter do not include reporting by the seven industries that were added to TRI in 1998. Industry-specific analyses appear in the subsequent chapters. Chapter 4 examines release and other waste management data for the seven industries newly reporting to TRI in 1998 and compares the new industries' information with TRI reports as a whole. Chapter 5 analyzes release and other waste management data reported by the original TRI industries for 1999 and examines trends in original-industry data since 1995, 1991, and 1988. Data are presented by SIC code within the original manufacturing industries, and trends for industry subsectors are examined. Data for all TRI chemicals appear in the appendices to this volume.

Important descriptions of the categories of releases and waste management activities that are reportable to TRI appear in Chapter 1, in **TRI Releases and Other Waste Management: Data Analyzed in *1999 TRI Public Data Release.*** The information provided in Chapter 1 is essential for understanding the data presented throughout this book.

The 1995 baseline serves to measure recent trends in the TRI data. Using 1995 as a baseline captures important expansions and revisions in TRI that occurred throughout the early-to-mid-1990s. These include the addition in 1991 of waste management data, under the Pollution Prevention Act of 1990; required reporting by federal facilities since 1994; the major expansion of reportable chemicals that nearly doubled the TRI chemical list beginning in 1995; and availability of Form A certification statement for facilities with low annual amounts, also beginning in 1995.

Chemical release trends can be further examined by using 1988 as a baseline to measure reductions in the release and original transfer categories. Data used in this analysis cover only the original TRI indus-

Table 3–1. TRI Facilities and Forms, 1995 and 1998–1999, Original Industries

	1995	1998	1999	Change 1998–1999		Change 1995–1999	
	Number	Number	Number	Number	Percent	Number	Percent
Total Facilities	22,436	21,334	20,698	–636	–3.0	–1,738	–7.7
Total Forms	74,465	70,975	69,471	–1,504	–2.1	–4,994	–6.7
Form Rs	68,109	60,641	59,265	–1,376	–2.3	–8,844	–13.0
Form As	6,356	10,334	10,206	–128	–1.2	3,850	60.6

tries and the chemicals that have been reportable under TRI in all years from 1988 to 1999.

TRI Releases, 1995–1999

For 1999, 20,698 facilities in the original industries filed 69,471 TRI reporting forms (see Table 3–1). The number of facilities reporting to TRI decreased 3.0 percent from 1998, continuing a longstanding trend. Since 1995, the number of original industry facilities reporting has decreased 7.7 percent. The number of forms submitted shows comparable declines.

Almost 15 percent of the 1999 original industry submissions were Form A certification statements rather than Form Rs, the standard TRI reports. EPA established the Form A certification option, beginning with the 1995 reporting year, for facilities that meet TRI reporting thresholds but that do not have a total annual reportable amount for a listed chemical exceeding 500 pounds and that do not manufacture, process, or otherwise use more than 1 million pounds of the chemical.[1] As explained in **How Do Facilities Report?** in Chapter 1, Form A certification statements do not report amounts of chemical releases, including transfers, or other waste management activities.

On- and Off-site Releases

In 1999, on-site and off-site releases reported to TRI by the original industries totaled 2.44 billion pounds, as shown in Table 3–2. This amount includes releases directly to the air, water, or land, as well as disposal of toxic chemicals in on-site or off-site landfills, surface impoundments, land treatment, and underground injection wells. (On-site and off-site releases are described in detail in Boxes 1–4 and 1–5 in Chapter 1.)

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

[1]The total annual reportable amount is defined as the sum of the production-related waste management categories that would be reported to TRI: quantities released (including disposal), recovered as a result of recycling operations, combusted for energy recovery, or treated at the facility, plus amounts transferred off-site for recycling, energy recovery, treatment, or disposal. These amounts correspond to total production-related waste in this report.

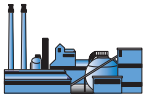


Table 3-2. TRI On-site and Off-site Releases, 1995 and 1998–1999, Original Industries

	1995	1998	1999	Change 1998-1999		Change 1995-1999	
	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
On-site Releases							
Total Air Emissions	1,590,651,239	1,270,193,503	1,175,054,932	–95,138,571	–7.5	–415,596,307	–26.1
Fugitive Air Emissions	394,285,344	294,971,535	270,765,473	–24,206,062	–8.2	–123,519,871	–31.3
Point Source Air Emissions	1,196,365,895	975,221,968	904,289,459	–70,932,509	–7.3	–292,076,436	–24.4
Surface Water Discharges	191,919,759	238,483,036	253,591,816	15,108,780	6.3	61,672,057	32.1
Underground Injection	248,927,637	209,711,433	199,547,803	–10,163,630	–4.8	–49,379,834	–19.8
On-site Land Releases	284,190,539	343,781,378	323,667,851	–20,113,527	–5.9	39,477,312	13.9
On-site Landfills	83,653,068	113,935,316	98,443,132	–15,492,184	–13.6	14,790,064	17.7
Land Treatment	11,405,847	8,154,812	8,961,222	806,410	9.9	–2,444,625	–21.4
Surface Impoundments	64,947,221	81,151,225	73,771,878	–7,379,347	–9.1	8,824,657	13.6
Other Disposal	124,184,403	140,540,025	142,491,619	1,951,594	1.4	18,307,216	14.7
Total On-site Releases	**2,315,689,174**	**2,062,169,350**	**1,951,862,402**	**–110,306,948**	**–5.3**	**–363,826,772**	**–15.7**
Off-site Releases							
Storage Only[a]	2,398,318	6,052,636	6,286,182	233,546	3.9	3,887,864	162.1
Solidification/Stabilization[b]	26,801,593	135,956,959	139,566,130	3,609,171	2.7	112,764,537	420.7
Metals and Metal Compounds Only							
Wastewater Treatment (excluding POTWs)[c]	3,881,107	3,968,149	6,593,482	2,625,333	66.2	2,712,375	69.9
Metals and Metal Compounds Only							
Transfers to POTWs[d]	2,552,146	3,009,214	3,345,324	336,110	11.2	793,178	31.1
Metals and Metal Compounds Only							
Underground injection	17,505,679	12,103,395	29,462,912	17,359,517	143.4	11,957,233	68.3
Landfills/Surface Impoundments	227,251,506	235,714,865	232,695,527	–3,019,338	–1.3	5,444,021	2.4
Land Treatment	4,505,535	1,396,685	4,239,385	2,842,700	203.5	–266,150	–5.9
Other Land Disposal	12,573,281	15,630,242	15,829,071	198,829	1.3	3,255,790	25.9
Other Off-site Management	15,460,852	10,372,175	34,080,934	23,708,759	228.6	18,620,082	120.4
Transfers to Waste Broker for Disposal	5,993,004	14,087,152	11,146,540	–2,940,612	–20.9	5,153,536	86.0
Unknown[e]	1,807,187	3,677,497	3,594,515	–82,982	–2.3	1,787,328	98.9
Total Off-site Releases (Transfers Off-site to Disposal)	**320,730,208**	**441,968,969**	**486,840,002**	**44,871,033**	**10.2**	**166,109,794**	**51.8**
Total On-site and Off-site Releases	**2,636,419,382**	**2,504,138,319**	**2,438,702,404**	**–65,435,915**	**–2.6**	**–197,716,978**	**–7.5**

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in the 1996 reporting year.

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

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

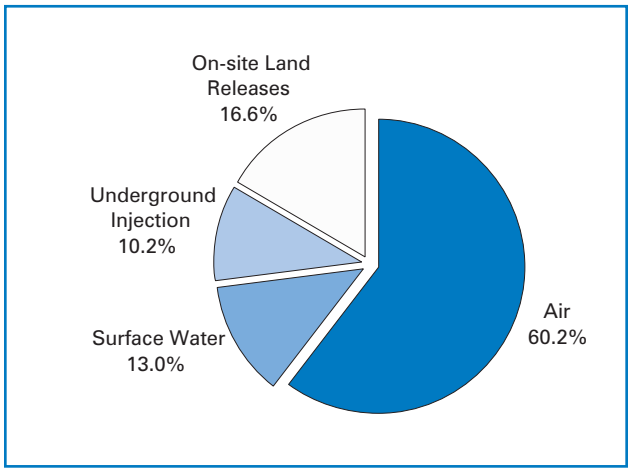
[b] Beginning in reporting year 1997, transfers to solidification/stabilization of metals and metal compounds (waste treatment code M41) are reported separately from transfers to solidification/stabilization of non-metal TRI chemicals (waste treatment code M40). Because this treatment method prepares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

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

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

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

Figure 3–1. 1999 TRI On-site Releases, Original Industries



Note: On-site Releases are from Section 5 of Form R.

Total on-site and off-site releases decreased by 197.7 million pounds between 1995 and 1999; including a reduction of 65.4 million pounds between 1998 and 1999. The decrease of 7.5 percent between 1995 and 1999 reflects reductions in on-site releases, which make up about 80 percent of all TRI releases for the original industries and which decreased by 15.7 percent (363.8 million pounds) during the five-year period. Off-site releases, by contrast, rose by 51.8 percent (166.1 million pounds) during the period 1995–1999 and showed a 10.2 percent increase between 1998 and 1999.

On-site Releases

On-site releases for the original industries totaled 1.95 billion pounds in 1999 (see Table 3–2). The largest category was air emissions, with 1.18 billion pounds. These releases to air consisted of 904.3 million pounds of point source (stack) emissions and 270.8 million pounds of non-point (fugitive) emissions. As is shown in Figure 3–1, releases to air represented 60.2 percent of all on-site releases in 1999.

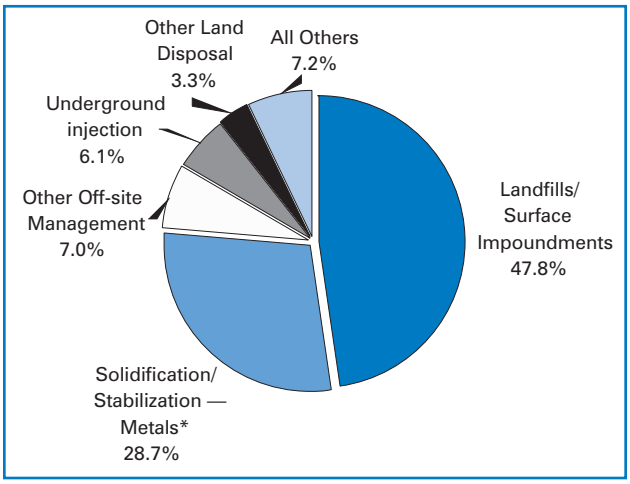
Facilities in the original industries discharged 253.6 million pounds of toxic chemicals into the nation's rivers, lakes, bays, and other bodies of water in 1999. These surface water discharges accounted for 13.0 percent of all TRI on-site releases for the original industries. Underground injection amounted to 199.5 million pounds, or 10.2 percent of the total. On-site releases to land came to 323.7 million pounds, 16.6 percent of all on-site releases. The largest amount under on-site land releases, 142.5 million pounds, was reported as other disposal, which includes accidental releases and disposal methods other than landfilling or surface impoundment.

Air emissions fell 26.1 percent between 1995 and 1998, and this decrease of 415.6 million pounds was the largest factor in the overall reduction of on-site releases for the original industries. Underground injection showed a reduction of 19.8 percent (49.4 million pounds). Both surface water discharges and on-site land releases increased between 1995 and 1998, by 32.1 percent (61.7 million pounds) and 13.9 percent (39.5 million pounds), respectively. On-site land releases, however, declined by 5.9 percent (20.1 million pounds) in the last year of the period as a result of reductions in releases to on-site landfills and surface impoundments.

Off-site Releases

As is explained in Box 1–5 in Chapter 1, off-site releases in this report consist of two general types of off-site transfers: transfers of all TRI chemicals to disposal (landfills, surface impoundments, underground injection, and other disposal practices, including storage) and transfers of metals and metal compounds to solidification/stabilization and to wastewater treatment by private treatment services or publicly

Figure 3-2. 1999 TRI Off-site Releases, Original Industries



Note: 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.
* See notes to Table 3–2.

owned treatment works (POTWs, or municipal sewage treatment facilities). Boxes 1–6 and 1–7 in Chapter 1 supply detailed information on reporting and analysis of data on TRI metals and metal compounds. (Data for metals and their compounds for 1999 appear in Appendix B.)

In 1999, TRI facilities in the original industries reported a total of 486.8 million pounds of toxic chemicals in transfers off-site that represent releases to the environment (see Table 3–2). Of this amount, 232.7 million pounds, or 47.8 percent of total off-site releases, was sent off-site for disposal in landfills or surface impoundments. Another 139.6 million pounds consisted of metals and metal compounds sent off-site for solidification/stabilization. These two types of off-site releases—landfills/surface impoundments and metals solidification/stabilization—accounted for 76.5 percent of all off-site releases in 1999, as illustrated in Figure 3–2.

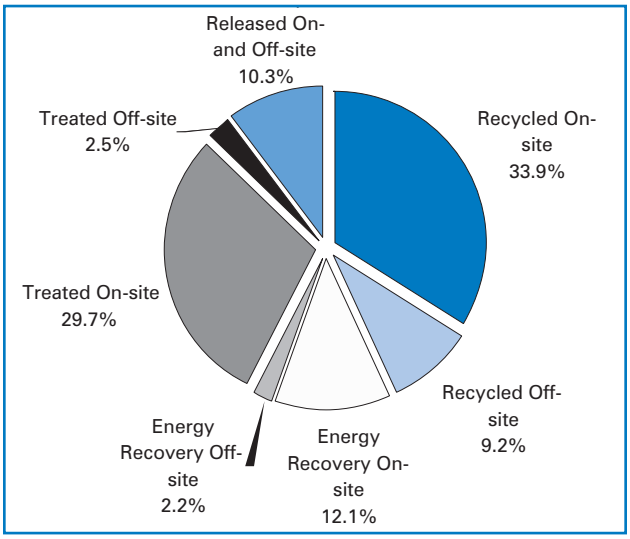
As noted above, between 1995 and 1999, off-site releases rose 51.8 percent, from 320.7 million pounds to 486.8 million pounds. A significant increase in solidification and stabilization of metals and metal

Table 3-3. Quantities of TRI Chemicals in Waste, 1995 and 1998–1999, Original Industries

Waste Management Activity	1995	1998	1999	Change 1998-1999		Change 1995-1999	
	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
Recycled On-site*	7,253,139,227	8,407,381,641	7,839,852,848	–567,528,793	–6.8	586,713,621	8.1
Recycled Off-site	2,340,012,471	2,071,439,013	2,134,897,467	63,458,454	3.1	–205,115,004	–8.8
Energy Recovery On-site	2,740,693,446	2,827,695,743	2,806,098,993	–21,596,750	–0.8	65,405,547	2.4
Energy Recovery Off-site	504,296,260	487,588,775	511,631,406	24,042,631	4.9	7,335,146	1.5
Treated On-site	6,504,643,933	5,913,717,613	6,850,326,119	936,608,506	15.8	345,682,186	5.3
Treated Off-site	604,897,307	592,216,295	571,669,556	–20,546,739	–3.5	–33,227,751	–5.5
Quantity Released On- and Off-site	2,588,477,206	2,475,386,574	2,384,303,476	–91,083,098	–3.7	–204,173,730	–7.9
Total Production-related Waste	**22,536,159,850**	**22,775,425,654**	**23,098,779,865**	**323,354,211**	**1.4**	**562,620,015**	**2.5**
Non-production-related Waste	30,108,369	26,311,489	305,727,127	279,415,638	1062.0	275,618,758	915.4

Note: All data are from Section 8 of Form R for the year indicated.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising quantities treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.
*Seven facilities in the food processing industry (SIC code 20) reported from 150 million pounds to 1 billion pounds each in on-site recycling of n-hexane in 1995, for a total of 4.0 billion pounds. In 1996 these facilities reported no on-site recycling of n-hexane. On their 1996 Form Rs, these facilities also reported zero for on-site recycling of n-hexane for the prior year (1995). However, they have not revised their 1995 forms. These amounts of on-site recycling in 1995 have been omitted from this table.

Figure 3-3. 1999 Quantities of TRI Chemicals in Waste, Original Industries



Note: Data are from Section 8 of Form R.

compounds contributed to this trend. Over the five-year period 1995–1999, solidification/stabilization of metals and metal compounds rose from 26.8 million pounds to 139.6 million pounds, an increase of 112.8 million pounds, or 420.7 percent, and from 1998 to 1999 the increase was 3.6 million pounds or 2.7 percent.

Waste Management Data, 1995–1999

Quantities of TRI Chemicals in Waste

Facilities in the original industries reported managing 23.10 billion pounds of production-related waste in 1999, as shown in Table 3–3. (Detailed descriptions of the types of waste management data reported to TRI appear in Box 1–9 in Chapter 1.)

Most waste management occurs on-site. The largest waste management quantity reported was in on-site recycling, 7.84 billion pounds. The next largest was on-site treatment, 6.85 billion pounds, followed by on-site energy recovery, which amounted to 2.81 billion pounds. As shown in Figure 3–3, 43.1 percent of TRI chemicals in waste was recycled, on- and off-site. On-site recycling alone accounted for 33.9 percent.

In 1999, quantities released on- and off-site—the least-desirable activity under the waste management hierarchy described in **Waste Management** in Chapter 1—amounted to 2.38 billion pounds, or 10.3 percent of total production-related waste managed. (It should be noted that the quantity released on- and off-site presented in Table 3–3 is not the same as the total on- and off-site releases presented in Table 3–2. As explained in Box 1–10 in Chapter 1, the difference arises principally from the types of releases reported in different sections of TRI Form R.)

The amount of total production-related waste was 2.5 percent higher in 1999 than in 1995. This reflects primarily changes in on-site recycling, which increased by 8.1 percent over the period 1995–1999, although there was a 6.8 percent decrease in the latest period from 1998–1999.

Quantities released on- and off-site decreased, by 7.9 percent, from 2.59 billion pounds in 1995 to 2.38 billion pounds in 1999. This included a 3.7 percent decrease from 1998 to 1999. Off-site recycling also decreased, by 8.8 percent, from 2.34 billion pounds in 1995 to 2.13 million pounds in 1999. However, from 1998 to 1999 off-site

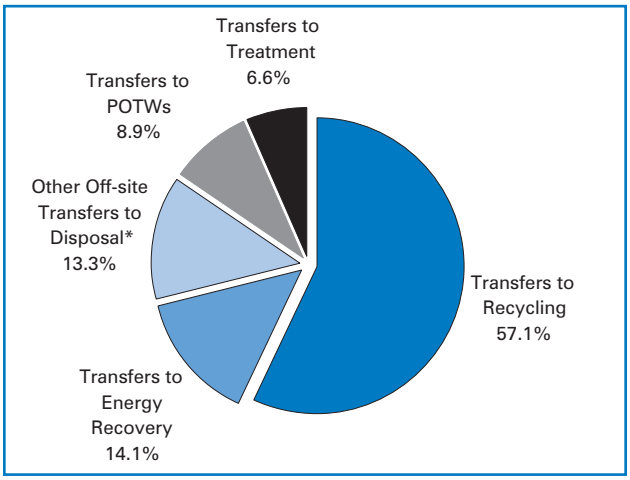
Table 3-4. TRI Transfers Off-site for Further Waste Management/Disposal, 1995 and 1998–1999, Original Industries

	1995	1998	1999	Change 1998-1999		Change 1995-1999	
	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
Transfers to Recycling	2,254,316,704	2,007,189,584	2,075,254,609	68,065,025	3.4	–179,062,095	–7.9
Transfers to Energy Recovery	519,311,395	483,159,533	514,397,272	31,237,739	6.5	–4,914,123	–0.9
Transfers to Treatment	251,853,859	252,642,579	240,886,196	–11,756,383	–4.7	–10,967,663	–4.4
Transfers to POTWs	299,380,690	328,348,688	322,267,961	–6,080,727	–1.9	22,887,271	7.6
Metals and Metal Compounds Only	2,552,146	3,009,214	3,345,324	336,110	11.2	793,178	31.1
Non-metal TRI Chemicals	296,828,544	325,339,474	318,922,637	–6,416,837	–2.0	22,094,093	7.4
Other Off-site Transfers*	2,501,306	648,856	308,270	–340,586	–52.5	–2,193,036	–87.7
Other Off-site Transfers to Disposal**	318,178,062	438,959,755	483,494,678	44,534,923	10.1	165,316,616	52.0
Total Transfers Off-site for Further Waste Management/Disposal	**3,645,542,016**	**3,510,948,995**	**3,636,608,986**	**125,659,991**	**3.6**	**-8,933,030**	**-0.2**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's other off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising other off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.
*Off-site Transfers are transfers reported without a valid waste management code.
**Does not include transfers to POTWs of metals and metal compounds.

recycling increased by 3.1 percent. Non-production-related waste is overstated in this report for all years. Those forms indicating NA for non-production-related waste were assigned one pound erroneously. The total amount overstated is about 4,500 pounds for each year.

Figure 3-4. 1999 TRI Transfers Off-site for Further Waste Management/Disposal, Original Industries



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

Transfers Off-site for Further Waste Management and Disposal

In 1999, facilities sent 3.64 billion pounds of toxic chemicals to off-site locations for further waste management by recycling, energy recovery, or treatment (including treatment by POTWs) and for disposal, as shown in Table 3–4. Box 1–11 in Chapter 1 describes the types of off-site transfers for further waste management analyzed in this section. Box 1–5 in Chapter 1 describes off-site transfers to disposal.

The largest category was recycling, 2.08 billion pounds. Recycling accounted for 57.1 percent of all off-site transfers (see Figure 3–4).

TRI facilities also reported sending 514.4 million pounds of toxic chemicals off-site to be burned for energy recovery. The share of this category in transfers off-site was 14.1 percent. Transfers to treatment totaled 240.9 million pounds (6.6 percent), and transfers to POTWs were 322.3 million pounds (8.9

percent). Off-site transfers to disposal accounted for 483.5 million pounds, or 13.3 percent of total transfers.

Although recycling remains by far the largest type of transfer off-site for further waste management, it declined by 179.1 million pounds, or 7.9 percent, between 1995 and 1999. During 1998–1999, however, it increased by 68.1 million pounds, or 3.4 percent. Transfers to energy recovery decreased slightly between 1995 and 1999, by 4.9 million pounds (0.9 percent), but between 1998 and 1999 they rose by 31.2 million pounds (6.5 percent). Transfers to treatment and to POTWs both decreased between 1998 and 1999, by 4.7 percent and 1.9 percent, respectively. Over the five-year period 1995–1999, however, transfers to POTWs grew 7.6 percent, mainly because of an increase of 22.1 million pounds for non-metal TRI chemicals. Transfers to treatment fell by 4.7 percent (11.8 million pounds) between 1998 and 1999, continuing a trend that saw these transfers decline by 4.4 percent between 1995 and 1999.

The category other off-site transfers to disposal grew 52.0 percent (165.3 million pounds) over the period 1995–1999 and 10.1 percent (44.5 million pounds) between 1998 and 1999.

TRI Data by State, 1995–1999

Tables 3–5 through 3–10 present the distribution of TRI releases and other waste management by state for the original industries.

On- and Off-site Releases by State

As is shown in Table 3–5, the three top states for total releases for the original industries in 1999 were Texas, with 260.5 million pounds, Ohio, with 151.5 million pounds, and Pennsylvania. As explained previously in the section on TRI Releases, 1995-1999, because of a data entry error, revisions by a facility in Pennsylvania were not incorporated into the data found in Table 3–5. The revisions change the rank of Pennsylvania to third behind Ohio. Three other states, Louisiana (135.1 million pounds), Indiana (134.6 million pounds), and Illinois (108.3 million pounds) had total releases of more than 100 million pounds.

Texas had the largest reduction in releases in absolute pounds over the period 1995–1999. Releases in Texas in 1999 were 50.2 million pounds lower than the 310.8 million pounds reported in 1995—a decline of 16.2 percent. Alabama facilities reported the second-largest decrease after that of Texas. With 115.9 million pounds in 1995 and 78.8 million pounds in 1999, the reduction amounted to more than 37 million pounds. Michigan ranked third for decreases, dropping from 103.7 million pounds of total releases in 1995 to 72.8 million pounds in 1999, a difference of almost 31 million pounds. Both represented substantial percentage reductions: 32.1 percent for Alabama and 29.7 percent for Michigan.

The fourth-ranked state for total releases, Louisiana, was also fourth in the size of its decrease. Its releases were 24.0 million pounds less in 1999 than the reported 159.2 million pounds in 1995, resulting in a decline over the five-year period of 15.1 percent. More than half of the decrease,

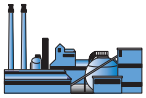


Table 3-5. TRI On-site and Off-site Releases by State, 1995 and 1998–1999, Original Industries

State	Total On-site and Off-site Releases			Change 1998-1999		Change 1995-1999	
	1995	1998	1999				
	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
Alabama	115,932,467	81,717,859	78,761,665	–2,956,194	–3.6	–37,170,802	–32.1
Alaska	6,840,330	1,948,222	1,671,982	–276,240	–14.2	–5,168,348	–75.6
American Samoa	5,300	8,750	0	–8,750	–100.0	–5,300	–100.0
Arizona	40,458,168	54,375,116	50,871,827	–3,503,289	–6.4	10,413,659	25.7
Arkansas	39,972,551	51,977,568	51,846,843	–130,725	–0.3	11,874,292	29.7
California	56,736,439	43,723,233	44,997,711	1,274,478	2.9	–11,738,728	–20.7
Colorado	5,353,118	6,488,073	7,557,002	1,068,929	16.5	2,203,884	41.2
Connecticut	12,267,823	8,029,467	6,410,818	–1,618,649	–20.2	–5,857,005	–47.7
Delaware	8,547,060	9,391,863	7,712,706	–1,679,157	–17.9	–834,354	–9.8
District of Columbia	56,970	11,511	18,096	6,585	57.2	–38,874	–68.2
Florida	58,508,260	72,203,527	77,375,527	5,172,000	7.2	18,867,267	32.2
Georgia	63,535,681	67,373,757	66,498,555	–875,202	–1.3	2,962,874	4.7
Guam	3,100		0	0	—	–3,100	–100.0
Hawaii	656,692	435,831	401,133	–34,698	–8.0	–255,559	–38.9
Idaho	16,070,326	22,230,052	26,633,633	4,403,581	19.8	10,563,307	65.7
Illinois	121,575,059	116,996,316	108,284,216	–8,712,100	–7.4	–13,290,843	–10.9
Indiana	115,571,740	122,992,083	134,591,753	11,599,670	9.4	19,020,013	16.5
Iowa	39,624,838	40,632,117	40,983,234	351,117	0.9	1,358,396	3.4
Kansas	29,605,908	26,537,764	35,812,594	9,274,830	34.9	6,206,686	21.0
Kentucky	52,179,818	43,154,168	48,242,312	5,088,144	11.8	–3,937,506	–7.5
Louisiana	159,157,725	147,798,128	135,114,882	–12,683,246	–8.6	–24,042,843	–15.1
Maine	11,509,253	9,829,245	7,729,738	–2,099,507	–21.4	–3,779,515	–32.8
Maryland	18,189,859	13,298,180	13,646,373	348,193	2.6	–4,543,486	–25.0
Massachusetts	10,141,671	7,319,912	5,630,725	–1,689,187	–23.1	–4,510,946	–44.5
Michigan	103,686,728	83,688,983	72,847,248	–10,841,735	–13.0	–30,839,480	–29.7
Minnesota	25,490,595	20,517,729	20,313,715	–204,014	–1.0	–5,176,880	–20.3
Mississippi	69,336,617	63,303,075	62,480,264	–822,811	–1.3	–6,856,353	–9.9
Missouri	62,104,512	59,537,825	56,852,850	–2,684,975	–4.5	–5,251,662	–8.5
Montana	43,931,043	51,222,448	49,913,550	–1,308,898	–2.6	5,982,507	13.6
Nebraska	16,969,385	24,268,297	23,280,757	–987,540	–4.1	6,311,372	37.2
Nevada	3,930,174	4,222,634	4,368,524	145,890	3.5	438,350	11.2
New Hampshire	2,925,757	2,947,018	3,123,368	176,350	6.0	197,611	6.8
New Jersey	22,229,192	20,708,010	21,872,605	1,164,595	5.6	–356,587	–1.6
New Mexico	45,048,134	24,950,377	20,463,178	–4,487,199	–18.0	–24,584,956	–54.6
New York	46,978,712	39,772,178	36,524,163	–3,248,015	–8.2	–10,454,549	–22.3
North Carolina	87,868,357	70,166,032	67,633,911	–2,532,121	–3.6	–20,234,446	–23.0
North Dakota	2,932,925	2,468,831	2,598,203	129,372	5.2	–334,722	–11.4
Ohio	154,911,309	158,080,966	151,549,085	–6,531,881	–4.1	–3,362,224	–2.2
Oklahoma	31,804,265	26,123,368	23,158,260	–2,965,108	–11.4	–8,646,005	–27.2
Oregon	28,622,527	34,289,507	30,982,214	–3,307,293	–9.6	2,359,687	8.2
Pennsylvania*	131,957,890	148,705,168	162,433,131	13,727,963	9.2	30,475,241	23.1
Puerto Rico	10,067,916	7,225,198	6,330,480	–894,718	–12.4	–3,737,436	–37.1
Rhode Island	3,409,036	1,782,638	1,313,328	–469,310	–26.3	–2,095,708	–61.5
South Carolina	61,069,599	60,763,074	66,729,933	5,966,859	9.8	5,660,334	9.3
South Dakota	4,185,248	3,340,352	3,564,341	223,989	6.7	–620,907	–14.8
Tennessee	117,969,211	95,933,525	91,588,366	–4,345,159	–4.5	–26,380,845	–22.4
Texas	310,751,491	270,875,835	260,518,331	–10,357,504	–3.8	–50,233,160	–16.2
Utah	79,909,533	106,332,023	88,822,084	–17,509,939	–16.5	8,912,551	11.2
Vermont	756,200	502,088	647,890	145,802	29.0	–108,310	–14.3
Virgin Islands	1,493,257	1,084,557	699,499	–385,058	–35.5	–793,758	–53.2
Virginia	61,772,339	58,556,730	57,814,647	–742,083	–1.3	–3,957,692	–6.4
Washington	29,626,614	32,133,720	25,234,284	–6,899,436	–21.5	–4,392,330	–14.8
West Virginia	33,061,820	26,283,313	21,913,735	–4,369,578	–16.6	–11,148,085	–33.7
Wisconsin	47,838,831	46,088,962	41,896,992	–4,191,970	–9.1	–5,941,839	–12.4
Wyoming	11,280,009	9,791,116	10,440,143	649,027	6.6	–839,866	–7.4
Total	**2,636,419,382**	**2,504,138,319**	**2,438,702,404**	**-65,435,915**	**-2.6**	**-197,716,978**	**-7.5**

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

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

Table 3-6. TRI On-site and Off-site Releases by State, 1999, Original Industries

State	Total Forms	On-site Releases						Off-site Releases
				Underground Injection		On-site Land Releases		
		Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other Landfills	
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	
Alabama	1,889	49,139,002	6,520,256	0	5	704,470	9,238,407	
Alaska	29	1,577,023	94,126	0	256	0	0	
American Samoa	0	0	0	0	0	0	0	
Arizona	516	3,175,737	5,452	0	15	0	14,072	
Arkansas	1,289	27,022,660	2,571,428	666,738	108,350	116,656	1,157,118	
California	3,623	29,343,914	5,020,783	0	34,972	121,835	1,130,506	
Colorado	437	2,721,432	3,114,517	0	0	137,583	48,936	
Connecticut	802	4,086,522	1,011,848	0	0	0	1,508	
Delaware	258	3,250,938	1,186,039	0	0	0	21,003	
District of Columbia	7	0	44	0	0	0	0	
Florida	1,283	36,023,988	2,430,306	32,769,162	0	22,669	69,171	
Georgia	2,245	47,896,400	7,382,145	0	0	1,266	421,814	
Guam	0	0	0	0	0	0	0	
Hawaii	48	353,488	2,489	0	5,065	0	0	
Idaho	203	6,389,268	7,592,735	0	0	0	137,850	
Illinois	4,194	50,371,772	6,459,380	1,200	0	7,572,117	9,003,111	
Indiana	3,264	52,122,195	6,749,598	890,265	0	1,975,358	13,358,785	
Iowa	1,162	22,476,828	3,966,598	0	0	397,177	2,734,782	
Kansas	852	15,331,200	1,063,516	1,168,778	250	0	959,728	
Kentucky	1,604	30,515,507	1,736,386	0	0	21,200	1,003,634	
Louisiana	2,213	66,858,651	15,037,778	44,030,834	0	4,021	4,733,581	
Maine	286	5,340,759	864,244	0	0	135,359	586,337	
Maryland	545	7,993,798	2,625,929	0	0	0	2,232,555	
Massachusetts	1,221	3,838,311	93,926	0	0	0	1,250	
Michigan	3,101	36,907,358	1,126,839	2,571,894	48	49,056	2,449,381	
Minnesota	1,230	14,757,728	1,735,699	0	0	44,250	100,437	
Mississippi	1,072	32,773,174	14,627,488	8,326,762	0	4,079	1,004,967	
Missouri	1,754	29,195,939	3,343,958	0	0	69,865	525,101	
Montana	160	5,368,777	36,047	0	0	2,298	37,000	
Nebraska	471	5,037,464	11,294,646	0	0	5	6,915	
Nevada	118	915,984	0	0	0	0	2,358,960	
New Hampshire	297	2,474,324	125,582	0	0	0	49,577	
New Jersey	1,815	8,183,307	5,382,208	2	2	164,498	39,320	
New Mexico	163	967,845	15,028	315	0	0	4,433	
New York	1,785	16,821,976	9,458,323	250	0	11,982	264,696	
North Carolina	2,323	42,196,361	9,100,746	0	0	104,632	276,256	
North Dakota	91	2,276,538	162,418	0	0	0	6	
Northern Marianas	0	0	0	0	0	0	0	
Ohio	5,033	62,985,422	6,776,057	14,285,086	0	1,994	9,414,998	
Oklahoma	876	16,763,490	3,046,633	52,827	0	82,801	46,277	
Oregon	697	16,789,945	3,282,352	0	0	5	360,100	
Pennsylvania*	3,904	36,641,899	48,992,454	0	0	107,772	1,846,172	
Puerto Rico	404	5,757,260	70,474	0	0	250	3,624	
Rhode Island	312	992,383	1,265	0	0	0	0	
South Carolina	1,788	42,770,032	3,432,379	0	0	88,133	1,254,705	
South Dakota	136	2,057,565	1,354,662	0	0	0	21	
Tennessee	1,976	73,652,645	2,074,806	0	0	136,933	5,534,355	
Texas	5,866	102,482,436	32,416,099	86,548,912	0	205,797	3,894,911	
Utah	495	50,620,528	1,037,793	3,600	0	10,492	7,021,811	
Vermont	79	150,666	179,767	0	0	74,490	755	
Virgin Islands	28	650,682	45,847	0	0	0	0	
Virginia	1,367	41,234,709	4,708,404	0	0	7,960	1,911,792	
Washington	898	18,913,981	3,098,503	0	0	1,865	86,602	
West Virginia	679	11,825,861	7,606,602	10	0	60,897	6,391	
Wisconsin	2,445	25,479,543	3,523,115	0	0	590	647,166	
Wyoming	138	1,579,717	6,099	8,081,700	505	0	1,900	
Total	**69,471**	**1,175,054,932**	**253,591,816**	**199,398,335**	**149,468**	**12,440,355**	**86,002,777**	

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.

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

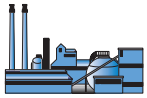


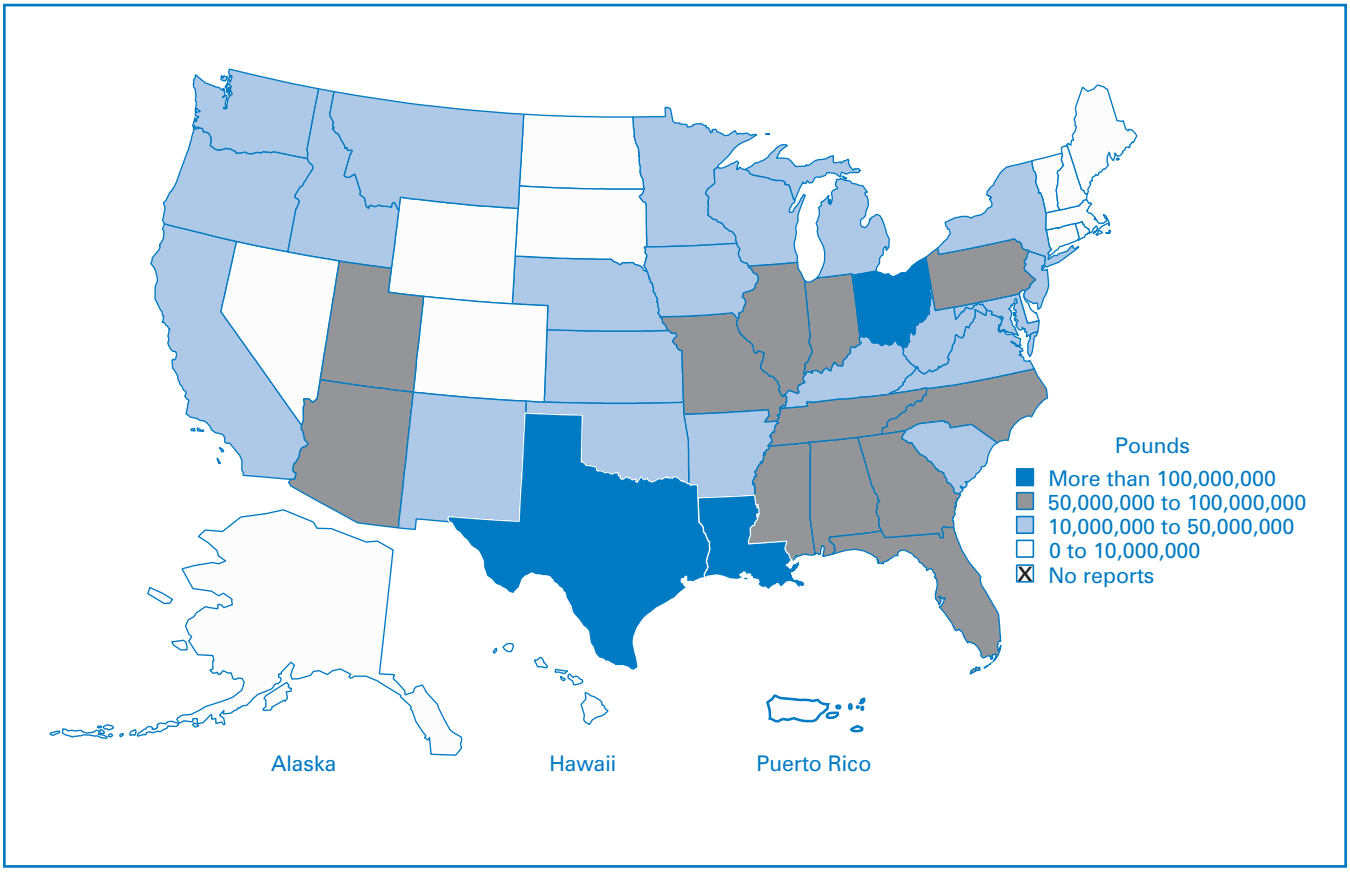
Table 3-6. TRI On-site and Off-site Releases by State, 1999, Original Industries *(continued)*

State	On-site Releases: On-site Land Releases: Land Treatment	On-site Releases: On-site Land Releases: Surface Impoundments	On-site Releases: On-site Land Releases: Other Disposal	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	159,052	639,659	186,134	66,586,985	12,174,680	78,761,665
Alaska	0	0	577	1,671,982	0	1,671,982
American Samoa	0	0	0	0	0	0
Arizona	11,583	597,432	46,237,180	50,041,471	830,356	50,871,827
Arkansas	172,828	1,046,631	13,007	32,875,416	18,971,427	51,846,843
California	1,092,552	404,983	210,828	37,360,373	7,637,338	44,997,711
Colorado	48,250	3,824	3,982	6,078,524	1,478,478	7,557,002
Connecticut	7,647	40	12,007	5,119,572	1,291,246	6,410,818
Delaware	14,101	243,164	51	4,715,296	2,997,410	7,712,706
District of Columbia	0	0	0	44	18,052	18,096
Florida	1,337,125	314,686	167,694	73,134,801	4,240,726	77,375,527
Georgia	294,133	993,660	196,593	57,186,011	9,312,544	66,498,555
Guam	0	0	0	0	0	0
Hawaii	37,599	0	499	399,140	1,993	401,133
Idaho	371,261	5,771,369	5,919,246	26,181,729	451,904	26,633,633
Illinois	201,830	1,569,618	319,409	75,498,437	32,785,779	108,284,216
Indiana	17,012	0	200,064	75,313,277	59,278,476	134,591,753
Iowa	1,770	1,086	9,236	29,587,477	11,395,757	40,983,234
Kansas	906,398	250	5,523	19,435,643	16,376,951	35,812,594
Kentucky	1,094,641	69,808	23,021	34,464,197	13,778,115	48,242,312
Louisiana	4,489	914,343	73,475	131,657,172	3,457,710	135,114,882
Maine	10	190	65,275	6,992,174	737,564	7,729,738
Maryland	80,512	23,889	8,448	12,965,131	681,242	13,646,373
Massachusetts	0	0	746	3,934,233	1,696,492	5,630,725
Michigan	44,028	0	27,423	43,176,027	29,671,221	72,847,248
Minnesota	134,801	37,258	1,280	16,811,453	3,502,262	20,313,715
Mississippi	64,275	4,075,094	129,676	61,005,515	1,474,749	62,480,264
Missouri	131,858	0	18,848,271	52,114,992	4,737,858	56,852,850
Montana	9	14,466	43,086,733	48,545,330	1,368,220	49,913,550
Nebraska	633,335	2,777	86,905	17,062,047	6,218,710	23,280,757
Nevada	0	44,820	1,001,183	4,320,947	47,577	4,368,524
New Hampshire	0	3,100	1,260	2,653,843	469,525	3,123,368
New Jersey	21,794	1,024	1,716,907	15,509,062	6,363,543	21,872,605
New Mexico	146,269	481,967	18,646,770	20,262,627	200,551	20,463,178
New York	29,535	7,804	10,669	26,605,235	9,918,928	36,524,163
North Carolina	78,265	9,026,296	112,410	60,894,966	6,738,945	67,633,911
North Dakota	750	2,000	0	2,441,712	156,491	2,598,203
Northern Marianas	0	0	0	0	0	0
Ohio	197	9,784,655	68,951	103,317,360	48,231,725	151,549,085
Oklahoma	13,294	7,508	304,988	20,317,818	2,840,442	23,158,260
Oregon	65,433	30,803	23,422	20,552,060	10,430,154	30,982,214
Pennsylvania*	23,277	134,433	1,826,569	89,572,576	72,860,555	162,433,131
Puerto Rico	0	0	37	5,831,645	498,835	6,330,480
Rhode Island	0	0	5	993,653	319,675	1,313,328
South Carolina	198,184	327,778	1,551,556	49,622,767	17,107,166	66,729,933
South Dakota	0	0	13,190	3,425,438	138,903	3,564,341
Tennessee	64,720	46,771	44,526	81,554,756	10,033,610	91,588,366
Texas	732,981	13,591,210	964,322	240,836,668	19,681,663	260,518,331
Utah	149,309	23,492,319	43,611	82,379,463	6,442,621	88,822,084
Vermont	0	0	255	405,933	241,957	647,890
Virgin Islands	489	1,302	0	698,320	1,179	699,499
Virginia	751	292	142,923	48,006,831	9,807,816	57,814,647
Washington	85,206	5,249	20,989	22,212,395	3,021,889	25,234,284
West Virginia	46,556	10,400	1,134	19,557,851	2,355,884	21,913,735
Wisconsin	441,613	40,447	160,979	30,293,453	11,603,539	41,896,992
Wyoming	1,500	7,473	1,680	9,680,574	759,569	10,440,143
Total	**8,961,222**	**73,771,878**	**142,491,619**	**1,951,862,402**	**486,840,002**	**2,438,702,404**

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.

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

Map 3–1. TRI On-site Releases, 1999, Original Industries

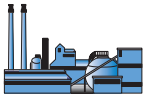


12.7 million pounds, occurred between 1998 and 1999.

In five states—Indiana, Florida, Arkansas, Idaho, and Arizona—total on- and off-site releases for the original industries rose by more than 10 million pounds between 1995 and 1999. Indiana facilities reported an increase of 19.0 million pounds, making a total of 134.6 million pounds in 1999. In Florida, the increase was 18.9 million pounds, and the 1999 total was 77.4 million pounds. Arkansas facilities reported an increase of 11.9 million pounds, with a 1999 total of 51.8 million pounds. The increase in Idaho was 10.6 million pounds, and the 1999 total was 26.6 million pounds. Arizona's increase of 10.4 million pounds brought that state's releases in 1999 to 50.9 million pounds. Idaho's percentage rise was the steepest, 65.7 percent; Florida's was 32.2. In Arkansas, Arizona, and Indiana, percentage growth for 1995–1999 was less than 30 percent. The apparent increase of 30.5 million pounds in Pennsylvania, as discussed above, was due to a data entry error and was actually less than 10 million pounds.

On-site Releases

Of the three states with the largest total releases in 1999, two, Texas and Ohio, also reported the largest on-site releases (see Table 3–6). Texas ranked first, with 240.8 million pounds of on-site releases. Louisiana, which ranked fourth in total releases, was second in on-site releases, with 132 million pounds. Ohio, second-ranked in total releases (ahead of



Pennsylvania due to a data entry error for one Pennsylvania facility, as explained above), also had the third-largest on-site releases, 103.3 million pounds. Map 3–1 shows the geographic distribution of on-site releases.

Texas reported the largest releases to air (102.5 million pounds) and to underground injection (86.5 million pounds, 43.4 percent of the total of 199.4 million pounds for this method). Louisiana did not rank first for any release type, but its facilities reported substantial amounts of air emissions (66.9 million pounds) and underground injection (44.0 million pounds, second after Texas). Louisiana's surface water discharges, 15.0 million pounds, were third highest among the states. Ohio's total of 103.3 million-pounds of on-site releases consisted primarily of air emissions (63.0 million pounds) and on-site land releases, which totaled 19.3 million pounds. Ohio also reported underground injection of 14.3 million pounds, the fourth largest among the states, after Texas, Louisiana, and Florida.

Tennessee had the second-largest air emissions, 73.7 million pounds. Pennsylvania facilities discharged the largest amount to surface waters, with 49.0 million pounds. Arizona reported a total of 46.9 million pounds of on-site land releases, including 46.2 million pounds of other disposal, the largest amounts in either category.

Off-site Releases

Table 3–7 supplies additional detail on the states' off-site releases. Off-site releases consist of all transfers of TRI chemicals off-site to disposal, as well as transfers of metals and metal compounds to solidification/ stabilization, treatment, and POTWs. The disposal methods applied to such transfers result in some of the same types of releases as those facilities report on-site.

Indiana facilities reported 59.3 million pounds of off-site releases. It ranked first for off-site releases, ahead of Pennsylvania whose apparent first rank was due to a data entry error, as explained previously in the section on TRI Releases, 1995–1999. Pennsylvania ranked second and Ohio, with 48.2 million pounds, ranked third.

Off-site releases constituted less than half of total releases in all states and territories except the District of Columbia (see Table 3–6). Aside from the District of Columbia, Kansas had the highest proportion of off-site releases, 45.7 percent (16.4 million pounds of off-site releases, with total releases of 35.8). The corresponding share for Indiana, was 44.0 percent and for Ohio was 31.8 percent (see Table 3–6).

Landfills/surface impoundments received the largest amount of off-site releases in 1999, 232.7 million pounds for all states, or 47.8 percent of the 486.8 million pounds of total off-site releases. Table 3–7 gives the breakdown by state. Pennsylvania facilities sent 44.7 million pounds to disposal in landfills/surface impoundments, the largest amount of any state. Indiana ranked second in this category, with 31.2 million pounds, and Michigan, with 26.5 million pounds, ranked third.

Off-site releases of metals and metal compounds in 1999 included 139.6 million pounds sent to solidification/stabilization, 6.6 million pounds in wastewater sent to treatment, and 3.3 million pounds sent to POTWs. Indiana facilities transferred 25.9 million pounds of metals to solidification/ stabilization, the largest amount of any

Table 3–7. TRI Off-site Releases (Transfers Off-site to Disposal), 1999, Original Industries

State	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	Underground Injection Pounds	Landfills/Surface Impoundments Pounds
Alabama	74,325	4,136,892	35,497	23,399	1,322,818	4,142,771
Alaska	0	0	0	0	0	0
American Samoa	0	0	0	0	0	0
Arizona	5,820	47,029	0	3,907	275,160	309,589
Arkansas	16,863	16,127,915	38,479	14,853	420,501	1,876,596
California	54,260	1,602,175	114,686	87,447	9,301	3,760,232
Colorado	762	17,457	20,332	1,751	24,691	1,067,222
Connecticut	176,774	237,146	154,746	40,259	5,391	406,115
Delaware	0	6,815	19,537	11,270	0	24,860
District of Columbia	0	0	0	0	0	0
Florida	38,679	307,462	233,610	10,593	323,971	1,119,282
Georgia	125,011	5,506,526	116,256	399,705	1,150	2,902,603
Guam	0	0	0	0	0	0
Hawaii	0	0	0	0	0	1,993
Idaho	192,640	116,239	83	537	0	133,832
Illinois	635,846	13,240,671	498,049	133,921	567,251	12,990,361
Indiana	304,894	25,854,219	459,571	84,690	270,442	31,178,389
Iowa	750	7,114,452	1,924	206,031	224,833	3,311,011
Kansas	46,368	10,451	4,180	17,836	13,172,179	2,779,116
Kentucky	7,660	9,072,322	159,623	63,491	36,036	4,208,890
Louisiana	15,945	84,348	6,649	7,980	179,097	2,982,331
Maine	22,288	42,112	5,052	71,569	0	267,823
Maryland	884	45,542	635	87,440	0	247,972
Massachusetts	26,818	420,650	30,503	26,197	0	632,675
Michigan	465,744	1,312,083	305,470	135,010	69,455	26,488,920
Minnesota	543	196,117	1,862	169,774	0	3,052,960
Mississippi	105,854	50,038	30	8,910	114,799	856,318
Missouri	169,133	86,662	16,402	139,194	171,455	2,301,458
Montana	0	0	0	10	5,975	1,261,507
Nebraska	0	5,127,117	1,201	13,245	0	707,053

Note: 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.

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

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

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

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

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

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

Table 3–7. TRI Off-site Releases (Transfers Off-site to Disposal), 1999, Original Industries *(continued)*

State	Land Treatment Pounds	Other Land Disposal Pounds	Other Off-site Management Pounds	Transfers to Waste Broker for Disposal Pounds	Unknown[e] Pounds	Total Off-site Releases: Transfers Off-site to Disposal Pounds
Alabama	1,418	1,875,609	350,269	79,116	132,566	12,174,680
Alaska	0	0	0	0	0	0
American Samoa	0	0	0	0	0	0
Arizona	0	52	70,370	40,372	78,057	830,356
Arkansas	28,969	6,723	37,644	49,846	353,038	18,971,427
California	1,241,750	89,854	68,932	411,343	197,358	7,637,338
Colorado	2,845	288,000	0	40,418	15,000	1,478,478
Connecticut	750	113,167	47,616	104,227	5,055	1,291,246
Delaware	0	0	2,931,178	3,750	0	2,997,410
District of Columbia	0	0	0	18,052	0	18,052
Florida	49,027	404,395	1,361,382	380,074	12,251	4,240,726
Georgia	67,737	7,916	34,976	74,472	76,192	9,312,544
Guam	0	0	0	0	0	0
Hawaii	0	0	0	0	0	1,993
Idaho	1,016	0	4,025	1,332	2,200	451,904
Illinois	6,718	436,257	1,049,002	3,075,203	152,500	32,785,779
Indiana	5,477	219,537	136,156	532,297	232,804	59,278,476
Iowa	177,093	10,679	131,755	25,099	192,130	11,395,757
Kansas	11,683	221,464	23,800	63,432	26,442	16,376,951
Kentucky	0	23,286	21,615	84,290	100,902	13,778,115
Louisiana	27,881	2,048	43,270	57,594	50,567	3,457,710
Maine	0	140,751	16,283	19,661	152,025	737,564
Maryland	428	220,776	25,833	37,621	14,111	681,242
Massachusetts	3,687	302,936	65,083	158,581	29,362	1,696,492
Michigan	10,995	227,024	379,599	249,114	27,807	29,671,221
Minnesota	38,091	13,389	3,152	26,288	86	3,502,262
Mississippi	31,206	72,748	15,031	139,306	80,509	1,474,749
Missouri	1,243,572	128,838	1,874	310,635	168,635	4,737,858
Montana	436	0	0	100,292	0	1,368,220
Nebraska	109,592	181,876	55,376	22,474	776	6,218,710

Note: 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.

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

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

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

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

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

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

Table 3–7. TRI Off-site Releases (Transfers Off-site to Disposal), 1999, Original Industries *(continued)*

State	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	Underground Injection Pounds	Landfills/Surface Impoundments Pounds
Nevada	0	170	0	34	0	43,441
New Hampshire	23,805	60,228	715	4,247	0	51,603
New Jersey	377,550	2,154,663	76,370	46,212	0	1,296,975
New Mexico	0	18,033	427	131	0	50,098
New York	123,131	1,614,219	372,438	143,380	2,376	6,807,578
North Carolina	46,641	671,007	29,717	45,705	317,746	4,788,919
North Dakota	0	0	0	286	1,070	154,385
Northern Marianas	0	0	0	0	0	0
Ohio	920,121	9,165,794	3,139,648	245,570	3,054,325	24,254,012
Oklahoma	493,025	653,237	46,388	13,219	43,649	1,547,760
Oregon	4,780	9,463,560	0	64,551	0	675,301
Pennsylvania*	255,593	2,319,998	315,995	255,234	103,881	44,747,054
Puerto Rico	92,108	16,015	16	2,351	0	252,442
Rhode Island	97,488	50,416	6,050	9,186	0	111,472
South Carolina	25,575	7,750,028	14,456	161,991	5,420	8,204,231
South Dakota	1,995	0	0	844	0	60,301
Tennessee	630,139	4,320,154	14,815	61,966	110,865	4,366,222
Texas	473,266	1,249,759	159,843	348,054	8,399,423	7,067,480
Utah	94,500	6,075,495	0	6,403	0	130,746
Vermont	970	17,095	0	531	0	67,090
Virgin Islands	0	765	0	0	0	370
Virginia	14,039	209,535	17,710	86,728	212,600	9,065,729
Washington	91,809	253,134	27,591	2,720	0	1,944,968
West Virginia	2,368	167,798	56,127	3,930	1	2,052,677
Wisconsin	29,418	1,823,587	90,549	83,012	17,051	5,932,495
Wyoming	0	749,000	250	20	0	10,299
Total	**6,286,182**	**139,566,130**	**6,593,482**	**3,345,324**	**29,462,912**	**232,695,527**

Note: 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.

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

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

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

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

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

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

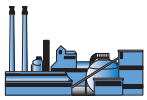


Table 3–7. TRI Off-site Releases (Transfers Off-site to Disposal), 1999, Original Industries *(continued)*

State	Land Treatment Pounds	Other Land Disposal Pounds	Other Off-site Management Pounds	Transfers to Waste Broker for Disposal Pounds	Unknown[e] Pounds	Total Off-site Releases: Transfers Off-site to Disposal Pounds
Nevada	0	1,523	1,548	5	856	47,577
New Hampshire	33	25,213	1,700	275,700	26,281	469,525
New Jersey	7,101	1,681,334	131,485	424,442	167,411	6,363,543
New Mexico	0	123,000	255	752	7,855	200,551
New York	24,191	388,420	84,950	144,865	213,380	9,918,928
North Carolina	273,227	89,735	14,802	265,724	195,722	6,738,945
North Dakota	0	0	0	750	0	156,491
Northern Marianas	0	0	0	0	0	0
Ohio	1,173	6,429,391	253,936	666,309	101,446	48,231,725
Oklahoma	1,034	780	147	10	41,193	2,840,442
Oregon	167,708	32,072	7,753	1,836	12,593	10,430,154
Pennsylvania*	243,471	458,303	23,182,672	831,913	146,441	72,860,555
Puerto Rico	0	14,160	12,516	0	109,227	498,835
Rhode Island	0	3,993	254	9,788	31,028	319,675
South Carolina	83,022	400,200	116,411	239,174	106,658	17,107,166
South Dakota	15,074	0	0	59,689	1,000	138,903
Tennessee	2,008	17,165	368,819	127,845	13,612	10,033,610
Texas	93,073	121,167	519,663	1,117,564	132,371	19,681,663
Utah	15	26,152	311	10	108,989	6,442,621
Vermont	99,560	0	6,100	50,581	30	241,957
Virgin Islands	0	0	0	0	44	1,179
Virginia	7,967	20,668	41,648	126,662	4,530	9,807,816
Washington	69,170	369,257	127,173	102,442	33,625	3,021,889
West Virginia	0	30,034	30,323	3,626	9,000	2,355,884
Wisconsin	91,187	609,179	2,304,247	591,964	30,850	11,603,539
Wyoming	0	0	0	0	0	759,569
Total	**4,239,385**	**15,829,071**	**34,080,934**	**11,146,540**	**3,594,515**	**486,840,002**

Note: 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.

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

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

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

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

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

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

state. Arkansas ranked second, with 16.1 million pounds, and Illinois was third, with 13.2 million pounds. Ohio sent by far the largest amount to wastewater treatment, 3.1 million pounds, or 47.6 percent of the total.

Transfers Within and Among States

Off-site Releases

TRI facilities report the specific off-site locations to which they are transferring TRI chemicals. Table 3–8 summarizes off-site releases (transfers to disposal) that were transferred within the state, received into the state from TRI facilities elsewhere, or sent out of state. The largest transfers to disposal within a state in 1999 were in Pennsylvania, with 41.5 million pounds, followed by Ohio, with 39.3 million pounds. Ohio received the largest amount of such transfers from facilities located in other states, 49.6 million pounds.

When all releases in a state are taken into account, Texas led all states and territories in the amount of total on- and off-site releases reported as occurring in the state. Releases in Texas, whether originating from facilities in Texas or transferred into Texas from facilities in other states and territories, totaled 263.5 million pounds, as shown in the Total Releases in the State column in Table 3–8. By this accounting, Ohio ranked second, with 192.2 million pounds, and Pennsylvania was third, with 141.8 million pounds.

Most off-site releases were transferred within the state where they originated. The total amount transferred within states was 274.8 million pounds, 56.5 percent of the total of off-site releases transferred within the state and those transferred into the state. A total of 212.0 million pounds nationwide was sent by facilities in one state to locations in another.

Transfers Off-site for Further Waste Management

According to the TRI reports for 1999, larger amounts of transfers off-site for further waste management were sent to other states than were transferred within state. Nationwide, transfers from one state to another for further waste management totaled 1.70 billion pounds, while within-states transfers totaled 1.13 billion pounds. These transfers off-site for further waste management, shown in Table 3–9, include transfers to recycling, energy recovery, and treatment; they exclude transfers off-site to disposal.

The largest within-state transfers for further waste management in 1999 were reported in Texas, with 196.7 million pounds. Pennsylvania was a distant second, with 131.4 million pounds. Illinois was the largest recipient state, with 197.7 million pounds, followed by Indiana, with 154.1 million pounds and Pennsylvania, with 150.3 million pounds. Ohio ranked first for amounts transferred out of state for further waste management, with 133.7 million pounds. Michigan was second, with 125.6 million pounds.

Taking into account transfers among states, Texas had the largest total transfers to destinations within its borders, whether originating from facilities in Texas or transferred into the state from facilities in other states and territories. Transfers within and into Texas totaled 298.3 million pounds in 1999. Pennsylvania, Indiana, and Illinois were

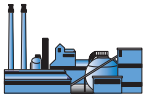


Table 3-8. TRI Releases in the State and Transferred Out of State, 1999, Original Industries

State	Releases in the State			Total Releases in the State**	Transferred Out of State
	Total On-site Releases	Transferred Within State	Transferred Into State		
	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	66,586,985	6,310,274	6,126,967	79,024,226	5,864,406
Alaska	1,671,982	0	12	1,671,994	0
American Samoa	0	0	0	0	0
Arizona	50,041,471	344,415	625,917	51,011,803	485,941
Arkansas	32,875,416	1,295,512	1,039,554	35,210,482	17,675,915
California	37,360,373	5,786,764	647,532	43,794,669	1,850,574
Colorado	6,078,524	428,144	93,664	6,600,332	1,050,334
Connecticut	5,119,572	351,506	349,927	5,821,005	939,740
Delaware	4,715,296	2,985,403	4,219	7,704,918	12,007
District of Columbia	44	0	519	563	18,052
Florida	73,134,801	2,898,128	205,323	76,238,252	1,342,598
Georgia	57,186,011	2,430,738	500,585	60,117,334	6,881,806
Hawaii	399,140	1,988	0	401,128	5
Idaho	26,181,729	156,914	22,368,704	48,707,347	294,990
Illinois	75,498,437	24,004,608	17,529,500	117,032,545	8,781,171
Indiana	75,313,277	32,562,569	2,818,138	110,693,984	26,715,907
Iowa	29,587,477	1,567,124	34,988	31,189,589	9,828,633
Kansas	19,435,643	1,874,398	158,530	21,468,571	14,502,553
Kentucky	34,464,197	4,000,081	1,026,798	39,491,076	9,778,034
Louisiana	131,657,172	2,047,335	3,524,067	137,228,574	1,410,375
Maine	6,992,174	553,001	51,947	7,597,122	184,563
Maryland	12,965,131	413,743	502,743	13,881,617	267,499
Massachusetts	3,934,233	891,238	677,395	5,502,866	805,254
Michigan	43,176,027	28,500,204	20,600,635	92,276,866	1,171,017
Minnesota	16,811,453	1,363,280	58,224	18,232,957	2,138,982
Mississippi	61,005,515	920,876	504,727	62,431,118	553,873
Missouri	52,114,992	3,896,307	5,965,293	61,976,592	841,551
Montana	48,545,330	94	7,200	48,552,624	1,368,126
Nebraska	17,062,047	985,408	368,665	18,416,120	5,233,302
Nevada	4,320,947	45,066	639,657	5,005,670	2,511
New Hampshire	2,653,843	129,692	276,976	3,060,511	339,833
New Jersey*	15,509,062	2,882,973	23,410,053	41,802,088	3,480,570
New Mexico	20,262,627	67,943	2,942	20,333,512	132,608
New York	26,605,235	4,371,633	1,273,494	32,250,362	5,547,295
North Carolina	60,894,966	5,201,203	470,878	66,567,047	1,537,742
North Dakota	2,441,712	150,876	2,400	2,594,988	5,615
Ohio	103,317,360	39,332,931	49,573,041	192,223,332	8,898,794
Oklahoma	20,317,818	1,542,203	16,686,928	38,546,949	1,298,239
Oregon	20,552,060	1,028,648	2,163,264	23,743,972	9,401,506
Pennsylvania*	89,572,576	41,468,402	10,776,075	141,817,053	31,392,153
Puerto Rico	5,831,645	360,237	0	6,191,882	138,598
Rhode Island	993,653	72,024	92,764	1,158,441	247,651
South Carolina	49,622,767	7,583,802	1,153,917	58,360,486	9,523,364
South Dakota	3,425,438	135,212	0	3,560,650	3,691
Tennessee	81,554,756	4,975,428	557,326	87,087,510	5,058,182
Texas	240,836,668	16,448,284	6,259,007	263,543,959	3,233,379
Utah	82,379,463	4,071,748	2,662,931	89,114,142	2,370,873
Vermont	405,933	71,931	44,728	522,592	170,026
Virgin Islands	698,320	0	0	698,320	1,179
Virginia	48,006,831	8,969,660	161,308	57,137,799	838,156
Washington	22,212,395	768,420	9,938	22,990,753	2,253,469
West Virginia	19,557,851	1,194,203	238,466	20,990,520	1,161,681
Wisconsin	30,293,453	7,361,798	3,316,836	40,972,087	4,241,741
Wyoming	9,680,574	6,575	0	9,687,149	752,994
Other***	0	0	6,464,356	6,464,356	0
Total	**1,951,862,402**	**274,810,944**	**212,029,058**	**2,438,702,404**	**212,029,058**

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

**Includes on-site releases and off-site releases (transfers off-site to disposal) transferred within the state and transferred into the state; excludes transfers out of state.

***Includes waste sent to other countries or to sites not identified by the reporting facility and transfers to POTWs in more than one state.

Table 3-9. TRI Transfers Off-site for Further Waste Management Among and Within State, 1999, Original Industries

State	Transferred Within or Into State		Total Transferred Within and Into State	Transferred Out of State
	Transferred Within State	Transferred Into State		
	Pounds	Pounds	Pounds	Pounds
Alabama	19,854,466	63,270,593	83,125,059	55,716,439
Alaska	587	20,620	21,207	1,750
American Samoa	0	3,505,127	3,505,127	0
Arizona	17,044,500	17,359,372	34,403,872	26,319,113
Arkansas	13,084,743	38,250,015	51,334,758	51,400,296
California	90,592,684	27,660,789	118,253,473	29,859,623
Colorado	9,302,553	829,432	10,131,985	16,510,626
Connecticut	13,114,062	40,182,759	53,296,821	15,147,049
Delaware	3,058,099	1,211,351	4,269,450	11,480,321
District of Columbia	0	64,460	64,460	14,089
Florida	16,191,689	3,997,576	20,189,265	17,592,762
Georgia	13,790,776	8,373,817	22,164,593	59,455,841
Hawaii	178,352	0	178,352	4,352
Idaho	861,869	162,949	1,024,818	1,611,681
Illinois	53,696,934	197,654,142	251,351,076	84,901,237
Indiana	99,446,914	154,088,391	253,535,305	89,119,833
Iowa	17,693,902	20,650,628	38,344,530	34,877,805
Kansas	7,674,788	9,136,679	16,811,467	73,333,490
Kentucky	16,680,764	13,909,638	30,590,402	47,851,843
Louisiana	39,339,022	52,681,360	92,020,382	37,793,515
Maine	1,254,732	26,477	1,281,209	1,878,509
Maryland	5,928,171	7,974,130	13,902,301	9,285,406
Massachusetts	21,073,514	4,294,492	25,368,006	21,930,732
Michigan	113,413,376	84,644,072	198,057,448	125,582,458
Minnesota	28,902,570	46,799,574	75,702,144	13,411,391
Mississippi	9,150,700	15,730,529	24,881,229	22,865,125
Missouri	47,568,838	95,911,163	143,480,001	34,070,482
Montana	146,475	10,391,716	10,538,191	144,481
Nebraska	19,576,441	6,622,241	26,198,682	23,076,299
Nevada	76,825	4,971,488	5,048,313	1,180,136
New Hampshire	3,336,936	28,135	3,365,071	15,996,072
New Jersey	76,104,734	57,513,031	133,617,765	49,877,333
New Mexico	806,948	734,840	1,541,788	6,888,806
New York	31,799,447	51,447,900	83,247,347	66,353,185
North Carolina	24,724,837	9,453,715	34,178,552	64,123,828
North Dakota	1,049,702	33,611	1,083,313	130,649
Ohio	109,482,388	133,394,461	242,876,849	133,698,534
Oklahoma	10,368,967	1,277,675	11,646,642	16,127,938
Oregon	19,594,984	797,121	20,392,105	10,651,811
Pennsylvania	131,377,585	150,344,397	281,721,982	87,400,714
Puerto Rico	35,208,992	0	35,208,992	10,979,770
Rhode Island	944,911	2,818,363	3,763,274	4,284,266
South Carolina	27,889,087	41,043,489	68,932,576	46,134,921
South Dakota	454,738	46,770	501,508	1,387,217
Tennessee	20,180,714	43,520,882	63,701,596	71,791,688
Texas	196,746,505	101,584,392	298,330,897	99,124,037
Utah	2,024,009	2,218,120	4,242,129	2,320,282
Vermont	220,417	187,820	408,237	1,401,132
Virgin Islands	0	0	0	182,223
Virginia	27,077,483	19,131,910	46,209,393	26,135,334
Washington	6,238,233	3,682,598	9,920,831	9,528,623
West Virginia	3,788,424	12,818,450	16,606,874	24,803,923
Wisconsin	43,553,250	21,717,531	65,270,781	42,261,869
Wyoming	255	505	760	96,253
Other*	0	113,925,796	113,925,796	0
Total	**1,133,870,973**	**1,696,975,374**	**2,830,846,347**	**1,696,975,374**

Note: Transfers Off-site for Further Waste Management are from Section 6 (excluding transfers off-site to disposal) of Form R.
*Includes waste sent to other countries or to sites not identified by the reporting facility and transfers to POTWs in more than one state.

next highest, with 281.7 million pounds, 253.5 million pounds, and 251.4 million pounds, respectively.

Management of TRI Chemicals in Waste by State

Nationwide, TRI facilities in the original industries managed 23.10 billion pounds of production-related waste in 1999. Texas ranked first among states and territories for total production-related waste managed, with 4.67 billion pounds, as shown in Table 3–10. Louisiana was second, with 2.32 billion pounds and Illinois ranked third, with 1.44 billion pounds. Map 3–2 presents the geographic distribution of production-related waste managed in 1999.

The states with the largest quantities released on- and off-site in 1999 were Texas, with 264.7 million pounds; Ohio, with 148.9 million pounds; and Pennsylvania, with 139.0 million pounds.

Texas ranked first, by far, in energy recovery in 1999. Its facilities reported 866.0 million pounds recovered on-site and 81.6 million pounds off-site. The second-ranking state in on-site energy recovery and in total energy recovery was Louisiana, with 307.5 million pounds recovered on-site and 12.7 million pounds off-site. Texas was first in treatment (2.19 billion pounds on-site and 75.7 million pounds off-site), and in on-site recycling (1.06 billion pounds). Illinois reported the second-largest amount of on-site recycling, 970.8 million pounds. The

Map 3-2. TRI Production-related Waste Managed, 1999, Original Industries

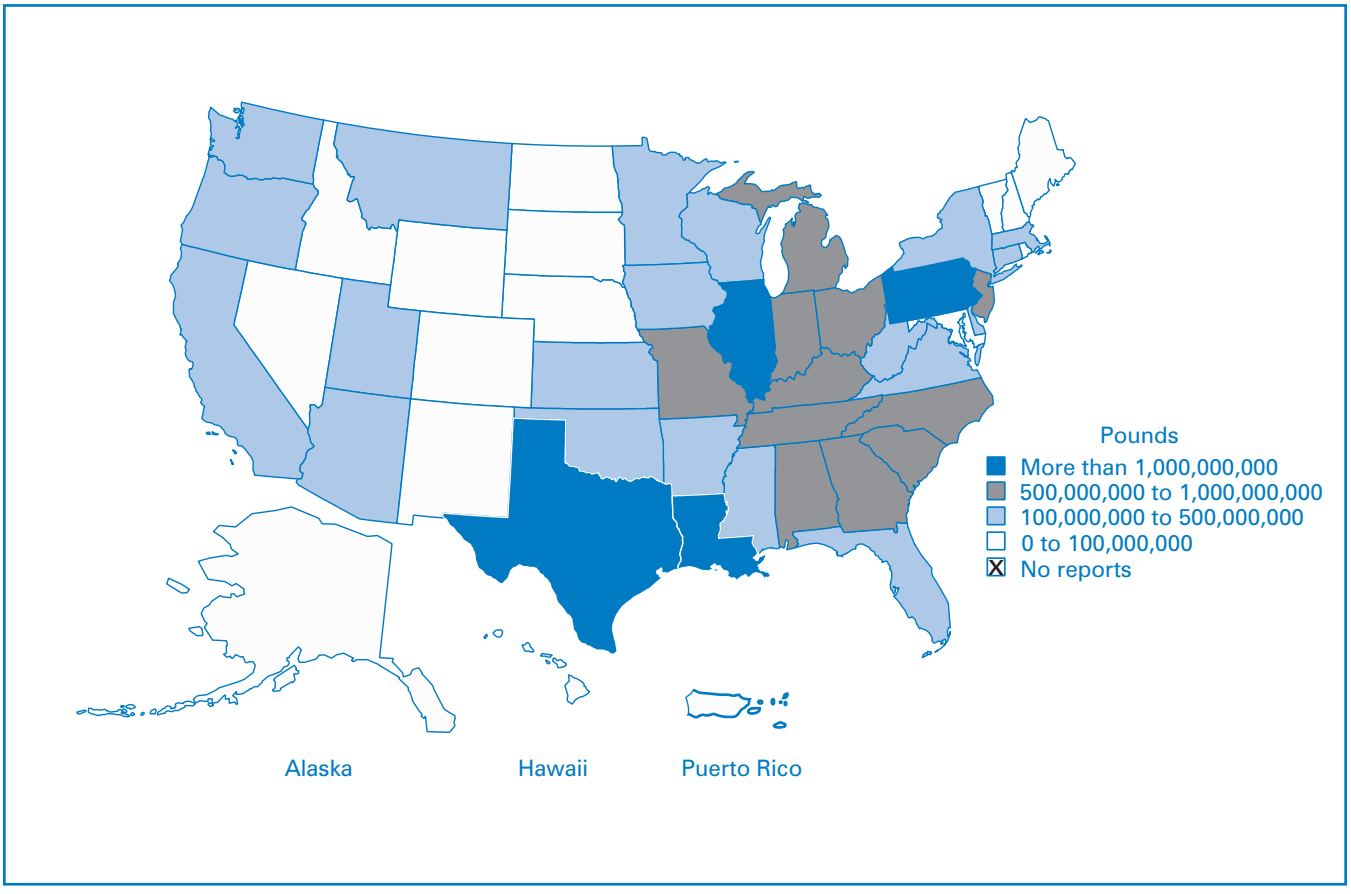


Table 3–10. Quantities of TRI Chemicals in Waste by State, 1999, Original Industries

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	169,786,350	61,390,656	43,612,900	11,121,513	261,272,116	18,088,559	70,142,216	635,414,310	48,462
Alaska	201,583	1,600	450,000	79	1,598,431	739	1,595,467	3,847,899	21,132
American Samoa	0	0	0	0	0	0	0	0	0
Arizona	109,669,789	38,880,138	964,220	714,035	6,854,784	3,243,311	50,951,351	211,277,628	146
Arkansas	111,677,082	53,576,282	32,793,225	7,381,969	86,906,289	2,955,904	53,957,981	349,248,732	1,177,284
California	38,316,764	86,115,813	30,599,409	9,137,864	238,892,556	26,639,188	49,549,599	479,251,193	404,950
Colorado	14,577,387	19,148,759	422,626	5,589,407	9,910,314	3,753,209	7,320,099	60,721,801	320,174
Connecticut	79,028,146	20,514,749	3,396,139	2,209,746	15,941,480	6,425,266	6,569,723	134,085,249	79,605
Delaware	32,571,856	9,345,837	22,981,591	1,420,826	69,149,944	3,882,099	7,673,600	147,025,753	22,528
District of Columbia	0	14,089	0	0	0	0	18,096	32,185	0
Florida	72,480,919	19,534,593	23,845,554	3,549,244	90,613,719	10,904,515	74,804,515	295,733,059	27,816
Georgia	278,533,026	53,538,883	55,205,937	12,287,418	157,728,920	6,812,218	65,295,118	629,401,520	759,682
Guam	0	0	0	0	0	0	0	0	0
Hawaii	0	4,138	0	1,134	3,353,850	3,223	575,178	3,937,523	16
Idaho	3,560,115	1,486,153	15,930	122,350	21,887,183	971,300	26,435,137	54,478,168	241
Illinois	970,752,375	93,996,116	29,329,613	29,891,613	190,430,501	17,462,059	106,718,228	1,438,580,505	529,536
Indiana	149,429,156	152,244,644	144,380,707	10,726,323	137,237,418	17,946,799	132,390,616	744,355,663	362,176
Iowa	162,226,099	36,809,582	1,670,852	4,215,416	57,597,992	12,270,344	38,978,093	313,768,378	280,436
Kansas	103,192,153	74,570,529	92,444,850	3,086,298	23,380,834	2,045,979	35,629,572	334,350,215	292,421
Kentucky	281,292,045	49,802,056	64,916,945	9,605,108	125,045,911	15,015,414	41,770,156	587,447,635	172,060
Louisiana	880,849,285	49,296,043	307,506,075	12,747,812	919,799,983	15,787,457	134,204,534	2,320,191,189	763,546
Maine	8,114,524	2,185,531	8,891,859	313,913	45,534,357	762,575	7,910,546	73,713,305	343
Maryland	20,289,905	6,268,088	11,482,923	928,230	26,757,669	10,083,425	13,642,248	89,452,488	156
Massachusetts	25,216,035	23,702,625	6,244,001	6,412,974	20,245,285	13,681,402	5,670,008	101,172,330	438,497
Michigan	433,415,864	125,410,264	62,125,600	74,367,494	96,691,662	35,062,778	73,419,983	900,493,645	24,198
Minnesota	204,704,491	21,596,576	4,659,701	2,179,958	44,229,956	17,053,519	20,219,005	314,643,206	225
Mississippi	130,199,405	19,903,207	35,410,943	7,492,881	84,770,737	5,817,860	62,205,644	345,800,677	154,002
Missouri	224,972,881	56,383,686	130,098,666	10,354,592	51,089,782	13,228,227	59,038,761	545,166,595	59,122
Montana	36,466,718	180,530	7,559,811	22,434	7,916,220	30,689	49,842,158	102,018,560	6,898
Nebraska	1,884,598	41,240,163	311,185	365,777	7,594,782	1,166,097	23,171,454	75,734,056	226,883
Nevada	65,595,518	1,178,696	0	21,160	9,045,979	61,950	4,362,990	80,266,293	27,096
New Hampshire	17,095,576	15,483,788	1,446,912	2,664,256	15,569,091	1,018,177	3,035,296	56,313,096	21,206
New Jersey	90,609,387	38,954,247	192,070,114	46,684,889	133,101,076	41,396,542	20,996,994	563,813,249	65,799
New Mexico	1,541,221	4,559,295	24,151,974	86,723	5,590,356	694,733	22,896,622	59,520,924	9
New York	155,961,572	78,820,848	26,617,963	6,192,842	105,436,700	15,678,021	32,947,844	421,655,790	4,127,502
North Carolina	327,414,744	84,106,160	32,825,939	11,149,800	136,464,165	5,170,785	67,054,426	664,186,019	850,800
North Dakota	2,480	520,138	0	41,491	4,053,454	528,994	2,543,318	7,689,875	3
Northern Marianas	0	0	0	0	0	0	0	0	0
Ohio	221,607,081	179,252,320	139,872,485	32,105,026	152,530,203	34,641,356	148,856,278	908,864,749	1,072,725
Oklahoma	39,567,380	22,990,740	231,400	1,525,109	34,661,231	1,784,576	22,806,188	123,566,624	42,764
Oregon	24,552,174	18,762,619	11,258,882	2,575,095	140,021,069	7,401,006	32,276,873	236,847,718	34,813
Pennsylvania*	350,066,276	180,352,997	51,115,733	20,435,839	248,978,886	49,943,621	138,983,952	1,039,877,304	1,336,554
Puerto Rico	13,660,194	10,663,327	54,091	18,218,540	26,556,033	10,539,593	6,255,204	85,946,982	6,491
Rhode Island	6,496,043	12,007,673	186,574	818,660	5,905,324	719,334	1,233,975	27,367,583	5,689
South Carolina	456,029,197	59,431,431	164,249,561	19,809,233	103,518,595	10,708,091	62,529,069	876,275,177	280,999,863
South Dakota	262,082	729,930	1,294,300	377,359	2,013,247	631,408	3,504,320	8,812,646	3,248
Tennessee	186,892,360	69,347,509	70,758,123	5,579,717	80,882,672	6,660,518	95,458,734	515,579,633	114,475
Texas	1,057,277,403	134,063,195	865,991,370	81,620,986	2,194,073,787	75,722,610	264,703,891	4,673,453,242	3,613,370
Utah	2,126,718	2,807,088	2,236,541	33,548	236,048,188	1,294,689	82,256,052	326,802,824	6,803,887
Vermont	145,062	1,390,069	0	9,317	1,378,272	382,312	444,303	3,749,335	3,512
Virgin Islands	864,705	159,347	0	4,184	13,041,037	18,692	699,019	14,786,984	480
Virginia	133,276,080	25,108,105	36,279,012	8,234,163	103,975,102	19,151,167	54,611,285	380,634,914	126,270
Washington	37,945,844	12,746,258	15,687,058	615,451	65,525,005	3,841,430	24,719,261	161,080,307	68,437
West Virginia	43,188,478	6,236,674	35,264,759	12,914,537	114,498,331	7,778,347	21,733,723	241,614,849	80,947
Wisconsin	62,455,920	57,992,583	13,025,800	13,661,973	111,613,249	14,802,366	39,179,381	312,731,272	148,650
Wyoming	1,810,802	91,100	159,140	5,100	3,412,392	5,083	10,515,392	15,999,009	2
Total	**7,839,852,848**	**2,134,897,467**	**2,806,098,993**	**511,631,406**	**6,850,326,119**	**571,669,556**	**2,384,303,476**	**23,098,779,865**	**305,727,127**

Note: Data are from Section 8 of Form R.

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

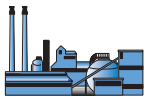


Table 3–11. Comparison of TRI On-site and Off-site Releases, 1988, 1995 and 1998–1999, Original Industries

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

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

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

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

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

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

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

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

largest quantity of off-site recycling, 180.4 million pounds, was reported by Pennsylvania facilities, but Ohio was a close second, with 179.3 million pounds.

Louisiana ranked second, after Texas, in on-site treatment with 919.8 million pounds. It ranked third in on-site recycling, after Texas and Illinois, reporting 880.8 million pounds in this category.

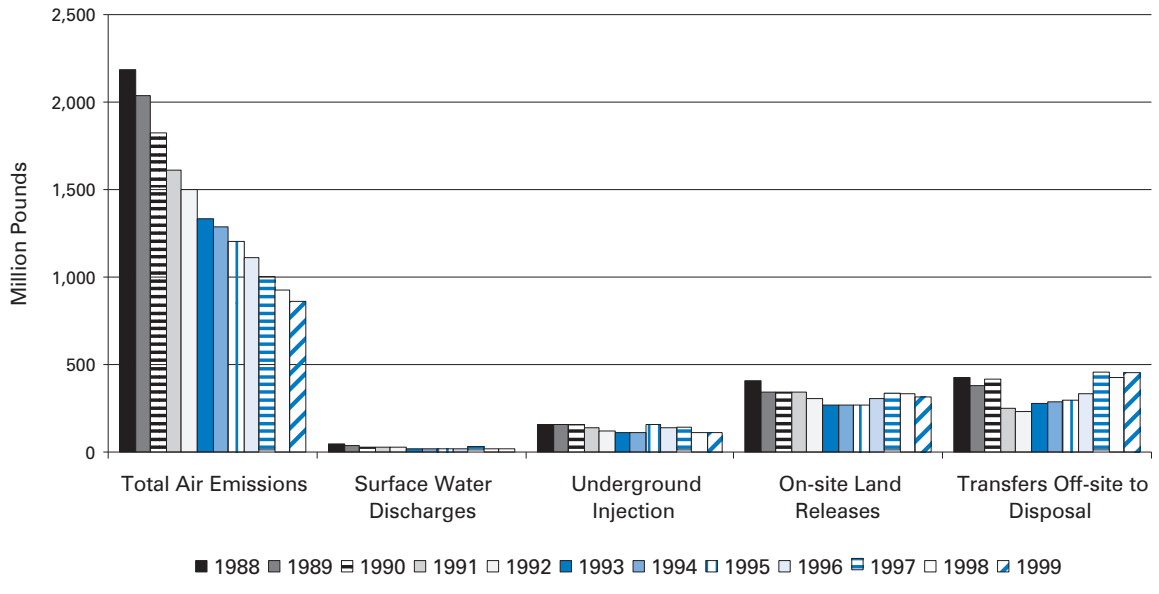
TRI Releases, 1988–1999

As noted in **Making Year-to-Year Comparisons of TRI Data** in Chapter 1, comparisons of TRI data across years must be based on a consistent set of chemicals and industries. Tables in this section address only data for the chemicals that were reportable in all years 1988 through 1999. Because reporting requirements for ammonia, hydrochloric acid, and sulfuric acid changed during that period, these substances are not included in the 1988–1999 analyses. Reporting by facilities in the industries added to TRI beginning in 1998 is also excluded here.

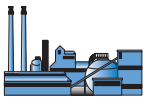
Table 3–11 compares TRI on-site and off-site releases for 1988, 1995, 1998, and 1999. For the chemicals reportable in all years, total releases decreased from 3.21 billion pounds in 1988 to 1.75 billion pounds in 1999, a 45.5 percent reduction. The number of forms submitted decreased by 5.5 percent, from 60,312 to 57,001.

On-site releases fell by 53.6 percent, from 2.79 billion pounds in 1988 to 1.29 billion pounds in 1999. The amounts for all on-site release categories decreased. As shown in Figure 3–5, most of the overall reduction occurred in air emissions, which dropped from 2.18 billion pounds to 858.5 million pounds. This amounted to a 60.6 percent

Figure 3-5. Distribution of TRI On-site and Off-site Releases, 1988–1999, Original Industries



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



decrease. The largest percentage reduction was in surface water discharges, which declined 66.0 percent, from 41.9 million pounds to 14.3 million pounds.

Fluctuations in off-site releases (transfers to disposal) over the period resulted in little net change between 1988 and 1999. These releases fell from the 1988 level of 422.7 million pounds to 293.3 million pounds in 1995 but rose to 422.1 million pounds in 1998 and to 455.7 million pounds in 1999. The result was an increase of 33.0 million pounds, or 7.8 percent, for the period 1988–1999. This outcome reflected a sharp increase in solidification/stabilization of metals. Solidification/stabilization rose 372.3 percent over the period 1988–1999, from 29.5 million pounds to 139.5 million pounds. This increase was partly offset by reductions in other types of off-site releases. Amounts sent to landfills/surface impoundment, the largest type of off-site release, decreased overall, from 265.7 million pounds in 1988 to 220.2 million pounds in 1999, a decrease of 17.1 percent. (The amount dipped to 215.1 million pounds in 1995 before rising again.)

Source Reduction and Projections of TRI Chemicals in Waste

The Pollution Prevention Act of 1990 (PPA) 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

Source reduction activities are undertaken to reduce the amount of a toxic chemical that 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 in Chapter 1 further explains source reduction as defined by the PPA.

Table 3-12. Facilities and Forms Reporting Source Reduction Activity, by Category, 1999 , Original Industries

	Facilities Reporting Source Reduction Activity As Percent of TRI Facilities Reporting Form Rs*		Forms Reporting Source Reduction ActivityAs Percent of TRI Form Rs*	
	Number	Percent	Number	Percent
Good Operating Practices	2,368	11.4	5,421	9.1
Inventory Control	551	2.7	1,170	2.0
Spill and Leak Prevention	954	4.6	2,320	3.9
Raw Material Modifications	990	4.8	1,671	2.8
Process Modifications	1,625	7.9	3,345	5.6
Cleaning and Degreasing	420	2.0	636	1.1
Surface Preparation and Finishing	528	2.6	963	1.6
Product Modifications	406	2.0	769	1.3
Any Source Reduction Activity	**4,798**	**23.2**	**11,208**	**18.9**

Note: All source reduction activities on a form are counted in the corresponding category. Totals do not equal the sum of the individual 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.

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 managed by a facility 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 would implementing the same activity earlier in the year.

Table 3–12 summarizes source reduction activity reporting by category for 1999. The most frequently reported categories of source reduction activity were good operating practices (9.1 percent of all forms), process modifications (5.6 percent), and spill and leak prevention (3.9 percent). These categories were also the most frequently reported in previous years. More than 4,798 facilities, 23.2 percent of all reporting facilities, reported at least one source reduction activity in 1999. These facilities submitted 11,208 forms that indicated at least one source reduction activity; these forms represented 18.9 percent of all Form Rs submitted in 1999. Thus, for every Form R indicating source reduction activity in 1999, more than four did not.

Facility Projections of TRI Chemicals in Waste

In 1999, facilities reported managing 23.1 billion pounds of TRI chemicals in production-related waste. As Table 3–13 shows, these facilities project a reduction of the total to 22.50 billion pounds in reporting year 2000, followed by an increase in 2001 to 23.42 billion pounds. These figures amount to a 2.6 percent projected decrease between 1999 and 2000 and a 4.1 percent projected increase between 2000 and 2001.

On-site recycling was expected to rise from 7.84 billion pounds in 1999 to 8.49 billion pounds in 2001, an increase of 8.3 percent. On-site energy recovery was projected to increase, from 2.81 billion pounds to 2.90 billion pounds, or 3.4 percent. Facilities expected on-site treatment to decline by 4.2 percent, from 6.85 billion pounds to 6.56 billion pounds. A slight rise was expected in off-site recycling and a slight decrease in off-site energy recovery. Off-site treatment was expected to fall from 571.7 million pounds to 543.8 million pounds, a 4.9 percent decrease. The quantity released on- and off-site was projected to fall by 5.2 percent, from 2.38 billion pounds in 1999 to 2.26 billion pounds in 2001.

These projections represent little change in how facilities expected to manage TRI chemicals in waste. Between 1999 and 2001, the quantity released on- and off-site—the least-desirable option under the waste management hierarchy described in **Waste Management** in Chapter 1—was projected to decrease from 10.3 percent of total production-related waste managed to 9.7 percent, according to facilities' submissions to TRI. This suggests only a slight positive shift from releases toward more-preferred options.

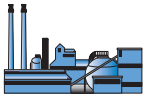


Table 3–13. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999–2001 , Original Industries

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	7,839,852,848	33.9	7,813,877,076	34.7	8,488,898,837	36.2
Recycled Off-site	2,134,897,467	9.2	2,123,946,416	9.4	2,159,583,461	9.2
Energy Recovery On-site	2,806,098,993	12.1	2,798,226,054	12.4	2,901,923,158	12.4
Energy Recovery Off-site	511,631,406	2.2	490,326,952	2.2	508,060,464	2.2
Treated On-site	6,850,326,119	29.7	6,465,227,785	28.7	6,559,499,666	28.0
Treated Off-site	571,669,556	2.5	535,158,963	2.4	543,776,497	2.3
Quantity Released On- and Off-site	2,384,303,476	10.3	2,277,326,241	10.1	2,261,450,905	9.7
Total Production-related Waste	**23,098,779,865**	**100.0**	**22,504,089,487**	**100.0**	**23,423,192,988**	**100.0**

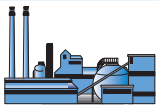
Waste Management Activity	Projected Change 1999-2000 Percent	Projected Change 2000-2001 Percent	Projected Change 1999-2001 Percent
Recycled On-site	–0.3	8.6	8.3
Recycled Off-site	–0.5	1.7	1.2
Energy Recovery On-site	–0.3	3.7	3.4
Energy Recovery Off-site	–4.2	3.6	–0.7
Treated On-site	–5.6	1.5	–4.2
Treated Off-site	–6.4	1.6	–4.9
Quantity Released On- and Off-site	–4.5	–0.7	–5.2
Total Production-related Waste	**-2.6**	**4.1**	**1.4**

Note: Current year and projected amounts are from Section 8 of Form R for 1999.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.

Chapter 4

Toxics Release Inventory Data for New Industries and Federal Facilities, 1998–1999

Chapter 4



Toxics Release Inventory Data for New Industries and Federal Facilities, 1998–1999

This chapter provides analyses of 1999 TRI data, by industry sector, for the seven industries that were required to report to TRI for the first time in 1998. Analyses of TRI reporting by the 20 industries in the manufacturing sector (Standard Industrial Classification codes 20 to 39) that have been required to report to TRI since the program began in 1987 appear in Chapters 3 and 5. Box 4–1 contains an explanation of SIC codes and their use in TRI.

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

More details for the individual industry sectors on products, services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxic Release Inventory Public Data Release* report (EPA 745-R-00-007).

Box 4–1. SIC Codes and Their Use in TRI

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

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

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

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

NEW INDUSTRIES

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

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

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

1998–1999 TRI Data

In 1999, TRI releases from all industries totaled 7.77 billion pounds, of which the new industries reported 5.45 billion (see Table 4–1). Among the new industries, metal mining and electric utilities accounted for the bulk of on- and off-site releases. Metal mining reported releases of 3.98 billion pounds (73.0 percent of the new industry total), and electric utilities reported 1.16 billion pounds (21.3 percent). Of the metal mining releases, most—3.93 billion pounds, or 98.7 percent—were on-site to land in other than RCRA subtitle C landfills. Metal mining's releases to Class II–V wells, 35.1 million pounds, made up less than 1 percent of the industry's releases but accounted for 99.2 percent of total TRI releases in this category. The original industries, by contrast, reported 199.4 million pounds of underground injection to Class I wells—89.7 percent of the TRI total—but less than 150,000 pounds to Class II–V wells. (For an explanation of the terminology, see Box 1–4 in Chapter 1.) Most (841.9 million pounds, or 72.4 percent) of the electric utilities' releases were on-site to the air.

Hazardous waste and solvent recovery facilities reported 288.0 million pounds of releases, 206.8 million pounds of which went to RCRA subtitle C landfills and 22.9 million pounds (10.3 percent of the TRI total for the category) to Class I wells.

Releases of all types from all industries rose 5.3 percent between 1998 and 1999, from 7.38 billion pounds to 7.77 billion pounds although overall the number of forms submitted decreased by 2.4 percent (Table 4-2). The overall increase can be accounted for by reporting by one facility in Utah. This metal mining facility retired a leach pad in

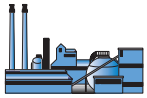


Table 4–1. TRI On-site and Off-site Releases by Industry, Original and New Industries, 1999

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

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

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

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

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

1999 and, therefore, had a large one-time increase of 505 million pounds reported as on-site land releases.

From 1998 to 1999, releases from the original industries decreased 2.5 percent. Among the new industries, coal mining reported a 9.7 decrease in releases, and petroleum terminals and bulk storage facilities reported a 5.5 percent decline. Releases from the chemical wholesale distributors category showed the largest increase, 28.3 percent, followed by metal mining, with 11.7 percent. Metal mining recorded the largest absolute increase, 416.3 million pounds; electric utilities reported the next-highest increase, 24.9 million pounds.

In 1999, production-related waste managed by all TRI industries totaled 29.49 billion pounds (Table 4–3). The original industries accounted for 23.10 billion pounds of production-related waste, of which 33.9 percent was recycled on-site. Among the new industries, 98.9 percent (3.59 billion pounds) of the production-related waste managed by metal mining was released on- or off-site, as was 70.9 percent (1.17 billion pounds) of the production-related waste from electric utilities. Hazardous waste and

Table 4–2. TRI Forms and Total Releases by Industry, Original and New Industries, 1998–1999

SIC Code	Industry	Total Forms				Total On-site and Off-site Releases			
		1998	1999	Change 1998-1999		1998	1999	Change 1998-1999	
		Number	Number	Number	Percent	Pounds	Pounds	Pounds	Percent
20–39	Original Industries	70,975	69,471	–1,504	–2.1	2,386,229,289	2,326,509,998	–59,719,291	–2.5
10	Metal Mining	768	692	–76	–9.9	3,560,719,410	3,977,016,866	416,297,456	11.7
12	Coal Mining	193	205	12	6.2	13,024,894	11,758,838	–1,266,056	–9.7
491/493	Electric Utilities	4,335	4,225	–110	–2.5	1,137,623,361	1,162,509,246	24,885,885	2.2
5169	Chemical Wholesale Distributors	3,615	3,459	–156	–4.3	1,537,099	1,971,659	434,560	28.3
5171	Petroleum Terminals and Bulk Storage Facilities	3,796	3,568	–228	–6.0	4,514,607	4,268,551	–246,056	–5.5
4953/7389	Hazardous Waste and Solvent Recovery Facilities	2,435	2,448	13	0.5	280,413,169	288,002,413	7,589,244	2.7
	Total	**86,117**	**84,068**	**-2,049**	**-2.4**	**7,384,061,829**	**7,772,037,571**	**387,975,742**	**5.3**

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.
Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total releases for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total releases for manganese compounds from 5,584,900 pounds to below 500 pounds.

solvent recovery facilities treated on-site 26.2 percent of their production-related waste and sent 24.9 percent to energy recovery off-site. The quantity released on- and off-site by this industry amounted to 27.5 percent of its production-related waste. Chemical wholesale distributors recycled on-site almost 50 percent of their production-related waste. The corresponding share for petroleum terminals and bulk storage facilities was 70.2 percent. Non-production-related waste is overstated in this report for all years. Those forms indicating NA for non-production-related waste were assigned one pound erroneously. The total amount overstated is about 4,500 pounds for each year.

As Table 4–4 shows, in 1999, transfers off-site to recycling made up more than half of total transfers for further waste management and disposal by all industries (2.11 billion pounds, out of a total 4.10 billion pounds). Although the original industries accounted for the bulk of the transfers, some of the new industries reported sizable amounts. For example, transfers to energy recovery by the original industries (514.4 million pounds) made up 66.2 percent of the total of 777.5 million pounds for all industries, but a new industry group, hazardous waste and solvent recovery facilities, reported 251.4 million pounds, or 32.3 percent of the total. The original industries accounted for 98.6 percent of transfers to off-site recycling, with 2.08 billion pounds, and for 82.2 percent of transfers to treatment (240.9 million pounds). For most industries, non-metal TRI chemicals predominated in transfers to publicly owned treatment works (POTWs). The original industries sent 318.9 million pounds and hazardous waste and solvent recovery facilities sent almost 2 million pounds of

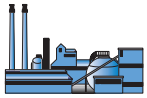


Table 4–3. Quantities of TRI Chemicals in Waste by Industry, Original and New Industries, 1999

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

Note: Data are from Section 8 of Form R.
Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.
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non-metal TRI chemicals to POTWs. The exception is metal mines where most transfers to POTWs were for metals.

Total Releases by State

The geographic distribution of total releases differed considerably for the original and the new industries, and the new industries' data strongly influenced state rankings for total releases by all TRI industries in 1999. State-by-state comparisons of total releases by original industries, new industries, and all TRI industries appear in Table 4–5.

The states with the largest releases by new industries were Nevada, with 1.16 billion pounds; Utah, with 1.08 billion pounds; and Arizona, with 912.5 million pounds. As is seen later in this chapter, metal mining facilities reported large releases in these three states. These were also the top states, in the same order, for total releases by all TRI industries. For total releases by the original industries, Nevada ranked 44th, Utah 8th, and Arizona 18th. The top states for total releases by original industries in 1999 were Texas (257.9 million pounds), Pennsylvania (160.5 million pounds), and Ohio (140.2 million pounds). Due to an EPA data entry error, three chemical reporting revisions for 1999 for one facility, US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facilities tables). The effect of the revisions is to change the facility's off-site transfers to disposal amounts

(off-site releases) for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal amounts (off-site releases) for manganese compounds from 5,584,900 pounds to below 500 pounds. Louisiana, which in 1998 ranked second in total releases by original industries, was in fourth place in 1999, with 134.8 million pounds.

Table 4-4. TRI Transfers Off-site for Further Waste Management/Disposal by Industry, Original and New Industries, 1999

SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers*	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/ Disposal
					Metals and Metal Compounds	Non-metal TRI Chemicals			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
20–39	Original Industries	2,075,254,609	514,397,272	240,886,196	3,345,324	318,922,637	308,270	483,494,678	3,636,608,986
10	Metal Mining	2,888,726	840	4,419	40,000	500	0	2,141,852	5,076,337
12	Coal Mining	6,753	0	0	0	0	0	0	6,753
491/493	Electric Utilities	4,206,466	42,205	403,920	3,569	10,017	0	60,645,291	65,311,468
5169	Chemical Wholesale Distributors	4,387,518	11,379,798	3,214,228	75	49,600	0	654,072	19,685,291
5171	Petroleum Terminals and Bulk Storage Facilities	1,285,255	315,319	719,019	322	24,678	0	176,130	2,520,723
4953/7389	Hazardous Waste and Solvent Recovery Facilities	23,591,607	251,398,997	47,886,693	14,417	1,953,144	553,773	46,863,651	372,262,282
	Total	**2,111,620,934**	**777,534,431**	**293,114,475**	**3,403,707**	**320,960,576**	**862,043**	**593,975,674**	**4,101,471,840**

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

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's other transfers off-site to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising other transfers off-site to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.

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

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

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

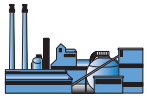


Table 4-5. TRI Total Releases by State, Original and New Industries, 1999

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

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

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

Metal Mining (SIC Code 10)

Introduction

Metal mining facilities in SIC code 10 explore for metallic minerals, develop mines, and conduct mining and milling operations for the production of metals. These facilities also reclaim the lands mined. Ores recovered for extraction and beneficiation are valued for the metals they contain. Metals are used in consumer and industrial products such as metal alloys, chemicals, and electronics, various modes of transport, and other products.

Mining operations are classified according to the ores they extract. Facilities in six categories reported to TRI for the first time in the 1998 reporting year (see Box 4–2). These categories include copper (SIC code 1021), lead and zinc (SIC code 1031), gold (SIC code 1041), and silver (SIC code 1044). Also covered are ferroalloy ores (SIC code 1061, alloys containing iron), such as chromium, manganese, molybdenum, nickel ore, and tungsten, and miscellaneous metal ores (SIC code 1099), which includes ores of aluminum, antimony, bauxite, beryllium, mercury, thorium, tin, and others. Three mining-related SIC codes are currently not subject to TRI reporting: iron ores (SIC code 1011), metal mining services (SIC code 1081), and uranium-radium-vanadium ores (SIC code 1094).

More details for this industry sector on products and services, employment and

Box 4–2. SIC Code 10, Metal Mining: Codes and Classifications Required to Report to TRI

1021	Copper Ores	Mining, milling, or otherwise preparing copper ores. Recovery of copper concentrates by precipitation and leaching.
1031	Lead and Zinc Ores	Mining, milling or otherwise preparing lead ores, zinc ores, or lead-zinc ores.
1041	Gold Ores	Mining gold ores from lode deposits. Recovering gold from placer deposits. Includes amalgamation, cyanidation, and production of bullion at mine, mill, or dredge sites.
1044	Silver Ores	Mining, milling or otherwise preparing silver ores. Includes production of bullion at mine or mill sites.
1061	Ferroalloy Ores, Except Vanadium	Mining, milling or otherwise preparing ferroalloy ores, except vanadium. Includes chromium, cobalt, molybdenum, nickel, and others.
1099	Miscellaneous Metal Ores, Not Elsewhere Classified	Mining, milling or otherwise preparing miscellaneous metal ores, including aluminum, antimony, mercury, tin, and others.

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

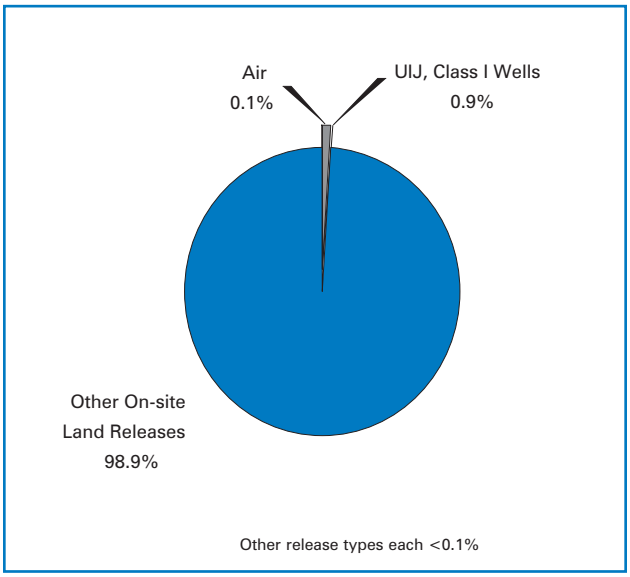
production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

1999 TRI Data for Metal Mining

On- and Off-site Releases

Metal mining facilities required to report to TRI had total on- and off-site releases of 3.98 billion pounds in 1999, as shown in Table 4–6. The bulk of these releases, 3.93 billion pounds, representing 98.9 percent of the total reported by the industry, was released on-site to land (Figure 4–1). All of the on-site land releases were released to land in other than RCRA subtitle C land-

Figure 4–1. Distribution of TRI On-site and Off-site Releases, 1999: Metal Mining



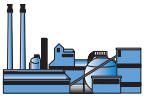
Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.
UIJ = Underground Injection

Table 4-6. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: Metal Mining

			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
1021	Copper Ores	173	566,909	15,723	0	0	0	2,022,866,579	2,023,449,211	33	2,023,449,244
1031	Lead and Zinc Ores	65	912,883	38,121	0	143,612	0	439,843,526	440,938,142	40,006	440,978,148
1041	Gold Ores	271	1,593,174	364,966	0	2,797	0	938,514,462	940,475,399	29	940,475,428
1044	Silver Ores	40	73,652	8,856	0	0	0	112,135,907	112,218,415	24	112,218,439
1061	Ferroalloy Ores, Except Vanadium		68,444	16,017	0	0	0	708,600	793,061	2,136,888	2,929,949
1099	Miscellaneous Metal Ores, n.e.c.*	18	421,841	0	0	0	0	2,392,223	2,814,064	0	2,814,064
	Multiple within SIC Code 10	46	73,734	3,189	0	34,946,000	0	54,717,177	89,740,100	4	89,740,104
	SIC Code 1021 and SIC Code 33 (Primary Metals)	30	611,626	10	0	0	0	237,417,389	238,029,025	1,884	238,030,909
	SIC Code 1021 and SIC Code 4931 (Electric Utilities)	20	130,351	147	0	0	0	126,250,083	126,380,581	0	126,380,581
	Total	**692**	**4,452,614**	**447,029**	**0**	**35,092,409**	**0**	**3,934,845,946**	**3,974,837,998**	**2,178,868**	**3,977,016,866**

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. Forms that reported more than one 4-digit SIC Code within SIC Code 10 are assigned to the multiple codes category.

*n.e.c.: not elsewhere classified.



fills. (Types of on-site land releases are described in Box 1–4 in Chapter 1.)

Metal mining facilities injected 35.1 million pounds into underground wells, all Class II–V. (For an explanation of the terminology, see Box 1–4 in Chapter 1.) Underground injection was the second-largest release type for this industry, but the amount represented just 0.9 percent of total on- and off-site releases.

Copper mining facilities reported 2.02 billion pounds of total releases, the largest quantity within the industry. Gold mining facilities ranked second, with 940.5 million pounds. Together, copper mining and gold mining accounted for three-quarters (74.4 percent) of the metal mining total for on- and off-site releases. Nearly all of the releases from these industries were on-site to land.

Facilities in the lead and zinc mining industry ranked third for total on- and off-site releases, with 441.0 million pounds. This total included 439.8 million pounds of on-site land releases and almost 144,000 pounds of underground injection.

Facilities mining ferroalloy ores (except vanadium) reported transfers to disposal of 2.14 million pounds, nearly all of the metal mining industry's 2.18 million pounds of off-site releases. Ferroalloy mining was the only type of metal mining that released a larger amount off-site than on-site.

Total TRI releases from the metal mining industry rose 11.7 percent between 1998 and 1999 (Table 4-7). Off-site releases rose 71.9 percent, from 1.3 million pounds to 2.2 million pounds, with landfills/surface impoundments and transfers to POTWs accounting for most of the increase. On-site releases rose 11.7 percent. Within this category, total air emissions declined by 3.9 percent and surface water discharges decreased by 16.0 percent. Underground injection (entirely to Class II-V wells) rose 6.3 percent. On-site land releases rose 11.7 percent due to increase of 25.7 percent in the category of other disposal. Much of this increase can be accounted for by reporting by one facility in Utah that retired a leach pad in 1999, and therefore, had a large one-year increase of 505 million pounds reported as on-site land releases, in the other disposal category.

Waste Management Data

Quantities of TRI Chemicals in Waste

Metal mines reported total production-related waste of 3.63 billion pounds in 1999, of which 3.59 billion pounds were released on- and off-site (Table 4–8). As shown in Figure 4–2, the quantity released amounted to 98.9 percent of the industry total. The next largest waste management types were on-site recycling, with 22.2 million pounds, and on-site treatment, with 15.0 million pounds.

Production-related waste totaled 1.63 billion pounds for copper mining and 963.6 million pounds for gold mining, the largest totals in the metal mining industry. The quantities released on- and off-site were 1.63 billion pounds for copper mining and 946.6 million pounds for gold mining. Lead and zinc mining ranked third, with 448.9 million pounds of production-related waste, including 438.5 million pounds in quantities released.

Table 4–7. TRI On-site and Off-site Releases, 1998–1999: Metal Mining

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	4,633,011	4,452,614	–180,397	–3.9
Fugitive Air Emissions	3,416,467	3,276,706	–139,761	–4.1
Point Source Air Emissions	1,216,544	1,175,908	–40,636	–3.3
Surface Water Discharges	532,476	447,029	–85,447	–16.0
Underground Injection	33,001,112	35,092,409	2,091,297	6.3
Class I Wells	0	0	0	—
Class II–V Wells	33,001,112	35,092,409	2,091,297	6.3
On-site Land Releases	3,521,285,025	3,934,845,946	413,560,921	11.7
RCRA Subtitle C Landfills	54	0	–54	–100.0
Other On-site Landfills	17,834,938	14,589,719	–3,245,219	–18.2
Land Treatment	32,171	4,796	–27,375	–85.1
Surface Impoundments	1,202,003,615	1,027,330,906	–174,672,709	–14.5
Other Disposal	2,301,414,247	2,892,920,525	591,506,278	25.7
Total On-site Releases	**3,559,451,624**	**3,974,837,998**	**415,386,374**	**11.7**
Off-site Releases				
Storage Only[a]	3	0	–3	–100.0
Solidification/Stabilization[b]	452	29	–423	–93.6
Metals and Metal Compounds Only				
Wastewater Treatment (excluding POTWs)[c]	0	0	0	—
Metals and Metal Compounds Only				
Transfers to POTWs[d]	798	40,000	39,202	4,912.5
Metals and Metal Compounds Only				
Underground injection	0	0	0	—
Landfills/Surface Impoundments	1,259,608	2,136,937	877,329	69.7
Land Treatment	0	0	0	—
Other Land Disposal	0	0	0	—
Other Off-site Management	1,039	988	–51	–4.9
Transfers to Waste Broker for Disposal	5,865	760	–5,105	–87.0
Unknown[e]	21	154	133	633.3
Total Off-site Releases (Transfers Off-site to Disposal)	**1,267,786**	**2,178,868**	**911,082**	**71.9**
Total On-site and Offsite Releases	**3,560,719,410**	**3,977,016,866**	**416,297,456**	**11.7**

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 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.

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

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

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

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

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

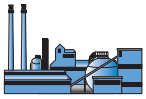
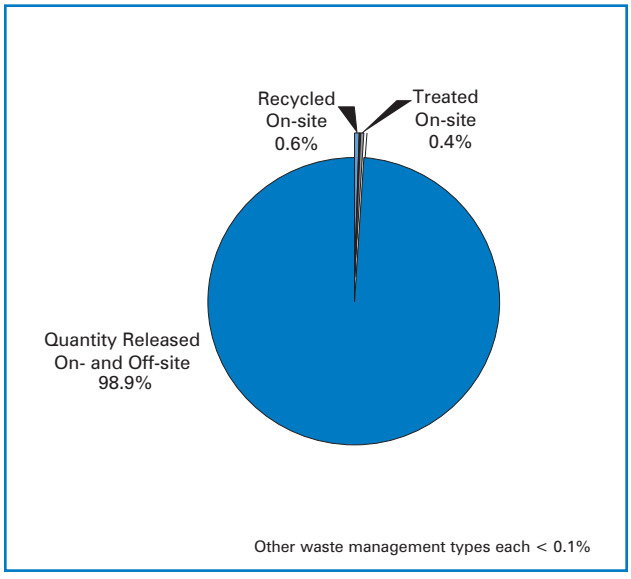


Table 4–8. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Metal Mining

SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Pounds	Pounds	Pounds
1021	Copper Ores	228,957	2,878,597	0	830	298,970	3,950	1,625,721,160	1,629,132,464	505,165,068
1031	Lead and Zinc Ores	10,392,057	31,904	0	0	0	0	438,476,266	448,900,227	8
1041	Gold Ores	5,323,207	181,991	0	0	11,498,647	9,346	946,563,131	963,576,322	27,298
1044	Silver Ores	12	59,138	0	0	2,788,000	0	112,207,937	115,055,087	20
1061	Ferroalloy Ores, Except Vanadium	0	2,900	0	0	0	0	2,928,604	2,931,504	25
1099	Miscellaneous Metal Ores, n.e.c.*	6,039,500	1,287	0	10	217,860	0	2,794,492	9,053,149	0
	Multiple within SIC Code 10	200,297	40,000	0	0	25,000	4	89,435,054	89,700,355	16
	SIC Code 1021 and SIC Code 33 (Primary Metals)	0	110,000	0	0	150,000	1,074	237,941,800	238,202,874	0
	SIC Code 1021 and SIC Code 4931 (Electric Utilities)	0	0	0	0	0	410	131,145,570	131,145,980	48
	Total	**22,184,030**	**3,305,817**	**0**	**840**	**14,978,477**	**14,784**	**3,587,214,014**	**3,627,697,962**	**505,192,483**

Note: Data are from Section 8 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 10 are assigned to the multiple codes category.
* n.e.c.: not elsewhere classified.

Figure 4–2. TRI Waste Management, 1999: Metal Mining



Note: Data are from Section 8 of Form R.

Gold mining facilities reported 11.5 million pounds treated on-site, the largest amount in this category. Metal mines sent little of their TRI chemicals in waste off-site for recycling (3.3 million pounds, mainly from copper mining) or treatment (less than 15,000 pounds). Lead and zinc mining reported the largest quantity recycled on-site (10.4 million pounds); next were miscellaneous metal mining (6.0 million pounds) and gold mining (5.3 million pounds). Only relatively small amounts of energy recovery, on- or off-site, were reported.

Table 4–9 shows the changes in the disposition of TRI chemicals in waste for the metal mining industry between 1998 and 1999. Total production-related waste decreased 2.5 percent. The largest absolute decrease was in the quantity released on- and off-site, which fell by 82.5 million pounds from 3.67 billion pounds to 3.59 billion pounds, a decrease of 2.2 percent. On-site treatment fell 37.3 percent, from 23.9 million pounds to 15.0 million pounds. On-site recycling also declined, from 26.1 million pounds to

Table 4–9. Quantities of TRI Chemicals in Waste, 1998–1999: Metal Mining

Waste Management Activity	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	26,135,717	22,184,030	–3,951,687	–15.1
Recycled Off-site	1,223,189	3,305,817	2,082,628	170.3
Energy Recovery On-site	0	0	0	—
Energy Recovery Off-site	0	840	840	—
Treated On-site	23,887,778	14,978,477	–8,909,301	–37.3
Treated Off-site	34,712	14,784	–19,928	–57.4
Quantity Released On- and Off-site	3,669,752,395	3,587,214,014	–82,538,381	–2.2
Total Production-related Waste	**3,721,033,791**	**3,627,697,962**	**–93,335,829**	**–2.5**
Non-production-related Waste	399,484	505,192,483	504,792,999	126,361.3

Note: All data are from Section 8 of Form R for the year indicated.

Table 4–10. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: Metal Mining

SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs: Metals and Metal Compounds	Transfers to POTWs: Non-metal TRI Chemicals	Other Off-site Transfers**	Other Transfers Off-site to Disposal***	Total Transfers for Further Waste Management/ Disposal
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1021	Copper Ores	2,520,398	830	3,950	0	0	0	448	2,525,626
1031	Lead and Zinc Ores	0	0	0	40,000	0	0	73	40,073
1041	Gold Ores	182,003	0	11	0	500	0	2,531	185,045
1044	Silver Ores	59,138	0	0	0	0	0	24	59,162
1061	Ferroalloy Ores, Except Vanadium	2,900	0	0	0	0	0	2,136,888	2,139,788
1099	Miscellaneous Metal Ores, n.e.c.*	1,287	10	0	0	0	0	0	1,297
	Multiple within SIC Code 10	13,000	0	0	0	0	0	4	13,004
	SIC Code 1021 and SIC Code 33 (Primary Metals)	110,000	0	0	0	0	0	1,884	111,884
	SIC Code 1021 and SIC Code 4931 (Electric Utilities)	0	0	458	0	0	0	0	458
	Total	**2,888,726**	**840**	**4,419**	**40,000**	**500**	**0**	**2,141,852**	**5,076,337**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 10 are assigned to the multiple codes category.

*n.e.c.: not elsewhere classified.

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

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

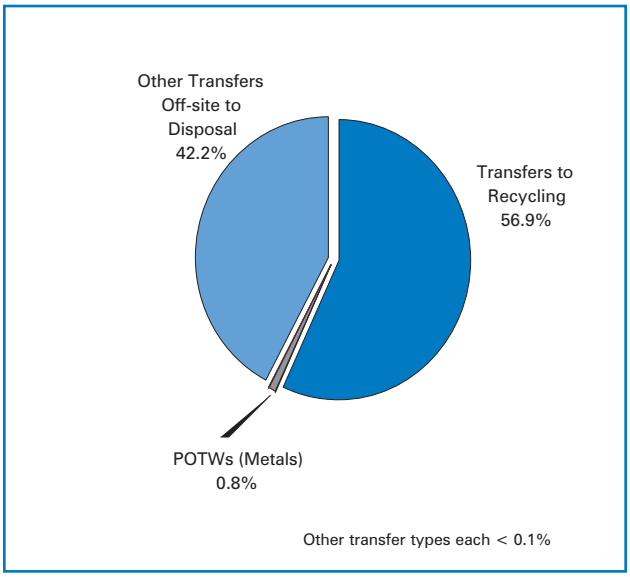
22.2 million pounds, or 15.1 percent, but off-site recycling rose from 1.2 million pounds to 3.3 million pounds, a jump of 170.3 percent.

Transfers Off-site for Further Waste Management/Disposal

Transfers off-site for further waste management/disposal by the metal mining industry totaled 5.1 million pounds, as shown in Table 4–10. Over half (56.9 percent) of this amount was transfers to recycling. The category other transfers off-site to disposal accounted for almost all the remainder—42.2 percent (see Figure 4–3).

Copper mining reported 2.5 million pounds, the largest of the four-digit SIC codes in this industry, almost all of which was transfers to recycling. The second largest amount (2.1 million pounds) was mining of ferroalloy ores (except vanadi-

Figure 4-3. Distribution of TRI Transfers Off-site for Further Waste Management/ Disposal, 1999: Metal Mining



Note: Data are from Section 6 of Form R.

um). Almost all of this amount was sent off-site to disposal. The largest transfers to POTWs were by lead and zinc mining facilities.

Table 4–11 shows changes in the disposition of waste sent off-site for further waste management or disposal. The total amount transferred rose sharply, from 2.3 million pounds to 5.1 million pounds, a 117.8 percent increase. Transfers to recycling rose 226.1 percent. Transfers to treatment showed a large increase (1,392.9 percent), but from a small base. Transfers to POTWs fell from almost 103,000 pounds to 40,500 pounds (60.6 percent). The category other off-site transfers to disposal rose from 1.3 million pounds to 2.1 million pounds, a 59.7 percent increase.

TRI Data by State

In 1999, metal mining facilities in 22 states, largely in the West, submitted a total of 692 TRI forms. Nevada facilities submitted 252 forms, the largest number of any state. Arizona, with 109 forms, was second, and New Mexico ranked third, with 62 forms.

On- and Off-site Releases

Metal mines in Nevada and Utah reported total on- and off-site releases of 1.16 billion pounds and 1.05 billion pounds, respectively, as shown in Table 4–12. Arizona ranked third, with 904.4 million pounds. Map 4–1 shows the geographic distribution of metal mining releases reported to TRI in 1999.

Nevada, Utah, and Arizona also had the largest on-site land releases — 99.9 percent of their total releases in each case. On-site

Table 4-11. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Metal Mining

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	885,726	2,888,726	2,003,000	226.1
Transfers to Energy Recovery	0	840	840	—
Transfers to Treatment	296	4,419	4,123	1,392.9
Transfers to POTWs	102,780	40,500	–62,280	–60.6
Metals and Metal Compounds Only	798	40,000	39,202	4,912.5
Non-metal TRI Chemicals	101,982	500	–101,482	–99.5
Other Off-site Transfers*	0	0	0	—
Other Off-site Transfers to Disposal**	1,341,520	2,141,852	800,332	59.7
Total Transfers Off-site for Further Waste Management/Disposal	**2,330,322**	**5,076,337**	**2,746,015**	**117.8**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Table 4–12. Summary of TRI Information by State, 1999: Metal Mining

State	Total Forms	On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
		Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alaska	35	503,301	2,095	0	34,946,000	0	395,352,370	430,803,766	5	430,803,771
Arizona	109	904,657	479	0	0	0	903,458,087	904,363,223	1,917	904,365,140
California	32	131,610	0	0	0	0	2,995,370	3,126,980	0	3,126,980
Colorado	16	8,456	16,484	0	143,612	0	8,787,803	8,956,355	440,037	9,396,392
Delaware	4	3,820	6	0	0	0	0	3,826	0	3,826
Florida	1	0	0	0	0	0	0	0	0	0
Idaho	27	3,638	11,526	0	0	0	35,383,022	35,398,186	24	35,398,210
Illinois	7	10,165	0	0	0	0	0	10,165	1,736,851	1,747,016
Minnesota	2	20,728	0	0	0	0	0	20,728	0	20,728
Missouri	19	185,639	24,404	0	0	0	45,487,756	45,697,799	0	45,697,799
Montana	38	141,747	0	0	0	0	70,753,568	70,895,315	0	70,895,315
Nevada	252	1,322,256	136,431	0	2,797	0	1,158,156,351	1,159,617,835	12	1,159,617,847
New Mexico	62	329,157	6	0	0	0	233,034,082	233,363,245	0	233,363,245
New York	7	62,022	2,876	0	0	0	7,763,814	7,828,712	0	7,828,712
Oklahoma	2	10	10	0	0	0	0	20	0	20
Oregon	1	0	0	0	0	0	0	0	0	0
South Carolina	5	0	0	0	0	0	1,158,825	1,158,825	0	1,158,825
South Dakota	13	121,254	228,280	0	0	0	5,117,500	5,467,034	10	5,467,044
Tennessee	21	193,759	9,047	0	0	0	13,196,626	13,399,432	1	13,399,433
Texas	4	53,179	0	0	0	0	0	53,179	0	53,179
Utah	29	457,169	15,385	0	0	0	1,053,722,357	1,054,194,911	0	1,054,194,911
Washington	6	47	0	0	0	0	478,415	478,462	11	478,473
Total	**692**	**4,452,614**	**447,029**	**0**	**35,092,409**	**0**	**3,934,845,946**	**3,974,837,998**	**2,178,868**	**3,977,016,866**

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.

land releases amounted to more than 90 percent of total releases in 15 of the 22 states with reporting by metal mines.

Alaska's metal mining facilities reported the largest underground injection, 34.9 million pounds. Facilities in Colorado reported the next-highest quantity released to underground injection, about 144,000 pounds. Total air emissions from facilities in Nevada were 1.3 million pounds. No other state reported more than a million pounds in air emissions, and total surface water discharges from all metal mining facilities were less than half a million pounds.

Table 4–13 summarizes, by state, changes in total releases in the metal mining group between 1998 and 1999. Total releases rose 11.7 percent. The largest absolute increases were for Utah (an increase of 605.1 million pounds, or 134.7 percent) and Alaska (an increase of 126.3 million pounds, or 41.5 percent). Illinois had the largest percentage increase, 186.4 percent, reflecting a rise from about 610,000 pounds of releases in 1998 to 1.7 million pounds in 1999. The largest absolute declines were for Nevada (a decrease of 151.7 million pounds, or 11.6 percent), and Arizona (a decrease of 101.5 million pounds, or 10.1 percent).

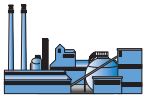


Table 4–12. Summary of TRI Information by State, 1999: Metal Mining *(continued)*

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
Alaska	761,277	49,921	0	0	41,631	9,330	425,956,878	426,819,037	18
Arizona	228,957	220,650	0	0	195,970	5,434	1,012,331,378	1,012,982,389	58
California	0	77,700	0	0	724,213	0	3,173,495	3,975,408	17
Colorado	0	2,900	0	0	0	0	9,394,824	9,397,724	8
Delaware	0	0	0	0	0	0	3,826	3,826	4
Florida	0	1,287	0	10	0	0	0	1,297	0
Idaho	832	8,920	0	0	0	0	40,941,286	40,951,038	6
Illinois	0	31,904	0	0	0	0	1,707,016	1,738,920	6
Minnesota	0	47,547	0	830	0	0	20,728	69,105	0
Missouri	0	0	0	0	0	0	45,489,544	45,489,544	0
Montana	0	27,000	0	0	20,460	0	70,794,069	70,841,529	12
Nevada	5,522,684	92,783	0	0	11,835,538	4	1,159,175,116	1,176,626,125	27,272
New Mexico	0	693,846	0	0	0	0	233,849,694	234,543,540	46
New York	0	0	0	0	0	0	10,142,877	10,142,877	0
Oklahoma	0	2,007,159	0	0	0	0	10	2,007,169	0
Oregon	0	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	32,000	0	1,165,000	1,197,000	0
South Dakota	0	44,200	0	0	1,931,265	5	5,465,830	7,441,300	24
Tennessee	9,630,780	0	0	0	0	0	13,362,037	22,992,817	8
Texas	0	0	0	0	0	0	53,179	53,179	4
Utah	6,039,500	0	0	0	197,400	0	553,708,827	559,945,727	505,165,000
Washington	0	0	0	0	0	11	478,400	478,411	0
Total	**22,184,030**	**3,305,817**	**0**	**840**	**14,978,477**	**14,784**	**3,587,214,014**	**3,627,697,962**	**505,192,483**

Note: Data are from Section 8 of Form R.

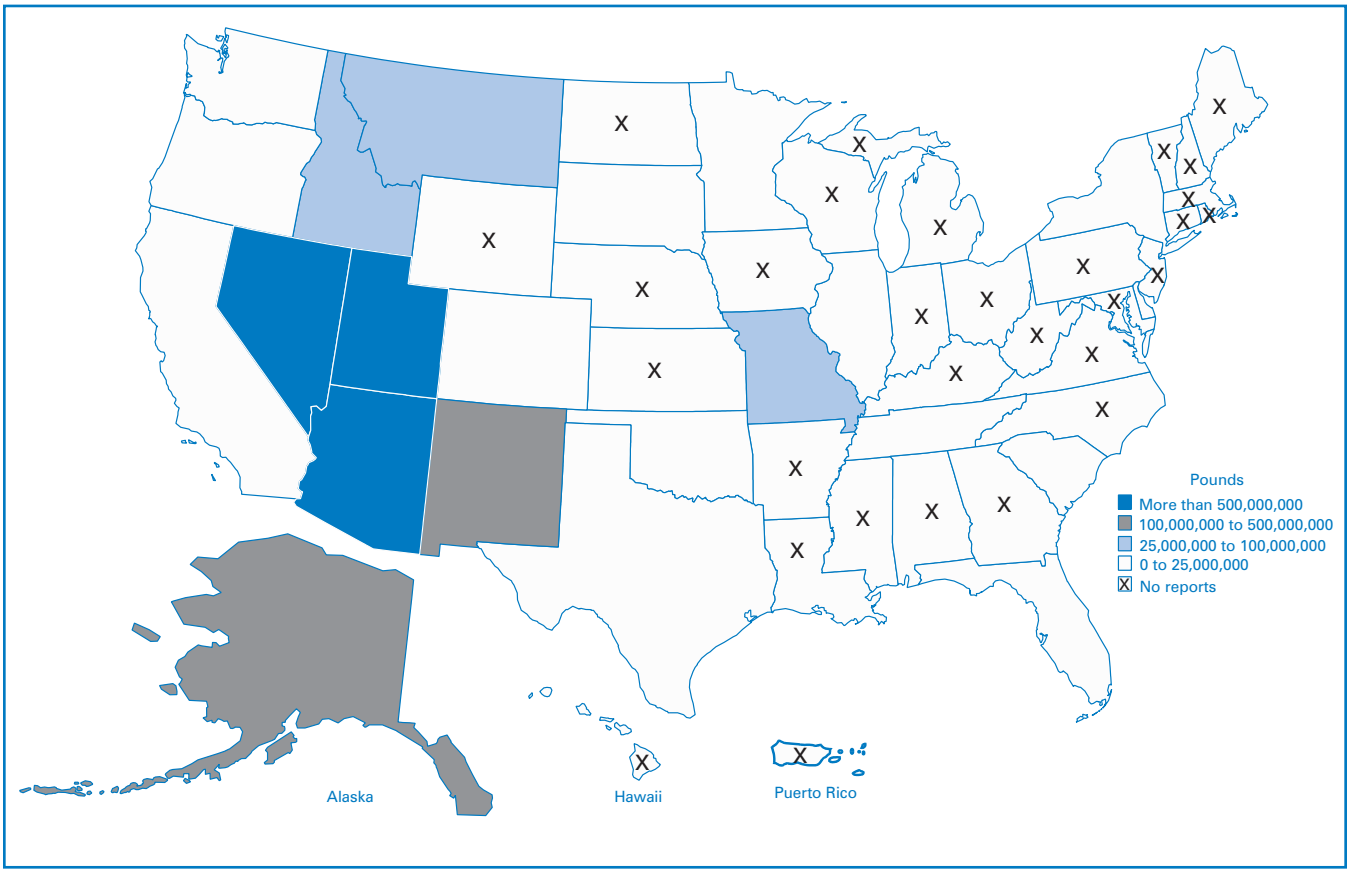
Waste Management Data

Nevada, Arizona, and Utah, the three states that ranked highest for total releases, also reported the largest amount of production-related waste in 1999. Nevada's production-related waste totaled 1.18 billion pounds. Arizona facilities reported 1.01 billion pounds, and Utah facilities reported 559.9 million pounds (see Table 4–12).

Quantities released on- and off-site accounted for more than 97 percent of total production-related waste in 15 states. Of these, Nevada, Arizona, and Utah reported the largest quantities: 1.16 billion pounds for Nevada, 1.01 billion pounds for Arizona, and 553.7 million pounds for Utah.

The states with the largest amounts of on-site recycling were Tennessee, with 9.6 million pounds, Utah, with 6.0 million pounds, and Nevada, with 5.5 million pounds. Oklahoma had the highest off-site recycling, 2.0 million pounds. Nevada reported the largest on-site treatment, 11.8 million pounds, followed by South Dakota, with 1.9 million pounds, and California, with about 724,000 pounds.

Map 4–1. Total On-site and Off-site Releases, 1999: Metal Mining



Top 15 Chemicals for On- and Off-site Releases

The top 15 chemicals released by the metal mining industry were metals, largely as metal compounds. On- and off-site releases of the top 15 chemicals totaled 3.95 billion pounds in 1999 (see Table 4–14). These 15 metals and metal compounds amounted to 99.3 percent of total releases from the industry.

The largest on- and off-site releases from the metal mining industry were of copper compounds, 1.71 billion pounds. Next largest was zinc compounds, with 678.5 million pounds. Arsenic compounds ranked third, with 549.9 million pounds.

On-site land releases accounted for 93 percent or more of the releases of all 15 chemicals. Underground injection, the second-largest release type, totaled 34.9 million pounds, of which 21.1 million pounds consisted of zinc compounds.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

Facilities in the metal mining industry expected to reduce their production-related waste by 18.7 percent between 1999 and 2001, from 3.63 billion pounds to 2.95 billion pounds. The projected overall reduction reflects expected decreases of 10.2 percent in 2000 and 9.4 percent in 2001 (see Table 4–15). The main change is expected to be in the quantity released on- and off-site, which dominates the industry totals. These

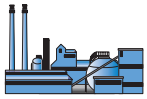


Table 4–13. TRI Total Releases by State, 1998–1999: Metal Mining

State	Total On-site and Off-site Releases			
	1998 Pounds	1999 Pounds	Change 1998-1999 Pounds	Change 1998-1999 Percent
Alaska	304,509,237	430,803,771	126,294,534	41.5
Arizona	1,005,845,908	904,365,140	–101,480,768	–10.1
California	5,947,616	3,126,980	–2,820,636	–47.4
Colorado	14,600,777	9,396,392	–5,204,385	–35.6
Delaware	12,713	3,826	–8,887	–69.9
Florida	0	0	0	—
Idaho	45,193,006	35,398,210	–9,794,796	–21.7
Illinois	609,917	1,747,016	1,137,099	186.4
Minnesota	0	20,728	20,728	—
Missouri	47,281,863	45,697,799	–1,584,064	–3.4
Montana	69,843,630	70,895,315	1,051,685	1.5
Nevada	1,311,271,215	1,159,617,847	–151,653,368	–11.6
New Mexico	226,009,646	233,363,245	7,353,599	3.3
New York	10,144,538	7,828,712	–2,315,826	–22.8
Oklahoma	0	20	20	—
Oregon	18,189,856	0	–18,189,856	–100.0
South Carolina	23,017,000	1,158,825	–21,858,175	–95.0
South Dakota	17,395,123	5,467,044	–11,928,079	–68.6
Tennessee	10,752,750	13,399,433	2,646,683	24.6
Texas	414,630	53,179	–361,451	–87.2
Utah	449,105,911	1,054,194,911	605,089,000	134.7
Washington	574,074	478,473	–95,601	–16.7
Total	**3,560,719,410**	**3,977,016,866**	**416,297,456**	**11.7**

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 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.

releases are projected to fall from 3.59 billion pounds in 1999 to 2.91 billion pounds in 2001. Even with this 18.9 percent reduction, quantity released, as a share of total production-related waste, was expected to decrease only slightly, from 98.9 percent to 98.7 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).

Source Reduction

In 1999, the metal mining industry filed 32 forms reporting source reduction activity (see Table 4–16). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is the preferred waste management option.

Facilities mining lead and zinc ores reported source reduction activity on 12 forms, 18.8 percent of the group's total Form Rs. Gold mining submitted 11 forms reporting source reduction activity, copper mining submitted 8 forms, and miscellaneous metals, 1 form.

The most frequently reported source reduction activity (identified on 24 forms, including 19 filed by lead and zinc mining facilities) was spill and leak prevention. Process modifications came next, with 13 forms, and good operating practices was third, with 9 forms.

Table 4–14. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: Metal Mining

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II–V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds		Transfers Off-site to Disposal Pounds	
—	Copper compounds	312,884	4,670	0	1,205,581	0	1,710,201,915	1,711,725,050	1,618	1,711,726,668
—	Zinc compounds	224,045	34,378	0	21,078,960	0	657,121,998	678,459,381	8,048	678,467,429
—	Arsenic compounds	57,401	6,057	0	880,034	0	548,995,573	549,939,065	263	549,939,328
—	Manganese compounds	71,727	10,505	0	1,100,000	0	373,166,213	374,348,445	1,964,332	376,312,777
—	Lead compounds	193,163	9,148	0	7,959,140	0	277,078,175	285,239,626	139	285,239,765
—	Chromium compounds	19,972	261	0	0	0	108,292,334	108,312,567	138,861	108,451,428
—	Barium compounds	8,741	25	0	1,900,000	0	91,548,207	93,456,973	25,170	93,482,143
—	Nickel compounds	6,021	3,340	0	41,007	0	39,562,810	39,613,178	5	39,613,183
7440-38-2	Arsenic	3,570	0	0	0	0	34,542,000	34,545,570	0	34,545,570
—	Antimony compounds	2,916	8,346	0	610,086	0	25,480,766	26,102,114	5	26,102,119
7440-50-8	Copper	9,714	5	0	0	0	11,139,279	11,148,998	0	11,148,998
—	Cobalt compounds	1,463	5	0	17,001	0	11,022,063	11,040,532	50	11,040,582
7440-47-3	Chromium	762	6	0	38,000	0	9,213,623	9,252,391	27	9,252,418
—	Cadmium compounds	18,434	754	0	100,000	0	8,571,734	8,690,922	255	8,691,177
—	Nitrate compounds	270	353,035	0	2,600	0	5,367,219	5,723,124	18	5,723,142
	Subtotal (top 15 chemicals)	**931,083**	**430,535**	**0**	**34,932,409**	**0**	**3,911,303,909**	**3,947,597,936**	**2,138,791**	**3,949,736,727**
	Total (all chemicals)	**4,452,614**	**447,029**	**0**	**35,092,409**	**0**	**3,934,845,946**	**3,974,837,998**	**2,178,868**	**3,977,016,866**

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.

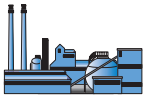


Table 4–15. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999–2001: Metal Mining

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	22,184,030	0.6	22,120,005	0.7	22,034,137	0.7
Recycled Off-site	3,305,817	0.1	3,214,707	0.1	3,198,617	0.1
Energy Recovery On-site	0	0.0	0	0.0	0	0.0
Energy Recovery Off-site	840	0.0	1,010	0.0	1,010	0.0
Treated On-site	14,978,477	0.4	14,685,590	0.5	14,273,070	0.5
Treated Off-site	14,784	0.0	14,945	0.0	14,945	0.0
Quantity Released On- and Off-site	3,587,214,014	98.9	3,217,644,294	98.8	2,910,564,928	98.7
Total Production-related Waste	**3,627,697,962**	**100.0**	**3,257,680,551**	**100.0**	**2,950,086,707**	**100.0**
Waste Management Activity	**Projected Change 1999-2000** Percent		**Projected Change 2000-2001** Percent		**Projected Change 1999-2001** Percent	
Recycled On-site	–0.3		–0.4		–0.7	
Recycled Off-site	–2.8		–0.5		–3.2	
Energy Recovery On-site	—		—		—	
Energy Recovery Off-site	20.2		0.0		20.2	
Treated On-site	–2.0		–2.8		–4.7	
Treated Off-site	1.1		0.0		1.1	
Quantity Released On- and Off-site	–10.3		–9.5		–18.9	
Total Production-related Waste	**–10.2**		**–9.4**		**–18.7**	

Note: Current year and projected amounts are from Section 8 of Form R for 1999.

Table 4–16. Number of Forms Reporting Source Reduction Activity, 1999: Metal Mining

SIC Code	Industry	Total Form Rs Number	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
1021	Copper Ores	167	8	4.8	1	0	4	0	5	0	0	0
1031	Lead and Zinc Ores	64	12	18.8	1	0	19	0	6	0	0	0
1041	Gold Ores	266	11	4.1	7	1	1	0	1	0	0	1
1044	Silver Ores	40	0	0.0	0	0	0	0	0	0	0	0
1061	Ferroalloy Ores, Except Vanadium	29	0	0.0	0	0	0	0	0	0	0	0
1099	Miscellaneous Metal Ores, n.e.c.*	18	1	5.6	0	0	0	0	1	0	0	0
	Multiple within SIC Code 10	37	0	0.0	0	0	0	0	0	0	0	0
	SIC Code 1021 and SIC Code 33 (Primary Metals)	30	0	0.0	0	0	0	0	0	0	0	0
	SIC Code 1021 and SIC Code 4931 (Electric Utilities)	16	0	0.0	0	0	0	0	0	0	0	0
	Total	**667**	**32**	**4.8**	**9**	**1**	**24**	**0**	**13**	**0**	**0**	**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. Forms that reported more than one 4-digit SIC Code within the SIC Code 10 are assigned to the multiple category.
*n.e.c.: not elsewhere classified.

Coal Mining (SIC Code 12)

Introduction

Coal mines in SIC code 12 include anthracite and bituminous mines, as listed in Box 4–3. They may be either surface or underground. Anthracite is a hard, compact coal differing from bituminous (or soft) coal in that it contains only a small amount of volatile matter and burns with a nearly smokeless flame. Most coal mined in the United States is bituminous. Production in the eastern United States is primarily from underground operations, and the bituminous coal found there typically has a high sulfur content. Anthracite is mined only in eastern Pennsylvania. No reports were received from anthracite mines in 1999.

Coal extraction activities are exempt from TRI reporting. Other coal mining activities, such as beneficiation, must be reported.

More details for this industry sector on products and services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

1999 TRI Data for Coal Mining

On- and Off-site Releases

Coal mining facilities required to report to TRI released 11.8 million pounds of TRI chemicals on- and off-site in 1999, as shown in Table 4–17. Most of this amount, 9.6 million pounds, was released on-site to land. (Types of on-site land releases are described in Box 1–4 in Chapter 1.) Figure 4–4 shows that the category other on-site releases to land amounted to 81.7 percent of the industry's total releases.

Box 4–3. SIC Code 12, Coal Mining: Codes and Classifications Required to Report to TRI

1221	Bituminous Coal and Lignite Surface Mining	Producing bituminous coal or lignite at surface mines or developing such surface mines. Includes coal preparation plants associated with a mine or operated independently of any mine.
1222	Bituminous Coal Underground Mining	Producing bituminous coal in underground mines or developing such mines. Includes coal preparation plants associated with a mine.
1231	Anthracite Mining	Producing anthracite or developing anthracite mines. Includes anthracite preparation plants.

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

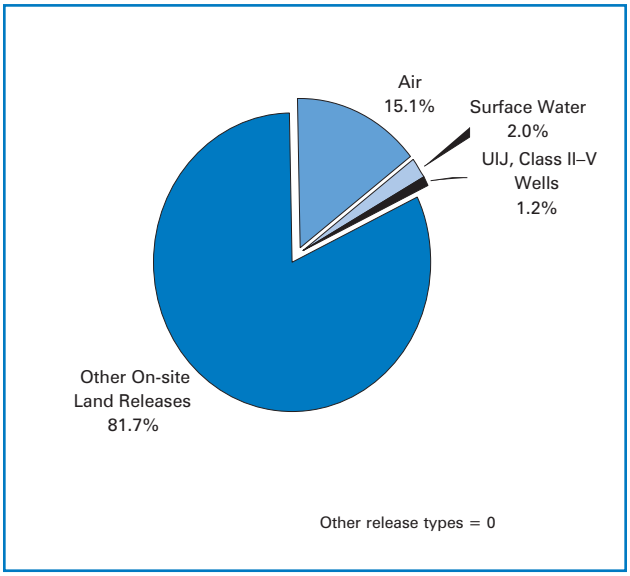
Table 4–17. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: Coal Mining

SIC Code	Industry	Total Forms	On-site Releases							Off-site Releases	
			Total Air Emissions	Surface Water Discharges	Underground Injection		On-site Land Releases		Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
					Class I Wells	Class II–V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases			
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1221	Bituminous Coal and Lignite Surface Mining	120	1,645,977	174,894	0	0	0	7,798,849	9,619,720	0	9,619,720
1222	Bituminous Coal Underground Mining	83	66,670	20,975	0	143,700	0	1,809,474	2,040,819	0	2,040,819
	Multiple within SIC code 12	2	58,901	39,398	0	0	0	0	98,299	0	98,299
	Total	**205**	**1,771,548**	**235,267**	**0**	**143,700**	**0**	**9,608,323**	**11,758,838**	**0**	**11,758,838**

Note: On-site Releases 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. Forms that reported more than one 4-digit SIC code within SIC code 12 are assigned to the "multiple codes" category.

Air emissions by coal mines totaled 1.8 million pounds, the industry's second-largest release type (15.1 percent of total releases). The coal mining industry reported less than 250,000 pounds each of surface water discharges and underground injection. No off-site releases were reported.

Figure 4–4. Distribution of TRI On-site and Off-site Releases, 1999: Coal Mining



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.
UIJ = Underground Injection

Bituminous coal and lignite surface mines reported the largest total releases, 9.6 million pounds. Underground coal mining facilities reported 2.0 million pounds of total releases. On-site releases to land predominated, with 7.8 million pounds from surface mines and 1.8 million pounds from underground mines.

Surface and underground mining accounted for most of the 205 forms submitted in the coal mining industry. Surface coal mines submitted 120 forms, and underground coal mines submitted 83 forms. No reports were received from anthracite mines in 1999; as previously noted, this type of coal is found only in eastern Pennsylvania.

Two forms were submitted with multiple SIC codes in SIC code 12 (coal mining). Releases reported by the multiple-codes group totaled less than 100,000 pounds.

Table 4–18 shows changes in releases by the coal mining industry between 1998 and 1999. Total on-site and off-site releases

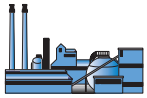


Table 4–18. TRI On-site and Off-site Releases, 1998–1999: Coal Mining

	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	1,105,245	1,771,548	666,303	60.3
Fugitive Air Emissions	453,341	1,716,321	1,262,980	278.6
Point Source Air Emissions	651,904	55,227	–596,677	–91.5
Surface Water Discharges	307,057	235,267	–71,790	–23.4
Underground Injection	90,480	143,700	53,220	58.8
Class I Wells	0	0	0	—
Class II–V Wells	90,480	143,700	53,220	58.8
On-site Land Releases	11,522,112	9,608,323	–1,913,789	–16.6
RCRA Subtitle C Landfills	0	0	0	—
Other On-site Landfills	8,162,856	6,381,871	–1,780,985	–21.8
Land Treatment	428,601	454,244	25,643	6.0
Surface Impoundments	2,493,943	2,456,027	–37,916	–1.5
Other Disposal	436,712	316,181	–120,531	–27.6
Total On-site Releases	**13,024,894**	**11,758,838**	**–1,266,056**	**–9.7**
Off-site Releases				
Storage Only[a]	0	0	0	—
Solidification/Stabilization[b]	0	0	0	—
Metals and Metal Compounds Only				—
Wastewater Treatment (excluding POTWs)[c]	0	0	0	—
Metals and Metal Compounds Only				—
Transfers to POTWs[d]	0	0	0	—
Metals and Metal Compounds Only				—
Underground injection	0	0	0	—
Landfills/Surface Impoundments	0	0	0	—
Land Treatment	0	0	0	—
Other Land Disposal	0	0	0	—
Other Off-site Management	0	0	0	—
Transfers to Waste Broker for Disposal	0	0	0	—
Unknown[e]	0	0	0	—
Total Off-site Releases (Transfers Off-site to Disposal)	**0**	**0**	**0**	**—**
Total On-site and Off-site Releases	**13,024,894**	**11,758,838**	**–1,266,056**	**–9.7**

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 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.

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

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

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

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

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

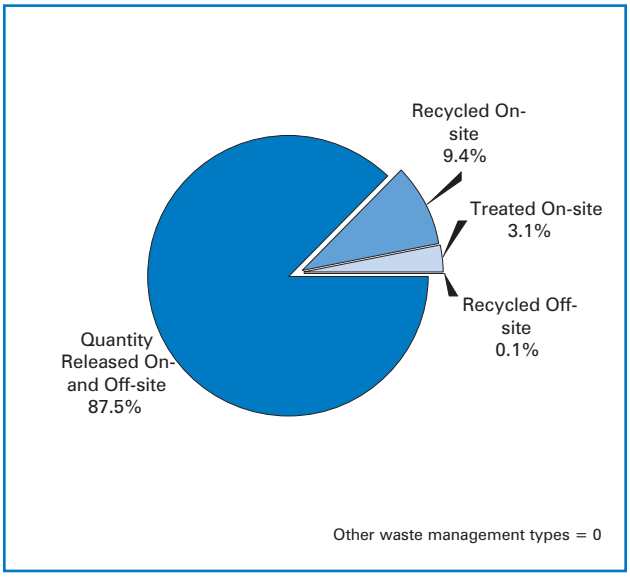
declined by 1.3 million pounds, or 9.7 percent. Total air emissions rose 60.3 percent, from 1.1 million pounds to 1.8 million pounds. Surface water discharges decreased 23.4 percent, and underground injection rose 58.8 percent, but both amounts were relatively modest. On-site land releases fell 16.6 percent, from 11.5 million pounds to 9.6 million pounds; within this category, the largest decrease was on-site releases to other than RCRA subtitle C landfills, a decline of 1.8 million pounds, or 21.8 percent.

Waste Management Data

Quantities of TRI Chemicals in Waste

Coal mines reported managing 12.2 million pounds of total production-related waste in 1999, as shown in Table 4–19. The quantity released on- and off-site totaled 10.6 million pounds, or 87.5 percent of the industry's production-related waste (see Figure 4–5). The industry's on-site treatment totaled about 377,000 pounds. On-site recycling amounted to 1.1 million pounds.

Figure 4–5. TRI Waste Management, 1999: Coal Mining



Note: Data are from Section 8 of Form R.

Surface mines managed 9.7 million pounds of total production-related waste, including 8.5 million pounds released on- and off-site. Underground mines managed a total of 2.4 million pounds, including 2.0 million pounds released on- and off-site. All of the less than 100,000 pounds of releases reported by the multiple-codes group was released on- and off-site.

Table 4–19. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Coal Mining

SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1221	Bituminous Coal and Lignite Surface Mining	1,130,070	6,753	0	0	36,642	0	8,495,746	9,669,211	34
1222	Bituminous Coal Underground Mining	7,900	0	0	0	339,900	0	2,038,428	2,386,228	0
	Multiple within SIC Code 12	0	0	0	0	0	0	98,299	98,299	0
	Total	**1,137,970**	**6,753**	**0**	**0**	**376,542**	**0**	**10,632,473**	**12,153,738**	**34**

Note: Data are from Section 8 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 12 are assigned to the multiple codes category.

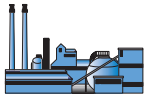


Table 4–20. Quantities of TRI Chemicals in Waste, 1998–1999: Coal Mining

Waste Management Activity	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	44,417	1,137,970	1,093,553	2,462.0
Recycled Off-site	0	6,753	6,753	—
Energy Recovery On-site	0	0	0	—
Energy Recovery Off-site	43,735	0	–43,735	–100.0
Treated On-site	458,544	376,542	–82,002	–17.9
Treated Off-site	0	0	0	—
Quantity Released On- and Off-site	12,976,368	10,632,473	–2,343,895	–18.1
Total Production-related Waste	**13,523,064**	**12,153,738**	**–1,369,326**	**–10.1**
Non-production-related Waste	39	34	–5	–12.8

Note: All data are from Section 8 of Form R for the year indicated.

Table 4–20 shows the change in quantities of TRI chemicals in waste managed between 1998 and 1999. Total production-related waste decreased 10.1 percent. The largest percentage increase, although from a small base, was 2,462.0 percent for on-site recycling. The largest absolute decrease was for on- and off-site releases, from 13.0 million pounds to 10.6 million pounds, or 18.1 percent. Off-site energy recovery fell 100 percent—to zero. On-site treatment decreased 17.9 percent.

Transfers Off-site for Further Waste Management/Disposal

Bituminous coal and lignite surface mines transferred 6,753 pounds off-site to recycling (see Table 4–21). No other type of coal mining reported off-site transfers for further waste management.

Table 4–22 shows changes in these transfers between 1998 and 1999. Transfers to recycling dropped by 84.6 percent.

Table 4–21. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: Coal Mining

SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers*	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/ Disposal
					Metals and Metal Compounds	Non-metal TRI Chemicals			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1221	Bituminous Coal and Lignite Surface Mining	6,753	0	0	0	0	0	0	6,753
1222	Bituminous Coal Underground Mining	0	0	0	0	0	0	0	0
	Multiple within SIC Code 12	0	0	0	0	0	0	0	0
	Total	**6,753**	**0**	**0**	**0**	**0**	**0**	**0**	**6,753**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 12 are assigned to the multiple codes category.
*Other Off-site Transfers are transfers reported without a valid waste management code.
**Does not include transfers to POTWs of metals and metal compounds.

Table 4–22. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Coal Mining

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	43,735	6,753	–36,982	–84.6
Transfers to Energy Recovery	0	0	0	—
Transfers to Treatment	0	0	0	—
Transfers to POTWs	0	0	0	—
Metals and Metal Compounds Only	0	0	0	—
Non-metal TRI Chemicals	0	0	0	—
Other Off-site Transfers*	0	0	0	—
Other Off-site Transfers to Disposal**	0	0	0	—
Total Transfers Off-site for Further Waste Management/Disposal	**43,735**	**6,753**	**-36,982**	**-84.6**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

TRI Data by State

Coal mines in 13 states reported to TRI in 1999. The states with the largest number of forms from coal mining facilities were Ohio (61 forms), Illinois (52 forms), and New Mexico (23 forms).

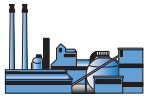
On- and Off-site Releases

As shown in Table 4–23, coal mining facilities in New Mexico reported the largest total on- and off-site releases in 1999, with 4.3 million pounds, all on-site to land. Illinois ranked second, with 2.7 million pounds of total releases, nearly all on-site to land. Together, New Mexico and Illinois facilities reported 72.7 percent of the coal mining industry's 9.6 million pounds of other on-site land releases (the majority of total releases). Colorado ranked third among states for coal mining releases, with

Table 4–23. Summary of TRI Information by State, 1999: Coal Mining

		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	2	19	96	0	109,000	0	337	109,452	0	109,452
Colorado	7	430	127	0	0	0	2,037,119	2,037,676	0	2,037,676
Illinois	52	1,340	11,098	0	0	0	2,642,435	2,654,873	0	2,654,873
Indiana	18	1,152,469	0	0	0	0	107,641	1,260,110	0	1,260,110
Maryland	5	12,733	1,515	0	34,700	0	42,150	91,098	0	91,098
Montana	1	0	0	0	0	0	12,217	12,217	0	12,217
New Mexico	23	0	0	0	0	0	4,345,334	4,345,334	0	4,345,334
North Dakota	2	0	0	0	0	0	145,225	145,225	0	145,225
Ohio	61	2,390	1,502	0	0	0	750	4,642	0	4,642
Pennsylvania	11	36,600	0	0	0	0	187,682	224,282	0	224,282
Virginia	1	9,100	0	0	0	0	1,000	10,100	0	10,100
West Virginia	19	556,467	220,929	0	0	0	86,433	863,829	0	863,829
Wyoming	3	0	0	0	0	0	0	0	0	0
Total	**205**	**1,771,548**	**235,267**	**0**	**143,700**	**0**	**9,608,323**	**11,758,838**	**0**	**11,758,838**

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.



2.0 million pounds; almost all of these releases were on-site to land.

The largest air emissions were for Indiana, 1.2 million pounds out of a total 1.8 million pounds for this type of release. West Virginia had the second largest quantity of air emissions, about 556,000 pounds, and the largest surface water emissions, nearly 221,000 pounds.

Map 4–2 shows the geographic distribution of coal mining releases reported to TRI in 1999.

Table 4–24 shows changes in coal mining releases, by state, between 1998 and 1999. Total releases fell by 9.7 percent. The largest absolute decreases were 1.3 million pounds in New Mexico (a decline of 22.7 percent), almost a million pounds in Alabama (89.4 percent), and about 575,000 pounds in West Virginia (40.0 percent). The largest increase was 1.2 million pounds in Indiana, a rise of 1,571.9 percent.

Waste Management Data

New Mexico, Illinois, Colorado, and Indiana ranked highest among the states for total production-related waste reported by the coal mining industry (see Table 4–23). New Mexico facilities managed 4.3 million pounds of production-related waste. This consisted entirely of quantities released on- and off-site. Illinois reported 2.7 million pounds of production-related waste, almost all of it released on- and off-site. All of Colorado's 2.0 million pounds of waste managed was released on- and off-site. Of Indiana's 1.3 million pounds of waste managed, 89.1 percent was recycled on-site.

Quantities released on- and off-site amounted to more than 90 percent of production-related waste in 7 of the 12 states:

Table 4–23. Summary of TRI Information by State, 1999: Coal Mining *(continued)*

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	3,900	0	0	0	4,100	0	109,000	117,000	0
Colorado	0	0	0	0	0	0	2,037,000	2,037,000	0
Illinois	0	0	0	0	94,400	0	2,653,838	2,748,238	0
Indiana	1,129,120	0	0	0	0	0	137,645	1,266,765	16
Maryland	0	0	0	0	43,000	0	90,255	133,255	0
Montana	0	6,753	0	0	0	0	12,217	18,970	1
New Mexico	0	0	0	0	0	0	4,345,334	4,345,334	12
North Dakota	0	0	0	0	0	0	145,225	145,225	0
Ohio	4,950	0	0	0	5,500	0	4,540	14,990	0
Pennsylvania	0	0	0	0	154,900	0	226,683	381,583	5
Virginia	0	0	0	0	0	0	10,100	10,100	0
West Virginia	0	0	0	0	74,642	0	860,636	935,278	0
Wyoming	0	0	0	0	0	0	0	0	0
Total	**1,137,970**	**6,753**	**0**	**0**	**376,542**	**0**	**10,632,473**	**12,153,738**	**34**

Note: Data are from Section 8 of Form R.

Map 4-2. Total On-site and Off-site Releases, 1999: Coal Mining

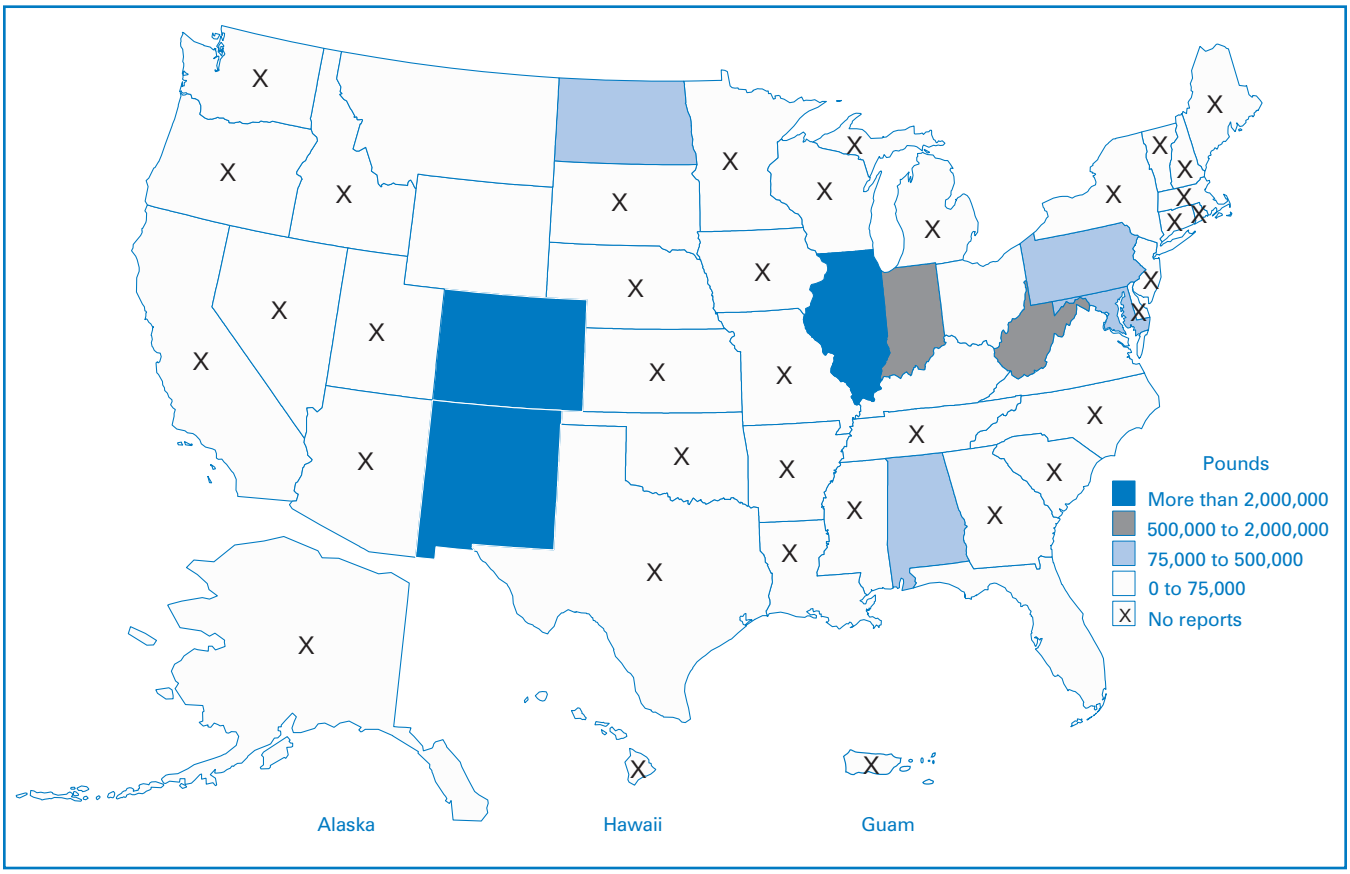
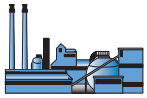


Table 4-24. TRI Total Releases by State, 1998–1999: Coal Mining

State	Total On-site and Off-site Releases			
	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Alabama	1,030,087	109,452	–920,635	–89.4
Colorado	1,593,746	2,037,676	443,930	27.9
Illinois	2,766,360	2,654,873	–111,487	–4.0
Indiana	75,371	1,260,110	1,184,739	1,571.9
Kentucky	19,588	0	–19,588	–100.0
Maryland	60,023	91,098	31,075	51.8
Montana	0	12,217	12,217	—
New Mexico	5,620,000	4,345,334	–1,274,666	–22.7
North Dakota	96,707	145,225	48,518	50.2
Ohio	3,642	4,642	1,000	27.5
Pennsylvania	318,563	224,282	–94,281	–29.6
Virginia	1,810	10,100	8,290	458.0
West Virginia	1,438,997	863,829	–575,168	–40.0
Wyoming	0	0	0	—
Total	**13,024,894**	**11,758,838**	**–1,266,056**	**–9.7**

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 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.



Alabama, Colorado, Illinois, New Mexico, North Dakota, Virginia, and West Virginia.

Coal mines reported much smaller quantities in other waste management activities. The largest single such item was Indiana's 1.1 million pounds of on-site recycling. On-site treatment accounted for 75,000–155,000 pounds of waste in Pennsylvania, Illinois, and West Virginia and for lesser quantities in Maryland, Ohio, and Alabama.

Top 15 Chemicals for On- and Off-site Releases

Table 4–25 presents data for the 15 chemicals released in the largest amounts by TRI coal mining facilities. Coal mines reported releasing more barium compounds, 5.7 million pounds, than any other chemical. They also reported releases of 1.7 million pounds of manganese compounds and just over 1 million pounds each of aluminum and of zinc compounds.

Table 4–25. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: Coal Mining

CAS Number	Chemical	Total Air Emissions (Pounds)	Surface Water Discharges (Pounds)	Underground Injection: Class I Wells (Pounds)	Underground Injection: Class II-V Wells (Pounds)	On-site Land Releases: RCRA Subtitle C Landfills (Pounds)	On-site Land Releases: Other On-site Land Releases (Pounds)	Total On-site Releases (Pounds)	Off-site Releases: Transfers Off-site to Disposal (Pounds)	Total On- and Off-site Releases (Pounds)
—	Barium compounds	436	144	0	82,400	0	5,638,016	5,720,996	0	5,720,996
—	Manganese compounds	642	49,389	0	50,500	0	1,590,560	1,691,091	0	1,691,091
7429-90-5	Aluminun (fume or dust)	1,013,539	0	0	0	0	0	1,013,539	0	1,013,539
—	Zinc compounds	38	27	0	10,800	0	998,549	1,009,414	0	1,009,414
7664-41-7	Ammonia	588,058	184,811	0	0	0	179,901	952,770	0	952,770
—	Copper compounds	12	5	0	0	0	288,155	288,172	0	288,172
—	Lead compounds	10	15	0	0	0	241,150	241,175	0	241,175
—	Chromium compounds	23	5	0	0	0	175,822	175,850	0	175,850
—	Nickel compounds	19	5	0	0	0	139,840	139,864	0	139,864
—	Arsenic compounds	0	864	0	0	0	120,914	121,778	0	121,778
7723-14-0	Phosphorus (yellow or white)	75,121	0	0	0	0	0	75,121	0	75,121
—	Cobalt compounds	0	0	0	0	0	64,080	64,080	0	64,080
7440-39-3	Barium	27,425	0	0	0	0	12,908	40,333	0	40,333
—	Beryllium compounds	0	0	0	0	0	39,224	39,224	0	39,224
—	Selenium compounds	0	0	0	0	0	34,453	34,453	0	34,453
	Subtotal (top 15 chemicals)	**1,705,323**	**235,265**	**0**	**143,700**	**0**	**9,523,572**	**11,607,860**	**0**	**11,607,860**
	Total (all chemicals)	**1,771,548**	**235,267**	**0**	**143,700**	**0**	**9,608,323**	**11,758,838**	**0**	**11,758,838**

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.

For barium compounds, ranked first, manganese, ranked second, and zinc compounds, ranked fourth, on-site land releases predominated. All the aluminum releases were to air. For manganese compounds, coal mines released about 50,000 pounds each to surface water and to Class II–V wells, in addition to 1.6 million pounds of on-site releases to land.

Releases of the 15 chemicals totaled 11.61 million pounds, 98.7 percent of the industry's total of 11.76 million pounds of releases.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

Table 4–26 shows the coal mining industry's expected changes in quantities released on- and off-site between 1999 and 2001. Facilities reporting to TRI expected to increase their production-related waste slightly during that period, from a total of 12.15 million pounds to 12.24 million pounds, or 0.7 percent. The projected increase represents a reduction of 0.2 percent in 2000 followed by an increase of 0.9 percent in 2001.

The projections indicate little change in waste management practices except for a decrease in off-site recycling of 11.2 percent. The quantity released on- and off-site—the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 1–2)—would rise slightly, from 87.5 percent of total production-related waste in 1999 to 87.6 percent in 2001.

Source Reduction

As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option. No coal mining facility reported any source reduction activity undertaken in 1999.

Table 4–26. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999–2001: Coal Mining

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	1,137,970	9.4	1,127,640	9.3	1,127,640	9.2
Recycled Off-site	6,753	0.1	6,000	0.0	6,000	0.0
Energy Recovery On-site	0	0.0	0	0.0	0	0.0
Energy Recovery Off-site	0	0.0	0	0.0	0	0.0
Treated On-site	376,542	3.1	383,900	3.2	383,900	3.1
Treated Off-site	0	0.0	0	0.0	0	0.0
Quantity Released On- and Off-site	10,632,473	87.5	10,609,017	87.5	10,719,427	87.6
Total Production-related Waste	**12,153,738**	**100.0**	**12,126,557**	**100.0**	**12,236,967**	**100.0**
Waste Management Activity	**Projected Change 1999-2000** Percent		**Projected Change 2000-2001** Percent		**Projected Change 1999-2001** Percent	
Recycled On-site	–0.9		0.0		–0.9	
Recycled Off-site	–11.2		0.0		–11.2	
Energy Recovery On-site	—		—		—	
Energy Recovery Off-site	—		—		—	
Treated On-site	2.0		0.0		2.0	
Treated Off-site	—		—		—	
Quantity Released On- and Off-site	–0.2		1.0		0.8	
Total Production-related Waste	**-0.2**		**0.9**		**0.7**	

Note: Current year and projected amounts are from Section 8 of Form R for 1999.

Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)

Introduction

Electric utilities may use a variety of fuels to generate electricity, but only facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce must report to TRI. These facilities report under SIC codes 4911, 4931, and 4939, as identified in Box 4–4. Other electric utilities in these SIC codes—those fueled only by natural gas, nuclear, hydroelectric, or other sources—are not required to report. Electric power generation by utilities takes place across the United States. The states with the highest utility net generation are those with the largest population densities and industrial centers: California, Texas, Illinois, Ohio, Pennsylvania, and Florida. Different areas of the country use different energy sources. Coal and petroleum-fired power plants are found in the East, while gas-fired plants are located in the coastal South.

More details for this industry sector on products and services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

Box 4-4. SIC Codes 493, Combination Electric and Gas, and Other Utility Services: Codes and Classifications Required to Report to TRI

TRI reporting in these SIC codes is limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce.

4911	Electric Services	Generation, transmission, and/or distribution of electric energy for sale.
4931	Electric and Other Services Combined	Mining, milling or otherwise preparing lead ores, zinc ores, or lead-zinc ores.
4939	Combination Utilities, Not Elsewhere Classified	Providing combinations of electric, gas, and other services, not elsewhere classified.

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

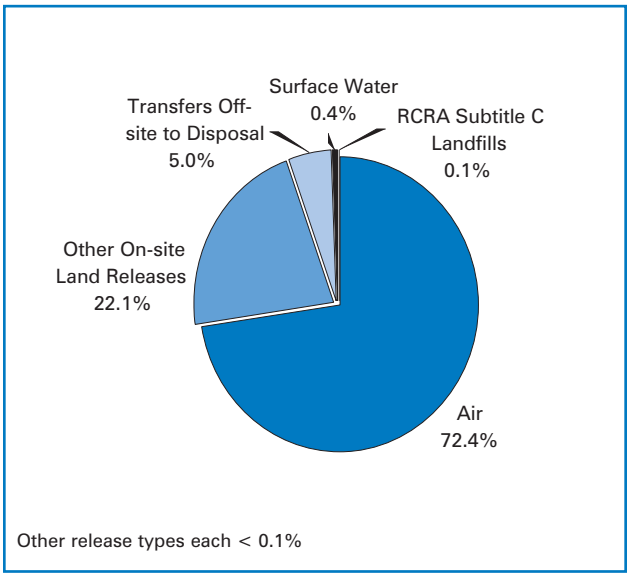
1999 TRI Data for Electric Utilities

On- and Off-site Releases

Electric utilities required to report to TRI reported 1.16 billion pounds of TRI chemicals released on- and off-site in 1999, as shown in Table 4–27. The bulk, 841.9 million pounds, was in the form of air emissions, which constituted 72.4 percent of the industry's total releases (see Figure 4–6.)

The electric utilities' second-largest release type was other on-site land releases (that is, other than to RCRA subtitle C landfills), which totaled 256.8 million pounds, or 22.1 percent of total releases. (Types of on-site land releases are described in Box 1–4 in Chapter 1.) Electric utilities reported 58.0 million pounds released off-site as transfers to disposal, 4.5 million pounds of surface water discharges, 1.3 million pounds of on-site releases to RCRA subtitle C landfills, and only 5 pounds of underground injection.

Figure 4-6. Distribution of TRI On-site and Off-site Releases, 1999: Electric Utilities



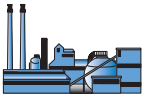
Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Facilities providing only electric services reported the largest total releases in this industry, with 1.11 billion pounds, or 95.1 percent of the electric utility industry total.

Table 4-27. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: Electric Utilities

SIC Code	Industry	Total Forms	On-site Releases						Off-site Releases	
					Underground Injection		On-site Land Releases			
			Total Air Emissions	Surface Water Discharges	Class I Wells	Class II–V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
4911	Electric Services	3,892	814,112,292	4,447,239	0	5	1,298,989	231,879,643	1,051,738,168	53,653,606	1,105,391,774
4931	Electric and Other Services Combined	120	7,138,195	14,386	0	0	0	207,965	7,360,546	2,501,335	9,861,881
4939	Combination Utilities, n.e.c.*	22	1,405,657	0	0	0	0	0	1,405,657	368,591	1,774,248
	Multiple within SIC Code 49	30	672,931	54	0	0	0	148,786	821,771	414,983	1,236,754
	SIC Code 4911 and SIC Code 12 (Coal Mining)	153	18,440,286	48,359	0	0	0	24,585,757	43,074,402	327,448	43,401,850
	SIC Code 4911 and SIC Code 28 (Chemicals)	8	150,459	0	0	0	0	0	150,459	692,280	842,739
	Total	**4,225**	**841,919,820**	**4,510,038**	**0**	**5**	**1,298,989**	**256,822,151**	**1,104,551,003**	**57,958,243**	**1,162,509,246**

Note: On-site Releases 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. Forms that reported more than one 4-digit SIC Code within SIC Code 49 are assigned to the multiple codes category.
*n.e.c.: not elsewhere classified.



These facilities reported 1.05 billion pounds of total on-site releases—largely air emissions (814.1 million pounds), other on-site land releases (231.9 million pounds), and surface water discharges (4.4 million pounds. They reported 53.7 million pounds of off-site releases (transfers to disposal).

The second ranked group within the electric utility industry was facilities that generate electricity in combination with coal mining. They accounted for 43.4 million pounds, or 3.7 percent of total releases from electric utilities. Their releases were mainly in the form of other on-site land releases (24.6 million pounds) and air emissions (18.4 million pounds).

Table 4–28 shows changes in releases by electric utilities reporting between 1998 and 1999. Total on- and off-site releases increased by 2.2 percent. On-site releases were 2.8 percent higher. The largest absolute change in on-site releases was a 43.5 million pound (5.4 percent) increase in total air emissions, mainly point source emissions. On-site land releases were 11.8 million pounds (4.4 percent) lower in 1999 than in 1998. Off-site releases fell by 8.2 percent, from 63.1 million pounds to 58.0 million pounds. The largest absolute decrease was in landfills/surface impoundments (4.1 million pounds, or 10.3 percent).

Waste Management Data

Quantities of TRI Chemicals in Waste

Electric utilities reported managing 1.65 billion pounds of total production-related waste in 1999, as shown in Table 4–29. The quantity released on- and off-site totaled 1.17 billion pounds, or 71.1 percent of the industry's production-related waste (see Figure 4–7). The industry's on-site treatment amounted to 463.6 million pounds, or 28.1 percent of the total. Off-site recycling accounted for 7.6 million pounds and on-site energy recovery for 5.3 million pounds.

Facilities providing only electric services managed 1.54 billion pounds of total production-related waste, including 1.12 billion pounds released on- and off-site. Facilities combining electric services and coal mining operations managed a total of 87.6 million pounds, including 43.4 million pounds released on- and off-site and 42.6 million pounds treated on-site.

Table 4–30 shows the changes in the quantities of TRI chemicals in waste from electric utilities between 1998 and 1999. Total production-related waste increased by 5.1 percent. The main increases were in on-site treatment (a rise of 40.9 million pounds, or 9.7 percent) and in quantity released on- and off-site (up by 38.4 million pounds, or 3.4 percent). On-site energy recovery fell by 2.8 million pounds, or 34.2 percent.

Transfers Off-site for Further Waste Management/Disposal

Electric utilities reported 65.3 million pounds of transfers off-site for further waste management and disposal in 1999, as shown in Table 4–31. Figure 4–8 shows that other transfers to disposal by reporting electric utilities accounted for 92.9 percent of all transfers for further waste management and disposal for this industry; the amount was 60.6 million pounds. Total transfers to recycling were 4.2 million pounds or 6.4 percent of total transfers off-site. Facilities providing only electric

Table 4-28. TRI On-site and Off-site Releases, 1998–1999: Electric Utilities

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	798,428,091	841,919,820	43,491,729	5.4
Fugitive Air Emissions	672,902	471,510	–201,392	–29.9
Point Source Air Emissions	797,755,189	841,448,310	43,693,121	5.5
Surface Water Discharges	6,086,113	4,510,038	–1,576,075	–25.9
Underground Injection	80,418	5	–80,413	–100.0
Class I Wells	18	0	–18	–100.0
Class II–V Wells	80,400	5	–80,395	–100.0
On-site Land Releases	269,887,886	258,121,140	–11,766,746	–4.4
RCRA Subtitle C Landfills	1,033,076	1,298,989	265,913	25.7
Other On-site Landfills	132,489,492	125,449,297	–7,040,195	–5.3
Land Treatment	852,400	1,403,445	551,045	64.6
Surface Impoundments	131,149,107	125,388,324	–5,760,783	–4.4
Other Disposal	4,363,811	4,581,085	217,274	5.0
Total On-site Releases	**1,074,482,508**	**1,104,551,003**	**30,068,495**	**2.8**
Off-site Releases				
Storage Only[a]	593,430	327,673	–265,757	–44.8
Solidification/Stabilization[b]	3,096,250	2,174,985	–921,265	–29.8
Metals and Metal Compounds Only				
Wastewater Treatment (excluding POTWs)[c]	4,333	120,425	116,092	2,679.3
Metals and Metal Compounds Only				
Transfers to POTWs[d]	5,807	3,569	–2,238	–38.5
Metals and Metal Compounds Only				
Underground injection	158,000	57,000	–101,000	–63.9
Landfills/Surface Impoundments	39,813,240	35,724,945	–4,088,295	–10.3
Land Treatment	486,892	598,862	111,970	23.0
Other Land Disposal	11,550,699	10,216,363	–1,334,336	–11.6
Other Off-site Management	6,878,619	8,260,469	1,381,850	20.1
Transfers to Waste Broker for Disposal	549,307	432,620	–116,687	–21.2
Unknown[e]	4,276	41,332	37,056	866.6
Total Off-site Releases (Transfers Off-site to Disposal)	**63,140,853**	**57,958,243**	**-5,182,610**	**-8.2**
Total On-site and Off-site Releases	**1,137,623,361**	**1,162,509,246**	**24,885,885**	**2.2**

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 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.

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

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

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

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

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

Table 4–29. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Electric Utilities

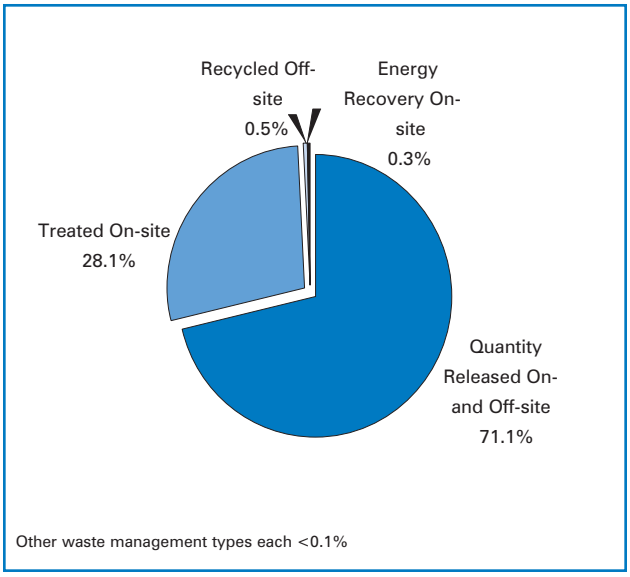
SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Pounds	Pounds	Pounds
4911	Electric Services	786,720	5,623,200	0	42,200	413,706,821	441,961	1,117,304,751	1,537,905,653	318,147
4931	Electric and Other Services Combined	0	317,477	9,780	0	4,519,674	0	9,320,577	14,167,508	30
4939	Combination Utilities, n.e.c.*	0	6	5,294,470	0	50,296	0	1,673,485	7,018,257	1
	Multiple within SIC Code 49	0	0	0	0	2,737,392	0	1,164,046	3,901,438	0
	SIC Code 4911 and SIC Code 12 (Coal Mining)	0	1,631,100	0	0	42,580,252	0	43,357,103	87,568,455	0
	SIC Code 4911 and SIC Code 28 (Chemicals)	0	0	0	0	0	0	841,000	841,000	0
	Total	**786,720**	**7,571,783**	**5,304,250**	**42,200**	**463,594,435**	**441,961**	**1,173,660,962**	**1,651,402,311**	**318,178**

Note: Data are from Section 8 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 49 are assigned to the multiple codes category.
* n.e.c.: not elsewhere classified.

services reported 58.9 million pounds, 90.2 percent of all transfers for further waste management and disposal for this industry sector.

Table 4–32 shows changes in the disposition of off-site transfers for further waste management and disposal by reporting electric utilities between 1998 and 1999. Total transfers fell by 2.8 percent. Transfers to recycling rose 19.7 percent, from 3.5 million pounds to 4.2 million pounds. Transfers to treatment rose dramatically, by 1,309.3 percent, from less than 30,000 pounds to over 400,000 pounds. The category other off-site transfers to disposal declined by 4.6 percent, from 63.6 million pounds to 60.6 million pounds.

Figure 4–7. TRI Waste Management, 1999: Electric Utilities



Note: Data are from Section 8 of Form R.

TRI Data by State

Electric utilities from 52 states and territories submitted 4,225 TRI forms for 1999. The states with the largest number of forms from electric utilities were Pennsylvania, with 345 forms, Indiana, with 234 forms, and Ohio, with 232 forms. No reports were received from Idaho and Vermont in 1999.

On- and Off-site Releases

As shown in Table 4–33, electric utilities in Ohio reported the largest total on- and off-site releases in 1999, with 102.1 million

Table 4-30. Quantities of TRI Chemicals in Waste, 1998–1999: Electric Utilities

Waste Management Activity	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	733,700	786,720	53,020	7.2
Recycled Off-site	4,216,363	7,571,783	3,355,420	79.6
Energy Recovery On-site	8,057,169	5,304,250	–2,752,919	–34.2
Energy Recovery Off-site	24,978	42,200	17,222	68.9
Treated On-site	422,718,142	463,594,435	40,876,293	9.7
Treated Off-site	386,691	441,961	55,270	14.3
Quantity Released On- and Off-site	1,135,275,908	1,173,660,962	38,385,054	3.4
Total Production-related Waste	**1,571,412,951**	**1,651,402,311**	**79,989,360**	**5.1**
Non-production-related Waste	211,290	318,178	106,888	50.6

Note: All data are from Section 8 of Form R for the year indicated.

Table 4-31. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: Electric Utilities

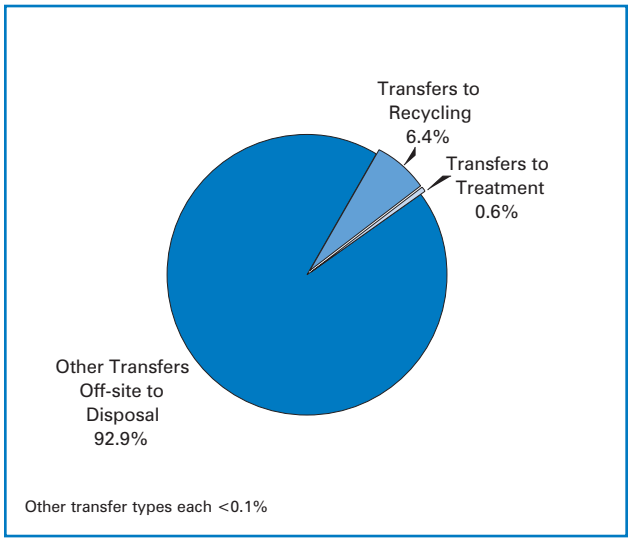
SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers**	Other Transfers Off-site to Disposal***	Total Transfers for Further Waste Management/ Disposal
					Metals and Metal Compounds	Non-metal TRI Chemicals			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
4911	Electric Services	2,146,173	42,205	403,920	3,549	818	0	56,340,536	58,937,201
4931	Electric and Other Services Combined	317,517	0	0	3	8,510	0	2,501,464	2,827,494
4939	Combination Utilities, n.e.c.*	111,602	0	0	0	500	0	368,591	480,693
	Multiple within SIC Code 49	56	0	0	17	189	0	414,966	415,228
	SIC Code 4911 and SIC Code 12 (Coal Mining)	1,631,118	0	0	0	0	0	327,454	1,958,572
	SIC Code 4911 and SIC Code 28 (Chemicals)	0	0	0	0	0	0	692,280	692,280
	Total	**4,206,466**	**42,205**	**403,920**	**3,569**	**10,017**	**0**	**60,645,291**	**65,311,468**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 49 are assigned to the multiple codes category.
* n.e.c.: not elsewhere classified.
** Other Off-site Transfers are transfers reported without a valid waste management code.
*** Does not include transfers to POTWs of metals and metal compounds.

pounds, of which 85.4 million pounds (83.6 percent) were in the form of air emissions. Ohio, North Carolina, and Pennsylvania reported the largest amounts of total releases in 1999. (Map 4–3 shows the geographic distribution of releases by the electric utilities industry.) North Carolina ranked second, with 90.8 million pounds of total releases, of which 81.4 million pounds were released to air. Pennsylvania ranked third among states for electric utility releases, with 85.9 million pounds, including 72.5 million pounds of air emissions.

In five other states, electric utility releases exceeded 55 million pounds. West Virginia electric utilities reported 77.8 million pounds, Florida reported 72.5 million pounds, Georgia reported 65.9 million pounds, Indiana reported 65.3 million pounds, and Kentucky reported 59.7 million pounds. Electric utilities in the eight states with the largest on- and off-site releases reported more than 70 percent of total releases as air emissions.

Figure 4–8. Distribution of TRI Transfers Off-site for Further Waste Management/ Disposal, 1999: Electric Utilities



Note: Data are from Section 6 of Form R.

Table 4–34 shows changes in releases by electric utilities between 1998 and 1999, by state. The largest absolute rise in on- and off-site releases was reported by Pennsylvania facilities, with an increase of 13.7 million pounds (19.0 percent), followed by North Carolina, with 9.5 million pounds (11.7 percent). The largest absolute decreases were in Ohio (11.7 million pounds, or 10.3 percent) and Missouri (5.0 million pounds, or 15.7 percent).

Waste Management Data

Ohio ranked highest among the states for total production-related waste reported by the electric utility industry, with 160.7 million pounds (see Table 4–33). This amount consisted largely of 102.1 million pounds released on- and off-site but also included 56.9 million pounds of waste treated on-site.

Pennsylvania ranked second in total production-related waste, with 121.8 million pounds. Of this, 85.3 million pounds were released on- and off-site (the third largest amount of any state), and 36.4 million pounds were treated on-site (the fifth-largest amount of any state). Indiana ranked third for total production-related waste, with 107.5 million pounds, consisting of 65.3 million pounds released on- and off-site (ranking seventh for this category) and 42.0 million pounds treated on-site (ranking third).

Electric utilities reported much smaller quantities in other waste management activities. The largest amounts were 5.3 million pounds of on-site energy recovery in Alabama (which accounted for almost all the total in this category), 1.8 million

Table 4–32. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Electric Utilities

	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	3,513,226	4,206,466	693,240	19.7
Transfers to Energy Recovery	24,952	42,205	17,253	69.1
Transfers to Treatment	28,661	403,920	375,259	1,309.3
Transfers to POTWs	40,530	13,586	–26,944	–66.5
Metals and Metal Compounds Only	5,807	3,569	–2,238	–38.5
Non-metal TRI Chemicals	34,723	10,017	–24,706	–71.2
Other Off-site Transfers*	0	0	0	—
Other Off-site Transfers to Disposal**	63,585,082	60,645,291	–2,939,791	–4.6
Total Transfers Off-site for Further Waste Management/Disposal	**67,232,981**	**65,325,054**	**–1,907,927**	**–2.8**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Table 4-33. Summary of TRI Information by State, 1999: Electric Utilities

State	Total Forms	On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
		Total Air Emissions	Surface Water Discharges	Class I Wells	Class II–V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	122	32,696,016	216,492	0	0	0	16,044,180	48,956,688	162,384	49,119,072
Alaska	5	502,375	0	0	0	0	0	502,375	0	502,375
Arizona	54	1,647,755	919	0	0	0	5,718,427	7,367,101	114,023	7,481,124
Arkansas	28	1,015,983	24,657	0	0	0	2,724,049	3,764,689	363	3,765,052
California	44	778,591	313	0	0	0	234,786	1,013,690	64,383	1,078,073
Colorado	66	1,343,235	4,070	0	0	0	2,616,208	3,963,513	3,954,394	7,917,907
Connecticut	18	538,911	257	0	0	0	0	539,168	161,166	700,334
Delaware	18	3,398,665	11,816	0	0	0	184,260	3,594,741	71,152	3,665,893
District of Columbia	1	79,000	0	0	0	0	0	79,000	0	79,000
Florida	216	60,570,202	53,942	0	0	1,298,793	9,319,310	71,242,247	1,238,932	72,481,179
Georgia	113	54,543,403	113,475	0	0	0	11,226,245	65,883,123	6	65,883,129
Guam	1	0	0	0	0	0	0	0	0	0
Hawaii	20	2,067,609	0	0	5	0	0	2,067,614	48,445	2,116,059
Illinois	198	34,537,639	241,297	0	0	196	4,923,905	39,703,037	2,129,383	41,832,420
Indiana	234	46,714,700	145,147	0	0	0	16,493,723	63,353,570	1,962,743	65,316,313
Iowa	107	9,122,604	6,552	0	0	0	4,610,803	13,739,959	360,720	14,100,679
Kansas	58	2,061,158	5,865	0	0	0	6,866,224	8,933,247	476,846	9,410,093
Kentucky	196	44,705,422	1,266,435	0	0	0	12,882,410	58,854,267	820,537	59,674,804
Louisiana	41	1,400,387	78,350	0	0	0	3,560,598	5,039,335	0	5,039,335
Maine	3	66,173	0	0	0	0	0	66,173	0	66,173
Maryland	58	29,542,697	220,527	0	0	0	58,610	29,821,834	372,000	30,193,834
Massachusetts	58	4,786,424	799	0	0	0	5,088	4,792,311	605,517	5,397,828
Michigan	163	39,088,613	131,604	0	0	0	7,609,212	46,829,429	2,701,675	49,531,104
Minnesota	60	940,738	20,566	0	0	0	8,911,560	9,872,864	1,218,357	11,091,221
Mississippi	30	11,957,940	3,370	0	0	0	1,372,758	13,334,068	16	13,334,084
Missouri	110	12,440,063	129,950	0	0	0	14,565,004	27,135,017	295	27,135,312
Montana	32	985,954	10	0	0	0	6,664,154	7,650,118	376,802	8,026,920
Nebraska	40	3,468,620	52,515	0	0	0	3,823,110	7,344,245	387,600	7,731,845
Nevada	26	1,158,997	0	0	0	0	1,042,724	2,201,721	37,173	2,238,894
New Hampshire	20	2,712,745	0	0	0	0	20,300	2,733,045	24,070	2,757,115
New Jersey	58	7,767,004	12,443	0	0	0	383,700	8,163,147	150,525	8,313,672
New Mexico	31	546,609	8,202	0	0	0	1,562,006	2,116,817	1,969,002	4,085,819
New York	120	19,265,823	363,617	0	0	0	1,361,757	20,991,197	679,084	21,670,281
North Carolina	155	81,356,465	79,663	0	0	0	9,207,440	90,643,568	138,237	90,781,805
North Dakota	72	1,496,223	62,731	0	0	0	9,017,040	10,575,994	10,338,610	20,914,604
Ohio	232	85,405,211	191,070	0	0	0	12,541,133	98,137,414	3,989,352	102,126,766
Oklahoma	51	1,513,280	16,568	0	0	0	2,180,182	3,710,030	1,554,825	5,264,855
Oregon	8	163,935	0	0	0	0	582,005	745,940	0	745,940
Pennsylvania	345	72,523,409	53,604	0	0	0	5,371,206	77,948,219	7,943,947	85,892,166
Puerto Rico	34	11,474,578	10,310	0	0	0	165,956	11,650,844	68,991	11,719,835
Rhode Island	4	41,134	5	0	0	0	0	41,139	0	41,139
South Carolina	103	15,253,504	37,970	0	0	0	2,345,801	17,637,275	272,808	17,910,083
South Dakota	13	207,869	51	0	0	0	2,520,000	2,727,920	369,772	3,097,692
Tennessee	102	33,342,755	709,105	0	0	0	7,994,950	42,046,810	280,365	42,327,175
Texas	193	7,509,773	61,400	0	0	0	28,568,098	36,139,271	4,680,842	40,820,113
Utah	57	1,930,027	165	0	0	0	6,068,857	7,999,049	258,715	8,257,764
Virgin Islands	10	64,515	10	0	0	0	0	64,525	0	64,525
Virginia	120	18,757,582	61,295	0	0	0	3,197,250	22,016,127	811,805	22,827,932
Washington	20	1,190,744	627	0	0	0	1,783,358	2,974,729	108,604	3,083,333
West Virginia	167	65,104,387	82,091	0	0	0	10,819,640	76,006,118	1,842,405	77,848,523
Wisconsin	114	11,319,107	17,835	0	0	0	1,396,192	12,733,134	4,598,275	17,331,409
Wyoming	76	813,267	12,348	0	0	0	8,277,932	9,103,547	613,097	9,716,644
Total	**4,225**	**841,919,820**	**4,510,038**	**0**	**5**	**1,298,989**	**256,822,151**	**1,104,551,003**	**57,958,243**	**1,162,509,246**

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.

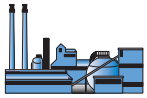
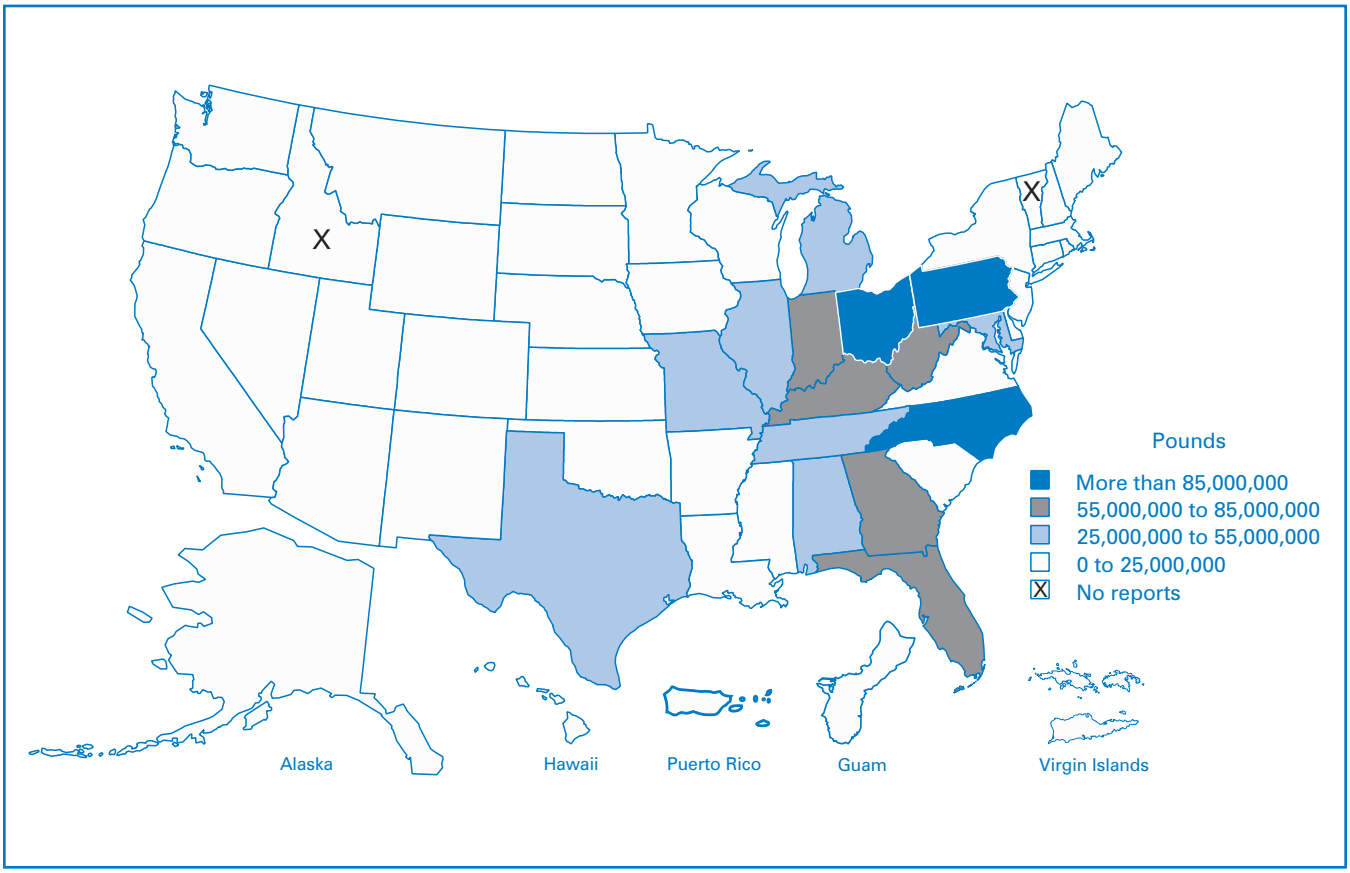


Table 4-33. Summary of TRI Information by State, 1999: Electric Utilities *(continued)*

State	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
	On-site	Off-site	On-site	Off-site	On-site	Off-site			
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	0	171,000	5,294,470	0	11,016,000	820	49,211,585	65,693,875	1
Alaska	0	0	0	0	0	0	502,375	502,375	5
Arizona	0	0	0	0	4,287,107	0	7,450,322	11,737,429	20
Arkansas	0	0	0	0	219,000	0	4,842,687	5,061,687	23
California	0	0	0	0	0	1,561	882,563	884,124	87
Colorado	0	0	0	0	2,652,175	0	8,186,351	10,838,526	480
Connecticut	0	11,600	0	0	1,228,000	24,831	675,226	1,939,657	6
Delaware	0	0	0	0	351,207	0	3,665,893	4,017,100	0
District of Columbia	0	0	0	0	0	0	79,000	79,000	0
Florida	0	27	0	0	33,697,141	8,600	70,546,941	104,252,709	120,134
Georgia	0	0	0	0	0	0	65,883,179	65,883,179	0
Guam	0	0	0	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0	2,114,825	2,114,825	0
Illinois	0	155,000	0	0	20,707,335	0	41,527,472	62,389,807	195,340
Indiana	0	208,688	0	0	41,997,784	890	65,321,106	107,528,468	12
Iowa	0	0	0	0	409,114	0	14,010,552	14,419,666	11
Kansas	0	314,477	0	0	2,802,000	207	8,913,471	12,030,155	0
Kentucky	0	49,200	0	0	36,489,000	0	59,650,092	96,188,292	28
Louisiana	0	0	0	0	1,896,768	0	5,037,766	6,934,534	8
Maine	0	0	0	0	0	0	66,002	66,002	1
Maryland	0	0	0	0	72,006,000	0	30,183,797	102,189,797	0
Massachusetts	0	673	0	0	703,830	30	5,397,699	6,102,232	0
Michigan	0	97,201	0	0	7,550,782	0	49,397,596	57,045,579	722
Minnesota	0	0	0	0	857,770	0	11,043,341	11,901,111	0
Mississippi	0	333,986	0	0	0	0	13,333,944	13,667,930	4
Missouri	529,340	745,548	0	0	4,789,820	0	26,956,740	33,021,448	0
Montana	0	0	0	0	2,873,000	0	8,121,829	10,994,829	4
Nebraska	257,380	389,705	0	0	0	0	7,656,675	8,303,760	0
Nevada	0	83,735	0	0	45,858	5,973	2,249,140	2,384,706	0
New Hampshire	0	0	0	0	470	0	2,756,800	2,757,270	0
New Jersey	0	6	0	0	3,467,431	0	8,311,269	11,778,706	0
New Mexico	0	0	0	0	3,110,111	0	6,397,629	9,507,740	0
New York	0	0	0	42,200	6,720,296	2	21,497,226	28,259,724	796
North Carolina	0	0	0	0	2,968,900	0	90,889,960	93,858,860	179
North Dakota	0	1,300	0	0	1,833,400	0	20,800,866	22,635,566	5
Ohio	0	1,749,313	0	0	56,866,617	0	102,052,709	160,668,639	52
Oklahoma	0	0	0	0	2,498,900	0	5,249,894	7,748,794	8
Oregon	0	0	0	0	0	0	745,910	745,910	0
Pennsylvania	0	185	0	0	36,426,719	17,500	85,328,161	121,772,565	15
Puerto Rico	0	0	0	0	0	0	11,717,418	11,717,418	154
Rhode Island	0	0	0	0	0	90	40,884	40,974	0
South Carolina	0	1,216	9,780	0	11,500,114	0	30,513,928	42,025,038	22
South Dakota	0	0	0	0	371,000	0	3,065,100	3,436,100	0
Tennessee	0	687,200	0	0	25,407,500	0	42,299,890	68,394,590	0
Texas	0	1,833,516	0	0	13,764,536	0	40,613,026	56,211,078	5
Utah	0	0	0	0	10,960,500	10	8,281,877	19,242,387	0
Virgin Islands	0	0	0	0	27,590	0	64,525	92,115	0
Virginia	0	123,060	0	0	9,938,680	0	22,647,401	32,709,141	0
Washington	0	189,897	0	0	96,966	0	3,083,437	3,370,300	0
West Virginia	0	425,250	0	0	26,770,000	0	77,874,751	105,070,001	0
Wisconsin	0	0	0	0	2,945,102	381,447	16,937,499	20,264,048	4
Wyoming	0	0	0	0	1,339,912	0	9,582,633	10,922,545	52
Total	**786,720**	**7,571,783**	**5,304,250**	**42,200**	**463,594,435**	**441,961**	**1,173,660,962**	**1,651,402,311**	**318,178**

Note: Data are from Section 8 of Form R.

Map 4-3. Total On-site and Off-site Releases, 1999: Electric Utilities



pounds of off-site recycling in Texas, and 1.7 million pounds of off-site recycling in Ohio.

Top 15 Chemicals for On- and Off-site Releases

Table 4–35 presents data for the 15 chemicals released in the largest amounts by the TRI electric utilities. Electric utilities reported releasing more hydrochloric acid, 615.4 million pounds, than any other chemical. Because only aerosol forms of hydrochloric acid are reportable to TRI, air emissions of hydrochloric acid accounted for almost all of the total releases of this chemical.

For barium compounds, ranked second with 180.8 million pounds, most of the releases were other on-site land releases, with 142.9 million pounds (79.1 percent of total releases for these compounds). Sulfuric acid was the chemical with the third-largest total releases, 152.9 million pounds. As with hydrochloric acid, only aerosol forms are reportable to TRI, and air emissions of sulfuric acid were nearly 100 percent of total releases for that chemical.

Releases of the 15 chemicals totaled 1.15 billion pounds, or 99.0 percent of the industry's total 1.16 million pounds of releases.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

Electric utility facilities reporting to TRI expected to reduce their production-related waste by 2.9 percent between 1999 and

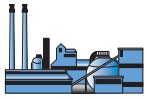


Table 4–34. TRI Total Releases by State, 1998–1999: Electric Utilities

State	Total On-site and Off-site Releases			
	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Alabama	46,039,988	49,119,072	3,079,084	6.7
Alaska	567,100	502,375	–64,725	–11.4
Arizona	9,533,058	7,481,124	–2,051,934	–21.5
Arkansas	3,312,965	3,765,052	452,087	13.6
California	555,449	1,078,073	522,624	94.1
Colorado	8,770,929	7,917,907	–853,022	–9.7
Connecticut	1,476,628	700,334	–776,294	–52.6
Delaware	6,400,919	3,665,893	–2,735,026	–42.7
District of Columbia	66,250	79,000	12,750	19.2
Florida	70,013,689	72,481,179	2,467,490	3.5
Georgia	58,465,777	65,883,129	7,417,352	12.7
Guam	0	0	0	—
Hawaii	3,137,772	2,116,059	–1,021,713	–32.6
Illinois	38,591,148	41,832,420	3,241,272	8.4
Indiana	61,830,845	65,316,313	3,485,468	5.6
Iowa	15,005,265	14,100,679	–904,586	–6.0
Kansas	11,480,944	9,410,093	–2,070,851	–18.0
Kentucky	59,914,104	59,674,804	–239,300	–0.4
Louisiana	8,799,994	5,039,335	–3,760,659	–42.7
Maine	43,001	66,173	23,172	53.9
Maryland	25,535,714	30,193,834	4,658,120	18.2
Massachusetts	4,304,824	5,397,828	1,093,004	25.4
Michigan	45,545,255	49,531,104	3,985,849	8.8
Minnesota	11,605,799	11,091,221	–514,578	–4.4
Mississippi	11,304,718	13,334,084	2,029,366	18.0
Missouri	32,170,255	27,135,312	–5,034,943	–15.7
Montana	8,005,777	8,026,920	21,143	0.3
Nebraska	7,846,522	7,731,845	–114,677	–1.5
Nevada	2,246,050	2,238,894	–7,156	–0.3
New Hampshire	4,097,749	2,757,115	–1,340,634	–32.7
New Jersey	8,055,418	8,313,672	258,254	3.2
New Mexico	7,791,792	4,085,819	–3,705,973	–47.6
New York	18,717,213	21,670,281	2,953,068	15.8
North Carolina	81,298,874	90,781,805	9,482,931	11.7
North Dakota	21,310,837	20,914,604	–396,233	–1.9
Ohio	113,846,358	102,126,766	–11,719,592	–10.3
Oklahoma	6,586,843	5,264,855	–1,321,988	–20.1
Oregon	747,590	745,940	–1,650	–0.2
Pennsylvania	72,176,234	85,892,166	13,715,932	19.0
Puerto Rico	10,277,247	11,719,835	1,442,588	14.0
Rhode Island	455,007	41,139	–413,868	–91.0
South Carolina	17,705,119	17,910,083	204,964	1.2
South Dakota	1,899,875	3,097,692	1,197,817	63.0
Tennessee	36,159,200	42,327,175	6,167,975	17.1
Texas	41,324,304	40,820,113	–504,191	–1.2
Utah	10,150,504	8,257,764	–1,892,740	–18.6
Virgin Islands	54,729	64,525	9,796	17.9
Virginia	20,873,294	22,827,932	1,954,638	9.4
Washington	4,593,693	3,083,333	–1,510,360	–32.9
West Virginia	75,881,813	77,848,523	1,966,710	2.6
Wisconsin	17,704,755	17,331,409	–373,346	–2.1
Wyoming	13,344,174	9,716,644	–3,627,530	–27.2
Total	**1,137,623,361**	**1,162,509,246**	**24,885,885**	**2.2**

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 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.

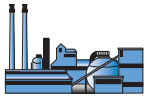
Table 4–35. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: Electric Utilities

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II–V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds		Transfers Off-site to Disposal Pounds	
7647-01-0	Hydrochloric acid	615,428,784	11	0	0	0	5	615,428,800	0	615,428,800
—	Barium compounds	2,213,061	1,061,682	0	0	600,000	142,937,546	146,812,289	33,984,111	180,796,400
7664-93-9	Sulfuric acid	152,853,011	6	0	0	0	0	152,853,017	17,800	152,870,817
7664-39-3	Hydrogen fluoride	58,264,893	11	0	0	0	86,120	58,351,024	15,743	58,366,767
—	Manganese compounds	505,509	485,010	0	0	180,081	31,981,637	33,152,237	5,906,702	39,058,939
—	Zinc compounds	2,255,717	335,379	0	0	80,408	25,191,550	27,863,054	4,834,770	32,697,824
—	Copper compounds	339,846	272,026	0	0	315,000	13,267,619	14,194,491	2,285,567	16,480,058
—	Nickel compounds	718,154	156,607	0	5	34,500	10,326,171	11,235,437	1,991,221	13,226,658
—	Chromium compounds	259,377	96,385	0	0	89,000	10,444,248	10,889,010	2,046,124	12,935,134
—	Lead compounds	153,039	24,335	0	0	0	5,606,969	5,784,343	662,079	6,446,422
—	Arsenic compounds	142,287	161,151	0	0	0	4,922,742	5,226,180	999,087	6,225,267
7440-39-3	Barium	150,261	55,281	0	0	0	3,897,093	4,102,635	1,372,843	5,475,478
7664-41-7	Ammonia	4,435,805	72,150	0	0	0	247,690	4,755,645	23,807	4,779,452
—	Cobalt compounds	43,272	24,943	0	0	0	3,509,799	3,578,014	400,998	3,979,012
7440-66-6	Zinc (fume or dust)	2,404,456	7,895	0	0	0	99,014	2,511,365	168,777	2,680,142
	Subtotal (top 15 chemicals)	**840,167,472**	**2,752,872**	**0**	**5**	**1,298,989**	**252,518,203**	**1,096,737,541**	**54,709,629**	**1,151,447,170**
	Total (all chemicals)	**841,919,820**	**4,510,038**	**0**	**5**	**1,298,989**	**256,822,151**	**1,104,551,003**	**57,958,243**	**1,162,509,246**

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.

2001, from a total of 1.65 billion pounds to 1.60 billion pounds (see Table 4–36). The projected decrease represents reductions of 0.7 percent in 2000 and 2.2 percent in 2001. These projections reflect in part the industry's expected reduction in the quantity released on- and off-site, from 1.17 billion pounds in 1999 to 1.12 billion pounds in 2001, a decline of 4.3 percent. On-site treatment, a large item (463.6 million pounds in 1999) is expected to increase in 2000, by 9.0 percent, but to decrease in 2001, by 6.1 percent, for an increase over the period of 2.4 percent.

The projections indicate only slight changes in waste management practices. The share of quantity released on- and off-site—the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 2–1)—would decrease little between 1999



(71.1 percent of total production-related waste) and 2001 (70.0 percent). Off-site recycling and off-site treatment would decrease somewhat; off-site energy recovery (already small) would fall to zero.

Source Reduction

Of the Form Rs submitted by electric utility facilities in 1999, 12.3 percent reported source reduction activity undertaken during the year (see Table 4–37). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Facilities that combine electric services and coal mining operations reported source reduction activities on 30 forms, 20.3 percent of the Form Rs submitted by this group. Facilities providing only electric services reported source reduction activity on 452 forms, representing 12.1 percent of the Form Rs from these facilities.

Good operating practices were identified on 345 forms, making it the most frequently cited source reduction activity in the industry. Raw material modifications were reported on 119 forms, inventory control on 49, process modifications on 48, and spill and leak prevention on 38 forms.

Table 4–36. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999–2001: Electric Utilities

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	786,720	0.0	270,000	0.0	260,500	0.0
Recycled Off-site	7,571,783	0.5	7,333,141	0.4	6,063,944	0.4
Energy Recovery On-site	5,304,250	0.3	380	0.0	380	0.0
Energy Recovery Off-site	42,200	0.0	42,200	0.0	0	0.0
Treated On-site	463,594,435	28.1	505,162,111	30.8	474,545,366	29.6
Treated Off-site	441,961	0.0	46,774	0.0	58,094	0.0
Quantity Released On- and Off-site	1,173,660,962	71.1	1,127,587,697	68.7	1,122,774,741	70.0
Total Production-related Waste	**1,651,402,311**	**100.0**	**1,640,442,303**	**100.0**	**1,603,703,025**	**100.0**
Waste Management Activity	**Projected Change 1999-2000** Percent		**Projected Change 2000-2001** Percent		**Projected Change 1999-2001** Percent	
Recycled On-site	–65.7		–3.5		–66.9	
Recycled Off-site	–3.2		–17.3		–19.9	
Energy Recovery On-site	–100.0		0.0		–100.0	
Energy Recovery Off-site	0.0		–100.0		–100.0	
Treated On-site	9.0		–6.1		2.4	
Treated Off-site	–89.4		24.2		–86.9	
Quantity Released On- and Off-site	–3.9		–0.4		–4.3	
Total Production-related Waste	**–0.7**		**–2.2**		**–2.9**	

Note: Current year and projected amounts are from Section 8 of Form R for 1999.

Table 4–37. Number of Forms Reporting Source Reduction Activity, 1999: Electric Utilities

SIC Code	Industry	Total Form Rs Number	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
4911	Electric Services	3,738	452	12.1	311	49	37	110	47	0	1	1
4931	Electric and Other Services Combined	113	15	13.3	6	0	1	7	1	0	0	0
4939	Combination Utilities, n.e.c.*	22	0	0.0	0	0	0	0	0	0	0	0
	Multiple within SIC Code 49	26	0	0.0	0	0	0	0	0	0	0	0
	SIC Code 4911 and SIC Code 12 (Coal Mining)	148	30	20.3	28	0	0	2	0	0	0	0
	SIC Code 4911 and SIC Code 28 (Chemicals)	8	0	0.0	0	0	0	0	0	0	0	0
	Total	**4,055**	**497**	**12.3**	**345**	**49**	**38**	**119**	**48**	**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. Forms that reported more than one 4-digit SIC Code within the SIC Code 49 are assigned to the multiple category.

*n.e.c.: not elsewhere classified.

Chemical Wholesale Distributors (SIC Code 5169)

Introduction

Chemical wholesale distributors (SIC code 5169) package, blend, or formulate chemicals for distribution into commerce, as shown in Box 4–5. Facilities that only store, relabel, or redistribute chemicals are not included in this industry sector. Chemical distribution facilities buy chemicals in bulk and blend and/or repackage them to customer specifications. Products include acids, industrial and heavy chemicals, dyes and substances used to make dyes, industrial salts, rosin, and turpentine. Also included are industrial gases (compressed and liquefied), such as oxygen and acetylene.

More details for this industry sector on products and services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

1999 TRI Data for Chemical Wholesale Distributors

On- and Off-site Releases

Chemical wholesale distributors required to report to TRI released 2.0 million pounds of TRI chemicals on- and off-site in 1999, as shown in Table 4–38. The largest type of release was 1.3 million pounds of air emissions, 66.9 percent of the industry's total releases (see Figure 4–9).

Off-site releases (transfers off-site to disposal) totaled about 650,000 pounds, or 32.9 percent of total releases, making this the industry's second-largest release type. A little more than 3,300 pounds were discharged to surface waters and less than 1,300 pounds were released on-site to land. Chemical wholesale distributors reported no underground injection.

Box 4–5. SIC Code 516, Wholesale Trade–Chemicals and Allied Products: Codes and Classifications Required to Report to TRI

5169	Chemicals and Allied Products, Not Elsewhere Classified	Wholesale distribution of chemicals and allied products not elsewhere classified, such as acids, industrial and heavy chemicals, dyestuffs, industrial salts, rosin, turpentine, and others.

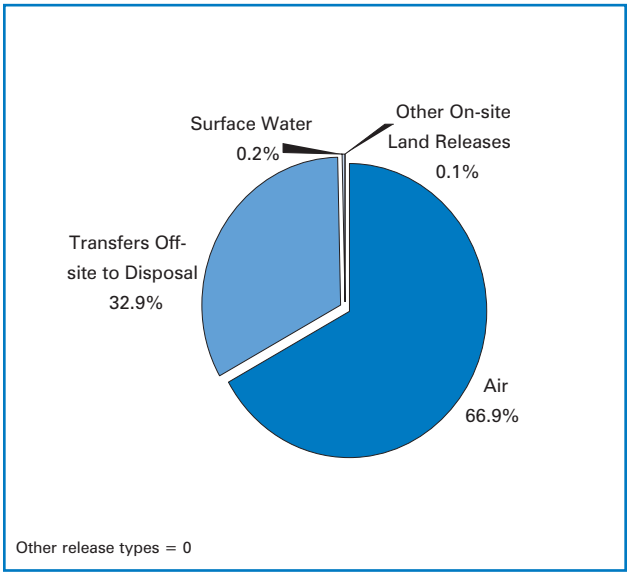
Source: Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual, 1987.*

Forms reporting only chemical wholesale distribution accounted for the bulk of total releases by the industry—1.9 million pounds, or 95.9 percent of the total. These were largely air emissions, totaling 1.3 million pounds.

Facilities reporting both chemical wholesale distribution operations and solvent recovery operations reported the second largest amount of total releases, about 55,000 pounds (2.8 percent of the total for the industry). Their releases consisted of almost 27,000 pounds of off-site releases and a little more than 27,000 pounds of air emissions.

Total on- and off-site releases by chemical wholesalers rose 28.3 percent between 1998 and 1999, as shown in Table 4–39. Transfers off-site to disposal rose 216.6 percent, from a little over 200,000 pounds to almost 650,000 pounds. Total air emissions rose 2.0 percent, from 1.29 million pounds to 1.32 million pounds.

Figure 4-9. Distribution of TRI On-site and Off-site Releases, 1999: Chemical Wholesalers



Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Table 4-38. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: Chemical Wholesalers

			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
5169	Chemical Wholesale Distributors	3,363	1,269,938	824	0	0	0	447	1,271,209	620,031	1,891,240
	SIC Code 5169 and SIC Code 5171 (Petroleum Bulk Terminals)	13	7,713	25	0	0	0	0	7,738	0	7,738
	SIC Code 5169 and SIC Code 7389 (Solvent Recovery Services)	40	27,338	0	0	0	0	334	27,672	26,987	54,659
	SIC Code 5169 and SIC Code 28 (Chemical Products)	43	13,406	2,495	0	0	0	500	16,401	1,621	18,022
	Total	**3,459**	**1,318,395**	**3,344**	**0**	**0**	**0**	**1,281**	**1,323,020**	**648,639**	**1,971,659**

Note: On-site Releases 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.

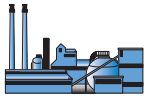


Table 4-39. TRI On-site and Off-site Releases, 1998–1999: Chemical Wholesalers

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	1,292,169	1,318,395	26,226	2.0
Fugitive Air Emissions	555,932	536,921	–19,011	–3.4
Point Source Air Emissions	736,237	781,474	45,237	6.1
Surface Water Discharges	22,075	3,344	–18,731	–84.9
Underground Injection	1	0	–1	–100.0
Class I Wells	0	0	0	—
Class II–V Wells	1	0	–1	–100.0
On-site Land Releases	17,981	1,281	–16,700	–92.9
RCRA Subtitle C Landfills	0	0	0	—
Other On-site Landfills	0	0	0	—
Land Treatment	0	0	0	—
Surface Impoundments	0	0	0	—
Other Disposal	17,981	1,281	–16,700	–92.9
Total On-site Releases	**1,332,226**	**1,323,020**	**-9,206**	**-0.7**
Off-site Releases				
Storage Only[a]	2,597	300	–2,297	–88.4
Solidification/Stabilization[b]	850	2,220	1,370	161.2
Metals and Metal Compounds Only				
Wastewater Treatment (excluding POTWs)[c]	6,000	1,612	–4,388	–73.1
Metals and Metal Compounds Only				
Transfers to POTWs[d]	351	75	–276	–78.6
Metals and Metal Compounds Only				
Underground injection	7,780	8,457	677	8.7
Landfills/Surface Impoundments	20,578	508,609	488,031	2,371.6
Land Treatment	112	57	–55	–49.1
Other Land Disposal	17,002	34,064	17,062	100.4
Other Off-site Management	93,984	24,839	–69,145	–73.6
Transfers to Waste Broker for Disposal	11,023	16,399	5,376	48.8
Unknown[e]	44,596	52,007	7,411	16.6
Total Off-site Releases (Transfers Off-site to Disposal)	**204,873**	**648,639**	**443,766**	**216.6**
Total On-site and Off-site Releases	**1,537,099**	**1,971,659**	**434,560**	**28.3**

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

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

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

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

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

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

Table 4–40. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Chemical Wholesalers

SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Pounds	Pounds	Pounds
5169	Chemical Wholesale Distributors	132,431	189,583	72,746	3,945,229	1,143,795	2,294,354	1,328,070	9,106,208	856,332
	SIC Code 5169 and SIC Code 5171 (Petroleum Bulk Terminals)	7	0	0	74,920	0	15,326	7,714	97,967	7
	SIC Code 5169 and SIC Code 7389 (Solvent Recovery Services)	19,481,224	0	0	10,240,971	0	690,344	59,492	30,472,031	958
	SIC Code 5169 and SIC Code 28 (Chemical Products)	1,448	16,959	0	11,668	45,000	16,921	24,717	116,713	1,292
	Total	**19,615,110**	**206,542**	**72,746**	**14,272,788**	**1,188,795**	**3,016,945**	**1,419,993**	**39,792,919**	**858,589**

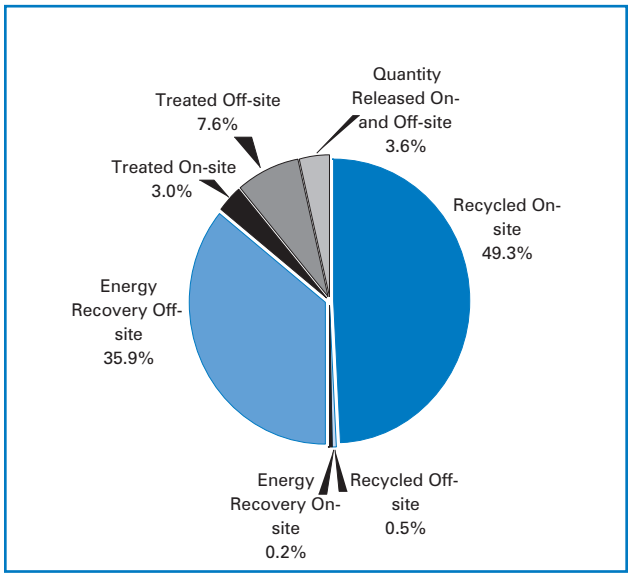
Note: Data are from Section 8 of Form R.

Waste Management Data

Quantities of TRI Chemicals in Waste

The chemical wholesale distribution industry reported managing 39.8 million pounds of total production-related waste in 1999, as shown in Table 4–40. On-site recycling totaled 19.6 million pounds, or 49.3 percent of the industry's production-related waste (see Figure 4–10). Off-site energy recovery totaled 14.3 million pounds, 35.9 percent. Off-site treatment amounted to 3.0 million pounds, and on-site treatment to 1.2 million pounds. Quantities released on- and off-site were 1.4 million pounds.

Figure 4–10. TRI Waste Management, 1999: Chemical Wholesalers



Note: Data are from Section 8 of Form R.

Facilities with a combination of chemical wholesale distribution and solvent recovery services managed the largest quantities of TRI chemicals in waste, with 30.5 million pounds of total production-related waste, or 76.6 percent of the total for the industry. These facilities reported 19.5 million pounds of on-site recycling and 10.2 million pounds of off-site energy recovery.

Facilities reporting only chemical wholesale distribution operations reported 9.1 million pounds of total production-related waste managed, or 22.9 percent of the industry total. These facilities reported 3.9 million pounds of off-site energy recovery, 2.3 million pounds treated off-site, 1.1 million pounds treated on-site, and 1.3 million pounds released on- and off-site.

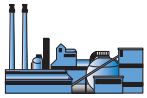


Table 4–41 shows the changes in the disposition of wastes from the chemical wholesale distribution industry between 1998 and 1999. Total production-related waste managed fell by 28.5 percent. The quantity released on- and off-site decreased by 18.2 percent, from 1.7 million pounds to 1.4 million pounds. Declines were reported in all waste management categories except for on-site energy recovery, which rose by about a third, from almost 55,000 pounds to almost 73,000 pounds. Energy recovery off-site fell by 46.3 percent, from 26.6 million pounds to 14.3 million pounds. On-site recycling fell by 10.9 percent, from 22.0 million pounds to 19.6 million pounds.

Transfers Off-site for Further Waste Management/Disposal

As shown in Table 4–42, the chemical wholesale distribution industry reported 19.7 million pounds of transfers off-site for further waste management and disposal in 1999. Transfers off-site to energy recovery represented 57.8 percent of all such transfers (see Figure 4–11). The industry reported 4.4 million pounds sent off-site to recycling (22.3 percent) and 3.2 million pounds sent to treatment (16.3 percent).

Facilities with a combination of chemical wholesale distribution operations and solvent recovery services reported 12.2 million

Table 4-41. Quantities of TRI Chemicals in Waste, 1998–1999: Chemical Wholesalers

Waste Management Activity	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	22,023,234	19,615,110	–2,408,124	–10.9
Recycled Off-site	735,748	206,542	–529,206	–71.9
Energy Recovery On-site	54,418	72,746	18,328	33.7
Energy Recovery Off-site	26,582,594	14,272,788	–12,309,806	–46.3
Treated On-site	1,521,953	1,188,795	–333,158	–21.9
Treated Off-site	3,031,122	3,016,945	–14,177	–0.5
Quantity Released On- and Off-site	1,735,780	1,419,993	–315,787	–18.2
Total Production-related Waste	**55,684,849**	**39,792,919**	**–15,891,930**	**–28.5**
Non-production-related Waste	49,671	858,589	808,918	1,628.6

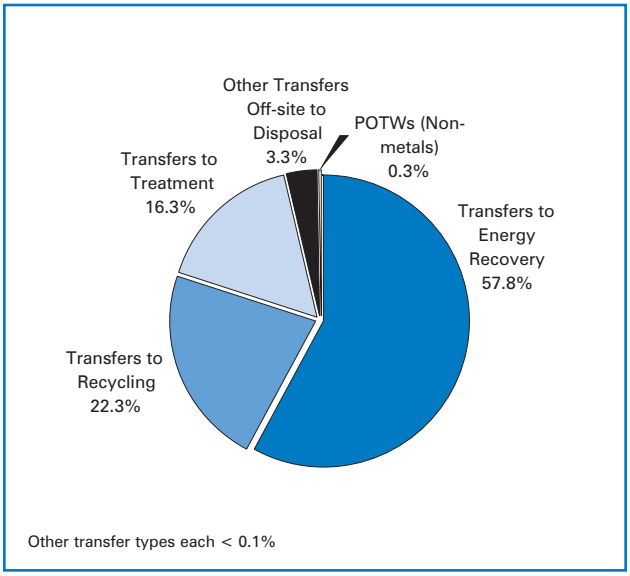
Note: All data are from Section 8 of Form R for the year indicated.

Table 4-42. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: Chemical Wholesalers

SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers*	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/ Disposal
					Metals and Metal Compounds	Non-metal TRI Chemicals			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
5169	Chemical Wholesale Distributors	300,578	3,903,431	2,497,669	69	32,995	0	620,212	7,354,954
	SIC Code 5169 and SIC Code 5171 (Petroleum Bulk Terminals)	0	74,920	23,931	0	0	0	0	98,851
	SIC Code 5169 and SIC Code 7389 (Solvent Recovery Services)	4,069,980	7,389,669	688,889	6	1,949	0	32,239	12,182,732
	SIC Code 5169 and SIC Code 28 (Chemical Products)	16,960	11,778	3,739	0	14,656	0	1,621	48,754
	Total	**4,387,518**	**11,379,798**	**3,214,228**	**75**	**49,600**	**0**	**654,072**	**19,685,291**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Figure 4–11. Distribution of TRI Transfers Off-site for Further Waste Management/Disposal, 1999: Chemical Wholesalers



Note: Data are from Section 6 of Form R.

pounds of off-site transfers, of which 60.7 percent (7.4 million pounds) was to energy recovery. Facilities with only chemical distribution operations reported 7.4 million pounds of transfers off-site for further waste management and disposal. These facilities reported 3.9 million pounds of transfers to energy recovery and 2.5 million pounds of transfers to treatment.

Table 4–43 shows changes in transfers between 1998 and 1999. Total transfers off-site for further waste management and disposal fell by 36.4 percent. The largest absolute decrease was in transfers to energy recovery, from 24.5 million pounds to 11.4 million pounds, a decline of 53.5 percent. Transfers to recycling increased, from 3.0 million pounds to 4.4 million pounds (45.9 percent). The category other off-site transfers to disposal rose 200.4 percent, to almost 655,000 pounds.

TRI Data by State

Facilities in the chemical wholesale distribution industry in Texas submitted the largest number of forms in 1999, 475 forms. Ohio and California ranked second and third, with 238 and 218 forms, respectively.

On- and Off-site Releases

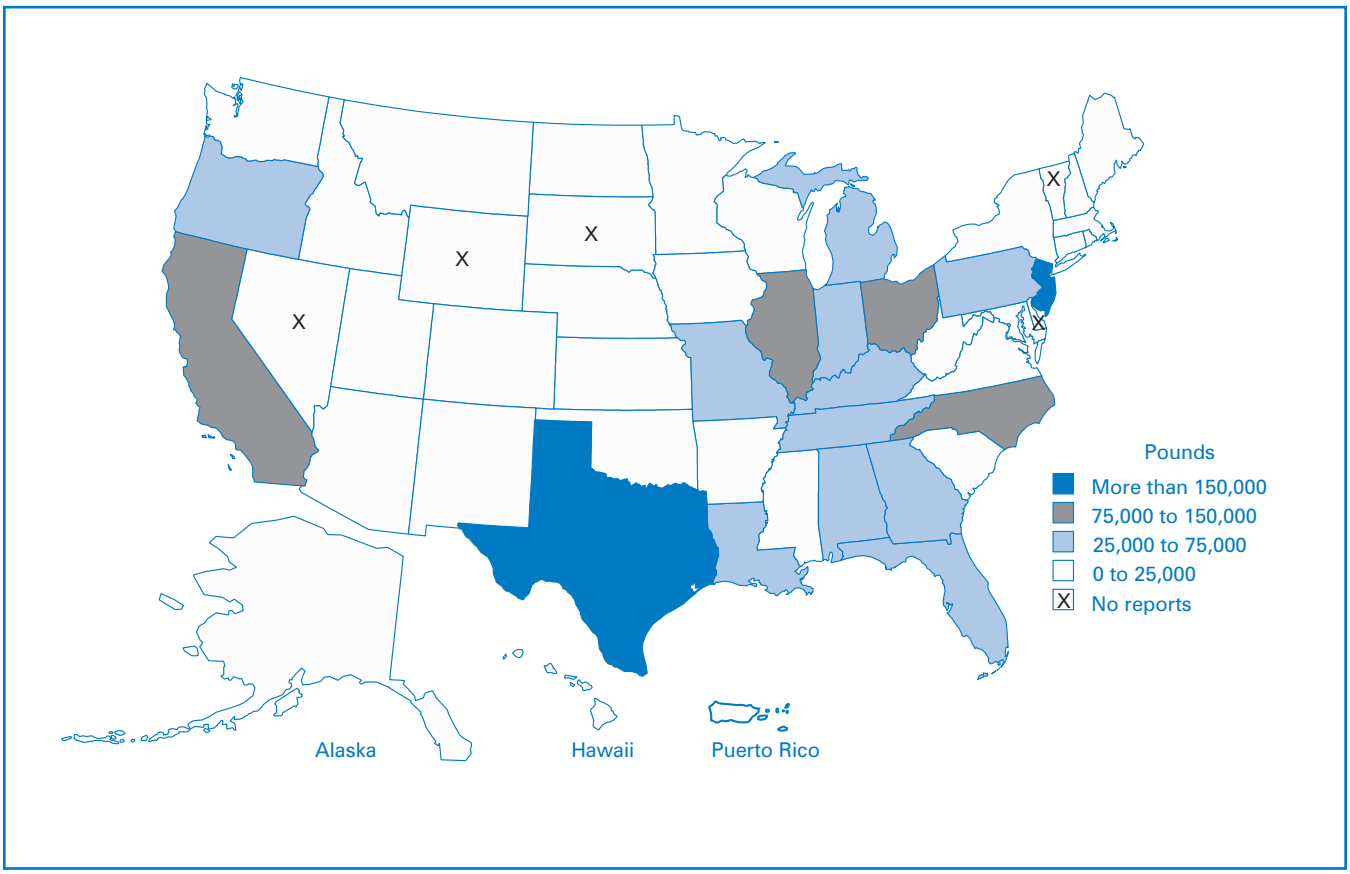
In 1999, chemical wholesale distributors in Texas reported about 716,000 pounds of on- and off-site releases, of which over 511,000 pounds were off-site releases and over 204,000 pounds were air emissions. Texas's off-site releases of 511,00 pounds totaled more than all other states combined (see Table 4–44). These were the largest of any state for both off-site releases and air emissions. As shown in Map 4–4, Texas and New Jersey reported the largest amounts of total releases in 1999; the total for New

Table 4-43. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Chemical Wholesalers

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	3,007,695	4,387,518	1,379,823	45.9
Transfers to Energy Recovery	24,491,927	11,379,798	–13,112,129	–53.5
Transfers to Treatment	3,093,759	3,214,228	120,469	3.9
Transfers to POTWs	116,369	49,675	–66,694	–57.3
Metals and Metal Compounds Only	351	75	–276	–78.6
Non-metal TRI Chemicals	116,018	49,600	–66,418	–57.2
Other Off-site Transfers*	4,320	0	–4,320	–100.0
Other Off-site Transfers to Disposal**	217,706	654,072	436,366	200.4
Total Transfers Off-site for Further Waste Management/Disposal	**30,931,776**	**19,685,291**	**-11,246,485**	**-36.4**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Map 4-4. Total On-site and Off-site Releases, 1999: Chemical Wholesalers



Jersey was more than 180,000 pounds, almost all in the form of air emissions. Next in rank were Ohio, North Carolina, California, and Illinois. Only Texas, New Jersey, Ohio, and North Carolina had releases of more than 100,000 pounds from the industry.

Ohio's more than 126,000 pounds of total releases included almost 90,000 pounds of air emissions and nearly 37,000 pounds of transfers off-site to disposal. Facilities in North Carolina reported about 120,000 pounds, including nearly 104,000 pounds of air emissions. The largest quantity of surface water emissions reported was about 2,300 pounds, for California.

Table 4–45 shows changes in total releases by the chemical wholesale distribution industry between 1998 and 1999, by state. The largest absolute increase was for Texas, from 236,137 pounds to 715,884 pounds, a rise of 203.2 percent. The largest absolute decrease was for Ohio, from 186,627 pounds to 126,256 pounds, a 32.3 percent decline.

Waste Management Data

The state with the largest quantity of total production-related waste reported by the chemical wholesale distribution industry was Ohio, with 23.8 million pounds (see Table 4–44). Ohio's 16.4 million pounds recycled on-site represented 83.6 percent of all on-site recycling by the industry. The state's off-site energy recovery amounted

Table 4-44. Summary of TRI Information by State, 1999: Chemical Wholesalers

State	Total Forms	On-site Releases						Off-site Releases	
				Underground Injection		On-site Land Releases			
		Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	67	29,529	191	0	0	0	0	29,720	0	29,720
Alaska	7	575	0	0	0	0	0	575	0	575
Arizona	46	16,625	0	0	0	0	0	16,625	0	16,625
Arkansas	9	1,702	0	0	0	0	0	1,702	0	1,702
California	218	80,605	2,304	0	0	0	0	82,909	13,395	96,304
Colorado	33	4,645	0	0	0	0	0	4,645	0	4,645
Connecticut	23	8,776	0	0	0	0	0	8,776	0	8,776
Florida	76	64,548	30	0	0	0	0	64,578	5	64,583
Georgia	104	28,566	0	0	0	0	0	28,566	10	28,576
Hawaii	1	5	0	0	0	0	0	5	0	5
Idaho	2	0	0	0	0	0	0	0	0	0
Illinois	125	42,405	30	0	0	0	0	42,435	33,708	76,143
Indiana	156	36,827	0	0	0	0	0	36,827	250	37,077
Iowa	71	12,693	5	0	0	0	5	12,703	3,610	16,313
Kansas	52	8,389	0	0	0	0	0	8,389	6,955	15,344
Kentucky	72	39,217	0	0	0	0	0	39,217	88	39,305
Louisiana	112	38,419	0	0	0	0	0	38,419	6,402	44,821
Maine	1	5	0	0	0	0	0	5	0	5
Maryland	19	380	0	0	0	0	0	380	0	380
Massachusetts	105	13,759	0	0	0	0	0	13,759	300	14,059
Michigan	100	29,165	0	0	0	0	0	29,165	0	29,165
Minnesota	77	12,710	0	0	0	0	0	12,710	0	12,710
Mississippi	20	2,400	5	0	0	0	0	2,405	0	2,405
Missouri	152	71,613	0	0	0	0	177	71,790	100	71,890
Montana	6	2,031	0	0	0	0	0	2,031	0	2,031
Nebraska	10	0	0	0	0	0	0	0	0	0
New Hampshire	3	418	0	0	0	0	0	418	0	418
New Jersey	165	180,214	5	0	0	0	0	180,219	5	180,224
New Mexico	6	14	0	0	0	0	0	14	710	724
New York	100	18,925	4	0	0	0	0	18,929	0	18,929
North Carolina	129	103,628	0	0	0	0	0	103,628	15,973	119,601
North Dakota	6	922	0	0	0	0	0	922	0	922
Ohio	238	89,522	0	0	0	0	0	89,522	36,734	126,256
Oklahoma	66	16,155	0	0	0	0	0	16,155	0	16,155
Oregon	50	16,864	0	0	0	0	5	16,869	9,684	26,553
Pennsylvania	195	47,539	5	0	0	0	0	47,544	3,121	50,665
Puerto Rico	15	15,029	0	0	0	0	0	15,029	0	15,029
Rhode Island	5	250	0	0	0	0	0	250	0	250
South Carolina	29	17,330	0	0	0	0	0	17,330	1,810	19,140
Tennessee	114	26,263	0	0	0	0	500	26,763	250	27,013
Texas	475	204,390	0	0	0	0	55	204,445	511,439	715,884
Utah	37	6,509	0	0	0	0	0	6,509	0	6,509
Virginia	28	4,260	0	0	0	0	0	4,260	0	4,260
Washington	41	3,934	765	0	0	0	205	4,904	3,650	8,554
West Virginia	17	1,650	0	0	0	0	0	1,650	440	2,090
Wisconsin	76	18,990	0	0	0	0	334	19,324	0	19,324
Total	**3,459**	**1,318,395**	**3,344**	**0**	**0**	**0**	**1,281**	**1,323,020**	**648,639**	**1,971,659**

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.

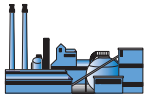


Table 4-44. Summary of TRI Information by State, 1999: Chemical Wholesalers *(continued)*

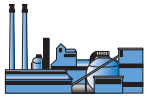
State	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
	On-site	Off-site	On-site	Off-site	On-site	Off-site			
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	0	0	0	23,990	4	1	28,191	52,186	148
Alaska	0	0	0	0	0	0	183	183	0
Arizona	10,000	0	0	15,758	169,000	78	15,600	210,436	2
Arkansas	0	0	0	0	0	0	1,702	1,702	0
California	12,198	32,159	0	434,694	19,045	19,643	122,814	640,553	1,261
Colorado	0	0	0	1,349	0	4,314	4,149	9,812	0
Connecticut	0	0	0	0	0	0	8,776	8,776	11
Florida	607	600	0	26,032	0	100	57,685	85,024	204
Georgia	0	4,106	0	28,139	9	250	27,703	60,207	42
Hawaii	0	0	0	0	0	0	2	2	5
Idaho	0	0	0	0	0	0	0	0	0
Illinois	0	0	0	479,964	210	22,388	74,204	576,766	229
Indiana	656	18,245	0	347,011	33,743	109,388	30,770	539,813	201
Iowa	43,693	24,244	0	86,378	0	5,210	12,383	171,908	0
Kansas	23,860	0	0	64,362	0	18,495	8,386	115,103	0
Kentucky	2,738	0	0	19,221	43	88	34,700	56,790	0
Louisiana	30,613	0	72,746	157,045	12	99	44,408	304,923	0
Maine	0	0	0	0	2,200	0	5	2,205	1
Maryland	0	0	0	0	0	0	380	380	0
Massachusetts	0	5,362	0	49,432	0	0	28,490	83,284	32
Michigan	0	8,900	0	213,257	1,015	9,251	26,536	258,959	18
Minnesota	0	6,208	0	71,528	1,828	5,413	12,433	97,410	0
Mississippi	0	0	0	22,500	0	68,691	2,298	93,489	0
Missouri	0	60	0	348,481	0	80,387	64,244	493,172	0
Montana	0	0	0	0	0	0	2,031	2,031	0
Nebraska	0	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	16	418	434	0
New Jersey	0	4,656	0	164,594	7,433	34,649	186,589	397,921	350,087
New Mexico	0	0	0	0	0	0	724	724	0
New York	0	0	0	52,750	0	104,701	16,396	173,847	4
North Carolina	0	2,600	0	355,571	14,338	1,511,768	101,698	1,985,975	5
North Dakota	0	0	0	0	0	0	922	922	0
Ohio	16,393,300	29,700	0	6,559,998	1,284	685,936	124,208	23,794,426	1,605
Oklahoma	0	0	0	45,994	0	310	14,191	60,495	562
Oregon	0	0	0	1,808	43,079	690	25,465	71,042	290
Pennsylvania	0	0	0	37,055	15,365	16,305	43,908	112,633	203
Puerto Rico	0	0	0	0	0	0	15,029	15,029	0
Rhode Island	0	0	0	0	0	0	400	400	0
South Carolina	0	600	0	994	2,679	2,750	17,330	24,353	1
Tennessee	3,125	0	0	17,029	4,054	24	32,379	56,611	240
Texas	6,396	65,902	0	694,242	867,828	303,133	202,607	2,140,108	498,947
Utah	0	0	0	57,988	4,968	6,944	5,457	75,357	1
Virginia	0	0	0	6,633	0	0	2,466	9,099	7
Washington	0	0	0	580	0	0	3,927	4,507	3,511
West Virginia	0	3,200	0	0	0	400	1,400	5,000	0
Wisconsin	3,087,924	0	0	3,888,411	658	5,523	16,406	6,998,922	972
Total	**19,615,110**	**206,542**	**72,746**	**14,272,788**	**1,188,795**	**3,016,945**	**1,419,993**	**39,792,919**	**858,589**

Note: Data are from Section 8 of Form R.

Table 4-45. TRI Total Releases by State, 1998–1999: Chemical Wholesalers

State	Total On-site and Off-site Releases			
	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Alabama	25,369	29,720	4,351	17.2
Alaska	1,255	575	–680	–54.2
Arizona	12,249	16,625	4,376	35.7
Arkansas	985	1,702	717	72.8
California	143,661	96,304	–47,357	–33.0
Colorado	4,092	4,645	553	13.5
Connecticut	7,408	8,776	1,368	18.5
Florida	85,572	64,583	–20,989	–24.5
Georgia	38,724	28,576	–10,148	–26.2
Hawaii	0	5	5	—
Idaho	0	0	0	—
Illinois	52,829	76,143	23,314	44.1
Indiana	39,300	37,077	–2,223	–5.7
Iowa	20,569	16,313	–4,256	–20.7
Kansas	10,576	15,344	4,768	45.1
Kentucky	29,925	39,305	9,380	31.3
Louisiana	47,045	44,821	–2,224	–4.7
Maine	17	5	–12	–70.6
Maryland	260	380	120	46.2
Massachusetts	31,796	14,059	–17,737	–55.8
Michigan	28,175	29,165	990	3.5
Minnesota	17,563	12,710	–4,853	–27.6
Mississippi	7,961	2,405	–5,556	–69.8
Missouri	65,547	71,890	6,343	9.7
Montana	1,907	2,031	124	6.5
Nebraska	0	0	0	—
Nevada	475	0	–475	–100.0
New Hampshire	504	418	–86	–17.1
New Jersey	156,061	180,224	24,163	15.5
New Mexico	1,165	724	–441	–37.9
New York	15,441	18,929	3,488	22.6
North Carolina	31,993	119,601	87,608	273.8
North Dakota	772	922	150	19.4
Ohio	186,627	126,256	–60,371	–32.3
Oklahoma	11,273	16,155	4,882	43.3
Oregon	35,337	26,553	–8,784	–24.9
Pennsylvania	42,974	50,665	7,691	17.9
Puerto Rico	22,161	15,029	–7,132	–32.2
Rhode Island	250	250	0	0.0
South Carolina	12,990	19,140	6,150	47.3
Tennessee	28,377	27,013	–1,364	–4.8
Texas	236,137	715,884	479,747	203.2
Utah	4,708	6,509	1,801	38.3
Virginia	27,158	4,260	–22,898	–84.3
Washington	31,275	8,554	–22,721	–72.6
West Virginia	2,300	2,090	–210	–9.1
Wisconsin	16,336	19,324	2,988	18.3
Total	**1,537,099**	**1,971,659**	**434,560**	**28.3**

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



to 6.6 million pounds, 46.0 percent of the total for the industry in this category.

Wisconsin ranked second, with total production-related waste of 7.0 million pounds. This consisted of 3.1 million pounds of on-site recycling and 3.9 million pounds of off-site energy recovery. Texas ranked third, with 2.1 million pounds of total production-related waste, including the largest amount treated on-site, about 868,000 pounds.

Chemical wholesale distributors reported smaller quantities in other waste management activities. The largest amount of production-related waste released on- and off-site was about 203,000 pounds in Texas. As seen in Table 4–45, total releases in Texas were about 716,000, which includes the non-production-related waste of almost 499,000 pounds. Texas also reported the largest amount of off-site recycling, almost 66,000 pounds.

Top 15 Chemicals for On- and Off-site Releases

Table 4–46 presents data for the 15 chemicals released in the largest amounts by TRI chemical wholesale distributors. Methyl acrylate was the chemical with the largest amount of on- and off-site releases in the chemical wholesale distribution industry. Chemical wholesale distributors reported releasing more than half a million pounds of this chemical, largely as transfers off-site to disposal.

Methanol ranked second, with 315,030 pounds, 93.4 percent of which was air releases. Five other chemicals had total on- and off-site releases greater than 100,000 pounds each: toluene (140,935 pounds), methyl ethyl ketone (140,606 pounds), dichloromethane (126,949 pounds), chlorodifluoromethane (107,851 pounds), and ammonia (100,176 pounds). For all of these chemicals except methyl acrylate, air emissions accounted for more than 85 percent of total on- and off-site releases. Only 3 of the top 15 chemicals—methyl acrylate, zinc compounds, and ethylene glycol—reported more than 50 percent of their total releases as off-site transfers to disposal; for methyl acrylate and zinc compounds, the share was more than 97 percent.

Releases of the 15 chemicals totaled 1.8 million pounds, 89.2 percent of the industry's total releases of 2.0 million pounds.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

Chemical wholesale distribution facilities reporting to TRI expected their production-related waste to increase by 8.7 percent between 1999 and 2001, from 39.8 million pounds to 43.3 million pounds (see Table 4–47). The projected increase represents a rise of 9.4 percent in 2000 followed by a decrease of 0.7 percent in 2001. On-site treatment is expected to fall by 63.3 percent and off-site treatment to increase by 21.4 percent. The largest amounts involved are for on-site recycling, which would increase from 19.6 million pounds to 20.6 million pounds (a rise of 5.1 percent, although its share of waste managed would decrease), and off-site energy recovery, projected to increase from 14.3 million pounds to 17.0 million pounds, a rise of 19.3 percent.

The projections indicate some change in waste management practices. The share of on-site recycling would decrease from 49.3 percent of total production-related waste managed in 1999 to 47.6 percent in 2001,

Table 4-46. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: Chemical Wholesalers

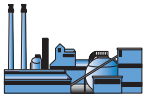
CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection: Class I Wells Pounds	Underground Injection: Class II–V Wells Pounds	On-site Land Releases: RCRA Subtitle C Landfills Pounds	On-site Land Releases: Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
96-33-3	Methyl acrylate	2,206	0	0	0	0	0	2,206	498,922	501,128
67-56-1	Methanol	294,222	0	0	0	0	345	294,567	20,463	315,030
108-88-3	Toluene	122,906	10	0	0	0	5	122,921	18,014	140,935
78-93-3	Methyl ethyl ketone	130,945	14	0	0	0	254	131,213	9,393	140,606
75-09-2	Dichloromethane	123,742	0	0	0	0	0	123,742	3,207	126,949
75-45-6	Chlorodifluoromethane (HCFC-22)	107,851	0	0	0	0	0	107,851	0	107,851
7664-41-7	Ammonia	98,252	794	0	0	0	205	99,251	925	100,176
1330-20-7	Xylene (mixed isomers)	79,076	20	0	0	0	145	79,241	6,991	86,232
110-54-3	n-Hexane	76,378	0	0	0	0	7	76,385	4,292	80,677
—	Glycol ethers	31,845	0	0	0	0	250	32,095	9,670	41,765
108-05-4	Vinyl acetate	28,070	0	0	0	0	0	28,070	598	28,668
—	Zinc compounds	703	0	0	0	0	0	703	24,965	25,668
107-21-1	Ethylene glycol	9,893	0	0	0	0	0	9,893	13,633	23,526
108-10-1	Methyl isobutyl ketone	19,048	0	0	0	0	5	19,053	1,426	20,479
75-71-8	Dichlorodifluoro-methane (CFC-12)	18,566	0	0	0	0	0	18,566	0	18,566
	Subtotal (top 15 chemicals)	**1,143,703**	**838**	**0**	**0**	**0**	**1,216**	**1,145,757**	**612,499**	**1,758,256**
	Total (all chemicals)	**1,318,395**	**3,344**	**0**	**0**	**0**	**1,281**	**1,323,020**	**648,639**	**1,971,659**

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.

and that of off-site energy recovery would increase from 35.9 percent to 39.4 percent. The quantity released on- and off-site—the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 2–1)—would decrease slightly, from 1.4 million pounds (3.6 percent of the total) to 1.3 million pounds (3.0 percent).

Source Reduction

Of the Form Rs submitted by chemical wholesale distribution facilities in 1999, 11.4 percent reported source reduction activity undertaken during the year (see Table 4–48). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.



Facilities with only chemical wholesale distribution operations reported 180 forms with source reductions activities, representing 10.3 percent of the total 1,741. These facilities identified good operating practices on 112 forms and spill and leak prevention on 105. Facilities with combinations of chemical wholesale distribution and other operations filed smaller numbers of forms but reported source reduction activity on a greater percentage of them. Facilities that combined chemical wholesale distribution with petroleum bulk terminals or with manufacture of chemical products reported source reduction activity on about 70 percent of their Form Rs. These facilities identified as their main source reduction activities spill and leak prevention (25 forms for the two groups) and good operating practices (23 forms).

Table 4-47. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999–2001: Chemical Wholsesalers

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	19,615,110	49.3	20,308,682	46.6	20,615,628	47.6
Recycled Off-site	206,542	0.5	143,232	0.3	143,388	0.3
Energy Recovery On-site	72,746	0.2	81,018	0.2	81,018	0.2
Energy Recovery Off-site	14,272,788	35.9	16,719,067	38.4	17,033,061	39.4
Treated On-site	1,188,795	3.0	435,666	1.0	436,303	1.0
Treated Off-site	3,016,945	7.6	4,554,572	10.5	3,661,683	8.5
Quantity Released On- and Off-site	1,419,993	3.6	1,311,017	3.0	1,294,814	3.0
Total Production-related Waste	**39,792,919**	**100.0**	**43,553,254**	**100.0**	**43,265,895**	**100.0**

Waste Management Activity	Projected Change 1999-2000 Percent	Projected Change 2000-2001 Percent	Projected Change 1999-2001 Percent
Recycled On-site	3.5	1.5	5.1
Recycled Off-site	–30.7	0.1	–30.6
Energy Recovery On-site	11.4	0.0	11.4
Energy Recovery Off-site	17.1	1.9	19.3
Treated On-site	–63.4	0.1	–63.3
Treated Off-site	51.0	–19.6	21.4
Quantity Released On- and Off-site	–7.7	–1.2	–8.8
Total Production-related Waste	**9.4**	**-0.7**	**8.7**

Note: Current year and projected amounts are from Section 8 of Form R for 1999.

Table 4-48. Number of Forms Reporting Source Reduction Activity, 1999: Chemical Wholesalers

SIC Code	Industry	Total Form Rs Number	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
5169	Chemical Wholesale Distributors	1,741	180	10.3	112	45	105	0	8	5	0	1
	SIC Code 5169 and SIC Code 5171 (Petroleum Bulk Terminals)	11	8	72.7	8	0	16	0	0	0	0	0
	SIC Code 5169 and SIC Code 7389 (Solvent Recovery Services)	40	0	0.0	0	0	0	0	0	0	0	0
	SIC Code 5169 and SIC Code 28 (Chemical Products)	29	20	69.0	15	0	9	0	3	0	0	0
	Total	**1,821**	**208**	**11.4**	**135**	**45**	**130**	**0**	**11**	**5**	**0**	**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.

Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)

Introduction

Petroleum terminals and bulk storage facilities (SIC code 5171) repackage or blend petroleum products for sale to gasoline stations and other retailers. Petroleum terminals and bulk storage facilities buy petroleum products in bulk and blend and/or repackage them to customer specifications. The industry includes liquefied petroleum gases. Petroleum terminals and bulk storage facilities sell to industrial, commercial, institutional, farm, construction, and business users and to other wholesalers. They have a bulk liquid storage capacity of 10,000 gallons or more, and the quantities sold are large. Retail gasoline stations are not included in this industry sector. Box 4–6 describes the products of the wholesale petroleum industry.

More details for this industry sector on products and services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

1999 TRI Data for Petroleum Terminals and Bulk Storage Facilities

On- and Off-site Releases

Petroleum terminals and bulk storage facilities required to report to TRI released 4.3 million pounds of TRI chemicals on- and off-site in 1999, as shown in Table 4–49. The bulk of the total, 4.0 million pounds, was air emissions, which accounted for 94.8 percent of the industry's total releases (see Figure 4–12).

Box 4–6. SIC Code 517, Wholesale Trade-Petroleum and Petroleum Products: Codes and Classifications Required to Report to TRI

5171	Petroleum Terminals and Bulk Stations	Wholesale distribution of crude petroleum and petroleum products, including liquefied petroleum gas, from bulk liquid storage facilities.

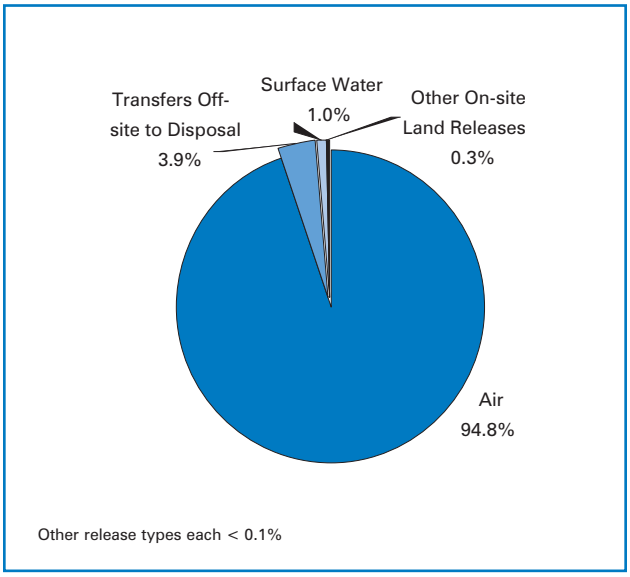
Source: Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual, 1987.*

The second-largest release type, off-site releases (transfers off-site to disposal), totaled about 166,000 pounds, or 3.9 percent of total releases. Petroleum terminals and bulk storage facilities also reported about 44,000 pounds discharged to surface waters and almost 15,000 pounds of on-site land releases. No underground injection was reported.

Of the 3,568 forms submitted in 1999, 32 indicated a combination of facility activities covering petroleum terminals and bulk storage operations, along with petroleum refining. Those reporting only petroleum terminals and bulk storage facilities represented 99.1 percent of total releases by this industry. Facilities reporting combined operations reported about 40,000 pounds of total releases for 1999.

Table 4–50 shows changes in releases from petroleum terminals and bulk storage facilities between 1998 and 1999. Total releases declined by 5.5 percent, on-site releases decreased 4.3 percent, and off-site releases fell 26.7 percent. Air emissions decreased by 3.9 percent. Surface water discharges and land treatment rose, although the amounts were modest. Off-site transfers to storage, solidification/stabilization, and underground injection all showed large percentage increases, but from small bases. The unknown category decreased by 81.8 percent, from almost 75,000 pounds to about 13,500 pounds.

Figure 4–12. Distribution of TRI On-site and Off-site Releases, 1999: Petroleum Terminals and Bulk Storage Facilities



Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Table 4-49. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: Petroleum Terminals and Bulk Storage Facilities

SIC Code	Industry	Total Forms	On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
			Total Air Emissions	Surface Water Discharges	Class I Wells	Class II–V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
5171	Petroleum Terminals and Bulk Storage Facilities	3,536	4,032,415	42,645	0	0	528	14,641	4,090,229	138,847	4,229,076
	SIC Code 5171 and SIC Code 29 (Petroleum Refining)	32	11,808	961	0	0	0	0	12,769	26,706	39,475
	Total	**3,568**	**4,044,223**	**43,606**	**0**	**0**	**528**	**14,641**	**4,102,998**	**165,553**	**4,268,551**

Note: On-site Releases 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.

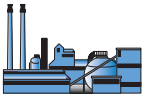


Table 4-50. TRI On-site and Off-site Releases, 1998–1999: Petroleum Terminals and Bulk Storage Facilities

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	4,209,302	4,044,223	–165,079	–3.9
Fugitive Air Emissions	1,142,198	1,117,226	–24,972	–2.2
Point Source Air Emissions	3,067,104	2,926,997	–140,107	–4.6
Surface Water Discharges	26,706	43,606	16,900	63.3
Underground Injection	0	0	0	—
Class I Wells	0	0	0	—
Class II–V Wells	0	0	0	—
On-site Land Releases	52,811	15,169	–37,642	–71.3
RCRA Subtitle C Landfills	0	528	528	—
Other On-site Landfills	0	0	0	—
Land Treatment	25	1,977	1,952	7,808.0
Surface Impoundments	0	4,881	4,881	—
Other Disposal	52,786	7,783	–45,003	–85.3
Total On-site Releases	**4,288,819**	**4,102,998**	**-185,821**	**-4.3**
Off-site Releases				
Storage Only[a]	258	22,642	22,384	8,676.0
Solidification/Stabilization[b] Metals and Metal Compounds Only	27	2,462	2,435	9,018.5
Wastewater Treatment (excluding POTWs)[c] Metals and Metal Compounds Only	0	0	0	—
Transfers to POTWs[d] Metals and Metal Compounds Only	370	322	–48	–13.0
Underground injection	1	2,502	2,501	250,100.0
Landfills/Surface Impoundments	32,616	34,662	2,046	6.3
Land Treatment	520	0	–520	–100.0
Other Land Disposal	41	0	–41	–100.0
Other Off-site Management	82,769	76,954	–5,815	–7.0
Transfers to Waste Broker for Disposal	34,950	12,464	–22,486	–64.3
Unknown[e]	74,236	13,545	–60,691	–81.8
Total Off-site Releases (Transfers Off-site to Disposal)	**225,788**	**165,553**	**-60,235**	**-26.7**
Total On-site and Off-site Releases	**4,514,607**	**4,268,551**	**-246,056**	**-5.5**

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

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

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

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

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

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

Table 4–51. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Petroleum Terminals and Bulk Storage Facilities

SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
5171	Petroleum Terminals and Bulk Storage Facilities	34,171,226	1,649,275	31,599	297,993	7,734,904	680,248	4,113,270	48,678,515	273,557
	SIC Code 5171 and SIC Code 29 (Petroleum Refining)	0	280	0	83	0	866	35,833	37,062	8
	Total	**34,171,226**	**1,649,555**	**31,599**	**298,076**	**7,734,904**	**681,114**	**4,149,103**	**48,715,577**	**273,565**

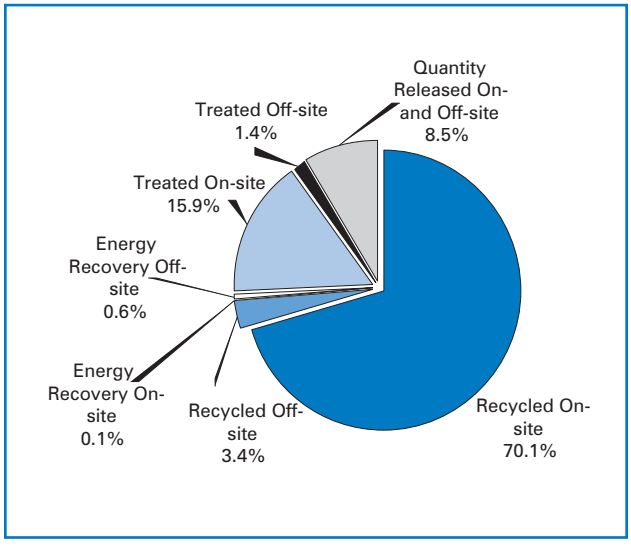
Note: Data are from Section 8 of Form R.

Waste Management Data

Quantities of TRI Chemicals in Waste

Petroleum terminals and bulk storage facilities reported managing a little over 48.7 million pounds of total production-related waste in 1999, as shown in Table 4–51. On-site recycling totaled 34.2 million pounds, or 70.1 percent of the industry's production-related waste (see Figure 4–13). The industry's on-site treatment was 7.7 million pounds (15.9 percent of the total), quantity released on- and off-site came to 4.1 million pounds, or 8.5 percent of the total, and off-site recycling amounted to 1.6 million pounds (3.4 percent). The total for on-site and off-site energy recovery was about 330,000 pounds.

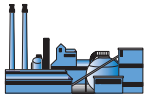
Figure 4–13. TRI Waste Management, 1999: Petroleum Terminals and Bulk Storage Facilities



Note: Data are from Section 8 of Form R.

Facilities reporting only petroleum terminals and bulk storage operations reported 48.68 million pounds of total production-related waste managed—more than 99.9 percent of the industry total. Facilities with a combination of petroleum terminals and bulk storage operations and petroleum refining reported about 37,000 pounds of production-related waste managed, largely as quantity released on- and off-site.

Table 4–52 shows changes in waste management activity by petroleum terminals and bulk storage facilities between 1998 and 1999. Total production-related waste fell 12.2 million pounds, a decline of 20.0 percent. Most of the decrease was attributable to a 71.4 percent fall in quantity released on- and off-site, from 14.5 million pounds in 1998 to 4.1 million pounds in 1999 and to an 85.2 percent decrease in off-site recycling, from 11.1 million pounds in 1998 to 1.6 million pounds in 1999. This is apparently due to a reporting error by two facilities owned by the same company that included the amounts sent off-site to recycling in the quantity released on- and off-



site. On-site recycling rose by 41.6 percent, from 24.1 million pounds to 34.2 million pounds.

Transfers Off-site for Further Waste Management/Disposal

Petroleum terminals and bulk storage facilities reported 2.5 million pounds of transfers off-site for further waste management and disposal in 1999, as shown in Table 4–53. Transfers off-site to recycling, 1.3 million pounds, represented 51.0 percent of all transfers for further waste management and disposal (see Figure 4–14). Transfers off-site to treatment, about 720,000 pounds, accounted for 28.5 percent of the total.

Most of these quantities were reported by facilities with only petroleum terminals and bulk storage operations. Facilities that combined petroleum terminals and bulk storage operations with petroleum refining reported less than 31,000 pounds of transfers off-site for further waste management and disposal.

Transfers off-site for further waste management or disposal by petroleum terminals and bulk storage facilities dropped by 10.5 million pounds, or 80.7 percent, between 1998 and 1999 (see Table 4–54). The largest absolute decrease was in transfers to recycling, which fell from 11.4 million pounds to 1.3 million pounds, a decrease of 88.7 percent. All other waste management cate-

Table 4–52. Quantities of TRI Chemicals in Waste, 1998–1999: Petroleum Terminals and Bulk Storage Facilities

Waste Management Activity	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	24,127,709	34,171,226	10,043,517	41.6
Recycled Off-site	11,136,925	1,649,555	–9,487,370	–85.2
Energy Recovery On-site	6	31,599	31,593	526,550.0
Energy Recovery Off-site	324,237	298,076	–26,161	–8.1
Treated On-site	9,606,632	7,734,904	–1,871,728	–19.5
Treated Off-site	1,190,963	681,114	–509,849	–42.8
Quantity Released On- and Off-site	14,502,350	4,149,103	–10,353,247	–71.4
Total Production-related Waste	**60,888,822**	**48,715,577**	**–12,173,245**	**–20.0**
Non-production-related Waste	830,269	273,565	–556,704	–67.1

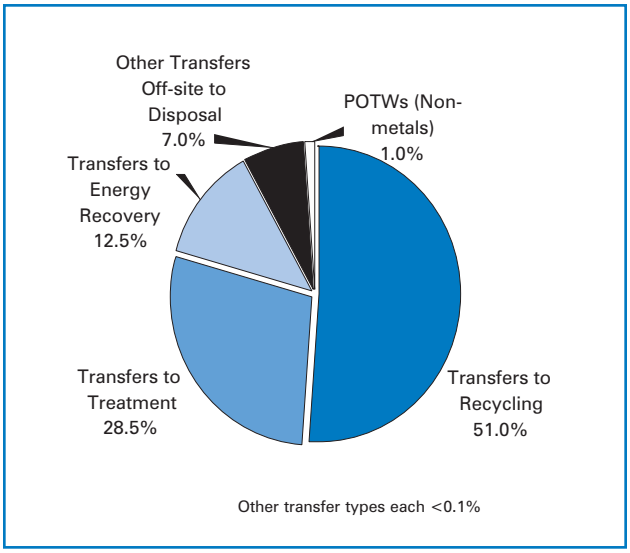
Note: All data are from Section 8 of Form R for the year indicated.

Table 4–53. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: Petroleum Terminals and Bulk Storage Facilities

SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers*	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/ Disposal
					Metals and Metal Compounds	Non-metal TRI Chemicals			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
5171	Petroleum Terminals and Bulk Storage Facilities	1,284,967	314,993	715,964	321	24,265	0	149,425	2,489,935
	SIC Code 5171 and SIC Code 29 (Petroleum Refining)	288	326	3,055	1	413	0	26,705	30,788
	Total	**1,285,255**	**315,319**	**719,019**	**322**	**24,678**	**0**	**176,130**	**2,520,723**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Figure 4–14. Distribution of TRI Transfers Off-site for Further Waste Management/Disposal, 1999: Petroleum Terminals and Bulk Storage Facilities



Note: Data are from Section 6 of Form R.

gories declined except for transfers to POTWs, which rose from about 8,200 pounds to 25,000 pounds.

TRI Data by State

Petroleum terminals and bulk storage facilities in California submitted 394 forms, the largest number of forms. New York and Pennsylvania ranked second and third, with 325 and 311 forms, respectively.

On- and Off-site Releases

Petroleum terminals and bulk storage facilities in Guam reported more than 500,000 pounds of on-and off-site releases in 1999, almost all in the form of air emissions (see Table 4–55). As is shown in Map 4–5, Guam, Texas, California, and New Jersey reported the largest amounts of total releases in 1999, over 300,000 pounds each.

Texas had the second highest releases, with over 483,000 pounds, of which almost 474,000 pounds were air emissions. California was third, with over 416,000 pounds, of which almost 412,000 pounds were air emissions. New Jersey ranked fourth among states for releases in this industry, with more than 302,000 pounds, including almost 297,000 pounds of air emissions.

Facilities in Kentucky reported the largest amount of discharges to surface waters, with 11,790 pounds, representing 27.0 percent of total surface water discharges for the industry. Facilities in Kentucky also reported the largest off-site releases (off-site transfers to disposal), with over 24,000 pounds.

Table 4–54. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Petroleum Terminals and Bulk Storage Facilities

	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	11,391,030	1,285,255	–10,105,775	–88.7
Transfers to Energy Recovery	345,493	315,319	–30,174	–8.7
Transfers to Treatment	1,057,826	719,019	–338,807	–32.0
Transfers to POTWs	8,188	25,000	16,812	205.3
Metals and Metal Compounds Only	370	322	–48	–13.0
Non-metal TRI Chemicals	7,818	24,678	16,860	215.7
Other Off-site Transfers*	6,000	0	–6,000	–100.0
Other Off-site Transfers to Disposal**	–370	–322	48	–13.0
Total Transfers Off-site for Further Waste Management/Disposal	**13,048,697**	**2,520,723**	**–10,527,974**	**–80.7**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Map 4-5. Total On-site and Off-site Releases, 1999: Petroleum Terminals and Bulk Storage Facilities

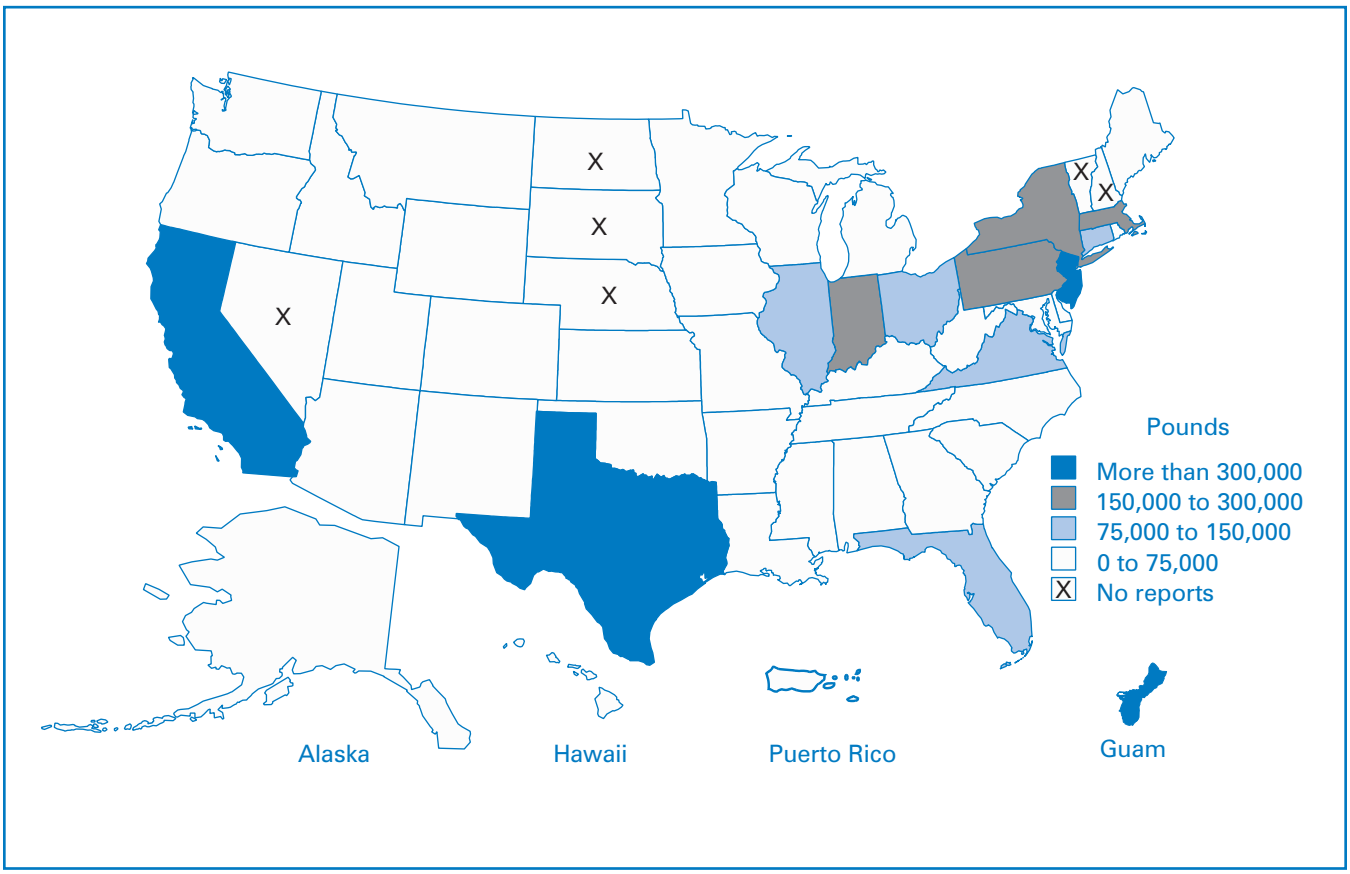


Table 4–56 summarizes the changes in total on-site and off-site releases by petroleum terminals and bulk storage facilities, by state, between 1998 and 1999. The largest increase was for Guam; releases jumped by 4,431.6 percent, from about 11,000 pounds to a little over 500,000 pounds. The largest absolute decreases were for Connecticut, from about 204,000 pounds to about 80,500 pounds, a decline of 60.4 percent, and New York, from about 344,000 pounds to about 238,500 pounds (30.7 percent).

Waste Management Data

Texas, with 16.4 million pounds, was the state with the largest total production-related waste in petroleum terminals and bulk storage facilities (see Table 4–55). Texas facilities in this industry reported 13.4 million pounds recycled on-site—the largest amount of on-site recycling in the industry, 39.2 percent of the total 34.2 million pounds for the category in this industry. Texas facilities also reported 2.0 million pounds of on-site treatment, or 25.5 percent of the total 7.7 million pounds of on-site treatment in the industry.

California ranked second, with total production-related waste of 4.8 million pounds. This included 3.1 million pounds of on-site recycling.

Georgia ranked third, with 4.1 million pounds of total production-related waste. Georgia facilities reported 4.0 million pounds recycled on-site, the second largest amount of any state for this industry.

Table 4-55. Summary of TRI Information by State, 1999: Petroleum Terminals and Bulk Storage Facilities

State	Total Forms	On-site Releases							Off-site Release	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
Alabama	28	10,997	61	0	0	0	0	11,058	0	11,058
Alaska	28	39,068	1	0	0	0	14	39,083	0	39,083
American Samoa	6	5,627	1	0	0	0	0	5,628	0	5,628
Arizona	62	57,811	0	0	0	0	25	57,836	0	57,836
Arkansas	11	16,017	0	0	0	0	0	16,017	0	16,017
California	394	411,624	535	0	0	461	827	413,447	2,924	416,371
Colorado	52	52,320	43	0	0	0	0	52,363	255	52,618
Connecticut	42	80,595	5	0	0	0	0	80,600	13	80,613
Delaware	33	2,455	0	0	0	0	0	2,455	0	2,455
District of Columbia	11	871	0	0	0	0	0	871	0	871
Florida	155	130,721	823	0	0	0	4,000	135,544	4,472	140,016
Georgia	71	29,799	512	0	0	0	0	30,311	19,566	49,877
Guam	20	501,016	25	0	0	67	0	501,108	0	501,108
Hawaii	41	57,237	292	0	0	0	65	57,594	0	57,594
Idaho	14	26,455	0	0	0	0	0	26,455	0	26,455
Illinois	92	95,421	186	0	0	0	242	95,849	1,113	96,962
Indiana	90	216,854	82	0	0	0	2,000	218,936	1,525	220,461
Iowa	12	9,888	0	0	0	0	0	9,888	0	9,888
Kansas	29	57,658	525	0	0	0	2,763	60,946	0	60,946
Kentucky	60	37,726	11,790	0	0	0	0	49,516	24,121	73,637
Louisiana	46	11,557	0	0	0	0	250	11,807	0	11,807
Maine	21	45,784	295	0	0	0	0	46,079	7,804	53,883
Maryland	48	66,624	1,604	0	0	0	0	68,228	1,312	69,540
Massachusetts	70	182,736	542	0	0	0	0	183,278	16,910	200,188
Michigan	82	51,626	7,135	0	0	0	0	58,761	1,339	60,100
Minnesota	12	2,255	6	0	0	0	0	2,261	0	2,261
Mississippi	53	7,090	0	0	0	0	0	7,090	0	7,090
Missouri	59	55,210	15	0	0	0	79	55,304	16	55,320
Montana	16	22,590	0	0	0	0	0	22,590	0	22,590
New Jersey	147	296,594	2,309	0	0	0	0	298,903	3,148	302,051
New Mexico	23	12,556	0	0	0	0	0	12,556	0	12,556
New York	325	222,928	2,609	0	0	0	5	225,542	12,893	238,435
North Carolina	118	58,604	54	0	0	0	290	58,948	3,360	62,308
Northern Marianas	10	3,387	25	0	0	0	0	3,412	0	3,412
Ohio	198	96,085	7,135	0	0	0	1	103,221	1,512	104,733
Oklahoma	25	32,363	0	0	0	0	0	32,363	0	32,363
Oregon	42	71,819	60	0	0	0	0	71,879	14	71,893
Pennsylvania	311	156,834	2,663	0	0	0	0	159,497	3,834	163,331
Puerto Rico	29	32,314	0	0	0	0	0	32,314	3,000	35,314
Rhode Island	21	36,596	36	0	0	0	0	36,632	16,498	53,130
South Carolina	11	10,439	9	0	0	0	0	10,448	0	10,448
Tennessee	89	37,667	136	0	0	0	0	37,803	1,015	38,818
Texas	287	473,797	1,249	0	0	0	2,575	477,621	5,602	483,223
Utah	16	8,979	0	0	0	0	0	8,979	0	8,979
Virgin Islands	12	3,960	0	0	0	0	0	3,960	1,010	4,970
Virginia	147	118,773	123	0	0	0	0	118,896	8,081	126,977
Washington	54	65,416	250	0	0	0	0	65,666	1,255	66,921
West Virginia	20	12,606	280	0	0	0	1,505	14,391	1,025	15,416
Wisconsin	16	5,031	2,190	0	0	0	0	7,221	0	7,221
Wyoming	9	1,843	0	0	0	0	0	1,843	21,936	23,779
Total	**3,568**	**4,044,223**	**43,606**	**0**	**0**	**528**	**14,641**	**4,102,998**	**165,553**	**4,268,551**

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.

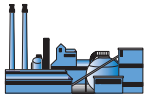


Table 4-55. Summary of TRI Information by State, 1999: Petroleum Terminals and Bulk Storage Facilities *(continued)*

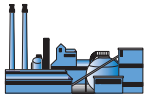
State	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
	On-site	Off-site	On-site	Off-site	On-site	Off-site			
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	0	900	0	0	6,833	30	10,746	18,509	8
Alaska	12,410	0	0	998	9,227	56	39,137	61,828	14
American Samoa	0	0	0	1,724	0	0	5,630	7,354	183
Arizona	0	189	0	0	0	259,148	56,197	315,534	0
Arkansas	15,553	0	0	0	0	0	16,017	31,570	0
California	3,065,821	425,270	59	859	824,117	54,552	389,039	4,759,717	2,517
Colorado	0	155	0	138	621,625	1,520	46,392	669,830	274
Connecticut	0	0	0	0	36,459	156	81,708	118,323	0
Delaware	0	0	0	0	0	0	2,455	2,455	0
District of Columbia	0	2,282	0	0	0	0	871	3,153	0
Florida	1,511,567	7,797	0	15,827	404,268	5,456	148,388	2,093,303	4,706
Georgia	3,993,600	4,050	31,540	22	35,587	6,652	52,801	4,124,252	139
Guam	0	0	0	0	0	67	501,143	501,210	113
Hawaii	0	0	0	5	9,500	94	52,892	62,491	1,941
Idaho	0	0	0	0	164,839	326	26,458	191,623	99
Illinois	581,250	13	0	32	266,930	70,405	96,742	1,015,372	106,732
Indiana	967,030	5,500	0	180	308,118	3,863	217,956	1,502,647	0
Iowa	4,510	0	0	0	0	0	9,891	14,401	89
Kansas	17,559	15	0	0	73,813	17	34,840	126,244	20,908
Kentucky	1,925,973	2	0	2,858	0	22,471	61,763	2,013,067	0
Louisiana	565,236	168,700	0	0	0	10,953	11,581	756,470	0
Maine	0	0	0	0	11,400	3,053	48,861	63,314	0
Maryland	18	332	0	609	267,641	8,900	67,576	345,076	586
Massachusetts	339,432	812	0	566	0	24,879	193,287	558,976	4,391
Michigan	3,071,455	883	0	23	9,361	52,149	51,333	3,185,204	512
Minnesota	1,590	770	0	0	70,345	18	2,125	74,848	118
Mississippi	0	0	0	0	0	1	7,120	7,121	0
Missouri	920	8,465	0	4,925	884,471	10,874	53,525	963,180	2,609
Montana	0	0	0	0	0	1,439	20,077	21,516	0
New Jersey	91	2,398	0	0	95,468	16,561	300,031	414,549	142
New Mexico	0	0	0	0	108,110	1,172	11,864	121,146	143
New York	1,170,500	47,897	0	149,886	181,311	22,302	265,548	1,837,444	9,131
North Carolina	30,911	22,927	0	12	93,529	19,494	58,787	225,660	3,232
Northern Marianas	0	0	0	0	0	0	3,387	3,387	0
Ohio	2,803,711	22,968	0	399	660,203	10,676	100,048	3,598,005	1,655
Oklahoma	0	0	0	0	67,128	23	29,585	96,736	0
Oregon	118,500	249,947	0	3,642	2,010	1,844	69,619	445,562	0
Pennsylvania	78,499	259,243	0	0	6,054	43,267	159,655	546,718	113,134
Puerto Rico	0	0	0	1,830	0	256	32,614	34,700	3
Rhode Island	0	0	0	242	151,289	1,932	51,933	205,396	0
South Carolina	0	0	0	0	0	1,459	10,439	11,898	0
Tennessee	4,152	3,096	0	0	0	77	38,038	45,363	3
Texas	13,406,341	409,702	0	112,548	1,970,231	12,715	472,148	16,383,685	103
Utah	0	0	0	0	0	5	8,109	8,114	0
Virgin Islands	0	0	0	0	0	0	3,750	3,750	0
Virginia	57,674	2,414	0	44	318,522	1,413	123,385	503,452	14
Washington	426,140	64	0	94	76,513	10,837	62,511	576,159	0
West Virginia	0	0	0	613	0	0	7,413	8,026	23
Wisconsin	783	2,764	0	0	0	0	7,133	10,680	37
Wyoming	0	0	0	0	2	2	26,555	26,559	6
Total	**34,171,226**	**1,649,555**	**31,599**	**298,076**	**7,734,904**	**681,114**	**4,149,103**	**48,715,577**	**273,565**

Note: Data are from Section 8 of Form R.

Table 4-56. TRI Total Releases by State, 1998–1999: Petroleum Terminals and Bulk Storage Facilities

State	Total On-site and Off-site Releases			
	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Alabama	9,535	11,058	1,523	16.0
Alaska	17,330	39,083	21,753	125.5
American Samoa	5,147	5,628	481	9.3
Arizona	57,397	57,836	439	0.8
Arkansas	24,216	16,017	–8,199	–33.9
California	499,086	416,371	–82,715	–16.6
Colorado	114,573	52,618	–61,955	–54.1
Connecticut	203,393	80,613	–122,780	–60.4
Delaware	2,100	2,455	355	16.9
District of Columbia	970	871	–99	–10.2
Florida	158,535	140,016	–18,519	–11.7
Georgia	35,668	49,877	14,209	39.8
Guam	11,058	501,108	490,050	4,431.6
Hawaii	56,143	57,594	1,451	2.6
Idaho	30,224	26,455	–3,769	–12.5
Illinois	114,989	96,962	–18,027	–15.7
Indiana	181,858	220,461	38,603	21.2
Iowa	9,978	9,888	–90	–0.9
Kansas	29,075	60,946	31,871	109.6
Kentucky	34,040	73,637	39,597	116.3
Louisiana	9,647	11,807	2,160	22.4
Maine	67,953	53,883	–14,070	–20.7
Maryland	91,117	69,540	–21,577	–23.7
Massachusetts	286,910	200,188	–86,722	–30.2
Michigan	130,069	60,100	–69,969	–53.8
Minnesota	2,557	2,261	–296	–11.6
Mississippi	29,372	7,090	–22,282	–75.9
Missouri	69,420	55,320	–14,100	–20.3
Montana	23,586	22,590	–996	–4.2
New Jersey	311,388	302,051	–9,337	–3.0
New Mexico	42,135	12,556	–29,579	–70.2
New York	343,936	238,435	–105,501	–30.7
North Carolina	70,646	62,308	–8,338	–11.8
Northern Marianas	3,086	3,412	326	10.6
Ohio	121,865	104,733	–17,132	–14.1
Oklahoma	49,020	32,363	–16,657	–34.0
Oregon	60,607	71,893	11,286	18.6
Pennsylvania	222,182	163,331	–58,851	–26.5
Puerto Rico	22,351	35,314	12,963	58.0
Rhode Island	84,115	53,130	–30,985	–36.8
South Carolina	28,234	10,448	–17,786	–63.0
Tennessee	45,493	38,818	–6,675	–14.7
Texas	530,011	483,223	–46,788	–8.8
Utah	5,988	8,979	2,991	49.9
Virgin Islands	3,676	4,970	1,294	35.2
Virginia	131,826	126,977	–4,849	–3.7
Washington	92,168	66,921	–25,247	–27.4
West Virginia	13,904	15,416	1,512	10.9
Wisconsin	26,030	7,221	–18,809	–72.3
Wyoming	0	23,779	23,779	—
Total	**4,514,607**	**4,268,551**	**-246,056**	**-5.5**

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



Top 15 Chemicals for On- and Off-site Releases

Table 4–57 presents data for the 15 chemicals released in the largest amounts by petroleum terminals and bulk storage facilities. Methyl tert-butyl ether was the chemical with the largest amount of on- and off-site releases in this industry: 1.3 million pounds, mostly in the form of air emissions.

Second in rank was n-hexane, with 884,251 pounds, most of which was air releases. Total releases of toluene were 600,042 pounds. The other chemicals had total on- and off-site releases of less than 500,000 pounds.

For 14 of the top 15 chemicals, air emissions accounted for more than 80 percent of total on- and off-site releases. The exception was zinc compounds, which were mainly (97.8 percent) in the form of off-site releases (transfers to disposal). The largest discharges to surface water were for toluene and benzene, both approximately 14,200 pounds. No releases to underground injection were reported for the industry, and land releases did not exceed 3,200 for any chemical.

Releases of the 15 chemicals totaled 4.1 million pounds, 96.7 percent of the industry's total releases of 4.3 million pounds.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

Petroleum terminals and bulk storage facilities reporting to TRI expected their production-related waste to increase by 1.2 percent between 1999 and 2001, as shown in Table 4–58. The projected increase represents a decrease of 0.5 percent in 2000, followed by an increase of 1.7 percent in 2000. The industry expects an increase in on-site recycling, from 34.2 million pounds to 35.3 million pounds, for a 3.4 percent rise. The category of on-site treatment is expected to grow from 7.7 million pounds to 8.3 million pounds, a 6.7 percent increase.

The quantity released on- and off-site is expected to fall from 4.1 million pounds to 3.7 million pounds, a decrease of 11.2 percent. That category is the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 2–1). Other types of off-site waste management are expected to decrease as well: off-site energy recycling by 18.9 percent (from 1.6 million pounds to 1.3 million pounds), off-site energy recovery by 94.6 percent (from almost 300,000 pounds to about 16,200 pounds), and off-site treatment by 7.4 percent, from about 681,000 pounds to over 630,000 pounds.

The projections indicate a continuation in the shift in the industry's waste management practices, away from off-site waste management activities and on- and off-site releases toward on-site recycling. The percentage of waste managed through on-site recycling would rise from 70.1 percent of total production-related waste in 1999 to 71.7 percent in 2001. The share of quantity released on- and off-site is expected to fall from 8.5 percent in 1999 to 7.5 percent in 2001, and reductions are also expected in the shares of off-site recycling, off-site energy recovery, and off-site treatment.

Source Reduction

Of the Form Rs submitted by petroleum terminals and bulk storage facilities in 1999, 7.4 percent reported source reduction activ-

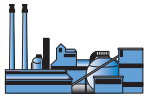
Table 4-57. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: Petroleum Terminals and Bulk Storage Facilities

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds		Transfers Off-site to Disposal Pounds	
1634-04-4	Methyl tert-butyl ether	1,241,571	2,286	0	0	0	1,020	1,244,877	21,641	1,266,518
110-54-3	n-Hexane	868,187	2,773	0	0	113	444	871,517	12,734	884,251
108-88-3	Toluene	561,025	14,208	0	0	78	3,124	578,435	21,607	600,042
71-43-2	Benzene	346,746	14,290	0	0	51	824	361,911	10,417	372,328
1330-20-7	Xylene (mixed isomers)	312,848	4,909	0	0	55	2,419	320,231	22,958	343,189
95-63-6	1,2,4-Trimethyl-benzene	134,612	1,607	0	0	22	1,032	137,273	7,972	145,245
91-20-3	Naphthalene	94,444	574	0	0	14	10	95,042	17,952	112,994
100-41-4	Ethylbenzene	97,160	1,799	0	0	16	957	99,932	10,365	110,297
7782-50-5	Chlorine	84,161	0	0	0	0	0	84,161	0	84,161
110-82-7	Cyclohexane	64,299	25	0	0	157	6	64,487	3,807	68,294
74-85-1	Ethylene	33,420	0	0	0	0	0	33,420	0	33,420
—	Zinc compounds	392	304	0	0	0	0	696	31,406	32,102
75-65-0	tert-Butyl alcohol	24,760	260	0	0	0	5	25,025	1,505	26,530
115-07-1	Propylene	25,411	0	0	0	0	0	25,411	0	25,411
106-42-3	p-Xylene	22,159	0	0	0	0	290	22,449	2,106	24,555
	Subtotal (top 15 chemicals)	**3,911,195**	**43,035**	**0**	**0**	**506**	**10,131**	**3,964,867**	**164,470**	**4,129,337**
	Total (all chemicals)	**4,044,223**	**43,606**	**0**	**0**	**528**	**14,641**	**4,102,998**	**165,553**	**4,268,551**

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.

ity undertaken during the year (see Table 4–59). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Facilities with only petroleum terminals and bulk storage operations filed the largest number of forms (3,025) and reported source reduction activities on 7.1 percent of them. These facilities identified spill and leak prevention on 191 forms and good operating practices on 112, making these practices the most frequently reported source reduction activities in the industry. The facilities with a combination of petrole-



um terminals and bulk storage operations and petroleum refining filed only 31 forms but reported source reduction activity on 35.5 percent of them (11 forms). These facilities identified as source reduction activities spill and leak prevention (14 forms) and good operating practices (3 forms).

Table 4-58. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999-2001: Petroleum Terminals and Bulk Storage Facilities

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	34,171,226	70.1	34,965,087	72.1	35,326,825	71.7
Recycled Off-site	1,649,555	3.4	1,308,545	2.7	1,337,519	2.7
Energy Recovery On-site	31,599	0.1	34,684	0.1	37,974	0.1
Energy Recovery Off-site	298,076	0.6	41,291	0.1	16,203	0.0
Treated On-site	7,734,904	15.9	7,925,242	16.3	8,253,505	16.7
Treated Off-site	681,114	1.4	629,297	1.3	630,431	1.3
Quantity Released On- and Off-site	4,149,103	8.5	3,581,416	7.4	3,684,013	7.5
Total Production-related Waste	**48,715,577**	**100.0**	**48,485,562**	**100.0**	**49,286,470**	**100.0**
Waste Management Activity	**Projected Change 1999-2000** Percent		**Projected Change 2000-2001** Percent		**Projected Change 1999-2001** Percent	
Recycled On-site	2.3		1.0		3.4	
Recycled Off-site	–20.7		2.2		–18.9	
Energy Recovery On-site	9.8		9.5		20.2	
Energy Recovery Off-site	–86.1		–60.8		–94.6	
Treated On-site	2.5		4.1		6.7	
Treated Off-site	–7.6		0.2		–7.4	
Quantity Released On- and Off-site	–13.7		2.9		–11.2	
Total Production-related Waste	**-0.5**		**1.7**		**1.2**	

Note: Current year and projected amounts are from Section 8 of Form R for 1999.

Table 4-59. Number of Forms Reporting Source Reduction Activity, 1999: Petroleum Terminals and Bulk Storage Facilities

SIC Code	Industry	Total Form Rs Number	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
5171	Petroleum Terminals and Bulk Stations	3,025	215	7.1	112	14	191	0	12	22	0	7
	SIC Code 5171 and SIC Code 29 (Petroleum Refining)	31	11	35.5	3	0	14	0	0	0	0	0
	Total	**3,056**	**226**	**7.4**	**115**	**14**	**205**	**0**	**12**	**22**	**0**	**7**

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.

RCRA Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and Solvent Recovery Facilities (in SIC Code 7389)

Introduction

Facilities regulated under the Resource Conservation and Recovery Act (RCRA), Subtitle C, receive hazardous wastes from other facilities or from other operations at their own facilities and treat, store, and dispose of the wastes. These TSD facilities are categorized among refuse systems in SIC code 4953, as shown in Box 4–7. This SIC code also includes many refuse facilities that collect and dispose of non-hazardous waste; these facilities are not covered by RCRA Subtitle C and are not required to report to TRI.

For the purpose of release reporting analyses within this document, RCRA Subtitle C treatment, storage, and disposal (TSD) facilities (in SIC Code 4953) and solvent recovery facilities (in SIC Code 7389) are treated as a single category. The two industries conduct similar waste management activities and employ the use of like chemicals.

TSD facilities obtain RCRA Subtitle C hazardous waste permits from EPA that regulate how they may treat, store, and dispose of wastes. RCRA Subtitle C established a federal program to manage hazardous wastes "from cradle to grave," to ensure

Box 4–7. SIC Codes 495, Sanitary Services, and 738, Miscellaneous Business Services: Codes and Classifications Required to Report to TRI

4953	Refuse Systems	Collection and disposal of refuse by processing or destruction. Operation of incinerators, waste treatment plants, landfills, or other disposal sites.
	TRI reporting in SIC code 4953 is limited to facilities regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. section 6921 et seq.	
7389	Business Services, Not Elsewhere Classified	Furnishing business services not elsewhere classified.
	TRI reporting in SIC code 7389 is limited to facilities primarily engaged in solvent recovery services on a contract or fee basis.	

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

that such waste is handled in a manner that protects human health and the environment. The law regulates hazardous waste generators, transporters, and TSD facilities.

Solvent recovery facilities receive spent solvents and recover them for further use. Only facilities that recover solvents on a contract or fee basis are required to report to TRI. This business activity is one of many categorized in miscellaneous business services (SIC code 7389), also listed in Box 4–7.

More details for this industry sector on products and services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

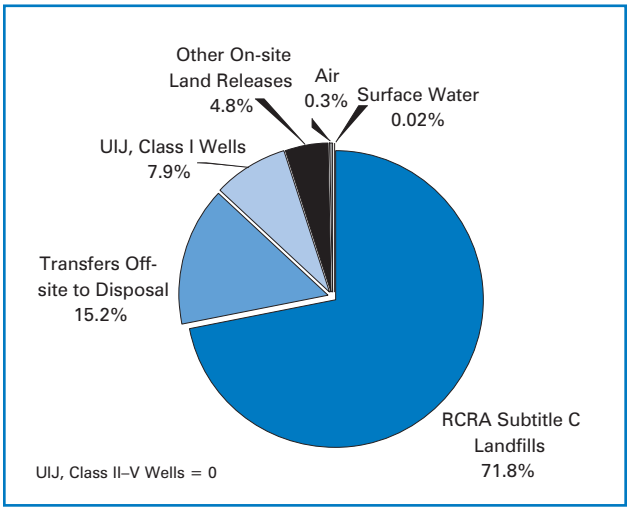
1999 TRI Data for RCRA Subtitle C TSD and Solvent Recovery Facilities

On- and Off-site Releases

RCRA Subtitle C TSD and solvent recovery facilities reported 288.0 million pounds of TRI chemicals released on- and off-site in 1999, as shown in Table 4–60. Most of the releases, 206.8 million pounds, went to on-site RCRA Subtitle C landfills. Releases to these landfills amounted to 71.8 percent of the industry's total releases (see Figure 4–15).

The industry's second-largest release type, off-site releases (transfers off-site to disposal), totaled 43.8 million pounds, 15.2 percent of total releases. The industry also

Figure 4–15. Distribution of TRI On-site and Off-site Releases, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities



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.
UIJ = Underground Injection.

reported 22.9 million pounds injected underground into Class I wells, representing 7.9 percent of total releases for this industry, and 13.7 million pounds of other on-site land releases, 4.8 percent of total releases. (Types of underground injection wells and on-site land releases are described in Box 1–4 in Chapter 1.)

Facilities with only RCRA Subtitle C TSD operations reported the largest total releases, with 261.4 million pounds, or 90.8 percent of total releases for this industry. These facilities reported 182.7 million pounds of TRI chemicals released on-site to RCRA Subtitle C landfills. Transfers off-site for disposal amounted to 42.2 million pounds. All of the industry's underground injection was from this group.

Facilities that had both RCRA Subtitle C TSD and solvent recovery operations reported the second-largest total releases for this industry, 24.1 million pounds. Of

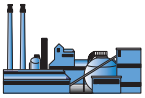


Table 4-60. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

			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
4953	RCRA Subtitle C TSD Facilities	2,039	311,083	50,671	22,861,227	0	182,725,050	13,264,572	219,212,603	42,202,456	261,415,059
7389	Solvent Recovery Services	324	412,654	0	0	0	0	0	412,654	954,052	1,366,706
	SIC Code 4953 and SIC Code 7389	63	69,746	0	0	0	24,031,000	0	24,100,746	1,548	24,102,294
	SIC Code 4953 and SIC Code 34 (Fabricated Metals)	16	2,270	5	0	0	0	442,442	444,717	666,499	1,111,216
	SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers)	3	1,690	0	0	0	0	0	1,690	0	1,690
	SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers)	3	5,448	0	0	0	0	0	5,448	0	5,448
	Total	**2,448**	**802,891**	**50,676**	**22,861,227**	**0**	**206,756,050**	**13,707,014**	**244,177,858**	**43,824,555**	**288,002,413**

Note: On-site Releases 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.

this quantity, 24.0 million pounds went to on-site RCRA Subtitle C landfills. Facilities with only solvent recovery operations had the third-largest total releases, with 1.4 million pounds, almost a million pounds of which were transferred off-site for disposal.

Table 4–61 summarizes the changes in total releases by RCRA Subtitle C TSD and solvent recovery facilities between 1998 and 1999. Total on- and off-site releases rose 2.7 percent, an increase of 7.6 million pounds. On-site releases decreased 0.4 percent, by a little over a million pounds. Decreases in this category were spread fairly evenly among total air emissions, surface water discharges (about half a million pounds each), underground injection (about 675,000 pounds), and surface impoundments (a little over 645,000 pounds). On-site land releases rose slightly, by 0.3 percent, but the subcategory other on-site landfills rose 23.6 percent, by 2.2 million pounds.

Total off-site releases to disposal rose 24.4 percent, from 35.2 million pounds to 43.8 million pounds. Storage declined 79.3 percent, from 2.1 million pounds to less than half a million pounds. Solidification/stabilization rose 49.0 percent, from 2.5 million pounds to 3.8 million pounds. Underground injection jumped 1,486.2 percent, from less than 170,000 pounds to 2.7 million pounds. Releases to landfills and surface impoundments decreased from 27.0 million pounds to 24.5 million pounds, a decline of 9.5 percent. Releases to other off-site management rose from 1.8 million pounds to 9.3 million pounds, an increase of 429.2 percent.

Waste Management Data

Quantities of TRI Chemicals in Waste

RCRA Subtitle C TSD and solvent recovery facilities reported managing 1.02 billion pounds of total production-related waste in 1999, as shown in Table 4–62. On-site treat-

Table 4-61. TRI On-site and Off-site Releases, 1998–1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	1,342,426	802,891	–539,535	–40.2
Fugitive Air Emissions	727,199	428,059	–299,140	–41.1
Point Source Air Emissions	615,227	374,832	–240,395	–39.1
Surface Water Discharges	578,810	50,676	–528,134	–91.2
Underground Injection	23,536,753	22,861,227	–675,526	–2.9
Class I Wells	23,536,753	22,861,227	–675,526	–2.9
Class II–V Wells	0	0	0	—
On-site Land Releases	219,733,801	220,463,064	729,263	0.3
RCRA Subtitle C Landfills	207,564,621	206,756,050	–808,571	–0.4
Other On-site Landfills	9,286,711	11,479,552	2,192,841	23.6
Land Treatment	0	0	0	—
Surface Impoundments	2,872,520	2,227,442	–645,078	–22.5
Other Disposal	9,949	20	–9,929	–99.8
Total On-site Releases	**245,191,790**	**244,177,858**	**–1,013,932**	**–0.4**
Off-site Releases				
Storage Only[a]	2,120,400	438,847	–1,681,553	–79.3
Solidification/Stabilization[b]	2,533,644	3,775,533	1,241,889	49.0
Metals and Metal Compounds Only				
Wastewater Treatment (excluding POTWs)[c]	104,967	63,488	–41,479	–39.5
Metals and Metal Compounds Only				
Transfers to POTWs[d]	411,897	14,417	–397,480	–96.5
Metals and Metal Compounds Only				
Underground injection	169,964	2,695,939	2,525,975	1,486.2
Landfills/Surface Impoundments	27,023,891	24,467,085	–2,556,806	–9.5
Land Treatment	251	0	–251	–100.0
Other Land Disposal	474,185	615,135	140,950	29.7
Other Off-site Management	1,753,497	9,279,117	7,525,620	429.2
Transfers to Waste Broker for Disposal	283,047	2,044,430	1,761,383	622.3
Unknown[e]	345,636	430,564	84,928	24.6
Total Off-site Releases (Transfers Off-site to Disposal)	**35,221,379**	**43,824,555**	**8,603,176**	**24.4**
Total On-site and Off-site Releases	**280,413,169**	**288,002,413**	**7,589,244**	**2.7**

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 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.

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

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

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

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

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

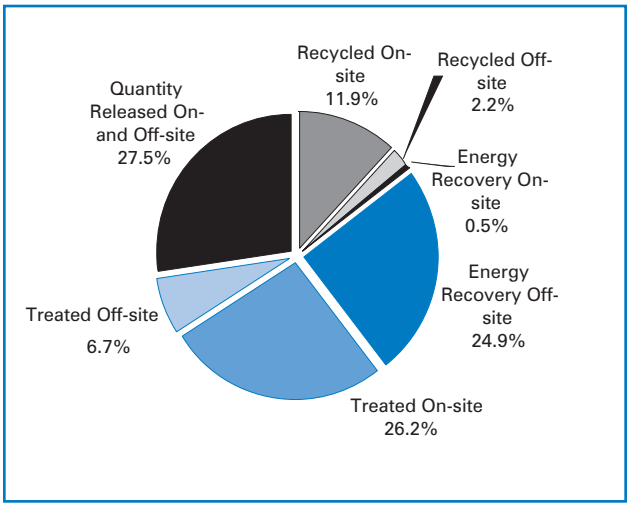
Table 4–62. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
4953	RCRA Subtitle C TSD Facilities	47,405,885	11,035,781	4,763,092	130,817,837	251,725,000	53,461,130	253,003,432	752,212,157	13,837
7389	Solvent Recovery Services	49,911,178	11,290,622	0	66,305,099	14,725,352	10,486,301	847,182	153,565,734	1,431
	SIC Code 4953 and SIC Code 7389	19,546,476	0	590,916	53,582,660	53	4,004,584	24,099,512	101,824,201	0
	SIC Code 4953 and SIC Code 34 (Fabricated Metals)	338,220	90,805	0	128,745	0	279,495	1,255,110	2,092,375	5
	SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers)	0	0	0	2,090	0	6,070	1,690	9,850	0
	SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers)	3,400,000	0	0	2,214,000	3,900	238,000	5,443	5,861,343	0
	Total	**120,601,759**	**22,417,208**	**5,354,008**	**253,050,431**	**266,454,305**	**68,475,580**	**279,212,369**	**1,015,565,660**	**15,273**

Note: Data are from Section 8 of Form R.

ment totaled 266.5 million pounds, or 26.2 percent of the industry's production-related waste (see Figure 4–16). Off-site energy recovery accounted for 253.1 million pounds, or 24.9 percent of the total, and on-site recycling totaled 120.6 million pounds, 11.9 percent of the total.

Figure 4–16. TRI Waste Management, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities



Note: Data are from Section 8 of Form R.

Facilities with only RCRA Subtitle C TSD operations reported 752.2 million pounds of total production-related waste managed, 74.1 percent of the total for this industry. These facilities reported 253.0 million pounds released on- and off-site, 251.7 million pounds treated on-site and 130.8 million pounds sent for energy recovery off-site.

Facilities with only solvent recovery operations reported 153.6 million pounds of total production-related waste managed, or 15.1 percent of the total for the industry. These facilities reported 66.3 million pounds in off-site energy recovery and 49.9 million pounds recycled on-site. Facilities reporting both RCRA Subtitle C TSD and solvent recovery operations managed 101.8 million pounds of total production-related waste, representing 10.0 percent of the total for the industry. These facilities reported 53.6 million pounds in off-site energy recovery and 24.1 million pounds released on- and off-site.

Total production-related waste for RCRA Subtitle C TSD and solvent recovery facilities fell 6.2 percent between 1998 and 1999, a decline of 66.7 million pounds (see Table 4–63). The largest absolute decline was in energy recovery off-site, a decrease of 133.1 million pounds, or 34.5 percent. Off-site treatment decreased by 20.7 percent and on-site recycling decreased by 8.2 percent. The quantity released on- and off-site declined by 1.7 percent, from 284.2 million pounds to 279.2 million pounds. The largest absolute increase was in on-site treatment, which rose by 55.8 percent, from 171.0 million pounds to 266.5 million pounds.

Transfers Off-site for Further Waste Management/Disposal

RCRA Subtitle C TSD and solvent recovery facilities reported 372.3 million pounds of transfers off-site for further waste management and disposal in 1999, as shown in

Table 4-63. Quantities of TRI Chemicals in Waste, 1998–1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

Waste Management Activity	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	131,315,578	120,601,759	–10,713,819	–8.2
Recycled Off-site	20,015,384	22,417,208	2,401,824	12.0
Energy Recovery On-site	3,287,608	5,354,008	2,066,400	62.9
Energy Recovery Off-site	386,128,229	253,050,431	–133,077,798	–34.5
Treated On-site	171,016,532	266,454,305	95,437,773	55.8
Treated Off-site	86,345,263	68,475,580	–17,869,683	–20.7
Quantity Released On- and Off-site	284,164,671	279,212,369	–4,952,302	–1.7
Total Production-related Waste	**1,082,273,265**	**1,015,565,660**	**-66,707,605**	**-6.2**
Non-production-related Waste	122,571	15,273	–107,298	–87.5

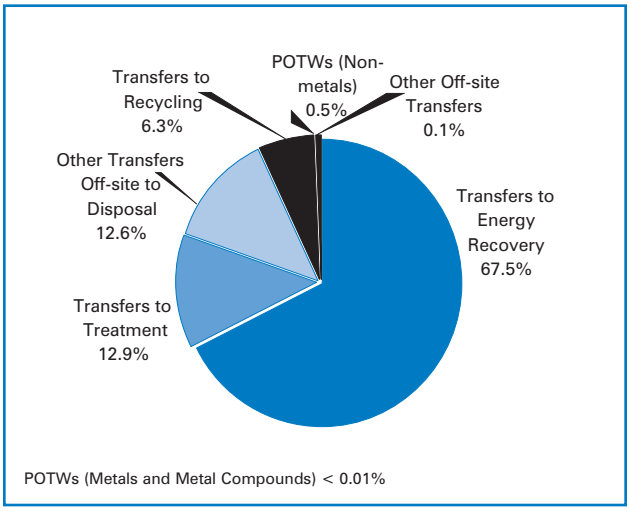
Note: All data are from Section 8 of Form R for the year indicated.

Table 4-64. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

SIC Code	Industry	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers*	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/ Disposal
					Metals and Metal Compounds	Non-metal TRI Chemicals			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
4953	RCRA Subtitle C Facilities	10,169,682	131,558,767	30,825,909	14,358	1,682,113	0	45,162,328	219,413,157
7389	Solvent Recovery Services	13,308,224	63,011,969	12,483,727	59	270,816	553,773	981,486	90,610,054
	SIC Code 4953 and SIC Code 7389	22,835	54,419,367	3,980,303	0	45	0	1,840	58,424,390
	SIC Code 4953 and SIC Code 34 (Fabricated Metals)	90,866	193,304	352,784	0	0	0	717,997	1,354,951
	SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers)	0	2,090	6,070	0	0	0	0	8,160
	SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers)	0	2,213,500	237,900	0	170	0	0	2,451,570
	Total	**23,591,607**	**251,398,997**	**47,886,693**	**14,417**	**1,953,144**	**553,773**	**46,863,651**	**372,262,282**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

Figure 4–17. Distribution of TRI Transfers Off-site for Further Waste Management/ Disposal, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities



Note: Data are from Section 6 of Form R.

Table 4–64. Transfers off-site to energy recovery amounted to 251.4 million pounds, or 67.5 percent of all transfers for further waste management and disposal (see Figure 4–17). The industry reported 47.9 million pounds sent off-site to treatment (12.9 percent of the total) and 23.6 million pounds sent off-site to recycling (6.3 percent). The category other transfers off-site to disposal totaled 46.9 million pounds (12.6 percent of total transfers for further waste management and disposal). Transfers of non-metal TRI chemicals to POTWs amounted to 2.0 million pounds (0.5 percent).

Facilities with only RCRA Subtitle C TSD operations reported a total of 219.4 million pounds of transfers off-site for further waste management and disposal, or 58.9 percent of the total for the industry. Most of this was transfers sent off-site for energy recovery (131.6 million pounds). These facilities sent 45.2 million pounds off-site for disposal, accounting for 96.4 percent of the industry total for this category.

Facilities with only solvent recovery operations reported 90.6 million pounds of transfers sent off-site for further waste management and disposal, 24.3 percent of the total. Of this, 63.0 million pounds went to energy recovery, 13.3 million pounds to recycling, and 12.5 million pounds to treatment. Other transfers off-site to disposal accounted for almost a million pounds. Facilities with both RCRA Subtitle C TSD and solvent recovery operations reported 58.4 million pounds, or 15.7 percent of total transfers for further waste management and disposal for the industry. These facilities reported 54.4 million pounds sent off-site for energy recovery and 4.0 million pounds sent off-site for treatment.

Transfers off-site for further waste management and disposal by RCRA Subtitle C TSD and solvent recovery facilities fell 30.3 percent between 1998 and 1999, a drop of 161.9 million pounds (see Table 4–65). The largest absolute decrease was in transfers to energy recovery, from 405.3 million pounds to 251.4 million pounds, or 38.0 percent. Transfers to treatment fell 29.4 percent, from 67.8 million pounds to 47.9 million pounds. Other off-site transfers to disposal rose 16.3 percent, from 40.3 million pounds to 46.9 million pounds. Transfers to recycling rose 24.6 percent, from 18.9 million pounds to 23.6 million pounds, and transfers to POTWs rose 10.6 percent, from 1.8 million pounds to 2.0 million pounds. Within the POTW category, transfers of metals and metal compounds fell 96.5 percent, and transfers of non-metal TRI chemicals rose 42.8 percent.

TRI Data by State

RCRA Subtitle C TSD and solvent recovery facilities in Texas submitted the largest number of TRI forms, 461. The only other

Table 4-65. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	18,927,984	23,591,607	4,663,623	24.6
Transfers to Energy Recovery	405,318,954	251,398,997	–153,919,957	–38.0
Transfers to Treatment	67,808,258	47,886,693	–19,921,565	–29.4
Transfers to POTWs	1,779,700	1,967,561	187,861	10.6
Metals and Metal Compounds Only	411,897	14,417	–397,480	–96.5
Non-metal TRI Chemicals	1,367,803	1,953,144	585,341	42.8
Other Off-site Transfers*	0	553,773	553,773	—
Other Off-site Transfers to Disposal**	40,279,522	46,863,651	6,584,129	16.3
Total Transfers Off-site for Further Waste Management/Disposal	**534,114,418**	**372,262,282**	**-161,852,136**	**-30.3**

Note: Total Transfers Off-site for Further Waste Management/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 compounds.

state to submit more than 300 forms was Ohio, with 356.

On- and Off-site Releases

RCRA Subtitle C TSD and solvent recovery facilities in Ohio reported the largest total on- and off-site releases in 1999, 60.7 million pounds (see Table 4–66). As shown in Map 4–6, Ohio, Oregon, Idaho, Illinois, California and Michigan reported the largest amounts of total releases in 1999, over 20 million pounds each.

Of Ohio's 60.7 million pounds in total transfers, 38.6 million pounds were released on-site to RCRA Subtitle C landfills, the largest such amount of any state. Ohio facilities also reported the largest amount injected underground in Class I wells, 13.4 million pounds.

Oregon ranked second in total releases, with 45.0 million pounds, of which 35.9 million pounds were released in on-site RCRA Subtitle C landfills. Idaho was third, with 24.0 million pounds of total releases, Illinois ranked fourth, with 22.8 million pounds, and California was fifth, with 21.6 million pounds. Most of those states' releases went to on-site RCRA Subtitle C landfills. Facilities in Michigan, which ranked sixth overall, with 20.2 million pounds of total releases, reported the largest amount of off-site releases; 13.1 million pounds were transferred off-site to disposal.

The largest absolute increase in total releases by RCRA Subtitle C TSD and solvent recovery facilities between 1998 and 1999, by state, was for Oregon, where total releases jumped 87.9 percent, from 24.0 million pounds to 45.0 million pounds (see Table 4–67). Next was Michigan, where total releases rose from 11.8 million pounds to 20.2 million pounds, an increase of 71.0 percent. Louisiana recorded an increase of almost 6 million pounds (130.0 percent). The largest decreases were for Ohio, from 75.3 million pounds to 60.7 million pounds, a 19.4 percent decline, and Idaho, from 31.7 million pounds to 24.0 million pounds, a 24.1 percent decrease. Indiana also recorded a large decrease, from 12.4 million pounds to 6.3 million pounds, a decline of 49.4 percent. No other state had absolute changes of more than 2 million pounds.

Waste Management Data

Among states, Ohio facilities reported the largest total production-related waste managed in RCRA Subtitle C TSD and solvent recovery facilities, 155.0 million pounds (see Table 4–66). Ohio facilities in this industry reported 61.0 million pounds of on- and off-site releases, the largest amount of any state for this category of waste management. Ohio facilities also reported 53.8 million pounds of on-site treatment, 21.6 million pounds of off-site energy recovery, and 14.9 million pounds of on-site recycling.

Texas ranked second, with total production-related waste managed of 122.6 million pounds. Texas facilities reported the largest amount of waste treated on-site, 62.8 million pounds. Texas also reported 29.3 million pounds sent to off-site energy recovery, the largest amount of any state in this industry, slightly ahead of Arkansas (27.7 million pounds) and California (27.2 million pounds).

California ranked third, with 116.5 million pounds of total production-related waste managed. The state ranked first in on-site recycling (32.3 million pounds) and off-site treatment (24.0 million pounds).

Top 15 Chemicals for On- and Off-site Releases

Table 4–68 presents data for the 15 chemicals released in the largest amounts by TRI

Map 4-6. Total On-site and Off-site Releases, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

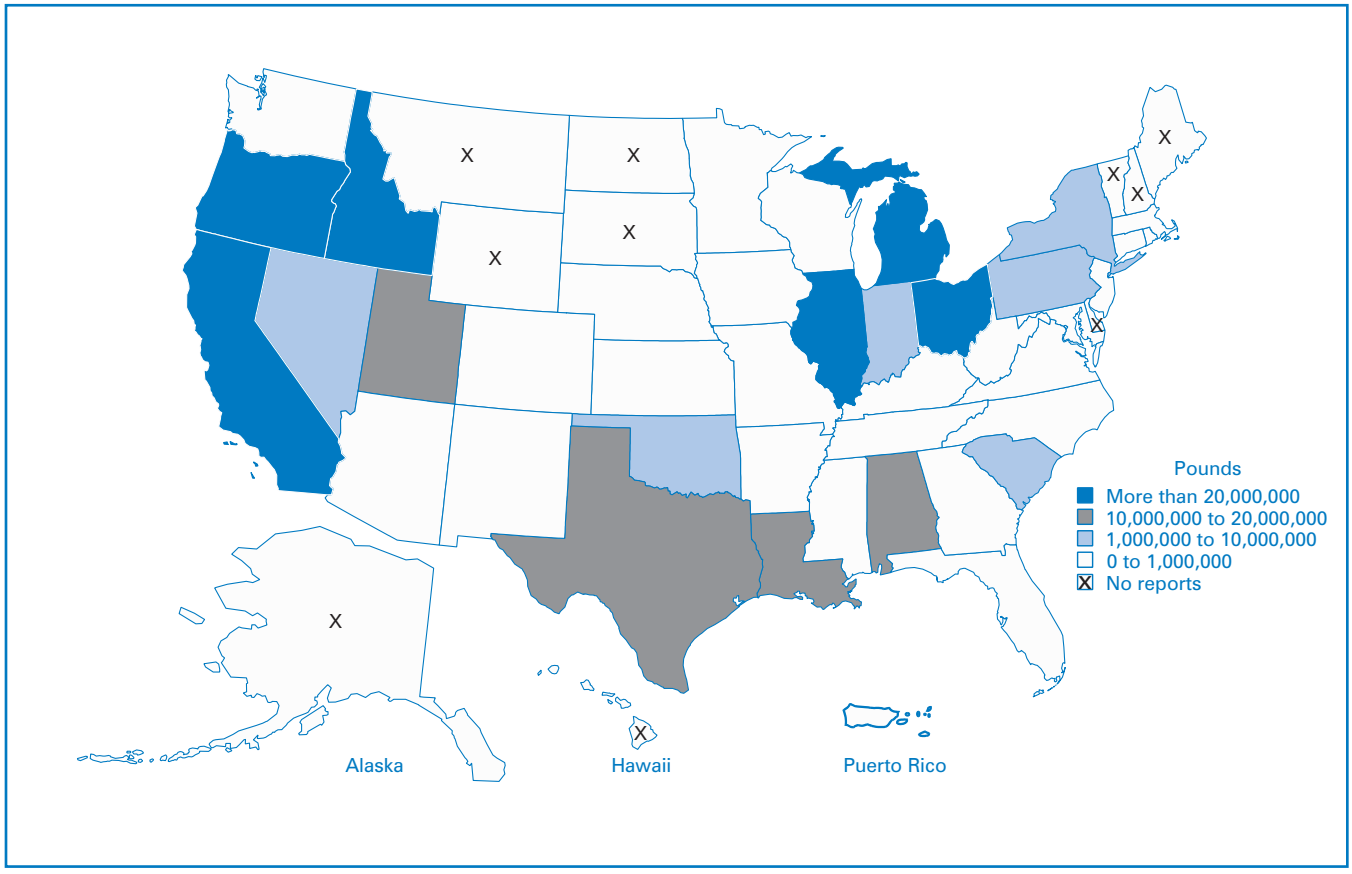


Table 4-66. Summary of TRI Information by State, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

State	Total Forms	On-site Releases							Off-site Releases	Total On- and Off-site Releases
		Total Air Emissions	Surface Water Discharges	Underground Injection		On-site Land Releases		Total On-site Releases	Transfers Off-site to Disposal	
				Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases			
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	50	3,004	0	0	0	13,554,931	0	13,557,935	168,697	13,726,632
Arizona	22	4,664	0	0	0	0	0	4,664	622,550	627,214
Arkansas	159	13,926	108	0	0	32,100	0	46,134	104,385	150,519
California	158	82,596	0	0	0	18,178,901	93,562	18,355,059	3,225,858	21,580,917
Colorado	2	251	0	0	0	0	0	251	0	251
Connecticut	20	0	0	0	0	0	0	0	685,800	685,800
Florida	8	6,622	0	0	0	0	0	6,622	180	6,802
Georgia	6	12,422	0	0	0	0	0	12,422	0	12,422
Idaho	12	3,205	0	0	0	24,031,000	0	24,034,205	25	24,034,230
Illinois	231	73,075	21	0	0	18,737,328	771,825	19,582,249	3,191,413	22,773,662
Indiana	33	11,497	168	0	0	0	0	11,665	6,243,238	6,254,903
Iowa	2	9	0	0	0	0	0	9	0	9
Kansas	12	17,671	1	0	0	0	0	17,672	185	17,857
Kentucky	102	17,872	15	0	0	0	442,442	460,329	143,322	603,651
Louisiana	63	2,930	0	2,807,375	0	7,311,500	0	10,121,805	109,781	10,231,586
Maryland	1	13	0	0	0	0	0	13	0	13
Massachusetts	10	3,693	5	0	0	0	0	3,698	657,617	661,315
Michigan	140	82,787	0	0	0	7,008,813	0	7,091,600	13,105,788	20,197,388
Minnesota	7	348	0	0	0	0	0	348	14,980	15,328
Mississippi	1	3	0	0	0	0	0	3	0	3
Missouri	8	24	0	0	0	0	0	24	0	24
Nebraska	76	18,643	0	0	0	0	476,841	495,484	27,493	522,977
Nevada	18	260	0	0	0	2,054,100	0	2,054,360	128,284	2,182,644
New Jersey	121	24,213	23	0	0	0	0	24,236	645,202	669,438
New Mexico	3	5,321	0	0	0	0	0	5,321	0	5,321
New York	18	1,072	209	0	0	6,184,700	0	6,185,981	30,962	6,216,943
North Carolina	15	15,188	34	0	0	0	0	15,222	249,760	264,982
Ohio	356	299,748	1,193	13,360,000	0	38,573,000	18	52,233,959	8,423,352	60,657,311
Oklahoma	22	1,205	0	2,513,899	0	6,264,394	0	8,779,498	15,351	8,794,849
Oregon	52	755	0	0	0	35,877,473	9,152,811	45,031,039	9,082	45,040,121
Pennsylvania	47	4,372	6,730	0	0	1,614,600	2,100,900	3,726,602	2,257,772	5,984,374
Puerto Rico	16	9,895	0	0	0	0	0	9,895	68,146	78,041
Rhode Island	2	510	0	0	0	0	0	510	0	510
South Carolina	36	4,347	0	0	0	5,227,609	2	5,231,958	0	5,231,958
Tennessee	47	6,840	2,136	0	0	0	0	8,976	38,725	47,701
Texas	461	40,731	40,033	4,179,953	0	6,281,274	0	10,541,991	3,393,643	13,935,634
Utah	63	4,267	0	0	0	15,824,327	668,613	16,497,207	35,979	16,533,186
Virginia	6	4,844	0	0	0	0	0	4,844	184,412	189,256
Washington	16	2,150	0	0	0	0	0	2,150	31,306	33,456
West Virginia	1	7	0	0	0	0	0	7	0	7
Wisconsin	25	21,911	0	0	0	0	0	21,911	11,267	33,178
Total	**2,448**	**802,891**	**50,676**	**22,861,227**	**0**	**206,756,050**	**13,707,014**	**244,177,858**	**43,824,555**	**288,002,413**

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.

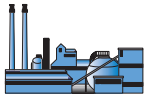


Table 4-66. Summary of TRI Information by State, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities *(continued)*

State	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
	On-site	Off-site	On-site	Off-site	On-site	Off-site			
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	3,151,674	141,710	0	227,000	23	330,531	10,179,113	14,030,051	0
Arizona	2,784,487	1,780,516	0	1,309,185	28,132	617,310	4,689	6,524,319	1
Arkansas	2,802,061	389,348	4,628,714	27,714,479	19,388,784	133,417	441,025	55,497,828	0
California	32,257,185	2,091,966	0	27,215,059	12,543,432	24,002,675	18,438,452	116,548,769	386
Colorado	1,075	27,098	0	0	2,398	0	1	30,572	0
Connecticut	0	0	0	0	352,400	218,687	935,020	1,506,107	8
Florida	880,501	160,832	0	1,876,021	1,447,266	181,646	6,622	4,552,888	0
Georgia	0	111,029	0	0	256,909	0	12,522	380,460	0
Idaho	0	0	0	0	0	0	24,031,000	24,031,000	0
Illinois	5,989,766	382,666	0	7,797,656	20,363,551	1,818,266	23,365,078	59,716,983	70
Indiana	8,358,000	835,520	0	2,235,574	1,692,512	950	6,237,945	19,360,501	0
Iowa	0	303,642	0	0	0	0	9	303,651	0
Kansas	208,100	172,640	0	0	1,050,437	4,135	20,124	1,455,436	0
Kentucky	0	240,359	0	12,806,818	10,006,596	1,417,282	619,485	25,090,540	0
Louisiana	0	74,082	0	2,800	18,503	1,193,537	10,257,665	11,546,587	0
Maryland	0	429,952	0	0	0	0	13	429,965	0
Massachusetts	338,220	210,937	0	130,835	0	279,942	805,404	1,765,338	6
Michigan	17,747,516	63,700	0	57,421,708	818,721	18,257,233	20,337,627	114,646,505	58
Minnesota	4,305,598	1,271,306	0	0	58,000	14,596	15,381	5,664,881	0
Mississippi	0	95,538	0	0	0	0	3	95,541	0
Missouri	0	542,305	0	0	20,000	20,000	19	582,324	0
Nebraska	0	100,011	0	15,048	23,879,414	46,658	487,136	24,528,267	0
Nevada	0	1,064,488	0	0	25,029	820,339	2,054,100	3,963,956	83
New Jersey	8,083,574	474,983	0	23,961,922	28,811,007	1,670,089	644,198	63,645,773	839
New Mexico	0	35,598	0	0	393,000	0	5,301	433,899	0
New York	0	308,244	0	0	323,500	64,049	6,221,767	6,917,560	0
North Carolina	0	883,707	0	0	378,000	460	426,677	1,688,844	520
Ohio	14,885,370	1,621,380	0	21,600,288	53,765,180	2,097,451	61,023,190	154,992,859	13,298
Oklahoma	0	0	0	0	2,713,439	6,102	8,854,083	11,573,624	0
Oregon	0	97,505	0	0	24,334	1,202,564	44,572,379	45,896,782	0
Pennsylvania	0	1,307,009	0	0	2,954,300	412,088	5,588,706	10,262,103	0
Puerto Rico	1,465,156	1,099,765	0	11,401,702	1,763,772	1,643,119	20,260	17,393,774	1
Rhode Island	120,974	0	0	0	0	768,783	402	890,159	0
South Carolina	3,195,088	246,310	0	14,585,574	34,777	473,521	5,216,491	23,751,761	0
Tennessee	0	215,260	134,378	3,574,812	171,842	51,596	45,297	4,193,185	0
Texas	5,590,594	3,592,225	0	29,266,230	62,822,278	9,690,926	11,590,400	122,552,653	0
Utah	0	0	0	0	20,072,066	48,163	16,710,703	36,830,932	3
Virginia	0	849,399	0	0	212,420	24,210	4,844	1,090,873	0
Washington	1,310,154	537,176	0	115	62,283	236,008	2,163	2,147,899	0
West Virginia	0	207,900	0	0	0	0	7	207,907	0
Wisconsin	7,126,666	451,102	590,916	9,907,605	0	729,247	37,068	18,842,604	0
Total	**120,601,759**	**22,417,208**	**5,354,008**	**253,050,431**	**266,454,305**	**68,475,580**	**279,212,369**	**1,015,565,660**	**15,273**

Note: Data are from Section 8 of Form R.

Table 4-67. TRI Total Releases by State, 1998-1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

State	Total On-site and Off-site Releases			
	1998 Pounds	1999 Pounds	Change 1998-1999 Pounds	Change 1998-1999 Percent
Alabama	12,309,866	13,726,632	1,416,766	11.5
Arizona	1,002	627,214	626,212	62,496.2
Arkansas	261,420	150,519	-110,901	-42.4
California	20,405,960	21,580,917	1,174,957	5.8
Colorado	250	251	1	0.4
Connecticut	708,015	685,800	-22,215	-3.1
Florida	21,001	6,802	-14,199	-67.6
Georgia	17,488	12,422	-5,066	-29.0
Idaho	31,653,505	24,034,230	-7,619,275	-24.1
Illinois	24,729,141	22,773,662	-1,955,479	-7.9
Indiana	12,365,925	6,254,903	-6,111,022	-49.4
Iowa	10	9	-1	-10.0
Kansas	24,677	17,857	-6,820	-27.6
Kentucky	1,290,632	603,651	-686,981	-53.2
Louisiana	4,449,005	10,231,586	5,782,581	130.0
Maryland	6	13	7	116.7
Massachusetts	1,173,299	661,315	-511,984	-43.6
Michigan	11,809,095	20,197,388	8,388,293	71.0
Minnesota	1,345	15,328	13,983	1,039.6
Mississippi	2	3	1	50.0
Missouri	28,931	24	-28,907	-99.9
Nebraska	209,481	522,977	313,496	149.7
Nevada	1,385,954	2,182,644	796,690	57.5
New Jersey	329,135	669,438	340,303	103.4
New Mexico	5,990	5,321	-669	-11.2
New York	6,282,640	6,216,943	-65,697	-1.0
North Carolina	546,966	264,982	-281,984	-51.6
Ohio	75,286,300	60,657,311	-14,628,989	-19.4
Oklahoma	7,884,687	8,794,849	910,162	11.5
Oregon	23,965,094	45,040,121	21,075,027	87.9
Pennsylvania	6,395,761	5,984,374	-411,387	-6.4
Puerto Rico	324,772	78,041	-246,731	-76.0
Rhode Island	1,432	510	-922	-64.4
South Carolina	5,373,461	5,231,958	-141,503	-2.6
Tennessee	72,855	47,701	-25,154	-34.5
Texas	13,201,673	13,935,634	733,961	5.6
Utah	16,379,483	16,533,186	153,703	0.9
Virginia	4,937	189,256	184,319	3,733.4
Washington	1,470,712	33,456	-1,437,256	-97.7
West Virginia	6	7	1	16.7
Wisconsin	41,255	33,178	-8,077	-19.6
Total	**280,413,169**	**288,002,413**	**7,589,244**	**2.7**

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 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.

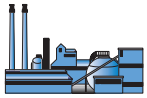


Table 4-68. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II–V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds		Transfers Off-site to Disposal Pounds	
7440-66-6	Zinc (fume or dust)	3,228	5	0	0	53,107,211	586,002	53,696,446	13,908	53,710,354
—	Zinc compounds	7,673	367	850,750	0	31,390,534	1,027,201	33,276,525	10,202,181	43,478,706
1344-28-1	Aluminum oxide (fibrous forms)	338	0	0	0	30,469,494	258,064	30,727,896	347,172	31,075,068
—	Lead compounds	6,244	308	0	0	12,043,875	189,232	12,239,659	6,237,980	18,477,639
1332-21-4	Asbestos (friable)	43	0	0	0	4,742,648	8,475,949	13,218,640	1	13,218,641
7439-92-1	Lead	3,893	30	13,250	0	9,046,156	160,054	9,223,383	1,469,410	10,692,793
1336-36-3	Polychlorinated biphenyls (PCBs)	531	2	0	0	10,316,919	313,508	10,630,960	1,533	10,632,493
—	Copper compounds	4,698	117	68,000	0	7,263,149	408,896	7,744,860	2,001,955	9,746,815
—	Chromium compounds	1,663	551	720,000	0	3,711,644	114,063	4,547,921	2,952,455	7,500,376
—	Nickel compounds	2,007	491	140,000	0	3,248,507	162,489	3,553,494	3,594,078	7,147,572
—	Barium compounds	1,286	272	250	0	5,034,475	66,561	5,102,844	1,821,748	6,924,592
7697-37-2	Nitric acid	471	0	6,328,468	0	58,238	1,780	6,388,957	206,958	6,595,915
—	Nitrate compounds	265	8,356	4,563,034	0	0	981,000	5,552,655	539,647	6,092,302
—	Manganese compounds	446	24	36,000	0	4,564,123	19,446	4,620,039	181,510	4,801,549
7429-90-5	Aluminum (fume or dust)	1,281	0	0	0	4,072,525	100,105	4,173,911	18,368	4,192,279
	Subtotal (top 15 chemicals)	**34,067**	**10,523**	**12,719,752**	**0**	**179,069,498**	**12,864,350**	**204,698,190**	**29,588,904**	**234,287,094**
	Total (all chemicals)	**802,891**	**50,676**	**22,861,227**	**0**	**206,756,050**	**13,707,014**	**244,177,858**	**43,824,555**	**288,002,413**

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.

RCRA Subtitle C TSD and solvent recovery facilities. Zinc (fume or dust) and zinc compounds were the two chemicals with the largest on- and off-site releases in the industry: 53.7 million pounds of zinc and 43.5 million pounds of zinc compounds. Over 98 percent of the zinc releases were to RCRA Subtitle C landfills. About 72.2 percent of the releases of zinc compounds (31.4 million pounds) went to RCRA Subtitle C landfills, other on-site releases accounted for a little over a million pounds, and 10.2 million pounds, or 23.4 percent of the total, were sent off-site to disposal.

Of the 15 top chemicals released by the industry, 9 reported more than 70 percent of their total releases as releases on-site to RCRA Subtitle C landfills. Almost 65 percent of the friable asbestos was in other on-site land releases, and a little more than half of nickel compounds releases were in

Table 4-69. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999-2001: RCRA Subtitle C TSD and Solvent Recovery Facilities

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	120,601,759	11.9	115,058,626	12.7	114,093,416	12.3
Recycled Off-site	22,417,208	2.2	20,573,530	2.3	19,113,105	2.1
Energy Recovery On-site	5,354,008	0.5	5,118,529	0.6	5,133,299	0.6
Energy Recovery Off-site	253,050,431	24.9	205,546,667	22.7	207,555,660	22.4
Treated On-site	266,454,305	26.2	234,650,449	25.9	234,189,867	25.3
Treated Off-site	68,475,580	6.7	59,675,842	6.6	74,231,467	8.0
Quantity Released On- and Off-site	279,212,369	27.5	264,851,809	29.3	270,462,371	29.2
Total Production-related Waste	**1,015,565,660**	**100.0**	**905,475,452**	**100.0**	**924,779,185**	**100.0**
Waste Management Activity	**Projected Change 1999-2000**		**Projected Change 2000-2001**		**Projected Change 1999-2001**	
	Percent		Percent		Percent	
Recycled On-site	–4.6		–0.8		–5.4	
Recycled Off-site	–8.2		–7.1		–14.7	
Energy Recovery On-site	–4.4		0.3		–4.1	
Energy Recovery Off-site	–18.8		1.0		–18.0	
Treated On-site	–11.9		–0.2		–12.1	
Treated Off-site	–12.9		24.4		8.4	
Quantity Released On- and Off-site	–5.1		2.1		–3.1	
Total Production-related Waste	**-10.8**		**2.1**		**-8.9**	

Note: Current year and projected amounts are from Section 8 of Form R for 1999.

transfers off-site to disposal. Nitrate compounds and nitric acid were mainly injected underground into Class I wells; the amounts were 6.3 million pounds for nitric acid and 4.6 million pounds for nitrate compounds.

Releases of the 15 chemicals amounted to 234.3 million pounds, 81.3 percent of the industry total of 288.0 million pounds.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

RCRA Subtitle C TSD and solvent recovery facilities reporting to TRI expected their production-related waste managed to decrease by 8.9 percent between 1999 and 2001, from a total of 1.02 billion pounds to 924.8 million pounds, as shown in Table 4–69. The projected decrease reflects an expected decrease of 10.8 percent in 2000 followed by a small increase of 2.1 percent in 2001.

The projected decrease between 1999 and 2001 is expected to come primarily from reductions of 5.4 percent in on-site recycling, 14.7 percent in off-site recycling, 18.0 percent in off-site energy recovery, and 12.1 percent in on-site treatment. The quantity released on- and off-site—the least-desirable outcome under the waste management hierarchy described in Waste Management in Chapter 1 (Figure 1–2)—is projected to decrease by 3.1 percent. The reductions are expected to offset an increase in off-site treatment of 8.4 percent.

The projections do not indicate dramatic changes in waste management practices. Off-site energy recovery would fall from

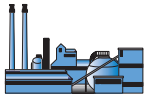


Table 4–70. Number of Forms Reporting Source Reduction Activity, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

SIC Code	Industry	Total Form Rs Number	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
4953	RCRA Subtitle C Facilities	2,022	143	7.1	136	0	51	0	25	0	0	0
7389	Solvent Recovery Services	305	65	21.3	64	0	23	0	11	0	0	4
	SIC Code 4953 and SIC Code 7389	63	23	36.5	0	0	46	0	0	0	0	0
	SIC Code 4953 and SIC Code 34 (Fabricated Metals)	16	0	0.0	0	0	0	0	0	0	0	0
	SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers)	3	0	0.0	0	0	0	0	0	0	0	0
	SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers)	3	1	33.3	1	0	0	0	0	0	0	0
	Total	**2,412**	**232**	**9.6**	**201**	**0**	**120**	**0**	**36**	**0**	**0**	**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.

24.9 percent of total production-related waste managed in 1999 to 22.4 percent in 2001. The share of on-site treatment would decline from 26.2 percent to 25.3 percent. The quantity released on- and off-site would increase from 27.5 percent of total production-related waste managed for this industry to 29.2 percent, although the absolute amount in this category would fall from 279.2 million pounds to 270.5 million pounds.

Source Reduction

Of the Form Rs submitted by RCRA Subtitle C TSD and solvent recovery facilities in 1999, 9.6 percent reported source reduction activity undertaken during the year (see Table 4–70). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Facilities with a combination of RCRA Subtitle C TSD and solvent recovery operations had the largest percentage of forms reporting source reduction activities, 36.5 percent. These facilities identified spill and leak prevention as the source reduction activity undertaken, on 46 forms. Facilities with solvent recovery services only reported undertaking source reduction activities on 21.3 percent of their Form Rs. These facilities identified good operating practices (64 forms), spill and leak prevention (23 forms), and process modifications (11 forms) as their main source reduction activities. Facilities with RCRA Subtitle C TSD operations only reported source reduction activity on 7.1 percent of their Form Rs, with good operating practices identified most often, on 136 forms, followed by spill and leak prevention (51 forms) and process modifications (25 forms).

Federal Facilities

Introduction

Facilities owned and operated by federal agencies are required to report to TRI. Executive Order 13148 extends reporting to federal facilities regardless of SIC code. As a result, facilities reporting to TRI range from military bases to agricultural testing sites. Federal facilities have been required to report to TRI since the 1994 reporting year, although Department of Energy facilities began reporting a year earlier. In addition to reporting to TRI, federal agencies have been directed by executive order to reduce their on-site releases and off-site transfers to treatment and disposal by 50 percent by the 1999 reporting year, based on the 1994 data. Federal facilities are encouraged to use source reduction wherever practicable to achieve their reductions.

Tables in this section 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.

As stated above, federal facilities should report to TRI regardless of SIC code. Some federal facilities have manufacturing activities similar to the original industries. Other federal facilities have activities similar to the new TRI industries. Still others have activities that are not in either the original industries or in the new industries. This section divides the federal facilities into two broad groups to show how the federal facilities mirror the activities in the private sector. These two broad groups are "Facilities with Activities Related to Original Industries and Other Industries" (hereafter referred to as original industries) and "Facilities with Activities Related to the New Industries" (hereafter referred to as new industries).

Due to an EPA data entry error, reporting revisions by one federal facility, US Army Letterkenny Depot in Chambersburg, Pennsylvania, were not included in the data used for this 1999 TRI Public Data Release report. Revisions for two chemical compounds (zinc compounds and lead compounds) have been included in the tables in this section, but not included in other tables in this report. The effect of these revisions is to change the facility's off-site transfers to disposal and treated off-site amounts for zinc compounds from 17,147,839 to zero and lead compounds from 60,123 pounds to zero. In addition, at the time of publication, the facility had notified EPA that it anticipated revising off-site transfers to disposal and treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.

1999 TRI Data for Federal Facilities

In 1999, a total of 127 federal facilities submitted 507 TRI forms, as shown in Table 4–71. Of these, 109 facilities and 328 forms were from original TRI industries, and 18 facilities and 179 forms from new industries.

Facilities owned or operated by Department of Defense agencies submitted 238 forms in the original TRI industries. DOD submissions included 110 reports by Army facilities, 53 reports by Navy facilities and 51 reports by Air Force facilities. The Department of Energy submitted 41 forms.

In the new industries, 14 Tennessee Valley Authority (TVA) facilities submitted 165 forms. (One TVA facility filed 3 forms in the original TRI industries.) Three Department of Energy facilities filed a total of 13 forms in new industry SIC codes. One DOD form, from the Navy, was submitted in a new industry, but it reported zero amounts of releases and waste management.

On- and Off-site Releases

As is also shown in Table 4–71, federal facilities reported on- and off-site releases totaling 87.4 million pounds. The bulk of the releases, 81.1 million pounds, occurred on-site. Off-site releases totaled 6.3 million pounds.

TVA facilities reported 69.7 million pounds of on- and off-site releases in the new industries. This amount represented 66.6 percent of all releases by all federal facilities. It included the largest amounts in all on-site release types by both original and new industries, except for 505 pounds of underground injection by the Energy Department. TVA's new industry reporting included 52.1 million pounds of air emissions and 15.5 million pounds of other on-site land releases.

Together, the DOD agencies reported 15.7 million pounds of total releases, including 9.7 million pounds of on-site releases, with 7.2 million pounds of that as air emissions. Within the DOD, Army releases of 14.1 million pounds consisted of on-site releases of 8.4 million pounds, of which air emissions were 6.0 million pounds, on-site land releases were 1.7 million pounds and surface water discharges were nearly 687,000 pounds. The Air Force's total of 1.1 million pounds consisted principally of air emissions (about 769,000 pounds) and surface water discharges (nearly 157,000 pounds).

Table 4–72 summarizes changes in on- and off-site releases reported by federal facilities between 1998 and 1999. Total releases rose 35.0 percent, an increase of 22.7 million pounds. Total on-site releases reported rose 27.1, largely because of a 32.9 percent (15.0 million pound) increase in air emissions. On-site land releases were 3.7 million pounds, or 25.6 percent, higher in 1999 than in 1998.

Off-site releases rose from less than 960,000 pounds to 6.3 million pounds. The main component of the increase was the category other off-site management, which increased from 47 pounds in 1998 to 5.6 million pounds in 1999. This was primarily due to reporting by one Army facility that expected to revise its reported amount of off-site releases, as explained above.

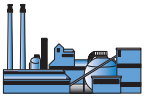


Table 4–71. TRI On-site and Off-site Releases, 1999: Federal Facilities

Federal Agency	Total Facilities	Total Forms	On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
			Total Air Emissions	Surface Water Discharges	Class I Wells	Class II–V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
	Number	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Federal Facilities with Activities Related to Original Industries and Other Industries											
Department of Defense	74	238	7,165,901	849,544	0	0	0	1,719,257	9,734,702	5,995,730	15,730,432
Air Force	15	51	768,715	156,629	0	0	0	21,930	947,274	116,777	1,064,051
Army	34	110	6,045,847	686,874	0	0	0	1,687,817	8,420,538	5,717,304	14,137,842
Army Corps of Engineers	2	6	0	44	0	0	0	0	44	16,700	16,744
Defense Logistics	1	4	5,670	0	0	0	0	0	5,670	0	5,670
Marines	8	14	62,387	0	0	0	0	0	62,387	9,319	71,706
Navy	14	53	283,282	5,997	0	0	0	9,510	298,789	135,630	434,419
Department of Energy	12	41	406,389	65,040	0	505	0	21,809	493,743	20,797	514,540
Department of Interior	2	2	750	4,333	0	0	0	0	5,083	0	5,083
Department of Treasury	8	14	834	0	0	0	0	138,690	139,524	13,598	153,122
Department of Veterans Affairs	1	1	0	0	0	0	0	0	0	0	0
Environmental Protection Agency	1	2	0	0	0	0	0	0	0	0	0
National Aeronautics and Space Administration	6	17	207,289	0	0	0	0	0	207,289	4,138	211,427
Tennessee Valley Authority	1	3	30	765	0	0	0	15	810	10,435	11,245
U.S. Department of Agriculture	3	4	0	0	0	0	0	541,563	541,563	0	541,563
U.S. Enrichment Corporation	1	6	517,200	153	0	0	0	0	517,353	0	517,353
Subtotal for Original Industries	**109**	**328**	**8,298,393**	**919,835**	**0**	**505**	**0**	**2,421,334**	**11,640,067**	**6,044,698**	**17,684,765**
Federal Facilities with Activities Related to New Industries											
Department of Defense —Navy	1	1	0	0	0	0	0	0	0	0	0
Department of Energy	3	13	48,044	2,136	0	0	0	0	50,180	1,091	51,271
Tennessee Valley Authority	14	165	52,085,546	1,761,635	0	0	0	15,529,475	69,376,656	287,645	69,664,301
Subtotal for New Industries	**18**	**179**	**52,133,590**	**1,763,771**	**0**	**0**	**0**	**15,529,475**	**69,426,836**	**288,736**	**69,715,572**
Total for Federal Facilities	**127**	**507**	**60,431,983**	**2,683,606**	**0**	**505**	**0**	**17,950,809**	**81,066,903**	**6,333,434**	**87,400,337**

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.

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.

Table 4-72. TRI On-site and Off-site Releases, 1998–1999: Federal Facilities

	1998	1999	Change 1998-1999	
	Pounds	Pounds	Pounds	Percent
On-site Releases				
Total Air Emissions	45,472,233	60,431,983	14,959,750	32.9
Fugitive Air Emissions	1,097,485	6,608,696	5,511,211	502.2
Point Source Air Emissions	44,374,748	53,823,287	9,448,539	21.3
Surface Water Discharges	4,009,631	2,683,606	–1,326,025	–33.1
Underground Injection	505	505	0	0.0
Class I Wells	0	0	0	—
Class II–V Wells	505	505	0	0.0
On-site Land Releases	14,292,558	17,950,809	3,658,251	25.6
RCRA Subtitle C Landfills	31,563	0	–31,563	–100.0
Other On-site Landfills	4,837,419	4,519,519	–317,900	–6.6
Land Treatment	582,541	552,597	–29,944	–5.1
Surface Impoundments	7,640,076	9,909,819	2,269,743	29.7
Other Disposal	1,200,959	2,968,874	1,767,915	147.2
Total On-site Releases	**63,774,927**	**81,066,903**	**17,291,976**	**27.1**
Off-site Releases				
Storage Only[a]	16,843	57,696	40,853	242.6
Solidification/Stabilization[b]	11,273	3,400	–7,873	–69.8
Metals and Metal Compounds Only				
Wastewater Treatment (excluding POTWs)[c]	320	1	–319	–99.7
Metals and Metal Compounds Only				
Transfers to POTWs[d]	2,746	4,326	1,580	57.5
Metals and Metal Compounds Only				
Underground injection	1,632	388	–1,244	–76.2
Landfills/Surface Impoundments	154,956	162,686	7,730	5.0
Land Treatment	4,190	1,356	–2,834	–67.6
Other Land Disposal	632,645	287,635	–345,010	–54.5
Other Off-site Management	47	5,585,458	5,585,411	11,883,853.2
Transfers to Waste Broker for Disposal	74,196	135,136	60,940	82.1
Unknown[e]	59,579	95,352	35,773	60.0
Total Off-site Releases (Transfers Off-site to Disposal)	**958,427**	**6,333,434**	**5,375,007**	**560.8**
Total On-site and Off-site Releases	**64,733,354**	**87,400,337**	**22,666,983**	**35.0**

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 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.
Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising off-site transfers to disposal (other off-site management) for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.

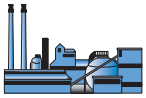
[a] Storage only (disposal code M10) indicates that the toxic chemical is sent off-site for storage because there is no known disposal method. Amounts reported as transferred to storage only are included as a form of disposal (off-site release). See Box 1–5.

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

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

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

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



Waste Management Data

Quantities of TRI Chemicals in Waste

Federal facilities reported managing 192.5 million pounds of TRI chemicals in production-related waste in 1999, as shown in Table 4–73. The largest waste management types reported by federal facilities were quantity released on- and off-site (81.5 million pounds) and on-site treatment (60.6 million pounds).

New industry reporting by TVA facilities accounted for 119.0 million pounds of production-related waste managed, or 56.7 percent of the total for all TRI industries. These TVA facilities reported 69.6 million pounds released on- and off-site and 48.5 million pounds treated on-site, as well as about 900,000 pounds sent off-site to recycling.

DOD facilities in the original industries reported the second-largest quantity of production-related waste, 39.7 million

Table 4–73. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: 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	Off-site	On-site	Off-site	On-site	Off-site			
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Federal Facilities with Activities Related to Original Industries and Other Industries									
Department of Defense	10,767,449	2,679,499	326	134,909	10,334,001	5,948,556	9,824,243	39,688,983	12,595
Air Force	27,360	152,816	0	12,260	586,615	205,182	1,080,490	2,064,723	51
Army	9,385,849	2,142,100	0	60,168	9,432,479	5,661,856	8,239,276	34,921,728	8,747
Army Corps of Engineers	0	1,502	0	0	0	0	16,744	18,246	0
Defense Logistics	1,324,948	0	0	0	0	0	5,670	1,330,618	0
Marines	21,392	134,491	326	27,100	526	2,572	71,170	257,577	1,273
Navy	7,900	248,590	0	35,381	314,381	78,946	410,893	1,096,091	2,524
Department of Energy	74,295	106,000	0	830	1,676,766	11,971	610,227	2,480,089	53
Department of Interior	0	0	0	0	0	0	5,122	5,122	0
Department of Treasury	0	29,374,571	0	0	2,467	63	157,328	29,534,429	0
Department of Veterans Affairs	0	0	0	0	0	0	0	0	0
Environmental Protection Agency	0	0	0	0	0	0	0	0	0
National Aeronautics and Space Administration	236,406	1,800	0	13,790	25,905	16,394	211,731	506,026	7,001
Tennessee Valley Authority	0	43,000	0	0	0	0	11,000	54,000	0
U.S. Department of Agriculture	0	0	0	0	0	0	541,349	541,349	0
U.S. Enrichment Corporation	0	0	0	0	60,300	0	521,343	581,643	0
Subtotal for Original Industries	**11,078,150**	**32,204,870**	**326**	**149,529**	**12,099,439**	**5,976,984**	**11,882,343**	**73,391,641**	**19,649**
Federal Facilities with Activities Related to New Industries									
Department of Defense—Navy	0	0	0	0	0	0	0	0	0
Department of Energy	0	100,058	0	0	33,937	0	52,070	186,065	1
Tennessee Valley Authority	0	892,320	0	0	48,461,200	820	69,601,046	118,955,386	0
Subtotal for New Industries	**0**	**992,378**	**0**	**0**	**48,495,137**	**820**	**69,653,116**	**119,141,451**	**1**
Total for Federal Facilities	**11,078,150**	**33,197,248**	**326**	**149,529**	**60,594,576**	**5,977,804**	**81,535,459**	**192,533,092**	**19,650**

Note: Data are from Section 8 of Form R.
Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.

pounds, including the Army's 34.9 million pounds. The Army recycled on-site 9.4 million pounds, treated on-site 9.4 million pounds and released on- or off-site 8.2 million pounds.

The Treasury Department ranked third among federal agencies for total production-related waste, with 29.5 million pounds. Most of this amount was reported as recycled off-site.

Table 4–74 shows changes between 1998 and 1999 in the disposition of production-related waste reported by federal facilities. Total production-related waste rose 23.7 percent. The quantity released on- and off-site increased from 64.7 million pounds to 81.5 million pounds, 26.0 percent higher in 1999 than in 1998. Off-site recycling increased by 60.6 percent, from 20.7 million pounds to 33.2 million pounds. On-site recycling fell by 26.5 percent, from 15.1 million pounds to 11.1 million pounds and off-site energy recovery fell by 43.3 percent, from about 264,000 pounds to about 150,000 pounds.

Transfers Off-site for Further Waste Management/Disposal

Table 4–75 summarizes reporting by federal facilities of transfers off-site for further waste management and disposal. These transfers totaled 40.4 million pounds in 1999. Much of this amount (33.4 million pounds) was transferred off-site to recycling. The category of other off-site transfers to disposal accounted for 6.5 million pounds. Much of this amount was due to reporting by one Army facility that expected to revise its reported amount of off-site transfers to disposal, as explained above.

Federal facilities in the original TRI industries reported the bulk of the total, with 39.1 million pounds sent off-site for further waste management and disposal. The Treasury Department reported the largest total transfers, 29.4 million pounds, and nearly all of this amount was sent off-site to recycling.

Federal facilities filing forms for new industry SIC codes reported a total of 1.3 million pounds transferred, of which almost a million pounds were sent to recycling, about 290,000 pounds were sent to disposal.

Table 4–76 presents the changes in transfers off-site between 1998 and 1999 reported by federal facilities. Total transfers increased by 82.7 percent, a gain of 18.3 million pounds. Transfers to recycling grew from 20.4 million pounds to 33.4 million pounds, a 63.5 percent increase.

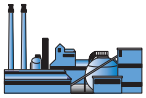


Table 4–74. Quantities of TRI Chemicals in Waste, 1998–1999: Federal Facilities

Waste Management Activity	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	15,069,474	11,078,150	–3,991,324	–26.5
Recycled Off-site	20,671,626	33,197,248	12,525,622	60.6
Energy Recovery On-site	0	326	326	—
Energy Recovery Off-site	263,952	149,529	–114,423	–43.3
Treated On-site	54,371,092	60,594,576	6,223,484	11.4
Treated Off-site	553,513	5,977,804	5,424,291	980.0
Quantity Released On- and Off-site	64,712,129	81,535,459	16,823,330	26.0
Total Production-related Waste	**155,641,786**	**192,533,092**	**36,891,306**	**23.7**
Non-Production-related Waste	44,847	19,650	–25,197	–56.2

Note: All data are from Section 8 of Form R for the year indicated.
Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.

Table 4–75. TRI Transfers Off-site for Further Waste Management/Disposal, 1999: Federal Facilities

Federal Agency	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs		Other Off-site Transfers*	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/ Disposal
				Metals and Metal Compounds	Non-metal TRI Chemicals			
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Federal Facilities with Activities Related to Original Industries and Other Industries								
Department of Defense	2,868,369	134,191	242,960	114,770	2,243	0	6,047,563	9,410,096
Air Force	141,772	11,573	94,070	112,453	686	0	136,625	497,179
Army	2,326,489	60,168	67,085	1,943	459	0	5,747,641	8,203,785
Army Corps of Engineers	1,502	0	0	0	0	0	16,700	18,202
Defense Logistics	0	0	0	0	0	0	0	0
Marines	134,903	27,100	2,604	320	0	0	9,319	174,246
Navy	263,703	35,350	79,201	54	1,098	0	137,278	516,684
Department of Energy	90,880	750	3,834	5,593	73	0	114,209	215,339
Department of Interior	0	0	0	0	0	0	0	0
Department of Treasury	29,374,572	0	0	0	2,010	0	15,676	29,392,258
Department of Veterans Affairs	0	0	0	0	0	0	0	0
Environmental Protection Agency	0	0	0	0	0	0	0	0
National Aeronautics and Space Administration	0	13,690	16,025	0	0	0	4,138	33,853
Tennessee Valley Authority	43,100	0	0	0	0	0	10,435	53,535
U.S. Department of Agriculture	0	0	0	0	0	0	0	0
U.S. Enrichment Corporation	0	0	0	0	0	0	0	0
Subtotal for Original Industries	**32,376,921**	**148,631**	**262,819**	**120,363**	**4,326**	**0**	**6,192,021**	**39,105,081**
Federal Facilities with Activities Related to New Industries								
Department of Defense — Navy	0	0	0	0	0	0	0	0
Department of Energy	100,058	0	0	0	0	0	1,891	101,949
Tennessee Valley Authority	893,600	0	820	0	0	0	287,645	1,182,065
Subtotal for New Industries	**993,658**	**0**	**820**	**0**	**0**	**0**	**289,536**	**1,284,014**
Total for Federal Facilities	**33,370,579**	**148,631**	**263,639**	**120,363**	**4,326**	**0**	**6,481,557**	**40,389,095**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.
Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising other off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal compounds.

Projected Quantities of TRI Chemicals Managed in Waste, 1999–2001

As Table 4–77 shows, production-related waste for federal facilities is projected to decrease by 2.2 percent between 1999 and 2001, with the largest decline, 2.2 percent, taking place in 2000. Treated on-site was expected to decrease by 5.2 percent. While off-site treatment was projected to decrease by 93.8 percent, much of this was due to reporting by one Army facility that expected to revise its reported amount of treated off-site for 1999, as explained above.

Off-site recycling was expected to rise by 14.1 percent, from 33.2 million pounds to 37.9 million pounds, and on-site recycling was expected to increase by 5.7 percent. The quantity released on- and off-site was projected to decrease slightly, by 1 percent.

These projected changes would not make much difference to the share of production-related waste handled by the various waste management methods. The share of on-site recycling would rise slightly, to 6.2 percent of the total, and that of off-site recycling would increase from 15.8 percent of the total to 20.1 percent. The share of on-site treatment would increase from 28.9 percent to 30.5 percent. Despite the decrease in the quantity released on- and off-site, this item was expected to account for 42.9 percent of total production-related waste in 2001, up from 38.9 percent in 1999. 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).

Source Reduction

In 1999, federal facilities filed 143 forms reporting source reduction activity (see Table 4–78). 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 70 forms, 29.4 percent of their total Form Rs. The National Aeronautics and Space Administration facilities submitted 12 forms reporting source reduction activity, representing 70.6 percent

Table 4–76. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Federal Facilities

	1998	1999	Change 1998–1999	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	20,407,893	33,370,579	12,962,686	63.5
Transfers to Energy Recovery	238,631	148,631	–90,000	–37.7
Transfers to Treatment	359,297	263,639	–95,658	–26.6
Transfers to POTWs	121,179	124,689	3,510	2.9
Metals and Metal Compounds Only	2,746	4,326	1,580	57.5
Non-metal TRI Chemicals	118,433	120,363	1,930	1.6
Other Off-site Transfers*	0	0	0	—
Other Off-site Transfers to Disposal**	1,047,978	6,481,557	5,433,579	518.5
Total Transfers Off-site for Further Waste Management/Disposal	**22,174,978**	**40,513,784**	**18,338,806**	**82.7**

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.
Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising other off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal compounds.

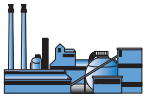


Table 4–77. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999–2001: Federal Faciltiies

Waste Management Activity	Current Year 1999		Projected 2000		Projected 2001	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	11,078,150	5.8	11,735,313	6.2	11,714,313	6.2
Recycled Off-site	33,197,248	17.2	37,864,844	20.1	37,887,263	20.1
Energy Recovery On-site	326	0.0	326	0.0	326	0.0
Energy Recovery Off-site	149,529	0.1	160,815	0.1	154,100	0.1
Treated On-site	60,594,576	31.5	57,297,203	30.4	57,420,937	30.5
Treated Off-site	5,977,804	3.1	383,094	0.2	370,468	0.2
Quantity Released On- and Off-site	81,535,459	42.3	80,906,904	43.0	80,682,560	42.9
Total Production-related Waste	**192,533,092**	**100.0**	**188,348,499**	**100.0**	**188,229,967**	**100.0**
Waste Management Activity	**Projected Change 1999-2000** Percent		**Projected Change 2000-2001** Percent		**Projected Change 1999-2001** Percent	
Recycled On-site	5.9		–0.2		5.7	
Recycled Off-site	14.1		0.1		14.1	
Energy Recovery On-site	0.0		0.0		0.0	
Energy Recovery Off-site	7.5		–4.2		3.1	
Treated On-site	–5.4		0.2		–5.2	
Treated Off-site	–93.6		–3.3		–93.8	
Quantity Released On- and Off-site	–0.8		–0.3		–1.0	
Total Production-related Waste	**-2.2**		**-0.1**		**-2.2**	

Note: Current year and projected amounts are from Section 8 of Form R for 1999.
Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the *1999 TRI Public Data Release* report.

of their total Form Rs. The Tennessee Valley Authority facilities with activities related to the new industry sectors reported source reduction activity on 50 forms, 30.3 percent of their total Form Rs.

The most frequently reported source reduction activity (identified on 65 forms, including 47 filed by the Tennessee Valley Authority facilities with activities related to the new industry sectors) was raw material modifications. Good operating practices came next, with 44 forms (including 32 by Department of Defense facilities), and surface preparation and finishing was third, with 26 forms (all from Department of Defense facilities).

Table 4–78. Number of Forms Reporting Source Reduction Activity, 1999: Federal Facilities

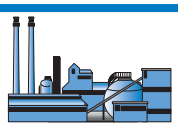
Federal Agency	Total Form Rs	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Percent of All Form Rs	Good Operating Practices	Inventory Control	Spill and Leak Prevention	Raw Material Modifications	Process Modifications	Cleaning and Degreasing	Surface Preparation and Finishing	Product Modifications
	Number	Number	Percent	Number	Number	Number	Number	Number	Number	Number	Number
Federal Facilities with Activities Related to Original Industries and Other Industries											
Department of Defense	238	70	29.4	32	15	9	14	13	17	26	2
Air Force	51	19	37.3	11	0	1	9	4	16	15	0
Army	110	21	19.1	8	5	8	1	7	0	1	1
Army Corps of Engineers	6	6	100.0	6	0	0	0	0	0	0	0
Defense Logistics	4	0	0.0	0	0	0	0	0	0	0	0
Marines	14	6	42.9	1	2	0	1	0	0	8	1
Navy	53	18	34.0	6	8	0	3	2	1	2	0
Department of Energy	41	6	14.6	1	4	1	2	1	1	0	0
Department of Interior	2	0	0.0	0	0	0	0	0	0	0	0
Department of Treasury	14	4	28.6	1	0	0	2	1	0	0	0
Department of Veterans Affairs	1	0	0.0	0	0	0	0	0	0	0	0
Environmental Protection Agency	2	0	0.0	0	0	0	0	0	0	0	0
National Aeronautics and Space Administration	17	12	70.6	9	2	0	0	4	3	0	1
Tennessee Valley Authority	3	0	0.0	0	0	0	0	0	0	0	0
U.S. Department of Agriculture	4	1	25.0	0	0	1	0	0	0	0	0
U.S. Enrichment Corporation	6	0	0.0	0	0	0	0	0	0	0	0
Subtotal for Original Industries	**328**	**93**	**28.4**	**43**	**21**	**11**	**18**	**19**	**21**	**26**	**3**
Federal Facilities with Activities Related to New Industries											
Department of Defense - Navy	1	0	0.0	0	0	0	0	0	0	0	0
Department of Energy	13	0	0.0	0	0	0	0	0	0	0	0
Tennessee Valley Authority	165	50	30.3	1	0	0	47	2	0	0	0
Subtotal for New Industries	**179**	**50**	**27.9**	**1**	**0**	**0**	**47**	**2**	**0**	**0**	**0**
Total for Federal Facilities	**507**	**143**	**28.2**	**44**	**21**	**11**	**65**	**21**	**21**	**26**	**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.

Chapter 5

Toxics Release Inventory Data for Original Reporting Industries

Chapter 5



Toxics Release Inventory Data for Original Reporting Industries

This chapter provides an overview of 1999 TRI data by industry sector for the 20 industries that have been required to report to TRI since the program began in 1987. Analyses of TRI reporting by the industries added in 1998 and federal facilities appear in Chapter 4.

The chapter summarizes release and other waste management data by industry for 1999 and for 1995 to 1999. Changes in on- and off-site releases are measured since 1988, and other waste management data are reviewed for 1991 to 1999. 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 significant changes in TRI over time.

Box 5–1 lists the original 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 5–2 explains EPA's method for analyzing this "multiple-codes" group, as well as the "no-codes" group.

TRI Data by Industry, 1999

In 1999, a total of 20,698 facilities in the original TRI industries submitted 69,471 forms, as shown in Table 5–1. The chemical manufacturing industry submitted the largest number of forms, 20,382. The fabricated metals industry ranked second, with 7,459 forms, followed by the primary metals industry, with 6,819 forms. Together, these three industries submitted nearly half (49.9 percent) of the forms for 1999 from the original industries covered by TRI.

On- and Off-site Releases, 1999

On- and off-site releases by the original industries totaled 2.44 billion pounds in 1999, and two industries reported more than half of that total. As shown in Table 5–2, the primary metals industry reported 683.7 million pounds of total releases, and the chemical manufacturing industry reported 670.5 million pounds. These amounts represented 28.0 percent and 27.5 percent, respectively, of all on- and off-site releases reported by the original industries, as illustrated in Figure 5–1. The paper products industry ranked third for total on- and off-site releases, with 225.6 million pounds, or 9.2 percent of the total.

Four other industry groups reported more than 100 million pounds each. The "multiple-codes" group ranked fourth among original industries, with 129.1 million pounds, 5.3 percent of the total. Food industries ranked fifth, with 123.2 million pounds, followed by the transportation equipment industry, with 105.0 million pounds and plastics, with 103.6 million pounds. Each of these four groups account-

Box 5–1. Standard Industrial Classification (SIC) Codes for the Original TRI Industries

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 plastics film and sheet.

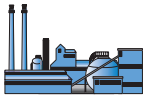
27 Printing, publishing, and allied industries
Printing by one or more common processes, such as letterpress, lithography (including offset), gravure, or screen. Bookbinding, platemaking, and other services performed for the printing trade. Publishing newspapers, books, and periodicals (whether or not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

28 Chemicals and allied products
Production of basic chemicals. Manufacture of products by predominantly chemical processes. (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.

(continued)



Box 5–1. Standard Industrial Classification (SIC) Codes for the Original TRI Industries *(continued)*

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.

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; metal working 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,transfor mation, and utilization of electrical energy. Manufacture of electricity distribution equipment, electrical industrial apparatus, household appliances, electrical lighting and wiring equipment, radio and televsion 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.

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

Box 5–2. Multiple SIC Codes and No SIC Codes

Multiple Codes 20–39. TRI facilities may report up to six four-digit SIC codes that describe their operations. They submit one Form R or Form A certification statement for each chemical they are reporting. 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 Standard Industrial Classification (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 new industry sectors 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 original and new industry SIC codes, it is not included in the analyses in this chapter but is included in the analyses in Chapter 4 under the new industry code

No codes 20–39. Forms that report no SIC code within the manufacturing sector and have no SIC code belonging to a new industry group 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.

ed for approximately 4 to 5 percent of the total (see Figure 5–1).

Figure 5–2 displays on- and off-site releases for the industries with the largest total releases. Air emissions were the largest release type for all of these industries except primary metals. In the primary metals industry, off-site releases (transfers off-site to disposal) and on-site land releases outweighed other release types. For the food industry, surface water discharges were almost as large as air emissions, accounting for 50.2 million pounds, or about 40 percent of total releases by that industry.

The primary metals, chemicals, and paper products industries, which reported the largest total on- and off-site releases in 1999, also reported the largest on-site releases, but in a different order.

The chemical manufacturing industry ranked first for on-site releases, with 609.3 million pounds. Chemical industry releases included 288.2 million pounds of air emissions, 77.1 million pounds of surface water discharges, and 195.4 million pounds of

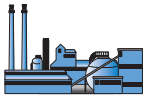


Table 5–1. TRI Facilities and Forms, Original Industries, by Industry, 1999

SIC Code	Industry	Total Facilities	Total Forms	Forms Rs	Form As
		Number	Number	Number	Number
20	Food	1,615	3,066	1,913	1,153
21	Tobacco	23	67	66	1
22	Textiles	241	485	430	55
23	Apparel	15	33	31	2
24	Lumber	830	2,000	1,220	780
25	Furniture	352	781	706	75
26	Paper	438	2,402	2,319	83
27	Printing	213	447	433	14
28	Chemicals	3,759	20,382	16,670	3,712
29	Petroleum	410	3,441	3,069	372
30	Plastics	1,831	3,731	3,122	609
31	Leather	72	183	163	20
32	Stone/Clay/Glass	668	1,919	1,648	271
33	Primary Metals	1,912	6,819	6,078	741
34	Fabricated Metals	2,846	7,459	6,651	808
35	Machinery	1,100	2,733	2,409	324
36	Electrical Equip.	1,167	2,926	2,763	163
37	Transportation Equip.	1,295	4,502	4,166	336
38	Measure/Photo.	240	588	492	96
39	Miscellaneous	307	686	580	106
	Multiple codes 20–39	1,190	4,280	3,862	418
	No codes 20–39	174	541	474	67
	Total	**20,698**	**69,471**	**59,265**	**10,206**

Note: Facilities/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 with no 2-digit SIC code within the range 20–39 are assigned to the "no codes" category.

underground injection—the largest amounts in these categories. The primary metals industry ranked second for on-site releases, with 399.9 million pounds. Primary metals reported 229.6 million pounds of on-site land releases, more than any other industry. Most of the sector's on-site land releases consisted of other disposal (130.4 million pounds). This sector also reported the largest off-site releases, 283.8 million pounds, 58.3 percent of all off-site releases.

Top 20 Chemicals for On- and Off-site Releases

Table 5–3 lists the 20 TRI chemicals with the largest total releases in 1999 by the original industries. On- and off-site releases of these chemicals totaled 1.85 billion pounds, 76.0 percent of the total 2.44 billion pounds for all chemicals.

Zinc compounds led all TRI chemicals, with releases totaling 330.7 million pounds. Off-site releases (transfers to disposal) contributed almost 60 percent (194.3 million pounds) of this total. As explained in Box

Table 5-2. TRI On-site and Off-site Releases, Original Industries, by Industry, 1999

SIC Code	Industry	Air			Underground Injection	
		Fugitive or Nonpoint Air Emissions	Stack or Point Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells
		Pounds	Pounds	Pounds	Pounds	Pounds
20	Food	19,887,134	39,910,073	50,225,853	4,514	0
21	Tobacco	35,725	2,728,904	162,296	0	0
22	Textiles	1,722,640	6,748,425	204,073	0	0
23	Apparel	24,590	361,953	0	0	0
24	Lumber	4,909,048	29,236,143	109,085	0	0
25	Furniture	2,098,901	13,093,100	9	0	0
26	Paper	13,663,381	172,304,976	19,118,393	0	0
27	Printing	9,104,599	11,396,535	436	0	0
28	Chemicals	75,405,717	212,746,746	77,097,472	195,332,322	108,858
29	Petroleum	20,653,721	27,356,853	15,655,884	2,805,588	40,085
30	Plastics	21,589,254	69,984,617	36,453	0	0
31	Leather	571,380	1,639,648	65,880	0	0
32	Stone/Clay/Glass	2,226,078	30,658,766	123,132	0	0
33	Primary Metals	23,932,051	82,677,214	62,513,740	1,186,718	15
34	Fabricated Metals	19,495,949	37,824,949	2,429,536	48,843	0
35	Machinery	3,977,903	6,776,871	140,051	0	0
36	Electrical Equip.	3,957,494	12,975,247	4,393,066	250	0
37	Transportation Equip.	18,174,725	73,554,187	177,754	0	0
38	Measure/Photo.	1,009,729	7,494,549	1,320,125	0	0
39	Miscellaneous	1,816,780	7,024,565	26,183	0	0
	Multiple codes 20–39	19,723,864	56,409,142	19,559,032	20,100	5
	No codes 20–39	6,784,810	1,385,996	233,363	0	505
	Total	**270,765,473**	**904,289,459**	**253,591,816**	**199,398,335**	**149,468**

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. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.

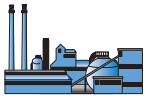


Table 5-2. TRI On-site and Off-site Releases, Original Industries, by Industry, 1999 *(continued)*

Industry	On-site Land Releases					Total On-site Releases	Off-site Releases	Total On- and Off-site Releases
	RCRA Subtitle C Landfills	Other Landfills	Land Treatment	Surface Impoundments	Other Disposal		Transfers Off-site to Disposal	
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Food	525	116,028	5,708,331	311,931	119,841	116,284,230	6,956,919	123,241,149
Tobacco	0	0	0	0	0	2,926,925	770,705	3,697,630
Textiles	0	3,650	234,799	104,438	112,700	9,130,725	682,024	9,812,749
Apparel	0	0	0	0	0	386,543	74,118	460,661
Lumber	31,282	68,556	37,115	32,611	7,228	34,431,068	818,837	35,249,905
Furniture	0	2,666	0	0	22,235	15,216,911	114,491	15,331,402
Paper	235,499	11,077,047	452,592	3,195,138	307,994	220,355,020	5,204,395	225,559,415
Printing	0	36,000	0	0	17,559	20,555,129	122,852	20,677,981
Chemicals	726,299	12,987,685	1,571,580	29,117,374	4,169,615	609,263,668	61,265,769	670,529,437
Petroleum	534	44,048	79,008	311,089	51,969	66,998,779	3,542,150	70,540,929
Plastics	9,195	574,092	0	5,860	33,436	92,232,907	11,394,450	103,627,357
Leather	0	0	0	10,369	255	2,287,532	2,092,878	4,380,410
Stone/Clay/Glass	6,500	3,522,389	260	96,509	71,154	36,704,788	6,274,400	42,979,188
Primary Metals	10,790,474	52,486,251	21,649	35,935,746	130,381,446	399,925,304	283,807,288	683,732,592
Fabricated Metals	125,093	173,517	8,016	3,817	341,357	60,451,077	21,778,616	82,229,693
Machinery	80,915	133,446	4,309	1,376	244,740	11,359,611	4,158,522	15,518,133
Electrical Equip.	150,717	830,209	255	760	17,895	22,325,893	18,799,534	41,125,427
Transportation Equip.	81,822	367,898	1,500	3,662	260,310	92,621,858	12,363,270	104,985,128
Measure/Photo.	5,327	16,000	380	6	1,559	9,847,675	1,051,304	10,898,979
Miscellaneous	27,896	1,203	0	0	23,631	8,920,258	1,308,864	10,229,122
Multiple codes 20–39	27,504	3,561,697	290,450	4,626,915	4,684,660	108,903,369	20,174,698	129,078,067
No codes 20–39	140,773	395	550,978	14,277	1,622,035	10,733,132	24,083,918	34,817,050
Total	**12,440,355**	**86,002,777**	**8,961,222**	**73,771,878**	**142,491,619**	**1,951,862,402**	**486,840,002**	**2,438,702,404**

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. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

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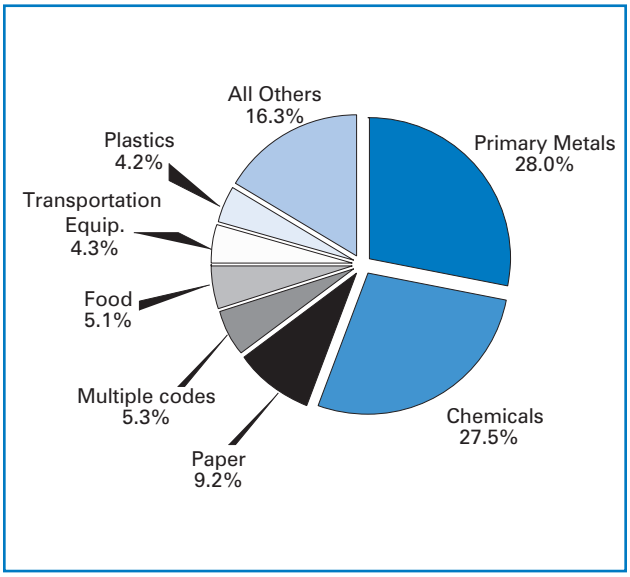
Figure 5–1. TRI On-site and Off-site Releases, Original Industries, by Industry, 1999



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1–5 in Chapter 1, off-site releases of metals and their compounds include transfers to solidification/stabilization and to wastewater treatment, including transfers to POTWs. Zinc compounds also had the largest on-site land releases, with 129.7 million pounds. This amount included 81.7 million pounds of other disposal and 32.0 million pounds in landfills other than RCRA subtitle C landfills.

Nitrate compounds ranked second in total releases, with 293.8 million pounds. More nitrate compounds were discharged to surface waters than any other chemical, 229.6 million pounds. TRI facilities in the original industries also injected 42.2 million pounds of nitrate compounds into underground wells on-site, the largest amount for that type of release.

Methanol releases amounted to 205.3 million pounds, the third-largest quantity of on- and off-site releases. Methanol ranked first for air emissions, with 183.9 million pounds, including 163.0 million pounds in stack or point source air emissions.

Ammonia ranked fourth overall, with 184.1 million pounds, and was second highest for air emissions (144.3 million pounds), surface water discharges (7.5 million pounds) and underground injection (25.6 million pounds). Manganese compounds had the second-highest on-site releases to land, 45.0 million pounds, followed closely by copper compounds, with 44.3 million pounds.

Waste Management Data, 1999

Facilities in the original TRI industries reported managing a total of 23.10 billion pounds of TRI chemicals in production-related waste in 1999, as shown in Table 5–4. Figure 5–3 shows production-related waste reported by the industries with the largest totals. Generally, on-site recycling and on-site treatment were the most common waste management methods for the original industries.

The chemical manufacturing industry reported managing 11.14 billion pounds of total production-related waste in 1999, and it reported the largest quantities in all waste management categories except off-site recycling. Almost 40 percent of the chemical manufacturing industry's production-related waste was recycled on-site (4.29 billion pounds). On-site treatment by this industry amounted to 3.91 billion pounds, and on-site energy recovery totaled 1.38 billion pounds. The chemicals industry reported 662.2 million pounds released on- and off-site. The industry sent

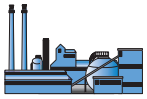
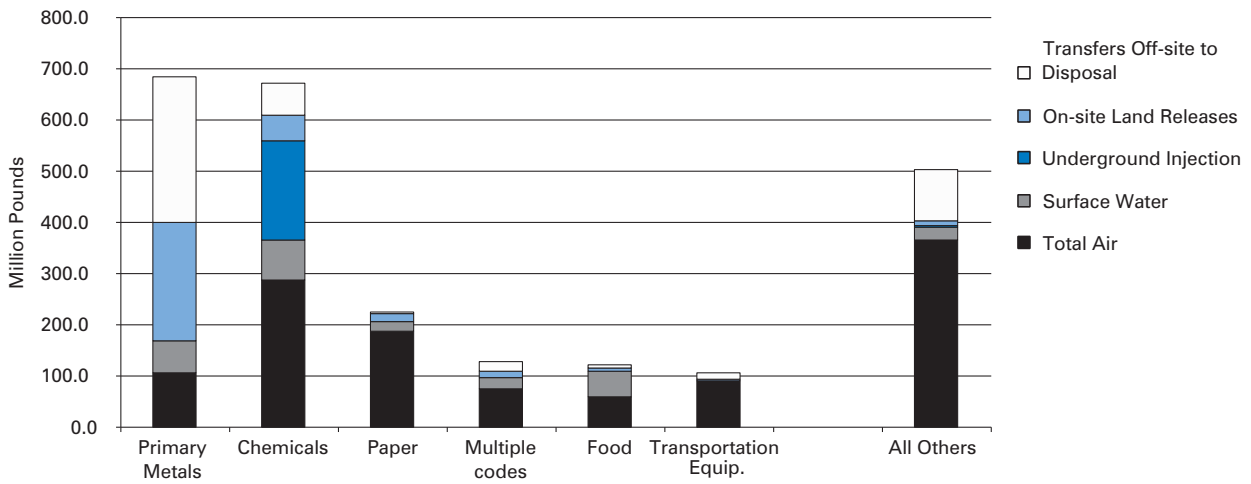


Figure 5-2. Distribution of TRI On-site and Off-site Releases, Original Industries with Largest Totals, 1999



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. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

401.9 million pounds to off-site energy recovery and 309.1 million pounds to off-site treatment.

The primary metals industry ranked second among original industries for total production-related waste managed, with 3.52 billion pounds. On-site recycling accounted for the largest portion of this total, 1.55 billion pounds; the primary metals industry ranked second in this category. The industry reported the largest quantity of off-site recycling (754.6 million pounds) and the second-largest quantity released on- and off-site (660.9 million pounds, a little lower than the amount for chemical manufacturing).

The paper products industry reported the third-largest total production-related waste managed, 1.59 billion pounds. More than 62 percent of this amount, 988.2 million pounds, was treated on-site, the second-largest quantity for on-site treatment.

Production-related waste exceeded 1 billion pounds in two other industry groups. The petroleum industry reported a total of 1.20 billion pounds, of which 530.6 million pounds were treated on-site and 408.8 million pounds went to on-site energy recycling. The petroleum industry ranked third in both on-site treatment (after the chemicals industry and the paper products industry) and on-site energy recovery (after the chemicals industry and the stone, clay, glass, and concrete products group). The "multiple-codes" group reported 1.05 billion pounds. The largest waste management categories for this group were on-site treatment, 362.9 million pounds, and on-site recycling, 277.7 million pounds.

Table 5-3. Top 20 Chemicals with Largest Total On-site and Off-site Releases, Original Industries, 1999

CAS Number	Chemical	Air			Underground Injection	
		Fugitive or Nonpoint Air Emissions	Stack or Point Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells
		Pounds	Pounds	Pounds	Pounds	Pounds
—	Zinc compounds	1,507,464	4,014,302	1,002,707	222,562	5,500
—	Nitrate compounds	1,818,184	211,738	229,551,038	42,176,095	250
67-56-1	Methanol	20,898,502	162,975,985	3,864,475	14,083,936	106,103
7664-41-7	Ammonia	31,279,310	112,955,136	7,649,385	25,611,167	24,618
—	Manganese compounds	939,302	941,228	4,853,311	7,011,377	250
108-88-3	Toluene	30,282,435	58,823,208	29,670	611,546	1,350
1330-20-7	Xylene (mixed isomers)	15,070,850	51,060,704	24,818	49,229	750
100-42-5	Styrene	12,824,242	41,906,888	3,168	191,124	0
—	Copper compounds	1,031,390	521,204	84,642	247,755	0
110-54-3	n-Hexane	19,240,208	35,816,968	11,114	36,501	10
7647-01-0	Hydrochloric acid	2,486,305	48,219,840	495	36,795	0
7782-50-5	Chlorine	1,012,814	48,151,981	328,493	62,440	0
—	Lead compounds	215,924	655,684	31,794	182,869	0
—	Chromium compounds	209,702	257,369	97,379	816,717	0
78-93-3	Methyl ethyl ketone	15,494,361	22,724,308	34,304	426,247	5
—	Glycol ethers	8,656,597	27,392,902	104,389	716	0
75-15-0	Carbon disulfide	1,147,325	34,741,100	6,548	16,110	0
75-09-2	Dichloromethane	11,096,910	24,459,564	12,056	107,386	0
7697-37-2	Nitric acid	556,845	1,683,464	60,181	16,482,141	0
7440-66-6	Zinc (fume or dust)	750,918	476,173	15,306	1	0
	Subtotal (top 20 chemicals)	**176,519,588**	**677,989,746**	**247,765,273**	**108,372,714**	**138,836**
	Total (all chemicals)	**270,765,473**	**904,289,459**	**253,591,816**	**199,398,335**	**149,468**

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

Non-production-related waste is overstated in this report for all years. Those forms indicating NA for non-production-related waste were assigned one pound erroneously. The total amount overstated is about 4,500 pounds for each year.

Economic Overview, by Industry

Although TRI data present significant information about toxic chemicals that are released on- and off-site, managed in waste on- and off-site, and transferred off-site for further waste management, certain limitations should be kept in mind, as described in **What Are the Benefits and Limitations of the Data**, in Chapter 1. One such limitation is that TRI data by themselves do not distinguish industry-specific factors that influence the chemicals, the amounts, and the types of releases and waste management reported by facilities. Table 5–5 presents two basic economic measures—employment and dollar value of ship-

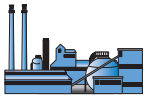


Table 5–3. Top 20 Chemicals with Largest Total On-site and Off-site Releases, Original Industries, 1999 *(continued)*

Chemical	On-site Land Releases					Total On-site Releases	Off-site Releases	Total On- and Off-site Releases
	RCRA Subtitle C Landfills	Other Landfills	Land Treatment	Surface Impoundments	Other Disposal		Transfers Off-site to Disposal	
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Zinc compounds	6,376,406	31,970,479	125,988	9,442,775	81,742,150	136,410,333	194,251,166	330,661,499
Nitrate compounds	21,702	50,493	5,317,279	1,525,491	87,554	280,759,824	13,075,242	293,835,066
Methanol	46,913	510,638	18,480	469,731	165,445	203,140,208	2,117,503	205,257,711
Ammonia	2,113	142,918	1,725,147	850,384	151,167	180,391,345	3,667,850	184,059,195
Manganese compounds	1,591,285	23,363,307	360,900	14,720,096	4,878,129	58,659,185	48,607,421	107,266,606
Toluene	15,312	13,748	1,587	1,545	61,805	89,842,206	1,448,961	91,291,167
Xylene (mixed isomers)	11,598	7,747	2,502	1,235	19,800	66,249,233	1,090,289	67,339,522
Styrene	6,461	360,088	3	514	2,084	55,294,572	2,100,121	57,394,693
Copper compounds	213,715	2,853,728	2,209	6,528,824	34,674,623	46,158,090	10,981,320	57,139,410
n-Hexane	952	1,471	730	255	4,016	55,112,225	47,900	55,160,125
Hydrochloric acid	36,558	0	0	0	28,876	50,808,869	2,399,296	53,208,165
Chlorine	0	0	44,684	25	10,611	49,611,048	7,745	49,618,793
Lead compounds	463,850	3,024,417	3,857	3,522,735	9,293,502	17,394,632	31,961,514	49,356,146
Chromium compounds	306,008	1,407,348	36,250	24,450,480	3,391,292	30,972,545	14,203,028	45,175,573
Methyl ethyl ketone	25,815	3,856	130	1,176	50,544	38,760,746	779,384	39,540,130
Glycol ethers	19,642	13,207	10,552	0	5,780	36,203,785	848,254	37,052,039
Carbon disulfide	5	251	0	0	0	35,911,339	2,730	35,914,069
Dichloromethane	1,157	1,898	10	0	5,279	35,684,260	154,374	35,838,634
Nitric acid	56,463	64,728	187,451	31,548	7,421	19,130,242	10,530,338	29,660,580
Zinc (fume or dust)	1,458,342	812,802	0	2,012	49,754	3,565,308	26,013,507	29,578,815
Subtotal (top 20 chemicals)	**10,654,297**	**64,603,124**	**7,837,759**	**61,548,826**	**134,629,832**	**1,490,059,995**	**364,287,943**	**1,854,347,938**
Total (all chemicals)	**12,440,355**	**86,002,777**	**8,961,222**	**73,771,878**	**142,491,619**	**1,951,862,402**	**486,840,002**	**2,438,702,404**

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

ments—that suggest the relative size of the original industries that report to TRI. Economic analyses make use of data on the value of production (shipments) as one way of indicating the size of industrial sectors because no direct comparison can be drawn among the products of the sectors. The economic data in Table 5–5 are from the *2000 Statistical Abstract of the United States*, the latest consistent data available across all TRI industries, original and new.

Table 5–5 also shows total production-related waste managed by TRI facilities in 1999 and provides approximate comparisons with the economic activity of the facilities. The percentages shown in the table indicate the relative contribution of each industry to total employment and production and to the total quantity of TRI chemicals in production-related waste managed. The ratio of total production-related waste managed to production value (value of shipments), in the last column, provides a com-

Table 5-4. Quantities of TRI Chemicals in Waste Managed, Original Industries, by Industry, 1999

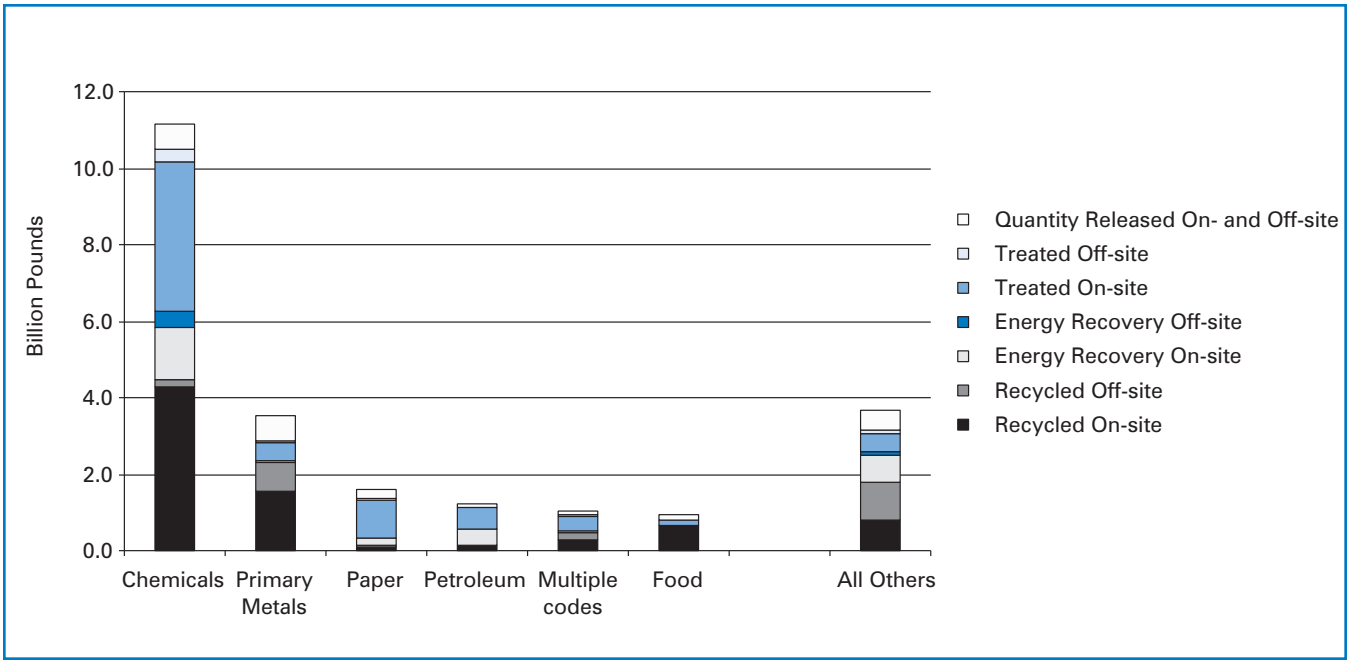
SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site Treated	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Pounds	Pounds	Pounds
20	Food	669,579,214	4,021,384	368,624	186,154	117,194,970	28,379,792	125,728,606	945,458,744	339,615
21	Tobacco	2,877	4,692	0	0	1,265,197	569,356	3,201,944	5,044,066	0
22	Textiles	13,131,341	1,193,970	5,328,483	1,923,938	8,766,593	1,778,044	9,198,301	41,320,670	350
23	Apparel	120,180	58,091	0	32,084	970,870	72,574	458,224	1,712,023	0
24	Lumber	8,168,812	493,445	2,763,496	2,115,995	9,619,148	1,627,693	34,853,373	59,641,962	539,833
25	Furniture	3,759,675	4,777,220	48,755	3,877,812	561,325	435,753	14,250,477	27,711,017	1,403
26	Paper	106,155,787	11,846,205	206,443,672	6,790,097	988,175,002	44,280,317	227,005,796	1,590,696,876	10,373
27	Printing	187,531,609	5,943,127	263,870	3,941,316	97,744,655	2,037,158	20,653,150	318,114,885	121,037
28	Chemicals	4,288,776,638	182,418,051	1,378,302,403	401,877,053	3,914,655,653	309,149,616	662,235,528	11,137,414,942	6,933,002
29	Petroleum	135,610,463	22,259,684	408,782,307	19,580,516	530,572,806	12,559,640	70,761,293	1,200,126,709	520,425
30	Plastics	47,915,834	18,907,706	14,502,896	7,925,098	40,366,020	8,985,212	107,483,282	246,086,048	37,698
31	Leather	464,526	226,469	0	72,698	8,860,855	439,888	4,412,697	14,477,133	15
32	Stone/Clay/ Glass	164,059,360	3,773,127	651,242,324	909,680	23,345,061	3,100,571	42,753,637	889,183,760	270,396
33	Primary Metals	1,552,531,491	754,626,615	37,661,422	3,655,699	475,675,781	30,818,969	660,931,823	3,515,901,800	293,814,961
34	Fabricated Metals	142,101,576	351,691,695	26,003,219	12,919,918	100,324,024	20,705,710	81,423,271	735,169,413	296,165
35	Machinery	13,944,720	75,086,526	310,093	2,443,766	7,350,148	6,285,050	15,638,658	121,058,961	74,380
36	Electrical Equip.	191,059,754	370,996,008	11,002,472	7,699,478	70,082,258	23,811,046	36,763,938	711,414,954	268,390
37	Transportation Equip.	20,905,454	127,096,625	644,190	12,550,137	29,902,730	13,193,003	102,506,313	306,798,452	14,183
38	Measure/Photo.	2,594,636	10,836,621	561,088	2,247,956	41,471,165	2,356,146	10,602,534	70,670,146	760,347
39	Miscellaneous	9,065,566	13,711,079	4,342,249	3,371,693	5,538,753	2,695,392	10,307,530	49,032,262	702,014
	Multiple codes 20–39	277,735,580	171,186,302	56,977,187	16,657,952	362,947,066	34,077,657	130,786,592	1,050,368,336	1,016,887
	No codes 20–39	4,637,755	3,742,825	550,243	852,366	14,936,039	24,310,969	12,346,509	61,376,706	5,653
	Total	**7,839,852,848**	**2,134,897,467**	**2,806,098,993**	**511,631,406**	**6,850,326,119**	**571,669,556**	**2,384,303,476**	**23,098,779,865**	**305,727,127**

Note: Data are from Section 8 of Form R. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.

parison of the 1999 TRI quantities reported by each industry with that industry's production level for 1999. Many factors influence the differences in TRI reporting among industries. Relating TRI quantities to the dollar value of each industry's products creates a measure of waste managed that takes into account differences in size among industries.

As shown in Table 5–5, the chemical manufacturing industry accounted for 5.5 percent of manufacturing employment in 1998, 9.7 percent of the value of manufacturing production (value of shipments) in 1999,

Figure 5-3. Distribution of Quantities of TRI Chemicals in Waste Managed, Original Industries with Largest Totals, 1999



Note: Data are from Section 8 of Form R. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category.

and 50.7 percent of TRI total production-related waste managed in 1999. The chemical manufacturing industry managed 26,949 pounds of total production-related waste for each $1 million value of shipments. This was the largest ratio among the original TRI industries. The primary metals industry ranked second, with 19,701 pounds per $1 million value, and the paper products industry ranked third, with 9,666 pounds per $1 million value. These three industries had the largest total production-related waste managed in 1999.

Year-by-Year Comparisons, by Industry

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

Progress in reducing releases and other quantities of TRI chemicals in wastes in recent years is measured from 1995. Waste management data authorized under the federal Pollution Prevention Act of 1990 have been collected since 1991 and can be compared using that baseline. Comparisons of on-site and off-site releases can also be made for chemicals that were reportable in all years from 1988 to 1999.

Table 5-5. Employees (1998), Shipments (1999) and Total Production-related Waste Managed (1999), by Industry

SIC Code	Industry	Paid Employees, 1998		Value of Shipments, 1999		Total Production-related Waste Managed, 1999		Production-related Waste Managed per Value of Shipments
		Number (000)	Percent	$1,000,000	Percent	Pounds	Percent	Pounds per $1,000,000
20	Food	1,648	8.9	500,901	11.8	945,458,744	4.3	1,888
21	Tobacco	39	0.2	50,551	1.2	5,044,066	0.0	100
22	Textiles	593	3.2	78,357	1.8	41,320,670	0.2	527
23	Apparel	745	4.0	<500	<0.01	1,712,023	0.0	—
24	Lumber	817	4.4	<500	<0.01	59,641,962	0.3	—
25	Furniture	523	2.8	<500	<0.01	27,711,017	0.1	—
26	Paper	671	3.6	164,558	3.9	1,590,696,876	7.2	9,666
27	Printing	1,478	8.0	<500	<0.01	318,114,885	1.4	—
28	Chemicals	1,023	5.5	413,277	9.7	11,137,414,942	50.7	26,949
29	Petroleum	135	0.7	171,149	4.0	1,200,126,709	5.5	7,012
30	Plastics	997	5.4	164,654	3.9	246,086,048	1.1	1,495
31	Leather	84	0.5	<500	<0.01	14,477,133	0.1	—
32	Stone/Clay/Glass	558	3.0	103,773	2.4	889,183,760	4.0	8,569
33	Primary Metals	709	3.8	178,466	4.2	3,515,901,800	16.0	19,701
34	Fabricated Metals	1,493	8.1	245,517	5.8	735,169,413	3.3	2,994
35	Machinery	2,181	11.8	455,140	10.7	121,058,961	0.6	266
36	Electrical Equip.	1,689	9.1	413,204	9.7	711,414,954	3.2	1,722
37	Transportation Equip.	1,881	10.2	583,559	13.7	306,798,452	1.4	526
38	Measure/Photo.	858	4.6	174,661	4.1	70,670,146	0.3	405
39	Miscellaneous	391	2.1	<500	<0.01	49,032,262	0.2	—
	Total	**18,513**	**100.0**	**4,259,532**	**100.0**	**21,987,034,823**	**100.0**	**5,162**

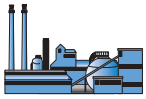
Note: Paid Employees is from Table No. 1233 and **Value of Shipments** is from Table No. 1235 of *2000 Statistical Abstract of the United States* (<http://www.census.gov/prod/www/statistical-abstract-us.html>). **Total Production-related Waste Managed** is from Section 8 (total of 8.1 through 8.7, Column B) for TRI Form R for 1999. **Total Production-related Waste Managed** in this table does not include forms reporting more than one 2-digit SIC code within SIC codes 20–39 and forms reporting SIC codes outside the 20–39 range.

On- and Off-site Releases, 1995–1999

Table 5–6 summarizes on- and off-site releases by the original TRI industries for 1995 through 1999. During this period, total on- and off-site releases decreased from 2.64 billion pounds to 2.44 billion pounds, a reduction of 7.5 percent.

The two industries with the largest total releases in 1999, the chemical manufacturing and primary metals industries, have exhibited contrasting trends since 1995. The chemical manufacturing industry's total has decreased steadily, from 828.3 million pounds in 1995 to 670.5 million pounds in 1999, and the industry has fallen from first to second place in total releases. The amount of the reduction was the largest for any original industry, a decrease of 157.8 million pounds, or 19.9 percent, over the five-year period.

Releases from the primary metals industry, by contrast, increased, from 567.5 million pounds in 1995 to 719.0 million pounds in 1998, when primary metals displaced



chemical manufacturing as the industry with the largest total releases. Although total releases for primary metals fell to 683.7 million pounds in 1999, the industry retained its top rank and recorded a total increase of 116.2 million pounds over the period 1995–1999, the largest of any industry. The increase amounted to a 20.5 percent rise in total releases for 1995–1999.

No other original TRI industry reported a reduction or an increase of comparable size between 1995 and 1999. The next largest absolute reductions were in the "multiple-codes" group, from 157.7 million pounds to 129.1 million pounds, a decline of 28.6 million pounds, and in the furniture industry, from 42.7 million pounds to 15.3 million pounds, a difference of 27.3 million pounds. Over the 1995–1999 period, the decrease for the "multiple-codes" group

Table 5-6. TRI On-site and Off-site Releases, Original Industries, by Industry, 1995 and 1998–1999

SIC Code	Industry	Total On-site and Off-site Releases						
		1995	1998	1999	Change 1998-1999		Change 1995-1999	
		Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20	Food	122,826,570	134,685,697	123,241,149	–11,444,548	–8.5	414,579	0.3
21	Tobacco	2,142,358	3,618,629	3,697,630	79,001	2.2	1,555,272	72.6
22	Textiles	18,793,736	12,100,340	9,812,749	–2,287,591	–18.9	–8,980,987	–47.8
23	Apparel	1,287,784	502,558	460,661	–41,897	–8.3	–827,123	–64.2
24	Lumber	35,993,438	35,018,765	35,249,905	231,140	0.7	–743,533	–2.1
25	Furniture	42,672,922	17,261,004	15,331,402	–1,929,602	–11.2	–27,341,520	–64.1
26	Paper	241,130,582	234,255,457	225,559,415	–8,696,042	–3.7	–15,571,167	–6.5
27	Printing	31,316,321	22,518,392	20,677,981	–1,840,411	–8.2	–10,638,340	–34.0
28	Chemicals	828,289,631	686,777,949	670,529,437	–16,248,512	–2.4	–157,760,194	–19.0
29	Petroleum	66,655,532	75,718,581	70,540,929	–5,177,652	–6.8	3,885,397	5.8
30	Plastics	128,215,794	112,004,623	103,627,357	–8,377,266	–7.5	–24,588,437	–19.2
31	Leather	4,851,489	4,835,113	4,380,410	–454,703	–9.4	–471,079	–9.7
32	Stone/Clay/Glass	37,117,116	45,143,632	42,979,188	–2,164,444	–4.8	5,862,072	15.8
33	Primary Metals	567,531,674	718,987,188	683,732,592	–35,254,596	–4.9	116,200,918	20.5
34	Fabricated Metals	106,935,535	88,486,037	82,229,693	–6,256,344	–7.1	–24,705,842	–23.1
35	Machinery	27,925,318	20,144,071	15,518,133	–4,625,938	–23.0	–12,407,185	–44.4
36	Electrical Equip.	44,286,449	32,558,396	41,125,427	8,567,031	26.3	–3,161,022	–7.1
37	Transportation Equip.	123,402,295	102,625,207	104,985,128	2,359,921	2.3	–18,417,167	–14.9
38	Measure/Photo.	17,702,014	12,423,576	10,898,979	–1,524,597	–12.3	–6,803,035	–38.4
39	Miscellaneous	13,974,408	10,399,631	10,229,122	–170,509	–1.6	–3,745,286	–26.8
	Multiple codes 20–39	157,717,666	127,497,594	129,078,067	1,580,473	1.2	–28,639,599	–18.2
	No codes 20–39	15,650,750	6,575,879	34,817,050	28,241,171	429.5	19,166,300	122.5
	Total	**2,636,419,382**	**2,504,138,319**	**2,438,702,404**	**-65,435,915**	**-2.6**	**-197,716,978**	**-7.5**

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total release amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total releases for manganese compounds from 5,584,900 pounds to below 500 pounds.

amounted to 18.2 percent and that for the furniture industry, to 64.1 percent.

Four industries, in addition to the primary metals industry, showed increases between 1995 and 1999: stone, clay, glass, and concrete products, from 37.1 million pounds to 43.0 million pounds (an increase of 5.9 million pounds, or 15.8 percent); petroleum refining, from 66.7 million pounds to 70.5 million pounds (3.9 million pounds, or 5.8 percent); tobacco products, from 2.1 million pounds to 3.7 million pounds (1.6 million pounds, or 72.6 percent); and the food industry, from 122.8 million pounds to 123.2 million pounds, an increase of about 415,000 pounds, or 0.3 percent.

In two of the five groups that reported increases between 1995 and 1999, the general upward trend was broken in 1998–1999. Total releases by the petroleum refining industry fell from 75.7 million pounds in 1998 to 70.5 million pounds in 1999, a decline of 6.8 percent. Releases from the food industry dropped by 8.5 percent, from 134.7 million pounds in 1998 to 123.2 million pounds in 1999.

On- and Off-site Releases, 1988 and 1995–1999

Table 5–7 summarizes original-industry data for the chemicals that have been reportable since 1988. Between 1988 and 1999, total on- and off-site releases decreased from 3.21 billion pounds to 1.75 billion pounds, a decline of 1.46 billion pounds, or 45.5 percent. The chemical manufacturing industry showed the largest absolute reduction, from 879.2 million pounds in 1988 to 384.5 million pounds in 1999, a decrease of 494.7 million pounds. This amounted to a reduction of 56.3 percent over the period. Only two other industry groups reported reductions of more than 100 million pounds each between 1988 and 1999. Releases from the "multiple-codes" group fell from 303.2 million pounds to 87.4 million pounds, a decrease of 215.7 million pounds, or 71.2 percent. For transportation equipment, the decrease was from 213.7 million pounds to 98.4 million pounds, a drop of 115.3 million pounds, or 54.0 percent.

Only one industry, food products, recorded an increase over the period 1988–1999 period. Reported releases from the industry declined slightly between 1988 and 1995, from 7.0 million pounds to 6.8 million pounds. They then rose to 21.5 million pounds in 1998 before falling to 11.3 million pounds in 1999. The reduction between 1998 and 1999 was 10.2 million pounds, or 47.5 percent, but over the whole 11-year period, releases rose 4.3 million pounds, or 62.0 percent.

TRI Chemicals Managed in Waste, 2000–2001 Projected, 1995–1998, and 1991–1998

Projected Quantities of TRI Chemicals Managed in Waste, 2000–2001

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. TRI facilities projected a 1.4 percent increase between 1999 and 2001 in production-related waste managed, from 23.10 billion pounds to 23.42 billion pounds in 2001, as shown in Table 5–8. The amount was expected to decrease by 2.6 percent in 2000,

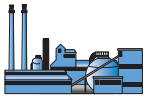


Table 5–7. TRI On-site and Off-site Releases, Original Industries, by Industry, 1988, 1995 and 1998–1999

SIC Code	Industry	Total On-site and Off-site Releases							
		1988	1995	1998	1999	Change 1998-1999		Change 1988-1999	
		Pounds	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20	Food	6,960,051	6,754,069	21,466,772	11,273,723	–10,193,049	–47.5	4,313,672	62.0
21	Tobacco	214,464	142,916	185,062	184,056	–1,006	–0.5	–30,408	–14.2
22	Textiles	36,798,254	15,917,509	10,256,849	7,917,290	–2,339,559	–22.8	–28,880,964	–78.5
23	Apparel	951,662	1,260,746	385,716	253,708	–132,008	–34.2	–697,954	–73.3
24	Lumber	32,846,967	31,372,956	31,907,744	32,719,762	812,018	2.5	–127,205	–0.4
25	Furniture	62,179,772	42,412,333	16,959,377	15,142,464	–1,816,913	–10.7	–47,037,308	–75.6
26	Paper	205,183,152	181,146,959	177,493,380	171,397,840	–6,095,540	–3.4	–33,785,312	–16.5
27	Printing	56,534,465	31,055,847	22,305,321	20,470,554	–1,834,767	–8.2	–36,063,911	–63.8
28	Chemicals	879,178,871	519,013,264	398,204,669	384,494,232	–13,710,437	–3.4	–494,684,639	–56.3
29	Petroleum	73,910,911	42,426,955	41,861,646	36,645,595	–5,216,051	–12.5	–37,265,316	–50.4
30	Plastics	160,548,761	114,713,683	99,360,082	93,220,822	–6,139,260	–6.2	–67,327,939	–41.9
31	Leather	10,089,020	4,418,337	4,266,247	3,797,296	–468,951	–11.0	–6,291,724	–62.4
32	Stone/Clay/Glass	37,871,123	21,906,899	29,118,229	27,357,696	–1,760,533	–6.0	–10,513,427	–27.8
33	Primary Metals	645,267,231	495,104,404	632,926,129	592,574,218	–40,351,911	–6.4	–52,693,013	–8.2
34	Fabricated Metals	159,981,808	95,153,392	80,075,950	74,904,189	–5,171,761	–6.5	–85,077,619	–53.2
35	Machinery	70,769,700	23,874,525	16,730,015	12,920,306	–3,809,709	–22.8	–57,849,394	–81.7
36	Electrical Equip.	128,704,186	31,699,285	23,260,595	29,980,664	6,720,069	28.9	–98,723,522	–76.7
37	Transportation Equip.	213,723,723	116,972,513	96,258,909	98,375,540	2,116,631	2.2	–115,348,183	–54.0
38	Measure/Photo.	56,725,985	12,564,459	6,939,168	5,861,067	–1,078,101	–15.5	–50,864,918	–89.7
39	Miscellaneous	31,785,682	13,390,926	9,968,642	9,607,043	–361,599	–3.6	–22,178,639	–69.8
	Multiple codes 20–39	303,164,914	123,464,135	88,752,495	87,446,724	–1,305,771	–1.5	–215,718,190	–71.2
	No codes 20–39	39,707,366	12,870,367	4,515,968	33,186,396	28,670,428	634.9	–6,520,970	–16.4
	Total	**3,213,098,068**	**1,937,636,479**	**1,813,198,965**	**1,749,731,185**	**-63,467,780**	**-3.5**	**-1,463,366,883**	**-45.5**

Note: Does not include delisted chemicals, chemicals added in 1990, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid and sulfuric acid. **On-site Releases** are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total release amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total releases for manganese compounds from 5,584,900 pounds to below 500 pounds.

to 22.50 billion pounds, before rising again. Of the five industry groups that had total releases exceeding 1 billion pounds in 1999, reductions were projected for chemical manufacturing, paper products, and petroleum refining, and increases were projected for the primary metals industry and the "multiple-codes" group.

Primary metals was the industry with the largest projected absolute increase, from 3.52 billion pounds in 1999 to 3.68 billion pounds in 2001, a rise of 167.8 million pounds. Although the amount of production-related waste for this industry was expected to dip in 2000, to 3.50 billion pounds, overall growth for the 1999–2001 period was expected to be 4.8 percent. The next-largest absolute increase projected was

for the food industry, which reported 945.5 million pounds of production-related waste in 1999. The amount was projected to grow by 1.2 percent by 2000, to 956.5 million pounds, but then to jump to 1.37 billion pounds by 2001. The increase of 421.8 million pounds over the 1999–2001 period would represent a rise of 44.6 percent.

The printing industry would experience the third-largest increase in production-related waste, nearly 57 million pounds. The growth from 318.1 million pounds in 1999 to 374.9 million pounds in 2001 would amount to an increase of 17.8 percent. The "multiple-codes" group was expected to see a rise of almost 34 million pounds in production-related waste, from 1.05 billion pounds to 1.08 billion pounds, an increase of 3.2 percent. The increase for electrical equipment industry was projected to be nearly 34 million pounds, from 711.4 million pounds to 745.3 million pounds, a rise of 4.8 percent. For transportation equipment, an increase of almost 12 million pounds was projected, from 306.8 million pounds to 318.7 million pounds, or 3.9 percent. Smaller increases, of less than 10 million pounds, were expected for four other industries.

Other industry groups expected to reduce their production-related waste between 1999 and 2001. The projected declines were more than 10 million pounds for several industries including paper manufacturing, plastics, and fabricated metals.

Production-related waste managed by the paper manufacturing industry was projected to fall from 1.59 billion pounds in 1999 to 1.53 billion pounds in 2001, a difference of 58.6 million pounds, or 3.7 percent. For plastics, the decrease was expected to be 20.6 million pounds, from 246.1 million pounds in 1999 to 225.5 million pounds in 2001, a decline of 8.4 percent.

Quantities of TRI Chemicals in Waste, 1995–1999

As shown in Table 5–9, facilities in the original TRI industries reported managing 22.54 billion pounds of production-related waste in 1995 and 23.10 billion pounds in 1999. The chemical manufacturing industry reported the largest absolute increase during the 1995–1999 period, from 9.53 billion pounds to 11.14 billion pounds, a rise of 1.61 billion pounds, or 16.9 percent. Second was the food products industry, which reported an increase of 808.7 million pounds, from 136.8 million pounds in 1995 to 945.5 million pounds in 1999. The increase amounted to 591.1 percent, the largest percentage change for any of the industries listed. A distant third was the petroleum industry, which reported an increase of 252.8 million pounds, from 947.3 million pounds in 1995 to 1.20 billion pounds in 1999, or 26.7 percent. No other industry reported an increase of more than 30 million pounds for the period.

The "multiple-codes" group (forms reporting more than one two-digit SIC code) recorded the largest absolute reduction in total production-related waste between 1995 and 1999. This group's forms reported 1.83 billion pounds in 1995 and 1.05 billion pounds in 1999, a decrease of 781.9 million pounds, or 42.7 percent. The primary metals industry had the second largest decrease, 591.9 million pounds, from 4.11 billion pounds in 1995 to 3.52 billion pounds in 1999. This represented a decline of 14.4 percent. Third in absolute reductions was the plastics industry, with a decrease of 296.5 million pounds. The drop

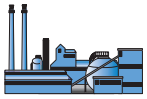


Table 5-8. Current Year and Projected Quantities of TRI Chemicals in Waste, Original Industries, by Industry, 1999-2001

SIC Code	Industry	Total Production-related Waste Managed				
			Projected			
		Current Year 1999	2000	2001	Change 1999-2000	Change 1999-2001
		Pounds	Pounds	Pounds	Percent	Percent
20	Food	945,458,744	956,515,862	1,367,304,781	1.2	44.6
21	Tobacco	5,044,066	4,807,872	4,827,989	–4.7	–4.3
22	Textiles	41,320,670	41,149,755	40,589,771	–0.4	–1.8
23	Apparel	1,712,023	1,727,507	1,737,624	0.9	1.5
24	Lumber	59,641,962	58,202,427	60,615,351	–2.4	1.6
25	Furniture	27,711,017	23,275,568	22,799,387	–16.0	–17.7
26	Paper	1,590,696,876	1,538,649,164	1,532,075,751	–3.3	–3.7
27	Printing	318,114,885	346,667,189	374,877,662	9.0	17.8
28	Chemicals	11,137,414,942	10,788,253,237	10,925,205,928	–3.1	–1.9
29	Petroleum	1,200,126,709	1,039,457,214	1,124,560,749	–13.4	–6.3
30	Plastics	246,086,048	230,182,484	225,454,098	–6.5	–8.4
31	Leather	14,477,133	14,211,729	13,918,647	–1.8	–3.9
32	Stone/Clay/Glass	889,183,760	885,032,733	893,848,610	–0.5	0.5
33	Primary Metals	3,515,901,800	3,496,898,737	3,683,729,325	–0.5	4.8
34	Fabricated Metals	735,169,413	729,182,579	722,185,557	–0.8	–1.8
35	Machinery	121,058,961	116,168,073	119,756,792	–4.0	–1.1
36	Electrical Equip.	711,414,954	716,988,656	745,284,087	0.8	4.8
37	Transportation Equip.	306,798,452	313,721,088	318,679,702	2.3	3.9
38	Measure/Photo.	70,670,146	70,506,601	70,856,667	–0.2	0.3
39	Miscellaneous	49,032,262	47,209,916	46,433,310	–3.7	–5.3
	Multiple codes 20–39	1,050,368,336	1,041,428,186	1,084,287,153	–0.9	3.2
	No codes 20–39	61,376,706	43,852,910	44,164,047	–28.6	–28.0
	Total	**23,098,779,865**	**22,504,089,487**	**23,423,192,988**	**-2.6**	**1.4**

Note: Data are from Section 8 (Total of 8.1 through 8.7) of Form R for 1999. Current Year is Column B, 2000 is Column C and 2001 is Column D. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total production-related waste amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total production-related waste for manganese compounds from 5,584,900 pounds to below 500 pounds.

from 542.6 million pounds in 1995 to 246.1 million pounds in 1999 amounted to a decline of 54.6 percent, the highest percentage decrease among the original industries.

Quantities of TRI Chemicals in Waste, 1991 and 1995–1998

As shown in Table 5–10, total production-related waste managed rose from 17.91 billion pounds in 1991 to 18.83 billion pounds in 1999, a 5.1 percent increase. This analysis addresses only the chemicals that were reportable in all years, 1991 to 1999.

The "multiple-codes" group reported the largest absolute reduction in total production-related waste managed. This group's forms totaled 1.91 billion pounds of production-related waste in 1991 and 877.0 million pounds in 1999. The reduction of

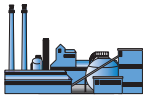
about 1.04 billion pounds represented a decrease of more than half, 54.2 percent. The plastics industry also reduced its production-related waste by more than half, 53.5 percent. With a drop of 252.3 million pounds between 1991 and 1999—from 471.4 million pounds in 1991 to 219.0 million pounds in 1999—the plastics industry ranked second in absolute reductions.

The petroleum industry ranked third in reductions; its production-related waste decreased from 1.17 billion pounds in 1991 to 989.8 million pounds in 1999. The total decrease of 177.2 million pounds over the period amounted to a 15.2 percent reduction. Between 1995 and 1999, however, the industry's production-related waste rose from 815.0 million pounds to 989.8 million

Table 5-9. Total Production-related Waste Managed, Original Industries, by Industry, 1995 and 1998–1999

SIC Code	Industry	Total Production-related Waste Managed						
		1995	1998	1999	Change 1998-1999		Change 1995-1999	
		Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20	Food	136,806,075	1,304,299,754	945,458,744	–358,841,010	–27.5	808,652,669	591.1
21	Tobacco	3,061,366	5,897,772	5,044,066	–853,706	–14.5	1,982,700	64.8
22	Textiles	55,150,811	49,340,819	41,320,670	–8,020,149	–16.3	–13,830,141	–25.1
23	Apparel	2,161,558	1,820,495	1,712,023	–108,472	–6.0	–449,535	–20.8
24	Lumber	112,361,152	62,637,123	59,641,962	–2,995,161	–4.8	–52,719,190	–46.9
25	Furniture	60,757,162	32,459,439	27,711,017	–4,748,422	–14.6	–33,046,145	–54.4
26	Paper	1,758,412,836	1,479,054,323	1,590,696,876	111,642,553	7.5	–167,715,960	–9.5
27	Printing	294,766,213	300,492,121	318,114,885	17,622,764	5.9	23,348,672	7.9
28	Chemicals	9,531,248,520	10,658,457,726	11,137,414,942	478,957,216	4.5	1,606,166,422	16.9
29	Petroleum	947,285,622	1,038,746,885	1,200,126,709	161,379,824	15.5	252,841,087	26.7
30	Plastics	542,626,137	262,371,142	246,086,048	–16,285,094	–6.2	–296,540,089	–54.6
31	Leather	10,331,453	10,755,703	14,477,133	3,721,430	34.6	4,145,680	40.1
32	Stone/Clay/Glass	863,902,116	796,266,984	889,183,760	92,916,776	11.7	25,281,644	2.9
33	Primary Metals	4,107,828,450	3,599,576,930	3,515,901,800	–83,675,130	–2.3	–591,926,650	–14.4
34	Fabricated Metals	764,447,335	713,661,894	735,169,413	21,507,519	3.0	–29,277,922	–3.8
35	Machinery	170,690,285	146,965,583	121,058,961	–25,906,622	–17.6	–49,631,324	–29.1
36	Electrical Equip.	695,872,529	781,666,242	711,414,954	–70,251,288	–9.0	15,542,425	2.2
37	Transportation Equip.	399,130,504	297,514,311	306,798,452	9,284,141	3.1	–92,332,052	–23.1
38	Measure/Photo.	79,445,972	74,842,678	70,670,146	–4,172,532	–5.6	–8,775,826	–11.0
39	Miscellaneous	52,389,911	50,947,108	49,032,262	–1,914,846	–3.8	–3,357,649	–6.4
	Multiple codes 20–39	1,832,303,176	1,076,773,946	1,050,368,336	–26,405,610	–2.5	–781,934,840	–42.7
	No codes 20–39	115,180,667	30,876,676	61,376,706	30,500,030	98.8	–53,803,961	–46.7
	Total	**22,536,159,850**	**22,775,425,654**	**23,098,779,865**	**323,354,211**	**1.4**	**562,620,015**	**2.5**

Note: Data are from Section 8 (total of 8.1 through 8.7) of Form R of year indicated. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total production-related waste amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total production-related waste for manganese compounds from 5,584,900 pounds to below 500 pounds.
Seven facilities in the food processing industry (SIC code 20) reported from 150 million pounds to 1 billion pounds each in on-site recycling of n-hexane in 1995, for a total of 4.0 billion pounds. In 1996 these facilities reported no on-site recycling of n-hexane. On their 1996 Form Rs, these facilities also reported zero for on-site recycling of n-hexane for the prior year (1995). However, they have not revised their 1995 form. These amounts of on-site recycling in 1995 have been omitted from this table.



pounds, increasing 16.1 percent in the last year.

Between 1991 and 1999, other industries reported decreases of more than 100 million pounds including machinery (a decline of 152.3 million pounds, or 58.1 percent) and the stone, clay, glass, and concrete group (a decrease of 126.0 million pounds, or 12.9 percent).

The largest absolute increase in production-related waste between 1991 and 1999—about 2.10 billion pounds—was reported by the chemical manufacturing industry. Its total rose from 6.86 billion pounds to 8.95 billion pounds, an increase of 30.3 percent. The primary metals industry had the second-largest increase, about 838.3 million pounds. Its production-related waste rose from 2.32 billion pounds in 1991 to 3.16 billion pounds in 1999, a 36.2 percent

Table 5–10. Total Production-related Waste Managed, Original Industries, by Industry, 1991, 1995 and 1998–1999

SIC Code	Industry	Total Production-related Waste Managed							
		1991	1995	1998	1999	Change 1998-1999		Change 1991-1999	
		Pounds	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20	Food	34,030,866	54,870,869	85,307,686	66,123,801	–19,183,885	–22.5	32,092,935	94.3
21	Tobacco	51,388,971	169,261	193,470	185,491	–7,979	–4.1	–51,203,480	–99.6
22	Textiles	46,542,986	44,062,387	42,525,705	35,426,982	–7,098,723	–16.7	–11,116,004	–23.9
23	Apparel	2,284,692	2,106,759	1,632,105	1,398,157	–233,948	–14.3	–886,535	–38.8
24	Lumber	59,992,495	108,841,005	60,012,518	56,835,760	–3,176,758	–5.3	–3,156,735	–5.3
25	Furniture	61,297,883	60,041,328	31,977,087	27,350,378	–4,626,709	–14.5	–33,947,505	–55.4
26	Paper	1,381,526,976	1,309,311,403	1,282,125,764	1,392,598,205	110,472,441	8.6	11,071,229	0.8
27	Printing	258,847,784	291,431,644	299,229,547	316,166,258	16,936,711	5.7	57,318,474	22.1
28	Chemicals	6,864,419,809	7,308,331,935	8,494,597,668	8,946,237,562	451,639,894	5.3	2,081,817,753	30.3
29	Petroleum	1,166,992,745	814,951,500	852,228,535	989,803,680	137,575,145	16.1	–177,189,065	–15.2
30	Plastics	471,361,440	498,338,513	233,487,822	219,020,288	–14,467,534	–6.2	–252,341,152	–53.5
31	Leather	17,878,399	7,025,037	6,357,174	10,884,687	4,527,513	71.2	–6,993,712	–39.1
32	Stone/Clay/Glass	973,517,811	839,829,747	758,453,750	847,543,492	89,089,742	11.7	–125,974,319	–12.9
33	Primary Metals	2,318,461,645	3,174,533,241	3,248,311,739	3,156,767,694	–91,544,045	–2.8	838,306,049	36.2
34	Fabricated Metals	577,710,938	674,521,043	669,846,491	692,674,442	22,827,951	3.4	114,963,504	19.9
35	Machinery	261,885,615	156,608,789	134,952,542	109,627,942	–25,324,600	–18.8	–152,257,673	–58.1
36	Electrical Equip.	672,688,221	584,251,230	674,122,398	630,274,036	–43,848,362	–6.5	–42,414,185	–6.3
37	Transportation Equip.	378,444,124	374,408,086	278,070,502	289,166,623	11,096,121	4.0	–89,277,501	–23.6
38	Measure/Photo.	116,365,141	69,734,482	62,842,869	59,143,750	–3,699,119	–5.9	–57,221,391	–49.2
39	Miscellaneous	67,562,403	49,482,747	48,058,590	46,359,139	–1,699,451	–3.5	–21,203,264	–31.4
	Multiple codes 20–39	1,914,546,773	1,271,967,092	869,100,658	876,956,089	7,855,431	0.9	–1,037,590,684	–54.2
	No codes 20–39	208,496,326	107,152,545	25,629,796	55,558,337	29,928,541	116.8	–152,937,989	–73.4
	Total	**17,906,244,043**	**17,801,970,643**	**18,159,064,416**	**18,826,102,793**	**667,038,377**	**3.7**	**919,858,750**	**5.1**

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid and sulfuric acid. Data are from Section 8 (total of 8.1 through 8.7) of Form R of year indicated. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's total production-related waste amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total production-related waste for manganese compounds from 5,584,900 pounds to below 500 pounds.

increase. In the last year, however, the total decreased by 2.8 percent. The fabricated metals industry had the third largest absolute increase, reporting 577.7 million pounds in 1991 and 692.7 million pounds in 1999. The rise of 115.0 million pounds amounted to a 19.9 percent increase in production-related waste. No other original industry reported an increase of more than 100 million pounds.

Economic Overview, by Industry, Multi-Year Comparisons

U.S. economic expansion continued in 1999, with 4.2 percent real growth (adjusted for inflation) in gross domestic product (*Economic Report of the President*, January 2001). As shown in Table 5–11, manufacturing production also continued to increase, for all industry groups except tobacco, leather, printing, fabricated metals, and textiles.

Table 5–11 presents production indexes for each industrial sector from 1991 to 1999. During this period, production increased 47.9 percent for U.S. manufacturing overall. Table 5–12 compares the change in manufacturing production since 1991 with the change in TRI quantities released on- and off-site and in TRI total production-related waste managed. As shown in Table 5–12, the quantity released on- and off-site steadily decreased (except for a very small increase between 1996 and 1997), even as manufacturing production expanded. Overall, while production rose 47.9 percent, TRI facilities reported a decrease of 28.3 percent in quantity released on- and off-site since 1991. Although the total quantity of production-related waste that facilities managed rose, by 5.1 percent, the overall increase was considerably smaller than the nation's increase in manufacturing production. While manufacturing production steadily increased from 1991 to 1999, for a gain of 47.9 percent over the period, TRI production-related waste decreased in about half of the years. Increases in 1994, 1997, 1998 and 1999, however, led to an overall increase for the period.

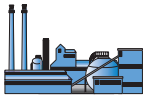


Table 5–11. Industrial Production Indexes by Industry, 1991–1999

		1991	1992	1993	1994	1995	1996	1997	1998	1999
Total Index		100.0	103.1	106.6	112.5	117.9	123.1	131.0	136.5	141.3
Manufacturing		100.0	104.0	107.8	114.3	120.4	126.1	135.2	141.8	147.9
SIC Code	**Industry**									
20	Food	100.0	101.6	103.7	105.4	107.5	107.1	109.6	111.1	111.9
21	Tobacco	100.0	101.1	85.0	105.6	113.0	114.8	114.2	107.4	95.3
22	Textiles	100.0	107.9	113.6	119.3	118.9	117.3	120.7	119.6	119.6
23	Apparel	NA	NA	NA	NA	NA	NA	NA	NA	NA
24	Lumber	100.0	105.8	106.7	112.1	114.2	116.5	121.7	125.4	128.7
25	Furniture	100.0	105.5	110.7	114.0	117.5	119.3	124.5	128.7	132.4
26	Paper	100.0	103.3	107.4	112.0	113.2	112.4	118.1	118.7	120.0
27	Printing	100.0	100.9	101.6	101.6	102.2	102.2	106.2	106.1	105.3
28	Chemicals	100.0	103.7	105.4	108.7	111.4	113.9	118.9	119.4	121.9
29	Petroleum	100.0	100.9	103.8	103.6	105.4	107.8	111.8	114.3	115.7
30	Plastics	100.0	110.3	117.9	128.4	132.0	135.9	141.6	146.9	151.8
31	Leather	100.0	101.6	102.6	95.1	88.3	88.9	85.0	78.4	70.9
32	Stone/clay/glass	100.0	102.9	105.0	111.0	114.3	117.9	124.0	NA	NA
33	Primary metals	100.0	103.4	108.7	117.7	120.2	123.7	131.0	129.9	130.9
34	Fabricated metals	100.0	104.0	108.5	116.6	121.0	124.9	131.1	133.9	133.8
35	Machinery	100.0	104.8	115.4	131.7	150.6	167.3	186.9	216.4	241.2
36	Electrical Equip.	100.0	111.6	122.1	145.6	184.9	230.6	290.2	351.7	435.5
37	Transportation Equip.	100.0	103.6	107.3	111.4	110.6	111.5	121.3	126.0	126.8
38	Measure/Photo.	100.0	100.2	101.0	100.0	103.8	107.8	109.8	112.8	116.7
39	Miscellaneous	100.0	101.6	107.4	111.8	115.5	120.7	127.9	NA	NA

Note: From *2000 Statistical Abstract of the United States*, No. 1238. *Industrial Production Indexes, by Industry*: 1990 to 1999 (<http://www.census.gov/prod/www/statistical-abstract-us.html>, accessed February 24, 2001).
NA—data not provided.

Table 5–12. Cumulative Change in Manufacturing Production and in TRI Quantities in Waste Managed, 1991–1999

	1991–1992	1992–1993	1993–1994	1994–1995	1995–1996	1996–1997	1997–1998	1998–1999
Manufacturing Production	4.0	3.8	6.5	6.0	5.7	9.1	6.5	6.1
TRI Quantity Released On- and Off-site	–8.5	–7.6	–1.1	–3.3	–3.4	0.3	–3.0	–5.5
TRI Total Production-related Waste Managed	–2.4	–0.6	6.6	–3.8	–1.7	2.8	0.9	3.7

Note: From *2000 Statistical Abstract of the United States*, No. 1238. *Industrial Production Indexes, by Industry: 1990 to 1999* (<http://www.census.gov/prod/www/statistical-abstract-us.html>, accessed February 24, 2001).

Appendix A

Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
71751-41-2	*	Abamectin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	1	250	0	0	251	0	251
			98o	3	1	250	0	0	251	0	251
			98n	No reports							
			99o	3	1	250	0	0	251	0	251
			99n	No reports							
30560-19-1	*	Acephate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	2,250	0	0	0	2,250	1,000	3,250
			98o	7	1,775	0	0	0	1,775	0	1,775
			98n	No reports							
			99o	7	645	0	0	0	645	0	645
			99n	No reports							
75-07-0	*,**	Acetaldehyde	88	67	6,951,807	98,236	2,219,105	194,958	9,464,106	24,930	9,489,036
			95	238	13,435,389	227,200	605,886	155,320	14,423,795	1,099	14,424,894
			98o	272	12,657,793	192,606	412,152	21,557	13,284,108	5,901	13,290,009
			98n	5	2,233	0	0	0	2,233	7	2,240
			99o	278	11,943,416	228,291	754,277	11,745	12,937,729	4,215	12,941,944
			99n	5	697	1	0	0	698	179	877
60-35-5	**	Acetamide	88	1	0	0	0	0	0	250	250
			95	5	8	0	920,000	0	920,008	0	920,008
			98o	9	106	1	2,157,694	0	2,157,801	0	2,157,801
			98n	3	63	0	0	25,474	25,537	10	25,547
			99o	10	107	1	2,452,733	0	2,452,841	0	2,452,841
			99n	2	51	0	0	0	51	2	53
75-05-8		Acetonitrile	88	67	2,194,739	42,223	16,739,010	1,790	18,977,762	416,333	19,394,095
			95	89	1,038,942	7,324	30,336,181	12	31,382,459	10,971	31,393,430
			98o	110	1,029,234	28,862	20,733,190	33	21,791,319	35,073	21,826,392
			98n	22	4,406	0	1,240,903	0	1,245,309	29,981	1,275,290
			99o	111	877,756	14,031	19,487,584	223	20,379,594	658,202	21,037,796
			99n	23	4,907	1	49,874	0	54,782	53,815	108,597
98-86-2	*	Acetophenone	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	39	205,888	971	629,201	3,369	839,429	19,427	858,856
			98o	46	138,515	655	732,358	0	871,528	49,744	921,272
			98n	6	33,106	0	1,649	0	34,755	0	34,755
			99o	43	178,003	699	627,563	0	806,265	35,156	841,421
			99n	5	5	1	62,265	0	62,271	4	62,275
53-96-3		2-Acetylaminofluorene	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	110	0	0	8,500	8,610	1,205	9,815
			99o	No reports							
			99n	4	139	1	0	38,197	38,337	20,648	58,985

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Abamectin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	6,425	10,152	29	16,606	0
		98o	0	0	0	0	6,230	4,165	28	10,423	0
		98n	No reports								
		99o	0	0	0	0	4,918	3,589	23	8,530	0
		99n	No reports								
*	Acephate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	10	0	0	0	183,000	15,728	1,409	200,147	0
		98o	90	0	0	0	9,800	12,683	2,186	24,759	0
		98n	No reports								
		99o	70	0	0	0	7,500	17,922	426	25,918	1
		99n	No reports								
*,**	Acetaldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	10,000	32,190	9,239,285	358,459	14,510,964	1,755,026	14,441,699	40,347,623	1,691
		98o	14,000	694	10,275,584	266,784	17,029,181	1,672,903	13,358,695	42,617,841	1,174
		98n	0	0	0	12,964,868	166,000	45	2,281	13,133,194	1
		99o	17,183	1,460	14,573,471	245,738	23,464,460	1,431,358	13,055,672	52,789,342	139
		99n	0	0	130	0	256,700	0	875	257,705	1
**	Acetamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	1,000	0	0	130	920,000	921,130	0
		98o	0	0	81,220	40,954	2	362	2,157,761	2,280,299	0
		98n	0	0	0	21,133	90,561	0	25,547	137,241	1
		99o	0	0	80,637	44,923	2	575	2,452,836	2,578,973	0
		99n	0	0	0	0	166,642	0	53	166,695	0
	Acetonitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,309,962	2,071,150	23,162,787	4,704,330	11,104,608	5,742,679	31,934,516	82,030,032	1,076
		98o	12,941,704	1,880,831	20,414,930	7,032,353	19,270,706	7,630,788	22,923,308	92,094,620	1,030
		98n	196,874	0	5,904	4,526,522	1,973,227	371,049	1,275,755	8,349,331	1
		99o	12,141,069	2,000,134	41,499,091	7,788,191	20,402,846	8,480,280	21,189,784	113,501,395	66
		99n	515,017	0	34,700	5,257,192	2,844,093	93,449	59,490	8,803,941	11
*	Acetophenone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	920,000	9,710	24,949,642	1,171,212	1,313,510	185,062	886,541	29,435,677	519
		98o	0	3,448	32,071,882	1,355,425	719,096	161,672	929,213	35,240,736	0
		98n	0	0	0	59,772	137,644	0	34,752	232,168	1
		99o	0	3,683	33,367,740	1,435,519	866,050	178,690	858,798	36,710,480	8
		99n	0	0	0	0	95,167	0	62,048	157,215	0
	2-Acetylaminofluorene	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	310	41	9,800	10,151	0
		99o	No reports								
		99n	0	0	0	0	99,902	0	58,981	158,883	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases					Off-site Releases	Total On- and Off-site Releases
					Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Transfers Off-site to Disposal	
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
62476-59-9	*	Acifluorfen, sodium salt	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	60	5	0	5	70	0	70
			98o	4	476	2,193	0	17	2,686	421,514	424,200
			98n	No reports							
			99o	4	315	4,757	0	0	5,072	222,680	227,752
			99n	No reports							
107-02-8	*	Acrolein	88	12	33,652	0	68,950	500	103,102	0	103,102
			95	21	71,302	4	83,465	0	154,771	0	154,771
			98o	29	184,134	270	95,900	1,351	281,655	665	282,320
			98n	No reports							
			99o	30	204,777	255	170,950	429	376,411	139	376,550
			98n	No reports							
79-06-1	*,**	Acrylamide	88	59	26,019	3,124	2,198,000	756	2,227,899	97,582	2,325,481
			95	82	19,083	1,801	6,279,626	235	6,300,745	3,083	6,303,828
			98o	78	23,349	2,272	6,333,564	0	6,359,185	6,789	6,365,974
			98n	7	129	0	0	0	129	172	301
			99o	80	22,458	369	7,510,853	22	7,533,702	2,224	7,535,926
			99n	10	2,416	1	0	6,267	8,684	3,920	12,604
79-10-7		Acrylic acid	88	158	800,046	16,646	22,262,010	15,950	23,094,652	134,139	23,228,791
			95	189	528,058	2,648	7,840,000	47	8,370,753	45,395	8,416,148
			98o	195	322,224	6,973	4,499,600	79	4,828,876	81,666	4,910,542
			98n	14	368	0	44	48,617	49,029	5,995	55,024
			99o	199	366,380	6,734	2,630,949	1,030	3,005,093	219,423	3,224,516
			99n	11	158	1	0	0	159	688	847
107-13-1	*,**	Acrylonitrile	88	113	4,796,161	6,531	4,562,713	2,150	9,367,555	151,450	9,519,005
			95	105	1,532,128	7,137	5,193,028	618	6,732,911	4,917	6,737,828
			98o	105	1,152,724	1,100	4,005,290	321	5,159,435	8,156	5,167,591
			98n	11	1,264	0	0	0	1,264	917	2,181
			99o	104	978,026	1,172	4,462,492	560	5,442,250	84,849	5,527,099
			99n	13	1,015	1	0	23,244	24,260	13,570	37,830
15972-60-8	*	Alachlor	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	756	280	0	0	1,036	2,940	3,976
			98o	2	1,510	220	0	0	1,730	9,100	10,830
			98n	3	54	0	0	0	54	613	667
			99o	2	755	390	0	0	1,145	1,270	2,415
			99n	3	42	0	0	0	42	655	697
116-06-3	*	Aldicarb	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	3,477	0	0	6	3,483	0	3,483
			98o	3	154	0	0	15	169	0	169
			98n	2	1	0	0	0	1	0	1
			99o	3	171	0	0	256	427	0	427
			99n	3	6	0	0	0	6	156	162

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Acifluorfen, sodium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	salt	95	0	0	0	0	600	1,272	65	1,937	0
		98o	0	0	0	0	13,105	3,237	423,965	440,307	0
		98n	No reports								
		99o	0	0	0	0	45,498	1,891	227,507	274,896	0
		99n	No reports								
*	Acrolein	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,800	0	3,752,847	43,323	5,168,260	11,361	154,579	9,135,170	86
		98o	0	0	3,712,551	38,933	16,430,612	12	278,469	20,460,577	194
		98n	No reports								
		99o	0	0	4,878,507	176,954	8,581,456	211	365,014	14,002,142	16
		98n	No reports								
*,**	Acrylamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,037	0	820	43,304	187,170	210,284	6,305,564	6,751,179	3,985
		98o	162	144	90,200	6,627	160,009	311,267	6,363,850	6,932,259	49,724
		98n	0	0	0	228,142	62,489	0	291	290,922	1
		99o	3	0	94,233	9,777	134,468	234,039	7,536,297	8,008,817	2
		99n	0	0	0	51,885	148,301	45,117	10,310	255,613	0
	Acrylic acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,339,863	34,800	26,544,419	5,033,613	26,801,813	471,136	8,407,802	70,633,446	3,411
		98o	4,863,156	0	31,350,455	5,916,104	24,168,363	2,077,125	4,895,656	73,270,859	6,994
		98n	0	101,540	1,605	659,051	452,945	9,417	63,584	1,288,142	1
		99o	4,680,911	120	20,851,955	6,323,120	32,320,082	1,201,617	3,235,863	68,613,668	111,055
		99n	0	52,100	1,323	37,623	1,082,263	89	697	1,174,095	1
*,**	Acrylonitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	12,408,043	69,716	3,326,652	666,245	10,647,695	1,131,550	6,769,787	35,019,688	8,110
		98o	12,827,695	190	4,841,082	158,067	10,880,197	872,541	5,135,764	34,715,536	1,573
		98n	0	0	0	24,762	433,873	1,519,681	2,043	1,980,359	0
		99o	12,435,645	0	3,909,625	211,021	11,415,674	1,743,040	8,476,594	38,191,599	81,964
		99n	0	0	0	52,049	766,904	16,283	36,383	871,619	0
*	Alachlor	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	5,481	120,000	217,179	3,930	346,590	30,000
		98o	0	0	0	0	17,300	181,800	10,830	209,930	0
		98n	0	0	0	0	64,944	0	183	65,127	0
		99o	0	0	0	0	11,000	139,100	2,401	152,501	0
		99n	0	0	0	0	261,537	0	197	261,734	0
*	Aldicarb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	580	20,011	3,472	24,063	1
		98o	0	0	0	0	502	40,611	149	41,262	10
		98n	0	0	0	0	16,633	0	1	16,634	0
		99o	0	0	0	0	376	19,953	166	20,495	0
		99n	0	0	0	0	170,879	0	162	171,041	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
309-00-2	*	Aldrin	88	No reports							
			95	No reports							
			98o	No reports							
			98n	3	307	7	0	22,000	22,314	3,308	25,622
			99o	No reports							
			99n	1	0	0	0	0	0	0	0
28057-48-9		d-trans-Allethrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
107-18-6	*	Allyl alcohol	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	31	168,141	6,519	298,801	1,100	474,561	11,296	485,857
			98o	32	262,353	9,688	424,120	0	696,161	16	696,177
			98n	4	111	0	39,734	0	39,845	0	39,845
			99o	29	263,169	5,041	595,114	755	864,079	28	864,107
			99n	5	520	0	4,832	0	5,352	16,195	21,547
107-11-9		Allylamine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	2	951	40	0	0	991	0	991
			98n	1	0	0	0	0	0	0	0
			99o	2	1,040	450	0	0	1,490	0	1,490
			99n	1	0	0	0	0	0	0	0
107-05-1		Allyl chloride	88	20	149,369	430	250	200	150,249	747	150,996
			95	21	52,698	95	0	481	53,274	13	53,287
			98o	24	70,809	5	0	2	70,816	860	71,676
			98n	2	91	0	0	0	91	864	955
			99o	27	79,237	25	0	0	79,262	1,586	80,848
			99n	3	253	1	0	8,189	8,443	4,526	12,969
7429-90-5	*	Aluminum	88	357	3,681,998	91,518	250	3,177,625	6,951,391	14,482,254	21,433,645
		(fume or dust)	95	330	1,976,660	36,979	250	1,872,773	3,886,662	6,293,022	10,179,684
			98o	321	1,302,266	3,618	0	1,907,917	3,213,801	6,802,860	10,016,661
			98n	17	109,949	0	5	3,752,538	3,862,492	41,326	3,903,818
			99o	333	5,634,715	4,753	0	1,346,058	6,985,526	13,809,568	20,795,094
			99n	12	1,144,097	0	0	4,283,907	5,428,004	18,368	5,446,372
1344-28-1		Aluminum oxide	88	NR	NR	NR	NR	NR	NR	NR	NR
		(fibrous forms)	95	60	133,416	2,805	0	593,000	729,221	4,499,941	5,229,162
			98o	54	26,665	750	0	46,575	73,990	2,936,026	3,010,016
			98n	12	285	0	0	15,572,355	15,572,640	141,030	15,713,670
			99o	50	112,241	756	0	55,341	168,338	2,879,680	3,048,018
			99n	12	338	0	0	30,727,558	30,727,896	347,172	31,075,068

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Aldrin	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	1	77,986	110	26,045	104,142	0
		99o	No reports								
		99n	0	0	0	0	53,598	0	0	53,598	0
	d-trans-Allethrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Allyl alcohol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	189,517	0	1,531,138	363,377	1,414,321	422,499	486,288	4,407,140	133
		98o	248,764	0	1,413,165	1,168,713	1,157,533	173,575	653,664	4,815,414	2
		98n	0	0	0	61,206	76,299	0	39,841	177,346	0
		99o	340,364	0	1,844,591	1,028,462	924,753	133,150	814,620	5,085,940	751
		99n	0	0	0	46,358	3,239,971	61,976	21,540	3,369,845	0
	Allylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	360	0	991	1,351	0
		98n	0	0	0	5	20	0	0	25	0
		99o	0	0	0	0	4,000	0	1,274	5,274	0
		99n	0	0	0	1	0	0	0	1	0
	Allyl chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	520,000	0	186,000	1,756	750,979	412,357	52,568	1,923,660	65
		98o	780,000	68,000	5,349,016	321,228	243,860	194,934	70,054	7,027,092	1
		98n	0	0	0	0	127,076	282	955	128,313	0
		99o	23,000	44,000	157,078	236,934	301,187	648,363	78,649	1,489,211	1,001
		99n	0	0	0	0	192,972	1,090	12,967	207,029	0
*	Aluminum	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(fume or dust)	95	15,378,165	24,327,521	0	164,604	15,628,491	332,192	8,051,958	63,882,931	714
		98o	15,726,178	29,635,638	0	4,267	18,287,637	176,034	9,868,341	73,698,095	29,317
		98n	0	210,000	0	0	226,635	550	3,781,933	4,219,118	10,984
		99o	15,508,535	28,604,288	0	5,058	21,798,263	425,726	19,199,937	85,541,807	25
		99n	1,013,539	0	0	0	289,500	127,156	4,320,550	5,750,745	1
	Aluminum oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(fibrous forms)	95	25,100	15,627	0	9,991	21,448	2,986,600	2,315,726	5,374,492	7
		98o	7,716,545	254,780	0	0	0	1,147,081	2,000,733	11,119,139	3
		98n	102,013	12,691	0	13,033	46,453	552,561	15,725,611	16,452,362	0
		99o	12,612,150	496,257	0	1,111	217	845,798	1,910,982	15,866,515	1
		99n	4	1,731	0	0	909,390	1,205,831	30,944,181	33,061,137	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
20859-73-8	*	Aluminum phosphide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	2	4	0	0	0	4	153	157
834-12-8	*	Ametryn	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	836	83	0	5	924	250	1,174
			98o	5	1,168	51	0	0	1,219	0	1,219
			98n	No reports							
			99o	4	1,460	16	0	0	1,476	0	1,476
			99n	No reports							
60-09-3	**	4-Aminoazobenzene	88	1	0	0	537	0	537	0	537
			95	1	0	0	64	0	64	0	64
			98o	2	0	0	124	0	124	0	124
			98n	No reports							
			99o	2	0	0	287	0	287	0	287
			99n	No reports							
92-67-1	**	4-Aminobiphenyl	88	1	10	0	4	0	14	0	14
			95	1	0	0	2	0	2	0	2
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	13	0	13	0	13
			99n	No reports							
33089-61-1	*	Amitraz	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
61-82-5	*,**	Amitrole	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	2	1	0	0	0	1	0	1
			99o	No reports							
			99n	3	7	1	0	0	8	168	176
7664-41-7	*	Ammonia	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2,940	159,200,954	9,320,538	23,959,031	5,588,138	198,068,661	1,600,225	199,668,886
			98o	2,726	153,291,641	7,383,797	25,647,620	3,268,821	189,591,879	2,017,531	191,609,410
			98n	262	5,756,672	364,668	502,580	1,339,588	7,963,508	29,639	7,993,147
			99o	2,610	144,234,446	7,649,385	25,635,785	2,871,729	180,391,345	3,106,589	183,497,934
			99n	249	6,666,922	268,326	610,000	3,781,015	11,326,263	221,689	11,547,952

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Aluminum phosphide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	66,262	0	28,100	94,362	0
*	Ametryn	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	108,500	12,502	256	121,258	1
		98o	25	0	0	0	120,083	85,000	592	205,700	0
		98n	No reports								
		99o	25	0	0	0	46,079	12,000	801	58,905	0
		99n	No reports								
**	4-Aminoazobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3	0	64	67	0
		98o	0	0	0	0	0	74	124	198	0
		98n	No reports								
		99o	0	0	0	0	0	67	287	354	0
		99n	No reports								
**	4-Aminobiphenyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	91,000	0	2	91,002	0
		98o	0	0	0	0	98,000	810	0	98,810	0
		98n	No reports								
		99o	0	0	0	0	124,926	48	13	124,987	0
		99n	No reports								
*	Amitraz	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*/**	Amitrole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	22,788	0	1	22,789	0
		99o	No reports								
		99n	0	0	0	0	205,239	0	170	205,409	0
*	Ammonia	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	190,464,294	12,036,036	43,263,891	112,865	308,699,468	18,737,292	198,317,491	771,631,337	1,096,464
		98o	342,121,789	10,214,289	103,213,049	150,020	271,591,316	17,260,247	196,040,261	940,590,971	515,621
		98n	7,858,375	1,883	0	97,656	5,093,107	91,284	7,900,197	21,042,502	61,159
		99o	208,384,055	7,750,820	89,129,210	134,609	306,220,697	16,191,460	185,216,055	813,026,906	517,454
		99n	7,480,382	368	0	9,769	6,261,581	173,273	11,526,954	25,452,327	1,639

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
62-53-3	*	Aniline	88	68	712,769	16,105	3,582,975	12,822	4,324,671	346,206	4,670,877
			95	67	200,799	8,943	1,221,381	4,193	1,435,316	21,600	1,456,916
			98o	69	216,517	19,549	1,076,445	252	1,312,763	25,401	1,338,164
			98n	12	696	0	85,466	0	86,162	1,479	87,641
			99o	70	176,497	15,782	533,803	1,013	727,095	55,479	782,574
			99n	10	302	1	0	0	303	344	647
90-04-0	**	o-Anisidine	88	6	2,293	285	0	250	2,828	3	2,831
			95	7	1,031	74	0	0	1,105	3	1,108
			98o	7	1,373	39	0	0	1,412	2	1,414
			98n	No reports							
			99o	7	1,587	14	0	0	1,601	1	1,602
			99n	No reports							
104-94-9		p-Anisidine	88	2	10	250	0	250	510	0	510
			95	2	5	0	0	0	5	0	5
			98o	1	45	0	0	0	45	0	45
			98n	No reports							
			99o	No reports							
			99n	No reports							
120-12-7		Anthracene	88	139	199,823	4,382	0	10,905	215,110	204,665	419,775
			95	70	81,471	4,943	0	939	87,353	48,140	135,493
			98o	69	56,059	580	0	3,564	60,203	69,966	130,169
			98n	3	15	0	0	0	15	0	15
			99o	67	75,827	515	0	3,185	79,527	65,057	144,584
			99n	4	303	0	0	166,319	166,622	7,172	173,794
7440-36-0		Antimony	88	152	69,916	11,114	2,100	903,916	987,046	625,682	1,612,728
			95	134	34,310	6,592	0	18,786	59,688	122,755	182,443
			98o	118	7,015	14,471	0	30,542	52,028	321,459	373,487
			98n	11	78	47	18,994	1,226,450	1,245,569	72,946	1,318,515
			99o	122	9,106	13,411	0	56,885	79,402	331,101	410,503
			99n	6	93	0	0	715,803	715,896	19,118	735,014
--		Antimony compounds	88	272	166,290	31,178	9,200	1,935,018	2,141,686	2,281,080	4,422,766
			95	561	105,476	33,705	11,332	1,598,569	1,749,082	3,425,678	5,174,760
			98o	588	73,626	33,435	11,298	1,242,642	1,361,001	3,524,101	4,885,102
			98n	57	11,794	22,136	170,062	23,472,944	23,676,936	179,968	23,856,904
			99o	581	116,799	31,374	62,911	980,943	1,192,027	3,034,587	4,226,614
			99n	62	14,064	31,354	610,086	27,110,578	27,766,082	373,803	28,139,885
7440-38-2	**	Arsenic	88	78	7,687	1,282	0	181,267	190,236	65,342	255,578
			95	94	7,121	368	0	27,356	34,845	81,878	116,723
			98o	50	16,672	533	0	5,065	22,270	117,860	140,130
			98n	35	40,200	1,334	269,393	76,489,637	76,800,564	194,051	76,994,615
			99o	54	1,257	547	0	76,294	78,098	99,163	177,261
			99n	24	5,547	505	250	35,645,402	35,651,704	393,702	36,045,406

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Aniline	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	7,243,251	0	7,419,516	354,598	3,749,706	1,258,936	1,455,266	21,481,273	1,148
		98o	7,549,987	2	8,579,301	2,940,299	3,611,723	3,537,666	1,358,868	27,577,846	6,698
		98n	0	0	0	17,825	837,519	305,538	86,786	1,247,668	0
		99o	9,876,710	0	7,785,942	2,307,087	3,248,988	3,625,271	769,364	27,613,362	8,993
		99n	0	0	0	57,303	638,618	0	136	696,057	0
**	o-Anisidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	143	0	14,704	5,100	1,061	21,008	0
		98o	0	0	2,756	0	991	5,176	1,413	10,336	0
		98n	No reports								
		99o	0	0	2,398	0	376	7,083	1,602	11,459	0
		99n	No reports								
	p-Anisidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	9	9	18	0
		98o	0	0	0	0	61	0	45	106	0
		98n	No reports								
		99o	No reports								
		99n	No reports								
	Anthracene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	176,705	20,744	183,121	200,541	1,693,357	5,084	115,722	2,395,274	34,354
		98o	244,557	33,782	333,554	97,248	100,138	63,167	130,316	1,002,762	2
		98n	0	0	0	0	4,354	37	8	4,399	1
		99o	599,528	30,256	237,242	162,322	78,457	25,067	148,881	1,281,753	3
		99n	0	0	0	0	228,324	215	173,562	402,101	0
	Antimony	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,831,021	5,483,416	0	1,730	818,680	95,864	127,061	10,357,772	463
		98o	4,625,143	727,639	30,405	66,692	308,925	52,241	340,759	6,151,804	12
		98n	0	0	0	0	0	38,018	1,284,899	1,322,917	1
		99o	5,276,182	1,167,889	0	0	351,900	108,459	289,408	7,193,838	13
		99n	0	0	0	0	0	0	734,829	734,829	0
	Antimony compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,373,201	3,311,424	0	50,997	79,188	939,909	4,047,038	13,801,757	27,841
		98o	4,885,114	3,998,003	6,820	16,879	566,509	503,989	4,533,424	14,510,738	142,994
		98n	10,441	0	0	0	16,484	8	23,852,433	23,879,366	159
		99o	5,050,525	3,858,336	0	53,103	470,311	521,640	3,679,812	13,633,727	213,256
		99n	11,713	14,752	0	0	0	470	27,836,527	27,863,462	300,004
**	Arsenic	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,072,279	162,386	7,700	496	13,030	45,969	66,757	1,368,617	749
		98o	3,403,468	205,974	0	0	64,685	3,058	223,391	3,900,576	2,534
		98n	542,954	0	0	0	60,800	17,033	76,970,133	77,590,920	6
		99o	1,502,341	567,744	0	0	74,034	3,652	183,470	2,331,241	1,172
		99n	0	142,814	0	0	0	111,931	36,300,636	36,555,381	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—		Arsenic compounds	88	274	268,528	6,243	27,400	4,946,184	5,248,355	1,407,110	6,655,465
			95	305	83,604	4,825	55,000	1,723,347	1,866,776	1,556,589	3,423,365
			98o	347	106,913	5,628	173,100	7,126,553	7,412,194	681,955	8,094,149
			98n	205	200,500	159,881	760,075	549,575,334	550,695,790	1,458,492	552,154,282
			99o	324	91,617	15,584	198,310	9,278,202	9,583,713	1,974,759	11,558,472
			99n	197	199,876	168,073	880,034	555,749,965	556,997,948	1,593,746	558,591,694
1332-21-4	*,**	Asbestos (friable)	88	146	48,496	10,699	0	2,111,880	2,171,075	12,135,707	14,306,782
			95	74	5,950	1	0	131,404	137,355	4,860,165	4,997,520
			98o	66	2,563	1	0	610,368	612,932	8,319,951	8,932,883
			98n	15	138	0	0	13,527,501	13,527,639	155,028	13,682,667
			99o	74	3,389	0	0	326,186	329,575	4,843,382	5,172,957
			99n	13	43	0	0	13,247,597	13,247,640	1	13,247,641
1912-24-9	*	Atrazine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	20	22,689	1,656	0	637,036	661,381	101,631	763,012
			98o	23	30,971	2,756	336	554,456	588,519	15,780	604,299
			98n	5	12	0	0	73,687	73,699	3,690	77,389
			99o	23	20,915	1,212	172	599,739	622,038	22,795	644,833
			99n	5	31	0	0	44,173	44,204	133	44,337
7440-39-3		Barium	88	142	266,811	18,650	0	6,721,686	7,007,147	1,883,903	8,891,050
			95	77	175,350	6,279	0	227,523	409,152	492,999	902,151
			98o	70	54,419	7,807	0	285,353	347,579	447,682	795,261
			98n	58	198,123	141,206	25,000	9,299,213	9,663,542	1,358,670	11,022,212
			99o	68	79,390	2,157	0	501,295	582,842	820,282	1,403,124
			99n	44	181,781	55,281	24,153	5,459,880	5,721,095	1,831,394	7,552,489
—		Barium compounds	88	629	1,027,722	104,302	2,773	5,791,655	6,926,452	17,532,268	24,458,720
			95	592	373,750	108,121	83,000	1,707,447	2,272,318	6,544,688	8,817,006
			98o	699	803,592	1,096,433	35,400	6,913,852	8,849,277	6,089,036	14,938,313
			98n	443	2,218,734	1,003,832	1,286,250	169,589,111	174,097,927	37,843,055	211,940,982
			99o	679	850,760	1,120,204	268	6,070,833	8,042,065	6,867,428	14,909,493
			99n	438	2,223,524	1,062,123	1,982,650	245,824,805	251,093,102	35,831,029	286,924,131
22781-23-3	*	Bendiocarb	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	555	0	0	0	555	0	555
			98o	3	2	0	0	0	2	0	2
			98n	1	3	0	0	0	3	10	13
			99o	3	5	0	0	0	5	0	5
			99n	1	11	0	0	0	11	10	21
1861-40-1	*	Benfluralin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	8	2,977	0	0	0	2,977	14,000	16,977
			98o	8	1,564	0	0	0	1,564	3	1,567
			98n	No reports							
			99o	9	1,231	0	0	0	1,231	5	1,236
			98n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Arsenic compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,446,334	300,321	0	231	227,628	1,302,233	2,883,568	7,160,315	93,392
		98o	2,534,030	858,825	0	0	68,912	121,938	7,033,868	10,617,573	2,154,034
		98n	58,677	12	0	1	43,270	7,039	552,256,545	552,365,544	43
		99o	3,529,653	1,087,793	300	0	78,979	202,247	7,917,170	12,816,142	2,438,639
		99n	65,746	351	0	0	0	474	559,062,571	559,129,142	5,200,019
*,**	Asbestos (friable)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	398,800	0	0	0	1,548,870	1,102	4,280,979	6,229,751	176,200
		98o	375,107	150	0	0	1,207,292	362	6,740,866	8,323,777	2,206,599
		98n	0	0	0	0	0	0	13,527,516	13,527,516	3
		99o	251,379	145	0	0	606,068	29,132	3,437,254	4,323,978	389,333
		99n	0	0	0	0	0	0	13,300,010	13,300,010	0
*	Atrazine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	73	0	0	0	556,057	180,643	685,144	1,421,917	17,002
		98o	250	0	0	0	654,669	213,479	612,381	1,480,779	254
		98n	0	0	0	0	268,583	10	77,389	345,982	0
		99o	2,250	0	0	0	510,071	190,895	679,522	1,382,738	252
		99n	0	0	0	0	146,907	10	44,337	191,254	0
	Barium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	14,719	448,944	0	102	43,195	37,552	774,572	1,319,084	5
		98o	159,389	413,535	601,788	418	399,046	120,846	1,012,348	2,707,370	652
		98n	4,992	437,318	0	0	376,908	289,982	10,731,478	11,840,678	10
		99o	164,889	70,441	0	0	34,104	105,417	1,614,604	1,989,455	6
		99n	28,292	819,285	0	0	1,177,015	167,327	6,778,677	8,970,596	17
	Barium compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	26,521,724	2,173,955	200	66,358	6,364,467	3,498,239	8,131,099	46,756,042	33,069
		98o	35,285,575	6,231,998	19,138	90,616	5,780,159	809,953	15,024,115	63,241,554	540
		98n	569,437	794,202	0	34,332	435,153	199,747	211,215,186	213,248,057	24,198
		99o	52,052,240	2,646,444	6,000	139,668	5,021,774	693,028	16,717,428	77,276,582	14,167
		99n	553,901	2,212,564	0	0	37,315	219,843	288,206,503	291,230,126	11,304
*	Bendiocarb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	560	0	0	0	0	0	560	1,120	0
		98o	0	0	0	0	0	580	0	580	0
		98n	0	0	0	0	0	0	30	30	0
		99o	0	0	0	0	0	581	0	581	0
		99n	0	0	0	0	56,392	0	11	56,403	0
*	Benfluralin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,205	0	0	0	6,200	175	16,910	27,490	4
		98o	79,000	0	0	0	31	897	1,347	81,275	1
		98n	No reports								
		99o	87,000	0	0	0	0	335	1,223	88,558	0
		98n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
17804-35-2	*	Benomyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	0	0
			98o	3	1	0	0	0	1	0	1
			98n	1	10	0	0	0	10	5	15
			99o	3	7	0	0	0	7	0	7
			99n	2	0	0	0	0	0	254	254
98-87-3		Benzal chloride	88	3	5,258	0	0	0	5,258	7,308	12,566
			95	4	1,112	0	0	0	1,112	0	1,112
			98o	3	398	0	0	0	398	0	398
			98n	3	20	0	0	0	20	0	20
			99o	3	387	0	0	0	387	0	387
			99n	1	23	0	0	0	23	22	45
55-21-0		Benzamide	88	1	500	250	250	0	1,000	750	1,750
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
71-43-2	*,**	Benzene	88	484	32,341,184	46,732	825,035	126,728	33,339,679	396,880	33,736,559
			95	476	9,410,086	21,290	282,642	18,583	9,732,601	71,391	9,803,992
			98o	484	7,239,578	15,070	504,109	237,544	7,996,301	130,443	8,126,744
			98n	523	362,733	3,943	71,697	2,727	441,100	67,440	508,540
			99o	487	7,287,778	13,647	617,825	18,732	7,937,982	71,349	8,009,331
			99n	490	353,408	14,291	222,803	555,127	1,145,629	71,868	1,217,497
92-87-5		Benzidine	88	No reports							
			95	No reports							
			98o	No reports							
			98n	4	38	0	0	0	38	0	38
			99o	2	7	0	0	0	7	0	7
			99n	4	6	0	0	0	6	165	171
98-07-7	**	Benzoic trichloride	88	4	24,963	0	0	0	24,963	9,777	34,740
			95	7	6,496	0	0	0	6,496	250	6,746
			98o	6	2,253	0	0	0	2,253	330	2,583
			98n	2	2	0	0	0	2	110	112
			99o	6	2,175	0	0	0	2,175	400	2,575
			99n	4	9	0	0	0	9	172	181
98-88-4		Benzoyl chloride	88	22	33,014	0	130,000	250	163,264	2,399	165,663
			95	22	16,749	0	0	0	16,749	1,460	18,209
			98o	25	11,905	0	0	0	11,905	0	11,905
			98n	1	88	0	0	0	88	3,980	4,068
			99o	22	10,351	0	0	0	10,351	0	10,351
			99n	2	74	0	0	0	74	2,393	2,467

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Benomyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	482,000	122,000	0	604,000	0
		98o	0	0	45,000	65,600	20,200	20,263	1	151,064	0
		98n	0	0	0	0	95,374	0	20	95,394	0
		99o	0	0	0	107,108	13,757	16,128	7	137,000	0
		99n	0	0	0	0	31,995	0	16	32,011	0
	Benzal chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	260,000	2,800	0	1,105	263,905	0
		98o	0	0	0	120,000	84,000	200	400	204,600	0
		98n	0	0	0	0	235,247	0	20	235,267	0
		99o	0	0	0	550,000	83,000	74	388	633,462	0
		99n	0	0	0	0	676,990	0	45	677,035	0
	Benzamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
*,**	Benzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	47,987,022	420,034	20,222,877	1,579,955	54,065,446	1,974,430	9,795,515	136,045,279	65,962
		98o	36,113,609	640,449	16,882,843	1,086,608	47,608,948	3,810,819	8,133,354	114,276,630	51,769
		98n	962,014	502,057	569,513	8,432,613	3,913,360	304,222	912,873	15,596,652	35,039
		99o	36,876,512	616,713	24,765,316	1,124,480	48,417,541	3,247,161	8,021,586	123,069,309	67,208
		99n	2,304,682	56,328	619,481	1,494,490	5,573,726	971,250	698,228	11,718,185	23,414
	Benzidine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	101,123	58	34	101,215	1
		99o	0	0	89,000	0	5,538	60	2	94,600	1
		99n	0	0	0	0	311,452	0	169	311,621	0
**	Benzoic trichloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	3,001	150,000	32	6,242	159,275	0
		98o	0	0	0	20,000	160,000	34,870	2,557	217,427	0
		98n	0	0	0	0	15,768	0	112	15,880	0
		99o	0	0	0	20,000	110,000	1,608	2,572	134,180	0
		99n	0	0	0	0	176,025	0	178	176,203	0
	Benzoyl chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	80	1,676,545	615,127	18,213	2,309,965	0
		98o	0	0	0	0	2,011,461	498,362	11,903	2,521,726	0
		98n	0	0	0	0	570,508	0	4,068	574,576	0
		99o	0	0	0	0	2,370,374	336,441	10,370	2,717,185	1
		99n	0	0	0	0	504,005	0	2,469	506,474	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
94-36-0	*	Benzoyl peroxide	88	50	6,294	0	5,350	36,050	47,694	23,954	71,648
			95	64	2,043	255	0	10,345	12,643	4,760	17,403
			98o	59	803	250	0	736	1,789	6,046	7,835
			98n	4	0	0	0	0	0	0	0
			99o	58	251	250	0	117	618	5,423	6,041
			99n	2	0	0	0	0	0	2	2
100-44-7		Benzyl chloride	88	51	43,329	640	0	500	44,469	9,687	54,156
			95	48	19,664	40	0	247	19,951	3,870	23,821
			98o	45	26,888	347	150	261	27,646	4,506	32,152
			98n	3	41	250	0	0	291	1	292
			99o	38	26,278	1,207	270	214	27,969	1,260	29,229
			99n	6	23	1	0	0	24	177	201
7440-41-7	**	Beryllium	88	12	2,763	74	0	37,000	39,837	3,160	42,997
			95	10	1,087	31	0	21,255	22,373	7,595	29,968
			98o	14	799	26	0	57,818	58,643	20,404	79,047
			98n	5	0	0	0	0	0	0	0
			99o	15	769	57	0	53,271	54,097	20,081	74,178
			99n	7	0	0	0	0	0	0	0
—	**	Beryllium compounds	88	5	862	17	0	12,000	12,879	8,261	21,140
			95	7	360	2	0	23,000	23,362	2,391	25,753
			98o	8	383	6	0	0	389	6,754	7,143
			98n	53	20,999	1,859	0	733,229	756,087	91,333	847,420
			99o	16	473	27	4,100	19	4,619	5,028	9,647
			99n	57	7,343	3,483	0	822,928	833,754	49,840	883,594
82657-04-3	*	Bifenthrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	10	0	0	5	15	0	15
			98o	5	760	5	0	0	765	0	765
			98n	1	0	0	0	0	0	19	19
			99o	5	546	0	0	0	546	0	546
			99n	No reports							
92-52-4	*	Biphenyl	88	181	1,211,292	88,197	82,760	222,297	1,604,546	227,492	1,832,038
			95	136	744,993	6,242	30,337	71,864	853,436	38,088	891,524
			98o	122	536,524	4,105	29,574	1,159	571,362	49,880	621,242
			98n	10	36	0	0	0	36	55	91
			99o	124	675,326	8,949	4,177	24	688,476	56,857	745,333
			99n	10	3,348	0	0	2	3,350	2,615	5,965
111-91-1		Bis(2-chloroethoxy)-methane	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	12,510	0	250	0	12,760	0	12,760
			98o	1	1,434	0	930	1,024	3,388	0	3,388
			98n	1	0	0	0	0	0	0	0
			99o	1	1,312	0	3,697	0	5,009	0	5,009
			99n	1	2	1	0	0	3	4	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Benzoyl peroxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,600	10,800	863	1,520	57,214	42,461	16,769	134,227	1
		98o	10,364	0	0	1,191	86,629	49,139	8,972	156,295	0
		98n	0	0	0	0	12,360	0	0	12,360	0
		99o	6,935	0	0	1,885	124,112	91,458	6,476	230,866	3
		99n	0	0	0	0	15,291	0	2	15,293	0
	Benzyl chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,000	0	25,481	430,300	256,947	11,027	21,421	746,176	81
		98o	4,800	0	17,000	420,878	250,910	76,610	31,360	801,558	2
		98n	0	0	0	0	483,947	0	66	484,013	0
		99o	0	0	0	392,457	169,516	37,127	28,550	627,650	1
		99n	0	0	0	0	678,251	0	198	678,449	0
**	Beryllium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	39,689	19,263	0	0	780	423	27,369	87,524	0
		98o	160,399	84,146	0	0	10	8	63,356	307,919	1
		98n	0	0	0	0	0	0	0	0	0
		99o	101,065	24,154	0	0	0	966	66,436	192,621	0
		99n	0	0	0	0	0	0	0	0	0
**		88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	7	23,880	0	0	0	1,011	24,661	49,559	0
		98o	0	26,450	0	0	0	1,090	1,833	29,373	1
		98n	9,700	0	0	0	194	0	846,933	856,827	308
		99o	0	38,384	0	0	0	1,349	8,089	47,822	2
		99n	9,700	0	0	0	0	0	898,112	907,812	9
*	Bifenthrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	10	10	20	0
		98o	0	0	0	0	0	402	230	632	0
		98n	0	0	0	0	11,275	0	19	11,294	0
		99o	0	0	0	0	1	2,069	71	2,141	0
		99n	No reports								
*	Biphenyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	268,053	156,081	1,088,381	346,055	963,993	615,716	904,745	4,343,024	11,639
		98o	306,564	260,334	1,209,699	131,946	495,349	764,962	626,662	3,795,516	3,939
		98n	0	0	0	12,840	279,525	263	89	292,717	0
		99o	446,648	245,973	2,098,273	150,054	663,883	610,722	764,610	4,980,163	4,190
		99n	0	0	0	42,583	711,018	2,824	3,152	759,577	5
	Bis(2-chloroethoxy)-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	methane	95	0	0	0	0	0	0	12,796	12,796	0
		98o	0	0	0	0	0	15	3,388	3,403	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	0	5,009	5,009	0
		99n	0	0	0	0	28,000	0	2	28,002	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases					Off-site Releases	Total On- and Off-site Releases
					Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Transfers Off-site to Disposal	
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
111-44-4	*	Bis(2-chloroethyl) ether	88	8	4,922	1,351	0	0	6,273	0	6,273
			95	11	564	3	0	0	567	0	567
			98o	11	844	4	0	0	848	1	849
			98n	3	0	0	0	0	0	0	0
			99o	12	353	23	0	0	376	296	672
			99n	3	11	1	0	0	12	17	29
542-88-1	**	Bis(chloromethyl) ether	88	2	1	0	0	0	1	0	1
			95	2	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	2	4	0	0	0	4	153	157
108-60-1		Bis(2-chloro-1-methylethyl) ether	88	2	7,959	30,000	0	0	37,959	0	37,959
			95	2	6,130	0	0	0	6,130	0	6,130
			98o	2	3,360	46	0	2	3,408	0	3,408
			98n	No reports							
			99o	2	4,110	2	0	2	4,114	0	4,114
			99n	No reports							
56-35-9	*	Bis(tributyltin) oxide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	32	0	0	32	13,873	13,905
			98o	3	0	6	0	2	8	3,372	3,380
			98n	No reports							
			99o	5	10	6	0	1	17	3,923	3,940
			99n	No reports							
10294-34-5		Boron trichloride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	5	0	0	0	5	0	5
			98o	5	750	0	0	0	750	0	750
			98n	No reports							
			99o	7	350	0	0	0	350	0	350
			99n	No reports							
7637-07-2		Boron trifluoride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	24	25,019	0	0	0	25,019	929	25,948
			98o	23	38,142	5	0	0	38,147	0	38,147
			98n	No reports							
			99o	23	16,722	0	0	0	16,722	0	16,722
			99n	No reports							
314-40-9	*	Bromacil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	500	27,897	0	0	28,397	0	28,397
			98o	1	10	0	0	0	10	0	10
			98n	1	25	0	0	0	25	0	25
			99o	1	10	0	0	0	10	0	10
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Bis(2-chloroethyl) ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	146,118	302,700	203,775	0	88,893	570	742,056	0
		98o	0	159,909	426,404	9,541	540,375	349,619	853	1,486,701	0
		98n	0	0	0	0	10,234	0	0	10,234	0
		99o	0	142,932	1,280,773	6,127	1,627,378	455,565	384	3,513,159	0
		99n	0	0	0	0	215,220	0	26	215,246	0
**	Bis(chloromethyl) ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	13,000	0	0	13,000	0
		98o	0	0	0	0	36,500	0	0	36,500	0
		98n	No reports								
		99o	0	0	0	0	34,000	0	0	34,000	0
		99n	0	0	0	0	111,933	0	157	112,090	0
	Bis(2-chloro-1-methylethyl) ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,200,000	0	8,540,000	0	10,840,000	0	6,100	24,586,100	1
		98o	8,900,000	0	6,000,000	0	1,410,000	0	3,500	16,313,500	0
		98n	No reports								
		99o	2,800,000	0	7,210,000	0	5,149,000	0	4,100	15,163,100	0
		99n	No reports								
*	Bis(tributyltin) oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	39,840	0	0	336	0	13,903	54,079	0
		98o	0	58,478	0	0	336	0	3,380	62,194	0
		98n	No reports								
		99o	0	35,864	0	0	346	530	4,367	41,107	1
		99n	No reports								
	Boron trichloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,000	0	0	0	200	0	1	5,201	0
		98o	6,700	0	0	0	53,000	0	335	60,035	2
		98n	No reports								
		99o	9,100	0	0	0	16,000	10,000	145	35,245	0
		99n	No reports								
	Boron trifluoride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	425,701	1,027	24,369	451,097	191
		98o	0	0	0	35	462,635	15,255	35,396	513,321	449
		98n	No reports								
		99o	0	0	0	0	509,864	1,130	16,452	527,446	181
		99n	No reports								
*	Bromacil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5	0	0	0	30,687	27,829	27,947	86,468	0
		98o	0	0	0	0	0	0	1,192	1,192	0
		98n	0	0	0	0	32,434	0	25	32,459	0
		99o	0	0	0	0	0	0	850	850	0
		99n	0	0	0	0	17,343	0	0	17,343	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
7726-95-6	*	Bromine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	46	112,466	880	7	10	113,363	250	113,613
			98o	52	104,083	7,110	7	7,705	118,905	3	118,908
			98n	4	84	0	0	0	84	2	86
			99o	48	235,390	15	0	7,705	243,110	30,508	273,618
			99n	2	33	0	0	0	33	7,360	7,393
35691-65-7	*	1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	4	0	0	0	0	0	0	0
			99n	No reports							
353-59-3		Bromochlorodifluoromethane (Halon 1211)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	4,811	0	0	0	4,811	0	4,811
			98o	4	3,673	0	0	0	3,673	0	3,673
			98n	No reports							
			99o	4	3,979	0	0	0	3,979	0	3,979
			99n	No reports							
75-25-2		Bromoform	88	2	0	8,600	0	0	8,600	0	8,600
			95	No reports							
			98o	No reports							
			98n	3	3	0	0	0	3	0	3
			99o	1	5	0	0	0	5	0	5
			99n	1	2	1	0	0	3	4	7
74-83-9	*	Bromomethane	88	36	2,784,795	0	1,546	0	2,786,341	0	2,786,341
			95	43	2,601,734	14	3,817	0	2,605,565	0	2,605,565
			98o	45	1,565,087	30	230	11	1,565,358	0	1,565,358
			98n	2	5	0	0	0	5	0	5
			99o	43	1,428,722	29	0	4	1,428,755	1,603	1,430,358
			99n	3	186	0	0	0	186	0	186
75-63-8		Bromotrifluoromethane (Halon 1301)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	8	33,632	0	0	0	33,632	0	33,632
			98o	6	26,842	0	0	0	26,842	0	26,842
			98n	No reports							
			99o	6	30,825	0	0	0	30,825	0	30,825
			99n	No reports							
1689-84-5	*	Bromoxynil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	6	0	0	0	6	990	996
			98o	2	506	0	0	0	506	1,483	1,989
			98n	No reports							
			99o	3	3	0	0	0	3	790	793
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Bromine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,960,000	740	0	0	14,808,669	283,435	112,386	20,165,230	29
		98o	5,670,000	230	0	0	18,611,926	20,781	121,933	24,424,870	196
		98n	0	0	0	162,356	12,791	0	86	175,233	1
		99o	130,800	430	0	0	850,764	483,028	241,997	1,707,019	800
		99n	0	2,991	0	0	11,373	0	7,393	21,757	0
*	1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	10,957	0	10,957	0
		98o	0	0	0	0	11,000	9,824	0	20,824	0
		98n	No reports								
		99o	0	0	0	0	0	9,595	0	9,595	0
		99n	No reports								
	Bromochlorodifluoromethane (Halon 1211)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	282,800	0	0	0	0	0	4,832	287,632	2
		98o	501,947	0	0	0	0	0	3,673	505,620	175
		98n	No reports								
		99o	485,900	0	0	0	0	0	3,827	489,727	152
		99n	No reports								
	Bromoform	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	10,594	2	3	10,599	1
		99o	0	0	0	0	216	2	1	219	1
		99n	0	0	0	0	18,000	0	1	18,001	0
*	Bromomethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	165,182	0	101,000	380	4,876,073	0	2,578,001	7,720,636	5
		98o	12,780	0	222,300	280	488,585	0	1,561,574	2,285,519	14,071
		98n	0	0	0	0	3,007	30	1	3,038	1
		99o	295,500	0	273,800	160	947,126	2,455	1,343,242	2,862,283	15,333
		99n	0	0	0	0	178,475	0	187	178,662	0
	Bromotrifluoromethane (Halon 1301)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	200,661	0	0	0	0	0	36,155	236,816	806
		98o	583,803	0	0	0	0	0	26,592	610,395	6,468
		98n	No reports								
		99o	647,796	0	0	0	0	0	29,446	677,242	1,630
		99n	No reports								
*	Bromoxynil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	996	996	0
		98o	0	0	0	0	0	0	1,244	1,244	0
		98n	No reports								
		99o	0	0	0	0	0	0	790	790	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1689-99-2	*	Bromoxynil octanoate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	500	0	0	0	500	13,569	14,069
			98o	5	1,566	0	0	0	1,566	14,420	15,986
			98n	No reports							
			99o	6	519	0	0	0	519	8,926	9,445
			99n	No reports							
357-57-3		Brucine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	No reports							
			99n	2	4	0	0	0	4	153	157
106-99-0	**	1,3-Butadiene	88	157	7,004,622	522,504	1,500	7,817	7,536,443	185,398	7,721,841
			95	186	3,050,945	5,393	0	277	3,056,615	4,892	3,061,507
			98o	189	2,741,685	8,834	732	7,998	2,759,249	2,067	2,761,316
			98n	6	1,035	0	0	0	1,035	500	1,535
			99o	190	1,909,518	1,900	720	127	1,912,265	2,066	1,914,331
			99n	4	2,178	0	0	0	2,178	505	2,683
141-32-2		Butyl acrylate	88	166	411,862	3,528	0	602	415,992	18,766	434,758
			95	164	230,275	2,919	0	559	233,753	73,591	307,344
			98o	158	206,776	7,790	0	546	215,112	25,473	240,585
			98n	12	6,009	0	0	0	6,009	22,581	28,590
			99o	157	241,981	8,747	156	546	251,430	31,763	283,193
			99n	12	3,031	0	0	0	3,031	445	3,476
71-36-3		n-Butyl alcohol	88	1,109	37,715,221	128,130	3,006,660	175,819	41,025,830	924,519	41,950,349
			95	1,125	26,124,368	115,353	2,263,357	4,631	28,507,709	290,886	28,798,595
			98o	1,027	21,606,870	94,523	3,169,538	5,209	24,876,140	382,843	25,258,983
			98n	180	27,573	0	61,068	370	89,011	16,075	105,086
			99o	971	21,015,396	56,286	3,097,813	3,226	24,172,721	647,251	24,819,972
			99n	171	31,534	1	91,230	1,400	124,165	76,715	200,880
78-92-2	*	sec-Butyl alcohol	88	92	1,097,163	122,291	0	2,600	1,222,054	21,351	1,243,405
			95	115	908,143	6,782	136,172	2,805	1,053,902	18,376	1,072,278
			98o	116	971,834	3,950	169,243	7	1,145,034	16,535	1,161,569
			98n	36	2,531	0	0	13,000	15,531	50	15,581
			99o	108	864,240	11,020	145,995	5	1,021,260	16,931	1,038,191
			99n	38	2,976	0	0	13,000	15,976	505	16,481
75-65-0	*	tert-Butyl alcohol	88	54	1,574,137	14,989	674,798	818	2,264,742	56,502	2,321,244
			95	91	657,818	20,183	1,082,071	751	1,760,823	30,783	1,791,606
			98o	84	420,564	30,330	861,956	7,352	1,320,202	178,217	1,498,419
			98n	26	25,804	21	0	1,092	26,917	4,029	30,946
			99o	82	366,121	15,354	770,634	751	1,152,860	76,468	1,229,328
			99n	33	31,061	260	0	5	31,326	1,813	33,139

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Bromoxynil octanoate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	173	13,689	13,862	0
		98o	0	0	0	0	0	40	21,215	21,255	0
		98n	No reports								
		99o	0	0	0	0	0	397	13,525	13,922	0
		99n	No reports								
	Brucine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	1
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	94,553	0	157	94,710	0
**	1,3-Butadiene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,513,939	13,652,736	31,663,920	34,519	58,474,775	96,310	2,879,808	112,316,007	200,548
		98o	5,428,029	15,574,853	15,171,040	260,947	53,274,984	3,918,622	2,724,665	96,353,140	776,818
		98n	0	0	0	218,662	130,866	9,120	1,035	359,683	1
		99o	5,566,810	11,539,016	15,618,413	433,581	62,997,080	307,699	1,912,694	98,375,293	59,754
		99n	0	0	0	27,320	232,521	1,620	2,068	263,529	0
	Butyl acrylate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	173,995	207,325	4,059,471	1,143,139	4,174,080	228,382	301,235	10,287,627	5,271
		98o	270,060	950	3,912,299	932,014	11,726,284	87,681	225,309	17,154,597	6,129
		98n	0	0	0	91,548	178,664	261	7,554	278,027	2
		99o	330,066	1,466	3,045,794	600,039	2,691,295	178,128	265,758	7,112,546	1,408
		99n	0	0	12,753	61,497	237,812	3,797	3,218	319,077	16
	n-Butyl alcohol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	8,438,990	3,351,225	24,665,663	8,572,532	38,018,327	3,346,692	28,870,500	115,263,929	52,341
		98o	8,306,964	2,608,611	29,189,033	8,360,639	42,906,842	5,218,604	25,588,497	122,179,190	58,888
		98n	1,704,649	8,376	32,154	9,817,765	1,739,894	963,207	94,668	14,360,713	23
		99o	9,132,073	2,250,267	33,288,202	8,396,622	32,557,149	4,666,674	24,995,850	115,286,837	11,269
		99n	2,619,863	7,646	37,137	4,621,141	2,708,082	1,192,341	127,721	11,313,931	10,357
*	sec-Butyl alcohol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	748,440	24,774	13,041,102	6,275,927	2,249,797	125,101	1,089,469	23,554,610	2,810
		98o	171,903	9,319	10,701,253	1,012,818	1,532,676	253,034	1,171,838	14,852,841	7
		98n	220	0	0	246,002	49	236,962	15,367	498,600	2
		99o	380,567	76,228	12,708,755	1,475,673	1,394,860	140,513	1,046,198	17,222,794	4
		99n	14	0	0	416,452	51,604	35,246	15,198	518,514	2
*	tert-Butyl alcohol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	466,023	2,256	64,310,733	27,469,833	2,447,778	1,794,551	2,230,055	98,721,229	2,091
		98o	662,776	231,209	37,637,302	7,506,442	2,331,750	1,841,732	1,494,042	51,705,253	61
		98n	31,188	200	0	3,841,737	129,572	11,110	23,110	4,036,917	16
		99o	658,568	19,879	38,801,127	8,108,339	1,673,758	1,754,071	1,567,501	52,583,243	21,102
		99n	50,563	122	0	898,535	258,975	35,514	29,903	1,273,612	24

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
106-88-7		1,2-Butylene oxide	88	18	99,931	3,500	0	250	103,681	898	104,579
			95	15	11,083	1	0	0	11,084	5	11,089
			98o	13	10,581	8,401	0	0	18,982	0	18,982
			98n	1	1	0	0	0	1	0	1
			99o	13	11,619	2,402	0	0	14,021	0	14,021
			99n	1	10	0	0	0	10	0	10
123-72-8	*	Butyraldehyde	88	26	2,218,692	3,812	1,997	31	2,224,532	117,741	2,342,273
			95	29	291,440	821	149,783	10	442,054	41	442,095
			98o	32	289,834	618	29,000	1,478	320,930	1,663	322,593
			98n	1	122	0	0	0	122	3	125
			99o	34	295,543	466	29,003	149,000	474,012	6,827	480,839
			99n	No reports							
7440-43-9	**	Cadmium	88	90	22,430	2,598	0	94,602	119,630	155,313	274,943
			95	48	12,196	463	0	19,861	32,520	90,519	123,039
			98o	50	2,109	542	0	158,670	161,321	100,921	262,242
			98n	20	1,318	0	166,607	2,282,416	2,450,341	60,410	2,510,751
			99o	46	2,377	691	0	31,889	34,957	45,656	80,613
			99n	19	1,920	0	61,000	1,628,788	1,691,708	319,554	2,011,262
—	**	Cadmium compounds	88	117	118,978	1,549	2,409	294,877	417,813	1,067,942	1,485,755
			95	120	54,853	948	34,109	797,776	887,686	1,743,893	2,631,579
			98o	94	68,890	923	130,033	778,483	978,329	1,307,328	2,285,657
			98n	39	16,431	1,218	96,875	7,910,629	8,025,153	291,393	8,316,546
			99o	93	29,838	1,501	23	656,007	687,369	701,113	1,388,482
			99n	36	18,768	765	100,000	9,933,779	10,053,312	152,773	10,206,085
156-62-7	*	Calcium cyanamide	88	3	12,600	0	0	66,000	78,600	0	78,600
			95	5	10	0	0	0	10	0	10
			98o	4	134	0	0	0	134	0	134
			98n	No reports							
			99o	4	250	0	0	0	250	0	250
			98n	No reports							
133-06-2	*	Captan	88	18	14,869	750	5,100	1,000	21,719	12,434	34,153
			95	15	7,280	5	0	5	7,290	3,868	11,158
			98o	11	9,211	5	0	0	9,216	1,761	10,977
			98n	3	2	0	0	0	2	138	140
			99o	13	5,111	5	0	0	5,116	1,070	6,186
			99n	1	0	0	0	0	0	27	27
63-25-2	*	Carbaryl	88	23	7,923	877	0	500	9,300	6,198	15,498
			95	21	7,824	10	0	1,060	8,894	26,861	35,755
			98o	22	7,824	10	0	100	7,934	9,156	17,090
			98n	3	7	0	0	0	7	132	139
			99o	15	5,276	5	0	8,405	13,686	41,376	55,062
			99n	3	4	0	0	11,743	11,747	27	11,774

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	1,2-Butylene oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	990	0	330,194	329,270	93	10,804	671,351	0
		98o	1	0	0	275,443	498,660	307	18,815	793,226	0
		98n	0	0	0	50	0	35	1	86	0
		99o	2	0	0	282,059	382,495	620	14,294	679,470	0
		99n	0	0	0	150	6	0	1	157	0
*	Butyraldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	1,300	2,545,861	22,000	1,982,004	169,714	440,778	5,161,657	10
		98o	1,500	31,000	2,136,982	20,760	1,928,392	651,126	317,716	5,087,476	5,208
		98n	0	0	0	19,950	392	409	122	20,873	0
		99o	1,500	1,200	4,909,209	40,812	7,983,588	176,272	409,140	13,521,721	81,118
		99n	No reports								
**	Cadmium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,471,697	545,490	29,191	633	91,725	53,384	74,415	2,266,535	3,918
		98o	1,101,823	320,139	0	0	27,779	52,294	276,672	1,778,707	9,411
		98n	0	8,110	0	0	0	10,742	2,462,721	2,481,573	1
		99o	88,054	202,689	0	0	29,363	11,102	119,767	450,975	3
		99n	143,393	139,104	0	0	0	471	1,699,147	1,982,115	10
**	Cadmium compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	8,221,097	1,482,852	0	1,082	86,561	138,528	2,509,561	12,439,681	11,698
		98o	2,561,776	643,605	0	5,236	3,225	47,340	3,218,632	6,479,814	59,621
		98n	1,900	71,989	0	0	3,000	4,772	8,315,149	8,396,810	94
		99o	3,003,967	636,397	0	212	4,654	19,971	1,824,458	5,489,659	39,151
		99n	77,444	27,995	0	0	0	1,050	6,733,862	6,840,351	120,009
*	Calcium cyanamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	6	6	0
		98o	0	0	0	0	0	0	130	130	0
		98n	No reports								
		99o	0	0	0	0	0	0	26	26	0
		98n	No reports								
*	Captan	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,070	0	0	0	9,834	1,072	7,479	23,455	2
		98o	2,697	0	0	0	9,000	3,944	11,297	26,938	1
		98n	0	0	0	0	68,416	0	140	68,556	0
		99o	2,314	0	0	0	9,000	17,910	9,922	39,146	1
		99n	0	0	0	0	66,081	0	27	66,108	0
*	Carbaryl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	36,618	0	0	0	467,593	7,885	32,697	544,793	1
		98o	80,456	0	79,931	0	365,862	24,121	14,478	564,848	101
		98n	0	0	0	0	77,947	0	139	78,086	0
		99o	71,825	0	64	0	373,282	11,446	7,907	464,524	0
		99n	0	97	0	0	133,259	0	11,774	145,130	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1563-66-2	*	Carbofuran	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	7	4,187	2	0	250	4,439	250	4,689
			98o	4	2,921	1	0	0	2,922	0	2,922
			98n	3	16	0	0	0	16	2	18
			99o	4	13,999	112	0	0	14,111	0	14,111
			99n	2	10	0	0	0	10	23	33
75-15-0	*	Carbon disulfide	88	88	124,109,904	39,501	13,400	43,436	124,206,241	58,473	124,264,714
			95	92	84,120,300	39,864	33,644	265	84,194,073	2,949	84,197,022
			98o	95	43,432,877	4,687	16,599	1,651	43,455,814	5,801	43,461,615
			98n	6	924	1	0	0	925	24	949
			99o	105	35,888,425	6,548	16,110	256	35,911,339	2,730	35,914,069
			99n	6	262	1	0	0	263	33	296
56-23-5	*,**	Carbon tetrachloride	88	95	3,795,248	15,627	98,050	14,759	3,923,684	49,703	3,973,387
			95	71	420,754	717	53,966	0	475,437	7,735	483,172
			98o	55	274,291	2,586	23,163	1,679	301,719	9,956	311,675
			98n	15	954	250	5	0	1,209	10,295	11,504
			99o	57	237,235	84	27,548	938	265,805	7,307	273,112
			99n	13	2,334	1	0	0	2,335	9,259	11,594
463-58-1		Carbonyl sulfide	88	38	25,954,103	0	0	0	25,954,103	0	25,954,103
			95	64	17,934,454	0	0	0	17,934,454	0	17,934,454
			98o	82	19,843,628	0	0	0	19,843,628	0	19,843,628
			98n	1	0	0	0	0	0	0	0
			99o	101	21,344,436	0	0	0	21,344,436	0	21,344,436
			99n	No reports							
5234-68-4	*	Carboxin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	8	0	0	0	8	428	436
			98o	3	5	0	0	0	5	17	22
			98n	No reports							
			99o	4	5	0	0	0	5	154	159
			99n	No reports							
120-80-9		Catechol	88	113	3,789	320,546	0	84,332	408,667	89,474	498,141
			95	127	3,457	24,747	0	3,479	31,683	563	32,246
			98o	139	5,345	24,122	0	1,029	30,496	914	31,410
			98n	4	3	0	0	0	3	24	27
			99o	136	6,801	28,696	0	878	36,375	2,996	39,371
			99n	2	235	0	0	0	235	46	281
133-90-4	*	Chloramben	88	1	1,418	250	0	0	1,668	1,159	2,827
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Carbofuran	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	1	3	47,158	5,422	52,584	1
		98o	0	0	0	0	3	35,601	2,922	38,526	275
		98n	0	0	0	0	243,290	0	15	243,305	1
		99o	0	0	0	0	0	19,615	14,111	33,726	0
		99n	0	0	0	0	162,525	0	25	162,550	0
*	Carbon disulfide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	20,874,450	18	5,775,132	368,509	18,092,770	361,938	84,767,924	130,240,741	154,892
		98o	30,024,800	1,985	10,070,374	216,999	32,269,421	239,776	43,245,898	116,069,253	24,336
		98n	0	0	0	25,038	779,188	11,922	849	816,997	0
		99o	25,913,004	1,067	9,352,618	99,958	34,307,856	3,954,153	28,187,942	101,816,598	22,518
		99n	0	0	0	0	530,976	0	290	531,266	0
*,**	Carbon tetrachloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,837,422	365,067	317,149	50,068	52,608,819	733,254	463,274	56,375,053	34,525
		98o	2,218,866	2,075,495	808,627	43,116	13,865,412	462,232	299,092	19,772,840	4,829
		98n	4,399	0	468,751	277,751	985,513	2,580,491	4,735	4,321,640	1
		99o	7,066,850	3,197,654	369,334	24,319	16,308,400	688,463	231,108	27,886,128	28,183
		99n	0	0	500,408	67,656	1,818,361	37,175	6,228	2,429,828	0
	Carbonyl sulfide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	1,508,252	0	14,572,854	16,000	18,778,809	34,875,915	1
		98o	0	0	2,403,251	0	17,913,061	0	19,995,133	40,311,445	5
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	3,422,194	0	76,837,634	0	21,523,038	101,782,866	5,714
		99n	No reports								
*	Carboxin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,817	0	0	0	0	402	436	3,655	0
		98o	1,110	0	0	0	0	218	22	1,350	0
		98n	No reports								
		99o	1,538	0	0	0	0	60	159	1,757	0
		99n	No reports								
	Catechol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	7,145,990	94,995	1,481,057	54,221	68,220	8,844,483	2,774
		98o	0	0	9,717,608	105,959	4,435,187	50,634	35,007	14,344,395	2
		98n	0	0	3,384	0	9,997	0	27	13,408	0
		99o	0	4,594	10,920,474	97,721	3,845,892	79,487	82,363	15,030,531	5
		99n	0	0	0	25,880	867	21,036	236	48,019	0
*	Chloramben	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
57-74-9	*,**	Chlordane	88	2	2,698	4	4,262	0	6,964	0	6,964
			95	1	823	22	0	0	845	0	845
			98o	No reports							
			98n	7	45	0	20,106	25,548	45,699	22	45,721
			99o	No reports							
			99n	4	8	1	0	0	9	40	49
115-28-6	**	Chlorendic acid	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	6	0	0	0	6	0	6
			98o	2	30	0	0	0	30	0	30
			98n	No reports							
			99o	2	32	0	0	0	32	0	32
			99n	No reports							
90982-32-4	*	Chlorimuron ethyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	1	0	0	0	1	0	1
			98o	2	3	0	0	0	3	0	3
			98n	No reports							
			99o	2	27	0	0	0	27	0	27
			99n	No reports							
7782-50-5	*	Chlorine	88	1,800	133,085,601	6,622,187	107,624	439,547	140,254,959	1,003,531	141,258,490
			95	1,380	65,761,772	442,215	74,124	13,095	66,291,206	12,286	66,303,492
			98o	1,191	59,757,962	252,747	81,637	56,122	60,148,468	27,010	60,175,478
			98n	149	77,026	168,797	27,639	154,480	427,942	3,000	430,942
			99o	1,109	49,164,795	328,493	62,440	55,320	49,611,048	7,745	49,618,793
			99n	130	206,361	63,090	0	55,359	324,810	94,167	418,977
10049-04-4	*	Chlorine dioxide	88	122	12,251,050	2,350	0	41,000	12,294,400	41,750	12,336,150
			95	127	1,305,279	5	0	0	1,305,284	0	1,305,284
			98o	117	1,037,587	71	0	0	1,037,658	0	1,037,658
			98n	4	13,000	510	0	0	13,510	0	13,510
			99o	111	987,794	109	0	5	987,908	0	987,908
			99n	4	5,200	764	0	0	5,964	0	5,964
79-11-8	*	Chloroacetic acid	88	37	26,819	850	10	0	27,679	2,506	30,185
			95	31	6,474	16	0	0	6,490	600	7,090
			98o	25	3,585	16	0	0	3,601	500	4,101
			98n	1	0	0	0	0	0	0	0
			99o	21	4,565	17	0	0	4,582	328	4,910
			99n	No reports							
4080-31-3	*	1-(3-Chloroallyl)-	88	NR	NR	NR	NR	NR	NR	NR	NR
		3,5,7-triaza-1-azonia-	95	7	93	10	0	521	624	2,514	3,138
		adamantane chloride	98o	16	437	11	0	653	1,101	5,138	6,239
			98n	No reports							
			99o	12	217	11	0	509	737	5,769	6,506
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*/**	Chlordane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	5,150	95	845	6,090	0
		98o	No reports								
		98n	0	0	0	25,778	187,264	35	45,721	258,798	1
		99o	No reports								
		99n	0	0	0	0	470,719	114	46	470,879	0
**	Chlorendic acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	488	6	494	0
		98o	0	0	0	0	0	567	30	597	0
		98n	No reports								
		99o	0	0	0	0	0	157	32	189	0
		99n	No reports								
*	Chlorimuron ethyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	5,838	1	5,839	0
		98o	0	0	0	0	0	33,861	3	33,864	0
		98n	No reports								
		99o	0	0	0	0	0	11,885	27	11,912	0
		99n	No reports								
*	Chlorine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	84,986,469	1,791,968	499	1,467	219,882,098	1,180,909	66,282,619	374,126,029	13,375
		98o	71,150,772	88,349	0	50,291	249,199,167	945,823	60,182,930	381,617,332	9,292
		98n	760,238	0	0	0	4,557,933	26,089	408,279	5,752,539	583
		99o	68,617,968	83,925	2	60,545	205,389,521	732,495	49,575,274	324,459,730	20,587
		99n	2,802,661	0	0	0	3,730,585	87,594	340,384	6,961,224	43
*	Chlorine dioxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,484,920	0	0	0	40,571,008	0	1,326,713	44,382,641	3,933
		98o	2,858,988	0	0	0	48,480,626	6,000	1,081,876	52,427,490	862
		98n	0	0	0	0	0	0	13,510	13,510	0
		99o	722,759	0	0	0	48,022,541	0	1,011,489	49,756,789	263
		99n	0	0	0	0	0	0	5,964	5,964	0
*	Chloroacetic acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	25,013	0	0	0	1,342,493	2,726	6,607	1,376,839	0
		98o	85,721	0	0	0	1,209,175	568	3,250	1,298,714	0
		98n	0	0	0	0	10,132	0	0	10,132	0
		99o	83,319	0	0	0	867,368	1,419	4,768	956,874	1
		99n	No reports								
*	1-(3-Chloroallyl)-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3,5,7-triaza-1-azonia-	95	2,700	0	0	0	720	4,700	3,570	11,690	0
	adamantane chloride	98o	78,111	0	0	0	2,310	12,150	6,753	99,324	0
		98n	No reports								
		99o	31,211	0	0	0	1,834	331,049	6,541	370,635	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
106-47-8	*,**	p-Chloroaniline	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	267	827	0	0	1,094	11	1,105
			98o	4	6,181	12	0	0	6,193	0	6,193
			98n	1	20	0	0	0	20	0	20
			99o	4	131	337	0	0	468	0	468
			99n	1	1	0	0	0	1	0	1
108-90-7	*	Chlorobenzene	88	66	4,375,887	98,354	84,457	4,127	4,562,825	117,624	4,680,449
			95	62	1,132,073	1,850	27,405	5	1,161,333	92,582	1,253,915
			98o	75	774,102	662	184,106	16	958,886	19,763	978,649
			98n	18	1,130	250	250	0	1,630	1,870	3,500
			99o	75	675,741	1,433	113,526	214	790,914	16,217	807,131
			99n	17	2,149	1	62,018	0	64,168	15,448	79,616
510-15-6		Chlorobenzilate	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	1	2	1	0	0	3	10	13
75-68-3		1-Chloro-1,1-difluoroethane	88	NR	NR	NR	NR	NR	NR	NR	NR
		(HCFC-142b)	95	25	6,954,443	771	6	0	6,955,220	21,600	6,976,820
			98o	28	5,529,844	40	0	0	5,529,884	4,979	5,534,863
			98n	3	11	0	0	0	11	614	625
			99o	29	5,644,136	44	0	0	5,644,180	4,989	5,649,169
			99n	6	24	0	0	0	24	119	143
75-45-6	*	Chlorodifluoromethane	88	NR	NR	NR	NR	NR	NR	NR	NR
		(HCFC-22)	95	244	12,585,061	2,279	22	1	12,587,363	55,084	12,642,447
			98o	242	8,942,117	3,652	0	1	8,945,770	50,648	8,996,418
			98n	1	64,602	0	0	0	64,602	0	64,602
			99o	250	8,376,930	3,652	0	1	8,380,583	67,799	8,448,382
			99n	5	108,930	0	0	0	108,930	0	108,930
75-00-3		Chloroethane	88	50	4,907,292	27,448	1,510	1	4,936,251	32,260	4,968,511
			95	55	2,890,354	2,320	0	116	2,892,790	4,400	2,897,190
			98o	59	2,198,423	1,024	67	50	2,199,564	3,900	2,203,464
			98n	2	16	0	0	0	16	3	19
			99o	56	2,127,670	261	130	0	2,128,061	2,309	2,130,370
			99n	No reports							
67-66-3	*,**	Chloroform	88	169	25,988,609	1,114,965	36,000	68,647	27,208,221	143,124	27,351,345
			95	163	10,496,501	332,473	33,276	4,297	10,866,547	6,647	10,873,194
			98o	140	6,506,538	135,414	44,102	12,344	6,698,398	42,857	6,741,255
			98n	21	2,226	6	5	0	2,237	3,471	5,708
			99o	132	5,335,138	86,305	59,399	11,771	5,492,613	32,282	5,524,895
			99n	22	3,231	1	64,297	0	67,529	59,348	126,877

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*,**	p-Chloroaniline	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	540	0	120,301	940	121,781	0
		98o	0	0	46,000	520	0	6,424	16,097	69,041	0
		98n	0	0	0	0	25,861	0	20	25,881	0
		99o	0	0	570,000	1,372	1,112	7,396	471	580,351	0
		99n	0	0	0	0	17,936	0	1	17,937	0
*	Chlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	9,123,869	1,016,982	2,099,757	1,366,145	11,231,684	1,503,368	1,242,678	27,584,483	20,613
		98o	1,107,325	976,071	5,490,480	3,476,264	10,333,365	4,804,121	983,806	27,171,432	831
		98n	260,432	0	20,907	81,425	1,819,899	1,302	2,040	2,186,005	3
		99o	4,394,439	6,186,066	4,355,424	1,518,569	6,283,038	1,640,671	784,133	25,162,340	16,458
		99n	443,673	0	8,156	287,236	2,576,220	1,174	64,394	3,380,853	11
	Chlorobenzilate	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	41,000	0	9	41,009	0
	1-Chloro-1,1-difluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(HCFC-142b)	95	52,560	0	0	320	304,070	26,330	6,933,797	7,317,077	459
		98o	67	0	0	5,400	534,586	165,589	5,537,482	6,243,124	103
		98n	0	0	0	0	136,697	0	625	137,322	0
		99o	12,089,067	0	0	142,321	537,217	190,798	5,577,057	18,536,460	13
		99n	0	0	0	0	591,193	0	124	591,317	0
*	Chlorodifluoromethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(HCFC-22)	95	2,374,126	242,386	0	27,002	401,771	258,992	12,473,833	15,778,110	196,364
		98o	698,765	168,042	0	237	505,214	291,198	9,092,224	10,755,680	125,566
		98n	0	0	0	0	0	0	63,090	63,090	1,512
		99o	867,732	472,424	0	2,422	346,748	203,402	8,524,280	10,417,008	28,185
		99n	3	0	0	0	12,715	1,114	108,966	122,798	1
	Chloroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,321,094	155,726	13,500,359	45,855	28,074,197	492,722	2,896,879	47,486,832	8,570
		98o	5,135,802	175,104	11,263,574	17,934	35,499,891	332,191	2,206,187	54,630,683	135
		98n	0	0	0	0	48,025	14	15	48,054	1
		99o	535,427	431,321	22,516,043	119,801	28,690,272	504,450	2,129,345	54,926,659	1,402
		99n	No reports								
*,**	Chloroform	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,138,816	175,713	17,199,219	103,558	17,286,695	2,062,169	10,831,218	52,797,388	27,208
		98o	6,749,489	1,871,565	5,133,726	164,858	16,253,651	1,722,202	6,714,471	38,609,962	21,625
		98n	53,314	0	1,650	326,742	1,473,283	2,409,085	3,716	4,267,790	6
		99o	8,936,153	2,756,665	1,606,655	89,563	25,578,063	2,025,057	5,489,112	46,481,268	51,614
		99n	222,080	0	18,133	468,149	2,136,199	187,350	70,520	3,102,431	53

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
74-87-3	*	Chloromethane	88	81	11,567,647	115,985	165,250	0	11,848,882	59,140	11,908,022
			95	111	4,394,877	57,430	50,198	35	4,502,540	1,557	4,504,097
			98o	101	2,650,625	1,742	323,201	57	2,975,625	952	2,976,577
			98n	9	2,812	0	0	0	2,812	7	2,819
			99o	98	2,776,733	2,159	158,680	53	2,937,625	2,194	2,939,819
			99n	11	1,150	0	0	8,228	9,378	4,456	13,834
107-30-2	**	Chloromethyl methyl ether	88	4	3,033	0	0	0	3,033	0	3,033
			95	3	2,865	10	0	0	2,875	70	2,945
			98o	2	1,000	0	0	0	1,000	0	1,000
			98n	1	0	0	0	0	0	0	0
			99o	2	1,300	0	0	0	1,300	0	1,300
			99n	3	70	1	0	0	71	169	240
563-47-3	**	3-Chloro-2-methyl-1-propene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	19,859	0	0	0	19,859	0	19,859
			98o	3	7,353	0	0	0	7,353	0	7,353
			98n	No reports							
			99o	4	8,716	0	0	0	8,716	0	8,716
			99n	No reports							
—	**	Chlorophenols	88	9	2,573	272	71,554	0	74,399	2	74,401
			95	9	4,997	30	105,687	0	110,714	958	111,672
			98o	6	4,864	36	73,548	0	78,448	8,013	86,461
			98n	5	16	0	0	0	16	4,175	4,191
			99o	8	3,519	75	59,159	2	62,755	3,339	66,094
			99n	3	1	0	0	0	1	285	286
76-06-2	*	Chloropicrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	15	11,472	0	0	0	11,472	36	11,508
			98o	16	7,560	0	0	0	7,560	270	7,830
			98n	1	4	0	0	0	4	0	4
			99o	15	6,647	0	0	0	6,647	1	6,648
			99n	1	4	0	0	0	4	0	4
126-99-8	**	Chloroprene	88	13	1,948,008	287	68,792	0	2,017,087	0	2,017,087
			95	15	983,932	0	60,000	5,104	1,049,036	7,102	1,056,138
			98o	12	977,628	0	100,000	0	1,077,628	0	1,077,628
			98n	2	528	0	0	0	528	1	529
			99o	10	906,891	0	29,000	0	935,891	0	935,891
			99n	1	255	0	0	0	255	0	255
542-76-7		3-Chloropropionitrile	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	2	4	0	0	0	4	153	157

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Chloromethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,803,788	650	4,517,896	4,505	14,364,776	240,406	4,522,298	26,454,319	7,918
		98o	3,447,064	23,740	4,341,426	17,950	8,368,825	292,447	2,931,738	19,423,190	12,003
		98n	0	0	0	0	342,535	1,997,213	2,861	2,342,609	1
		99o	3,323,869	1	5,274,618	2,063	13,727,873	234,597	2,935,887	25,498,908	2,699
		99n	0	0	0	0	363,375	0	13,928	377,303	33,696
**	Chloromethyl methyl ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	15,900	0	2,909	18,809	0
		98o	0	0	0	0	280	0	1,000	1,280	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	1,600	0	1,300	2,900	0
		99n	0	0	0	0	163,369	0	235	163,604	0
**	3-Chloro-2-methyl-1-propene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	544,134	14,819	19,859	578,812	10
		98o	0	0	0	0	637,973	344	7,353	645,670	0
		98n	No reports								
		99o	0	0	0	0	550,770	16,664	8,525	575,959	0
		99n	No reports								
**	Chlorophenols	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,919,075	0	0	6,400	237,484	26,212	109,865	3,299,036	1,776
		98o	2,737,000	0	0	0	297,377	7,807	85,733	3,127,917	725
		98n	0	0	1,009	62,967	281,511	9,645	3,940	359,072	0
		99o	2,148,700	0	0	0	1,740,690	3,639	65,024	3,958,053	1,070
		99n	0	0	2,837	78,708	188,731	71	286	270,633	0
*	Chloropicrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	9,981	632	0	54	441	34,524	10,677	56,309	0
		98o	2,250	1,064	0	0	1,110	483	7,544	12,451	1
		98n	0	0	0	0	0	0	4	4	0
		99o	2,206	914	0	0	4,233	412	6,647	14,412	10
		99n	0	0	0	0	0	0	4	4	0
**	Chloroprene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	480,972	466,280	9,105	4,233,572	138,421	1,051,019	6,379,369	518
		98o	0	306,514	1,200,000	66,206	8,860,286	209,184	1,077,632	11,719,822	10
		98n	0	0	0	13,385	102,414	173	299	116,271	0
		99o	0	584,238	1,945,200	798	8,671,014	115,522	935,889	12,252,661	0
		99n	0	0	0	0	102,743	0	15	102,758	0
	3-Chloropropionitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	106,854	0	157	107,011	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
63938-10-3	Chlorotetrafluoroethane	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	No reports							
		98o	No reports							
		98n	1	0	0	0	0	0	0	0
		99o	1	129,800	0	0	0	129,800	0	129,800
		99n	1	0	0	0	0	0	0	0
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	4	504,553	0	0	0	504,553	0	504,553
		98o	3	23,336	0	0	0	23,336	0	23,336
		98n	No reports							
		99o	3	59,525	0	0	0	59,525	0	59,525
		99n	No reports							
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	11	752,215	1,255	0	0	753,470	0	753,470
		98o	23	750,474	5	0	0	750,479	0	750,479
		98n	1	852	0	0	0	852	0	852
		99o	22	599,721	5	0	0	599,726	0	599,726
		99n	1	4,651	0	0	0	4,651	0	4,651
1897-45-6 *	Chlorothalonil	88	10	28,476	250	0	0	28,726	396,274	425,000
		95	25	7,440	35	0	750	8,225	97,420	105,645
		98o	25	9,236	35	0	0	9,271	301,801	311,072
		98n	1	0	0	5	32,000	32,005	5	32,010
		99o	19	5,106	7	0	0	5,113	280,116	285,229
		99n	1	0	0	0	0	0	0	0
75-88-7	2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	2	35,523	0	0	0	35,523	0	35,523
		98o	4	162,775	52	0	0	162,827	0	162,827
		98n	No reports							
		99o	3	23,950	30	0	0	23,980	0	23,980
		99n	No reports							
75-72-9	Chlorotrifluoromethane (CFC-13)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	250	0	0	0	250	0	250
		98o	1	14,700	5	0	0	14,705	0	14,705
		98n	No reports							
		99o	2	10,790	5	0	0	10,795	0	10,795
		99n	No reports							
5598-13-0 *	Chlorpyrifos methyl	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	4	510	0	0	6,000	6,510	0	6,510
		98o	5	500	0	0	0	500	0	500
		98n	No reports							
		99o	4	10	0	0	0	10	24,197	24,207
		99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Chlorotetrafluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	29,571	0	0	29,571	0
		99o	0	0	0	0	0	0	129,800	129,800	0
		99n	0	0	0	0	47,355	0	0	47,355	0
	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,725	0	504,011	505,736	0
		98o	0	0	0	0	165,890	0	23,136	189,026	0
		98n	No reports								
		99o	0	0	0	0	457,049	474,629	59,325	991,003	0
		99n	No reports								
	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	239,200	0	0	193,194	35,816	753,296	1,221,506	401
		98o	44,530	282,345	0	0	501,437	0	749,963	1,578,275	32
		98n	0	0	0	0	0	0	852	852	0
		99o	110,249	246,089	0	0	263,090	1,085	599,669	1,220,182	41
		99n	0	0	0	0	0	0	4,651	4,651	0
*	Chlorothalonil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,339	0	0	2,294	24,716	139,966	102,279	274,594	5
		98o	4,726	0	0	0	65,406	195,241	311,120	576,493	419
		98n	0	0	0	0	0	0	32,000	32,000	0
		99o	25,082	0	0	0	63,840	149,720	285,866	524,508	1,614
		99n	0	0	0	0	14,075	0	0	14,075	0
	2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	35,608	35,608	0
		98o	0	0	0	0	33,000	0	162,925	195,925	4
		98n	No reports								
		99o	0	0	0	0	250,000	0	23,700	273,700	1
		99n	No reports								
	Chlorotrifluoromethane (CFC-13)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	30	30	0
		98o	0	0	0	0	0	0	14,705	14,705	0
		98n	No reports								
		99o	0	33,339	0	0	0	0	10,795	44,134	0
		99n	No reports								
*	Chlorpyrifos methyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	400	0	0	0	0	6,095	6,402	12,897	0
		98o	2,000	0	0	0	0	4,990	285	7,275	0
		98n	No reports								
		99o	4,000	0	0	0	0	0	8	4,008	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
64902-72-3 *	Chlorsulfuron	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	1	0	0	0	1	0	1
		98o	1	1	0	0	0	1	0	1
		98n	No reports							
		99o	1	1	0	0	0	1	0	1
		99n	No reports							
7440-47-3	Chromium	88	1,257	566,498	75,442	2,249	9,282,766	9,926,955	11,710,612	21,637,567
		95	1,995	418,408	17,266	33	1,109,958	1,545,665	5,771,254	7,316,919
		98o	1,954	478,733	13,112	9	685,766	1,177,620	12,286,701	13,464,321
		98n	58	7,409	25,220	260,448	14,863,233	15,156,310	1,684,877	16,841,187
		99o	1,971	300,814	11,236	56	715,100	1,027,206	15,226,590	16,253,796
		99n	55	3,879	20,333	38,250	10,484,695	10,547,157	1,582,791	12,129,948
—	Chromium compounds	88	1,214	764,851	326,027	52,653	30,938,106	32,081,637	14,898,699	46,980,336
		95	1,478	650,311	138,551	1,084,747	22,090,165	23,963,774	20,389,031	44,352,805
		98o	1,501	347,629	112,520	874,795	30,241,083	31,576,027	14,258,085	45,834,112
		98n	325	305,563	114,397	667,755	58,501,745	59,589,460	5,859,141	65,448,601
		99o	1,471	467,071	97,379	816,717	29,591,378	30,972,545	11,704,628	42,677,173
		99n	311	281,396	97,202	720,000	122,827,111	123,925,709	5,140,315	129,066,024
6459-94-5 **	C.I. Acid Red 114	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	0	0	0	0	0	0	0
		98o	1	0	0	0	0	0	0	0
		98n	No reports							
		99o	1	0	0	0	0	0	0	0
		99n	No reports							
569-64-2 *	C.I. Basic Green 4	88	6	750	0	0	0	750	250	1,000
		95	2	5	0	0	0	5	0	5
		98o	3	5	0	0	0	5	750	755
		98n	1	0	0	0	0	0	0	0
		99o	1	0	0	0	0	0	0	0
		99n	No reports							
989-38-8	C.I. Basic Red 1	88	No reports							
		95	2	0	0	0	0	0	668	668
		98o	1	0	0	0	0	0	0	0
		98n	No reports							
		99o	2	0	0	0	0	0	0	0
		99n	No reports							
28407-37-6	C.I. Direct Blue 218	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	6	10	6	0	0	16	1,400	1,416
		98o	6	0	10	0	5	15	2,142	2,157
		98n	No reports							
		99o	8	0	10	0	0	10	2,259	2,269
		99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Chlorsulfuron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	3,444	1	3,445	0
		98o	0	0	0	0	0	10,508	1	10,509	0
		98n	No reports								
		99o	0	0	0	0	0	2,221	1	2,222	0
		99n	No reports								
	Chromium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	29,383,000	102,620,653	9,781,278	51,737	407,059	1,625,216	8,196,383	152,065,326	41,531
		98o	86,941,979	85,701,571	86,318	17,198	815,469	1,198,804	13,503,531	188,264,870	55,236
		98n	1	141,529	0	0	59,920	48,806	16,443,437	16,693,693	9
		99o	27,015,081	86,204,633	0	1,555	506,478	774,300	12,439,973	126,942,020	3,887,557
		99n	1,524	383,454	0	0	1,977	187,876	11,309,149	11,883,980	15
	Chromium compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	36,402,729	45,926,897	44,280	66,691	94,217,654	3,498,201	40,262,731	220,419,183	1,658,998
		98o	38,004,484	33,563,950	10,015	33,545	1,225,288	2,591,138	44,564,125	119,992,545	175,639
		98n	64,201	903,937	0	57,374	133,506	449,066	65,248,633	66,856,717	2,871
		99o	27,604,292	34,962,321	2,000	64,839	8,936,864	1,354,628	43,372,240	116,297,184	1,444,247
		99n	14,417	1,765,370	0	0	91,982	207,012	85,760,261	87,839,042	43,000,521
**	C.I. Acid Red 114	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	C.I. Basic Green 4	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	110	499	10	619	0
		98o	0	0	0	0	0	998	20	1,018	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	C.I. Basic Red 1	88	No reports								
		95	0	0	0	54	0	289	668	1,011	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	C.I. Direct Blue 218	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5	0	0	0	619	5,151	1,411	7,186	0
		98o	0	260	0	0	312	1,417	2,144	4,133	0
		98n	No reports								
		99o	0	450	0	0	53	1,622	2,262	4,387	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
16071-86-6	C.I. Direct Brown 95	88	No reports							
		95	1	0	0	0	0	0	0	0
		98o	No reports							
		98n	No reports							
		99o	No reports							
		99n	No reports							
2832-40-8	C.I. Disperse Yellow 3	88	1	398	302	0	0	700	899	1,599
		95	3	450	27	0	0	477	1,061	1,538
		98o	3	205	25	0	0	230	876	1,106
		98n	No reports							
		99o	3	50	25	0	0	75	900	975
		99n	No reports							
81-88-9	C.I. Food Red 15	88	2	250	0	0	0	250	0	250
		95	2	0	0	0	0	0	0	0
		98o	2	0	0	0	0	0	0	0
		98n	No reports							
		99o	3	0	0	0	0	0	0	0
		99n	No reports							
3118-97-6	C.I. Solvent Orange 7	88	No reports							
		95	No reports							
		98o	No reports							
		98n	No reports							
		99o	1	0	0	0	0	0	0	0
		99n	No reports							
97-56-3	C.I. Solvent Yellow 3	88	1	250	0	0	0	250	0	250
		95	1	0	0	0	0	0	0	0
		98o	1	0	0	0	0	0	0	0
		98n	No reports							
		99o	1	0	0	0	0	0	0	0
		99n	No reports							
842-07-9	C.I. Solvent Yellow 14	88	2	0	0	0	0	0	0	0
		95	No reports							
492-80-8 *,**	C.I. Solvent Yellow 34	98o	1	0	0	0	0	0	0	0
		98n	No reports							
		99o	1	0	0	0	0	0	0	0
		99n	2	5	0	0	0	5	157	162
7440-48-4 **	Cobalt	88	178	44,038	16,744	0	213,204	273,986	248,089	522,075
		95	260	35,521	17,070	0	46,487	99,078	223,081	322,159
		98o	268	40,630	3,597	0	85,063	129,290	414,253	543,543
		98n	6	280	7	0	133,731	134,018	17,870	151,888
		99o	250	24,325	5,600	0	5,803	35,728	330,771	366,499
		99n	5	27	0	0	83,115	83,142	5	83,147

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year. C.I. Solvent Yellow 14 has no reports for 1998 or 1999 and CI.I Solent Yellow 34 has no reports for 1988 and 1995.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	C.I. Direct Brown 95	88	No reports								
		95	0	0	0	0	0	0	0	0	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
	C.I. Disperse Yellow 3	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,061	5,189	1,410	7,660	0
		98o	0	0	0	0	0	1,882	1,106	2,988	1
		98n	No reports								
		99o	0	0	0	0	0	0	950	950	0
		99n	No reports								
	C.I. Food Red 15	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	C.I. Solvent Orange 7	88	No reports								
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	C.I. Solvent Yellow 3	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	C.I. Solvent Yellow 14	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
*,**	C.I. Solvent Yellow 34	98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	129,504	0	162	129,666	0
**	Cobalt	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,583,408	12,062,557	0	1	379,265	85,327	250,979	16,361,537	19
		98o	4,249,702	7,607,336	0	10,000	14,107	32,813	326,390	12,240,348	311
		98n	0	0	0	0	0	0	151,859	151,859	1
		99o	4,421,707	7,424,436	0	0	5,886	14,387	250,501	12,116,917	38
		99n	0	0	0	0	0	0	83,124	83,124	0

Note: Data from Section 8 (Current Year) of Form R. C.I. Solvent Yellow 14 has no reports for 1998 or 1999 and CI.I Solent Yellow 34 has no reports for 1988 and 1995.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—	**	Cobalt compounds	88	150	56,410	63,662	18,500	38,960	177,532	300,641	478,173
			95	233	29,756	70,646	51,657	505,634	657,693	352,486	1,010,179
			98o	287	32,098	35,350	32,950	500,101	600,499	353,801	954,300
			98n	157	55,229	24,069	12,006	12,610,937	12,702,241	461,156	13,163,397
			99o	288	33,861	58,826	30,421	494,601	617,709	501,159	1,118,868
			99n	155	45,019	24,948	17,001	14,769,746	14,856,714	401,282	15,257,996
7440-50-8	*	Copper	88	1,976	1,525,312	117,147	15,646	10,466,155	12,124,260	17,233,013	29,357,273
			95	2,797	1,270,554	44,746	29,787	1,658,490	3,003,577	14,995,886	17,999,463
			98o	2,794	783,514	37,959	56,634	1,535,810	2,413,917	9,189,922	11,603,839
			98n	58	117,699	17,196	23,211	278,545,097	278,703,203	2,423,176	281,126,379
			99o	2,726	2,147,555	33,835	62,367	1,356,172	3,599,929	9,389,644	12,989,573
			99n	45	83,855	2,985	5	12,843,001	12,929,846	1,593,575	14,523,421
—		Copper compounds	88	1,045	3,158,742	185,292	165,957	29,683,607	33,193,598	14,135,121	47,328,719
			95	1,470	2,026,261	93,463	284,852	40,773,223	43,177,799	10,135,478	53,313,277
			98o	1,578	3,537,103	95,291	187,400	51,931,154	55,750,948	8,689,722	64,440,670
			98n	385	608,782	369,878	1,374,646	1,233,639,938	1,235,993,244	4,574,527	1,240,567,771
			99o	1,592	1,552,594	84,642	247,755	44,273,099	46,158,090	9,377,458	55,535,548
			99n	362	657,441	276,825	1,273,581	1,731,744,734	1,733,952,581	4,289,275	1,738,241,856
8001-58-9	*,**	Creosote	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	85	928,376	8,427	0	500	937,303	2,595,570	3,532,873
			98o	78	869,799	24,842	0	12,275	906,916	1,204,515	2,111,431
			98n	14	1,142	0	0	2,176,468	2,177,610	1,996	2,179,606
			99o	75	742,018	22,318	0	34,237	798,573	607,485	1,406,058
			99n	15	1,059	1	0	1,174,746	1,175,806	636	1,176,442
120-71-8	**	p-Cresidine	88	6	7,080	250	0	750	8,080	4,700	12,780
			95	6	4,606	0	0	0	4,606	2,200	6,806
			98o	4	2,400	0	0	0	2,400	0	2,400
			98n	No reports							
			99o	3	1,730	410	0	0	2,140	0	2,140
			99n	No reports							
108-39-4	*	m-Cresol	88	15	18,432	283	0	455	19,170	13,503	32,673
			95	29	48,000	1,675	680,000	0	729,675	3,316	732,991
			98o	26	44,999	141	502,670	4,655	552,465	632	553,097
			98n	4	9	0	0	0	9	0	9
			99o	24	41,392	670	401,011	3,096	446,169	755	446,924
			99n	6	116	1	250	0	367	279	646
95-48-7		o-Cresol	88	28	89,793	448	0	1,667	91,908	12,458	104,366
			95	23	12,425	82	590,000	0	602,507	5,257	607,764
			98o	21	9,270	16	466,578	20	475,884	39,525	515,409
			98n	6	12	0	0	0	12	0	12
			99o	25	11,059	19	381,376	20	392,474	2,674	395,148
			99n	7	717	1	250	11,770	12,738	743	13,481

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Cobalt compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	222,882	1,987,024	0	847	1,394,924	98,451	958,210	4,662,338	4,241
		98o	151,421	1,678,717	0	7,985	1,459,617	37,257	955,881	4,290,878	1,602
		98n	39,737	18,567	0	0	46,417	15	13,158,477	13,263,213	4,021
		99o	314,090	1,460,920	117	14,204	1,157,119	65,427	1,093,446	4,105,323	3,773
		99n	164,666	11,144	0	0	0	10	15,256,539	15,432,359	30
*	Copper	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	497,597,679	568,944,460	506	43,341	41,198,550	1,758,270	11,536,321	1,121,079,127	92,197
		98o	538,829,326	569,858,783	189,372	499,061	45,072,502	1,422,645	8,791,428	1,164,663,117	952,172
		98n	2,708,008	817,145	0	0	1,370	27,294	281,065,001	284,618,818	5
		99o	467,406,131	597,997,865	0	332	742,770	1,671,710	8,440,789	1,076,259,597	165,014
		99n	3,363,123	1,633,389	0	0	51,153	42,171	14,495,146	19,584,982	2
	Copper compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	215,002,488	181,627,923	0	30,802	60,465,252	2,278,683	50,020,457	509,425,605	1,323,186
		98o	186,532,474	150,451,923	0	23,292	2,735,305	1,819,514	61,391,920	402,954,428	4,149,261
		98n	5,677,807	1,786,645	0	15,858	483,340	168,564	1,349,748,709	1,357,880,923	297,963
		99o	220,044,782	148,611,331	1,200	324,339	3,100,191	1,429,907	52,719,419	426,231,169	4,476,230
		99n	2,005,320	2,249,900	0	0	7,214,180	491,128	1,476,246,887	1,488,207,415	330,001,090
*/**	Creosote	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	64,447,471	2,180	6,100	94,871	163,131	298,027	3,208,184	68,219,964	322,992
		98o	11,514,469	717,808	2,626,352	81,103	842,960	902,470	1,907,684	18,592,846	541,707
		98n	0	0	10	49,454	523,727	41,936	2,177,407	2,792,534	3
		99o	6,427,378	696,540	2,143,805	163,252	432,906	1,051,318	1,345,805	12,261,004	519,891
		99n	0	0	471	225	1,490,119	22,639	1,179,126	2,692,580	0
**	p-Cresidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	51,611	6,806	58,417	3,400
		98o	0	0	0	0	0	29,000	2,400	31,400	0
		98n	No reports								
		99o	0	0	0	0	1,106	5,700	1,387	8,193	0
		99n	No reports								
*	m-Cresol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,309,373	1,500,001	615,425	17,910	329,024	91,159	737,708	5,600,600	151
		98o	1,769,226	1,064,540	649,489	18,878	240,659	8,216	554,568	4,305,576	719
		98n	0	0	0	45,524	40,473	0	9	86,006	0
		99o	32,821	943,956	631,926	19,426	264,730	7,763	450,744	2,351,366	667
		99n	0	0	0	44,270	531,957	0	436	576,663	0
	o-Cresol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	171,098	76	304,801	321	184,032	125,072	606,682	1,392,082	117
		98o	95,701	0	339,395	1,218	206,884	17,724	516,766	1,177,688	376
		98n	0	0	0	45,524	58,649	0	12	104,185	0
		99o	29,734	75	250,748	24,837	206,544	16,996	394,795	923,729	89
		99n	0	0	0	44,270	521,460	1,500	14,240	581,470	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases					Off-site Releases	Total On- and Off-site Releases
					Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Transfers Off-site to Disposal	
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
106-44-5		p-Cresol	88	18	640,703	1,143	152,000	62,291	856,137	643	856,780
			95	30	44,901	1,066	342,500	0	388,467	3,168	391,635
			98o	30	57,003	43	299,485	0	356,531	50,556	407,087
			98n	5	13	0	0	0	13	0	13
			99o	28	44,318	422	244,834	68	289,642	32,884	322,526
			99n	7	148	1	250	0	399	222	621
1319-77-3	*	Cresol (mixed isomers)	88	111	787,305	6,811	1,804,060	4,516	2,602,692	483,488	3,086,180
			95	155	1,606,566	15,011	648,882	2,345	2,272,804	47,654	2,320,458
			98o	147	1,563,222	8,374	489,033	11,839	2,072,468	18,781	2,091,249
			98n	21	2,449	251	750	12,984	16,434	1,032	17,466
			99o	151	1,410,156	5,025	899,887	9,317	2,324,385	117,260	2,441,645
			99n	18	3,500	252	0	63,963	67,715	17,134	84,849
4170-30-3	*	Crotonaldehyde	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	7	101,579	680	391,500	0	493,759	0	493,759
			98o	6	29,584	3,800	1,300	0	34,684	0	34,684
			98n	1	0	0	0	0	0	0	0
			99o	8	28,867	37,297	1,350	0	67,514	0	67,514
			99n	3	16	1	0	0	17	176	193
98-82-8		Cumene	88	118	5,239,958	3,201	30,165	8,591	5,281,915	83,287	5,365,202
			95	241	1,876,436	1,490	9,403	1,102	1,888,431	70,457	1,958,888
			98o	245	1,326,837	660	1,040	9,537	1,338,074	32,676	1,370,750
			98n	159	10,482	5	0	926	11,413	861	12,274
			99o	242	1,393,731	3,133	1,271	9,196	1,407,331	16,670	1,424,001
			99n	145	11,274	19	0	12	11,305	1,188	12,493
80-15-9		Cumene hydroperoxide	88	40	192,523	1,784	371,000	250	565,557	22,944	588,501
			95	44	72,898	68	280,000	3,400	356,366	9,725	366,091
			98o	45	75,036	79	210,000	11,000	296,115	10,747	306,862
			98n	No reports							
			99o	49	63,230	120	330,000	10,400	403,750	10,428	414,178
			99n	3	173	0	0	0	173	14,690	14,863
135-20-6	**	Cupferron	88	4	920	0	0	0	920	0	920
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
21725-46-2	*	Cyanazine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	991	492	0	0	1,483	2,527	4,010
			98o	6	193	0	0	0	193	0	193
			98n	1	9	0	0	12,000	12,009	0	12,009
			99o	2	77	0	0	0	77	0	77
			99n	1	67	0	0	81,464	81,531	0	81,531

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	p-Cresol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	137,136	900,001	454,288	58,641	239,766	989,315	392,942	3,172,089	100
		98o	83,138	654,268	449,080	76,711	1,156,104	54,263	387,019	2,860,583	280
		98n	0	0	0	45,524	58,586	0	13	104,123	0
		99o	21,521	471,978	368,924	105,385	1,393,414	45,727	321,096	2,728,045	230
		99n	0	0	0	44,270	511,244	0	416	555,930	0
*	Cresol (mixed isomers)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,052,270	187,427	5,077,170	637,169	8,558,967	1,143,472	2,204,126	18,860,601	6,814
		98o	125,717	645,573	7,298,232	434,321	11,306,167	313,764	2,097,628	22,221,402	8
		98n	0	0	0	2,688,010	1,748,792	105,015	17,166	4,558,983	2
		99o	117,186	816,127	5,452,294	400,508	10,422,770	324,550	2,497,295	20,030,730	1,704
		99n	167,180	0	0	2,894,302	1,561,752	13,363	68,371	4,704,968	10
*	Crotonaldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	202,400	0	498,820	701,220	0
		98o	0	0	1,837,500	0	569,220	16	34,884	2,441,620	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	1,823,660	7,492	1,255,658	1,552	66,911	3,155,273	0
		99n	0	0	0	0	252,503	0	188	252,691	0
	Cumene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	17,285,493	60,160	7,052,013	1,626,798	6,412,021	169,307	2,048,017	34,653,809	2,276
		98o	19,166,077	147,270	9,222,203	855,853	16,050,082	187,647	1,482,966	47,112,098	917
		98n	161,872	500	14,642	614,478	74,840	17,918	6,080	890,330	878
		99o	20,953,597	58,642	5,571,585	1,043,530	12,802,582	114,628	1,492,979	42,037,543	523
		99n	417,429	308	21,094	711,535	389,237	3,104	9,153	1,551,860	23
		88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	6	482,755	21,434	375,758	879,953	1
		98o	0	0	0	1,066	399,343	264,990	304,800	970,199	1
		98n	No reports								
		99o	0	6	500	476	1,095,436	435,408	424,604	1,956,430	1
		99n	0	0	0	50,683	111,872	15,702	326	178,583	0
**	Cupferron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	5,648	0	5,648	0
		98o	0	0	13,228	659	0	0	0	13,887	0
		98n	No reports								
		99o	0	0	3,750	9,623	0	0	0	13,373	0
		99n	No reports								
*	Cyanazine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	545,000	8,100	3,887	556,987	0
		98o	0	0	0	0	43,000	27,576	453	71,029	0
		98n	0	0	0	0	0	0	12,000	12,000	1
		99o	0	0	0	0	0	75,400	75,500	150,900	0
		99n	0	0	0	0	0	0	81,531	81,531	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—		Cyanide compounds	88	393	1,248,012	195,244	3,707,326	107,208	5,257,790	581,408	5,839,198
			95	247	1,074,734	89,753	4,429,640	18,581	5,612,708	149,457	5,762,165
			98o	242	703,161	54,613	3,762,384	16,821	4,536,979	109,484	4,646,463
			98n	86	62,250	2,996	18,750	3,882,176	3,966,172	45,428	4,011,600
			99o	240	944,249	68,306	3,459,749	10,989	4,483,293	76,107	4,559,400
			99n	67	13,934	2,157	19,000	2,302,994	2,338,085	8,873	2,346,958
1134-23-2	*	Cycloate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	26	1,108	16	0	1,150	242	1,392
			98o	3	97	113	77	0	287	4	291
			98n	No reports							
			99o	3	625	113	89	0	827	684	1,511
			99n	No reports							
110-82-7	*	Cyclohexane	88	304	13,984,542	20,071	334,471	38,190	14,377,274	211,575	14,588,849
			95	366	8,098,877	18,908	238,200	10,809	8,366,794	105,702	8,472,496
			98o	378	5,947,982	13,718	348,428	1,357	6,311,485	56,057	6,367,542
			98n	197	84,998	28	8,430	262	93,718	12,027	105,745
			99o	369	4,763,575	13,055	272,426	1,051	5,050,107	100,931	5,151,038
			99n	193	72,799	26	61,998	6,422	141,245	13,156	154,401
108-93-0	*	Cyclohexanol	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	25	167,959	154	3,623,000	0	3,791,113	70	3,791,183
			98o	27	300,624	298	4,307,800	0	4,608,722	1,490	4,610,212
			98n	3	43	0	0	0	43	13	56
			99o	24	161,524	41	3,730,307	0	3,891,872	881	3,892,753
			99n	7	9	0	0	0	9	181	190
68359-37-5	*	Cyfluthrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	10	0	0	0	10	0	10
			98o	2	4	1	0	0	5	0	5
			98n	1	0	0	0	0	0	0	0
			99o	4	16	72	0	0	88	0	88
			99n	1	0	0	0	0	0	0	0
68085-85-8	*	Cyhalothrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
94-75-7	*,**	2,4-D (acetic acid)	88	28	7,020	549	3,789	38,000	49,358	68,422	117,780
			95	27	6,888	1,083	250	4,325	12,546	17,430	29,976
			98o	28	3,970	88	1,300	1,798	7,156	2,887	10,043
			98n	6	18	0	29,909	0	29,927	269	30,196
			99o	28	7,879	74	440	1,798	10,191	11,426	21,617
			99n	7	34	0	21,850	0	21,884	480	22,364

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Cyanide compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	664,976	32,518	19,000	3,523	9,342,137	713,508	5,685,128	16,460,790	6,222
		98o	1,692,214	58,277	7,028,885	2,185	11,964,665	718,714	4,574,383	26,039,323	2,497
		98n	4,803,744	0	143	195	22,269,231	55,905	3,952,976	31,082,194	24
		99o	463,102	24,093	5,174,259	31	12,949,714	1,059,035	4,531,674	24,201,908	25,138
		99n	1,091,815	0	92	116	12,243,449	20,585	2,427,129	15,783,186	27,248
*	Cycloate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	2,000	6,001	1,346	9,347	0
		98o	0	0	0	0	1,148	3,574	289	5,011	0
		98n	No reports								
		99o	0	0	0	0	1,097	2,054	600	3,751	1,652
		99n	No reports								
*	Cyclohexane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	54,644,021	1,585,367	10,345,060	5,145,025	23,742,793	1,250,210	8,426,987	105,139,463	123,189
		98o	67,098,407	638,827	18,369,452	3,402,221	21,853,631	4,380,775	6,176,219	121,919,532	9,059
		98n	457,159	1,685	3,156	4,891,083	3,435,597	248,265	93,750	9,130,695	357
		99o	42,836,316	961,401	15,660,044	1,898,114	23,104,408	2,183,050	5,103,249	91,746,582	175,033
		99n	1,567,007	63,963	18,735	2,573,663	3,408,308	135,743	146,034	7,913,453	2,164
*	Cyclohexanol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	677,199	16,473	154,921	21,584	3,836,687	4,706,864	1
		98o	0	0	3,021,084	75,661	150,421	104,240	4,649,061	8,000,467	0
		98n	0	0	29	144	12,360	0	33	12,566	0
		99o	0	100	1,781,743	64,445	155,135	89,275	3,871,747	5,962,445	0
		99n	0	0	0	31	82,814	0	181	83,026	0
*	Cyfluthrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	989	890	20	1,899	0
		98o	0	0	0	0	3,496	964	5	4,465	0
		98n	0	0	0	0	15,916	0	0	15,916	0
		99o	0	0	0	0	3,024	1,623	83	4,730	0
		99n	0	0	0	0	13,783	0	0	13,783	0
*	Cyhalothrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*,**	2,4-D (acetic acid)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	29,200	0	0	0	23,780	24,490	27,595	105,065	6,192
		98o	87,757	0	0	11	111,450	59,436	9,964	268,618	1
		98n	0	0	0	0	125,425	0	30,192	155,617	0
		99o	94,815	0	0	0	118,130	63,548	26,173	302,666	0
		99n	0	0	0	0	386,422	164	22,131	408,717	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
533-74-4	*	Dazomet	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	11	1,042	230	0	0	1,272	2,578	3,850
			98o	14	0	0	0	0	0	1,274	1,274
			98n	No reports							
			99o	15	250	450	0	5	705	250	955
			98n	No reports							
53404-60-7	*	Dazomet, sodium salt	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	250	250
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
94-82-6	*	2,4-DB	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	750	0	0	0	750	0	750
			98o	2	7	0	0	0	7	0	7
			98n	1	10	0	0	0	10	0	10
			99o	2	17	0	0	0	17	0	17
			99n	No reports							
1929-73-3	*,**	2,4-D butoxyethyl ester	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	510	0	0	0	510	0	510
			98o	2	255	0	0	0	255	0	255
			98n	No reports							
			99o	3	255	0	0	0	255	0	255
			99n	No reports							
94-80-4	*,**	2,4-D butyl ester	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	3	0	0	0	3	0	3
			98o	2	1	0	0	0	1	0	1
			98n	No reports							
			99o	2	0	1	0	0	1	0	1
			99n	No reports							
1163-19-5		Decabromodiphenyl oxide	88	58	29,604	500	292	21,450	51,846	555,181	607,027
			95	139	39,283	3,846	11	204,248	247,388	716,245	963,633
			98o	142	31,114	3,168	0	191,253	225,535	710,069	935,604
			98n	1	0	0	0	310,000	310,000	0	310,000
			99o	141	116,239	2,701	0	396,169	515,109	838,696	1,353,805
			99n	2	0	0	0	350,000	350,000	0	350,000
13684-56-5	*	Desmedipham	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	94	0	0	0	94	0	94
			98n	No reports							
			99o	1	62	0	0	0	62	0	62
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Dazomet	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	20,110	1,178	3,542	24,830	0
		98o	0	0	0	0	100	2,100	1,400	3,600	0
		98n	No reports								
		99o	0	0	0	0	13,093	9,803	602	23,498	0
		98n	No reports								
*	Dazomet, sodium salt	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	56	7,807	0	7,863	0
		98o	0	0	0	0	73	12,620	90	12,783	0
		98n	No reports								
		99o	0	0	0	0	38	12,165	4	12,207	0
		99n	No reports								
*	2,4-DB	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	217	290	507	0
		98o	0	0	0	0	0	14	7	21	0
		98n	0	0	0	21,140	0	0	10	21,150	1
		99o	0	0	0	0	0	8	17	25	0
		99n	No reports								
*,**	2,4-D butoxyethyl ester	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,600	318	1,918	0
		98o	0	0	0	0	0	0	76	76	0
		98n	No reports								
		99o	0	0	0	0	0	0	26	26	0
		99n	No reports								
*,**	2,4-D butyl ester	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	600	0	3	603	0
		98o	0	0	0	0	9,400	0	1	9,401	0
		98n	No reports								
		99o	0	0	0	0	11,000	0	1	11,001	0
		99n	No reports								
	Decabromodiphenyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	oxide	95	992,673	144,205	0	18,686	32,138	322,935	947,336	2,457,973	3,805
		98o	264,731	88,843	385	3,214	43,588	257,120	905,470	1,563,351	8
		98n	0	0	0	0	0	0	310,000	310,000	0
		99o	368,187	29,007	6,600	8,732	58,412	419,598	1,314,803	2,205,339	11
		99n	0	0	0	0	29,784	29,784	350,000	409,568	0
*	Desmedipham	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	1,150	94	1,244	0
		98n	No reports								
		99o	0	0	0	0	0	691	62	753	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1928-43-4	*/**	2,4-D 2-Ethylhexyl ester	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	11	2,765	250	0	0	3,015	3,131	6,146
			98o	10	4,722	5	0	0	4,727	1,735	6,462
			98n	No reports							
			99o	10	4,672	5	0	0	4,677	927	5,604
			99n	No reports							
2303-16-4		Diallate	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	7	1	0	0	8	170	178
615-05-4	**	2,4-Diaminoanisole	88	1	0	0	0	0	0	0	0
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
39156-41-7	**	2,4-Diaminoanisole sulfate	88	1	0	0	0	0	0	0	0
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
101-80-4	**	4,4'-Diaminodiphenyl ether	88	5	216	585	0	0	801	142	943
			95	3	23	359	0	0	382	120	502
			98o	3	22	340	0	0	362	55	417
			98n	No reports							
			99o	3	169	449	0	0	618	41	659
			99n	No reports							
95-80-7	**	2,4-Diaminotoluene	88	2	2,988	250	0	0	3,238	0	3,238
			95	5	500	0	0	0	500	0	500
			98o	3	1,954	0	0	0	1,954	0	1,954
			98n	2	5	0	0	0	5	54,062	54,067
			99o	2	629	0	0	0	629	0	629
			99n	4	35	0	0	0	35	774	809
25376-45-8	**	Diaminotoluene (mixed isomers)	88	13	21,097	3,288	174,000	295	198,680	289,591	488,271
			95	11	9,594	5,522	7,050	55	22,221	28,625	50,846
			98o	13	13,523	5,785	13,000	205	32,513	12,531	45,044
			98n	2	10	0	0	0	10	0	10
			99o	11	10,381	28,633	6,200	14	45,228	15,912	61,140
			99n	6	287	1	0	0	288	1,030	1,318

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*/**	2,4-D 2-Ethylhexyl ester	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	36,531	0	0	0	0	10,318	5,468	52,317	0
		98o	7,870	0	0	0	0	14,179	6,334	28,383	0
		98n	No reports								
		99o	13,250	0	0	0	0	9,898	6,150	29,298	0
		99n	No reports								
	Diallate	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	176,396	0	175	176,571	0
**	2,4-Diaminoanisole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
**	2,4-Diaminoanisole sulfate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
**	4,4'-Diaminodiphenyl ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	4,929	380,289	377	385,595	0
		98o	0	0	0	0	140	4,483	357	4,980	0
		98n	No reports								
		99o	0	0	0	0	62	138	613	813	0
		99n	No reports								
**	2,4-Diaminotoluene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	7,192	29,774	655	37,621	0
		98o	0	0	0	0	67,020	360	1,953	69,333	0
		98n	0	0	0	0	40,920	162,187	54,065	257,172	0
		99o	0	0	0	0	8,987	0	624	9,611	0
		99n	0	0	0	0	778,686	0	795	779,481	0
**	Diaminotoluene (mixed isomers)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	755,917	386,996	362,357	1,923,183	48,109	3,476,562	3,550
		98o	0	0	2,714,193	4,287,968	669,862	1,072,322	44,224	8,788,569	255
		98n	0	0	0	10,092	961,202	0	13	971,307	0
		99o	0	82,392	2,202,232	8,664,291	340,504	853,564	61,864	12,204,847	9
		99n	0	0	0	70,190	1,219,290	2,922	12,470	1,304,872	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
333-41-5	*	Diazinon	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	31	3,245	8	0	0	3,253	1,560	4,813
			98o	29	13,564	11	0	0	13,575	1,955	15,530
			98n	5	15	0	0	0	15	157	172
			99o	32	26,532	13	0	0	26,545	2,326	28,871
			99n	5	15	0	0	0	15	75	90
334-88-3		Diazomethane	88	No reports							
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	1	4	0	0	0	4	0	4
			99n	No reports							
132-64-9		Dibenzofuran	88	110	71,093	1,510	0	9,929	82,532	181,799	264,331
			95	37	18,704	2,843	0	220	21,767	19,824	41,591
			98o	39	93,615	29	0	56,670	150,314	13,304	163,618
			98n	3	615	0	0	0	615	0	615
			99o	36	57,743	20	0	40	57,803	16,835	74,638
			99n	1	4	0	0	0	4	0	4
96-12-8		1,2-Dibromo-3-chloropropane	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	1	0	0	0	0	0	6	6
106-93-4	*,**	1,2-Dibromoethane	88	34	63,342	1,011	6,882	259	71,494	27,924	99,418
			95	19	12,372	306	0	256	12,934	3	12,937
			98o	12	10,047	6	0	1	10,054	0	10,054
			98n	1	0	0	0	0	0	0	0
			99o	13	9,103	11	0	7	9,121	35,529	44,650
			99n	2	5	1	0	0	6	5	11
124-73-2		Dibromotetrafluoroethane (Halon 2402)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	10	0	0	0	10	0	10
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
84-74-2	*	Dibutyl phthalate	88	126	204,058	14,339	350,000	6,395	574,792	113,068	687,860
			95	126	104,833	3,981	390,000	1,402	500,216	25,991	526,207
			98o	109	33,577	206	210,000	5,480	249,263	25,676	274,939
			98n	62	834	0	0	0	834	560	1,394
			99o	115	35,356	273	290,000	4,224	329,853	41,342	371,195
			99n	68	1,121	6	0	9,421	10,548	9,006	19,554

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Diazinon	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	21,330	0	0	1	66,150	7,596	4,355	99,432	5
		98o	53,095	0	0	0	37,803	33,649	15,018	139,565	3
		98n	0	0	0	0	180,882	4	162	181,048	0
		99o	63,631	0	0	0	86,025	57,255	26,738	233,649	1
		99n	0	97	0	0	295,239	0	80	295,416	0
	Diazomethane	88	No reports								
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	0	0	0	0	232	0	4	236	0
		99n	No reports								
	Dibenzofuran	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	70,546	25,036	113	176	405,125	1,471	37,508	539,975	13,220
		98o	131,734	4,920	230,475	92,830	26,678	5,981	119,032	611,650	1,302
		98n	0	0	0	1,352,711	32,439	0	615	1,385,765	1
		99o	109,749	1,450	210,545	96,365	31,728	1,887	77,457	529,181	3
		99n	0	0	0	0	77,842	0	4	77,846	0
	1,2-Dibromo-3-	88	No reports								
	chloropropane	95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	29,000	0	3	29,003	0
*,**	1,2-Dibromoethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,000	0	60	17	34,174	72,467	11,740	123,458	0
		98o	0	0	0	8,701	17,054	863	9,899	36,517	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	120,000	22,252	58,073	9,226	209,551	792
		99n	0	0	0	0	84,312	0	7	84,319	0
	Dibromotetrafluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(Halon 2402)	95	No reports								
		98o	127,308	0	0	0	0	0	10	127,318	0
		98n	No reports								
		99o	130,692	0	0	0	0	0	0	130,692	0
		99n	No reports								
*	Dibutyl phthalate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	51,458	26,123	1,086,538	172,397	314,761	115,699	386,156	2,153,132	173,706
		98o	30,100	12,207	1,028,453	215,856	177,719	95,702	280,203	1,840,240	4
		98n	0	0	0	288,896	89,847	1,697	668	381,108	6
		99o	27,111	5,499	913,586	195,636	318,148	161,391	385,306	2,006,677	85
		99n	17,911	0	0	24,730	355,078	12,444	15,094	425,257	461

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1918-00-9	*	Dicamba	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	6	12,580	250	113,600	0	126,430	0	126,430
			98o	9	1,207	59	32,000	0	33,266	2,100	35,366
			98n	2	10	0	0	0	10	77	87
			99o	13	1,259	37	18,600	0	19,896	140	20,036
			99n	2	2	0	0	0	2	87	89
99-30-9	*	Dichloran	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	10	0	0	0	10	0	10
			98o	3	0	0	0	0	0	0	0
			98n	1	0	0	0	0	0	0	0
			99o	3	0	0	0	0	0	0	0
			99n	1	0	0	0	0	0	0	0
95-50-1	*	1,2-Dichlorobenzene	88	45	530,535	11,624	20,000	13,354	575,513	38,266	613,779
			95	28	271,539	3,789	26,000	11,521	312,849	28,228	341,077
			98o	36	208,463	2,352	3,800	1,245	215,860	6,076	221,936
			98n	10	1,036	5	5	0	1,046	610	1,656
			99o	35	308,537	2,069	2,500	475	313,581	7,920	321,501
			99n	10	1,741	1	0	65,593	67,335	1,566	68,901
541-73-1		1,3-Dichlorobenzene	88	6	15,282	1,281	0	0	16,563	290	16,853
			95	6	7,528	526	0	0	8,054	0	8,054
			98o	6	4,018	203	0	0	4,221	0	4,221
			98n	2	5	0	0	0	5	0	5
			99o	8	3,640	807	0	0	4,447	0	4,447
			99n	2	9	1	0	0	10	30	40
106-46-7	*,**	1,4-Dichlorobenzene	88	24	1,891,419	6,153	4,000	1,300	1,902,872	750	1,903,622
			95	24	242,372	1,287	0	3,100	246,759	3,328	250,087
			98o	19	181,899	1,706	3,100	460	187,165	0	187,165
			98n	11	417	0	0	0	417	81	498
			99o	23	178,210	1,880	7,300	1,370	188,760	0	188,760
			99n	6	44	1	0	0	45	18	63
25321-22-6	**	Dichlorobenzene (mixed isomers)	88	15	163,684	40	0	0	163,724	19,672	183,396
			95	9	5,443	0	0	0	5,443	9	5,452
			98o	6	14,218	0	0	0	14,218	8	14,226
			98n	8	319	250	0	0	569	1,498	2,067
			99o	5	13,796	0	0	0	13,796	0	13,796
			99n	7	52	0	0	0	52	357	409
91-94-1	**	3,3'-Dichlorobenzidine	88	14	255	752	0	0	1,007	209,785	210,792
			95	3	11	0	0	0	11	2,400	2,411
			98o	1	255	0	0	0	255	41,600	41,855
			98n	3	6	0	0	0	6	0	6
			99o	2	15	0	0	0	15	44,145	44,160
			99n	4	5	0	0	0	5	161	166

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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.

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Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Dicamba	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	510	0	0	0	0	29	126,662	127,201	0
		98o	0	0	0	0	37,557	65,900	35,366	138,823	0
		98n	0	0	0	0	22,223	0	87	22,310	0
		99o	0	0	0	0	39,143	42,080	20,039	101,262	0
		99n	0	0	0	0	27,830	0	90	27,920	0
*	Dichloran	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	50	25	10	85	0
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	39,948	0	0	39,948	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	55,619	0	0	55,619	0
*	1,2-Dichlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,527,161	3,626,496	354,610	763,438	172,717	1,999,033	340,963	12,784,418	153
		98o	11,995,819	2,222,086	1,395,535	513,369	374,719	973,511	216,633	17,691,672	62
		98n	2,230,878	0	159	42,595	653,679	4,239,558	1,443	7,168,312	3
		99o	11,893,164	1,378,067	3,964,034	546,751	713,178	1,496,579	327,728	20,319,501	259
		99n	1,705,966	0	412	43,256	1,303,837	314,609	67,005	3,435,085	53
	1,3-Dichlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,068	1,291	0	0	10	3,989	8,079	18,437	36
		98o	1,988	950	0	0	10	2,555	4,260	9,763	1
		98n	0	0	0	0	20,077	202	1	20,280	1
		99o	2,129	930	68,399	0	20,895	3,169	4,439	99,961	6
		99n	0	0	0	0	247,556	0	37	247,593	0
*,**	1,4-Dichlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	705,345	34,882	42,157	11,053	73,030	621,194	248,721	1,736,382	1,609
		98o	2,602,061	0	134,272	6,691	1,766	299,525	185,980	3,230,295	110
		98n	36,560	0	1	149,250	376,335	1,350	256	563,752	2
		99o	1,927,605	0	416,356	2,702	18,350	390,802	188,336	2,944,151	49,306
		99n	28,229	0	0	8,306	658,480	1	48	695,064	5
**	Dichlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(mixed isomers)	95	0	0	266,997	5,165	79,032	3,684	5,452	360,330	0
		98o	0	0	191,010	611	248,100	6,720	14,226	460,667	0
		98n	0	4,724	2,147	712,291	321,134	328	1,849	1,042,473	1
		99o	0	0	1,567,000	0	1	13,402	13,796	1,594,199	0
		99n	0	0	613	665,533	207,957	0	154	874,257	11
**	3,3'-Dichlorobenzidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	22,000	14,000	1,600	2,701	40,301	1
		98o	0	0	0	0	10,000	45,000	42,000	97,000	0
		98n	0	0	0	0	65,021	63	2	65,086	1
		99o	0	0	0	0	11,787	64,065	44,001	119,853	1
		99n	0	0	0	0	237,063	0	163	237,226	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
612-83-9	**	3,3'-Dichlorobenzidine dihydrochloride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	13	0	0	0	0	0	0	0
			98o	16	250	5	0	0	255	6,790	7,045
			98n	No reports							
			99o	16	7	5	0	0	12	3,400	3,412
			99n	No reports							
64969-34-2	**	3,3'-Dichlorobenzidine sulfate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	260	260
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
75-27-4		Dichlorobromomethane	88	1	13,440	0	0	0	13,440	0	13,440
			95	1	2,300	0	0	50	2,350	0	2,350
			98o	1	2,370	0	0	90	2,460	0	2,460
			98n	No reports							
			99o	2	3,405	0	0	80	3,485	0	3,485
			99n	No reports							
764-41-0		1,4-Dichloro-2-butene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	3,950	0	4,500	0	8,450	0	8,450
			98o	3	1,713	0	5,700	0	7,413	0	7,413
			98n	1	0	0	0	0	0	0	0
			99o	3	910	0	1,200	0	2,110	0	2,110
			99n	1	26	1	0	0	27	4	31
110-57-6		trans-1,4-Dichloro-2-butene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	137	0	0	0	137	0	137
			98o	1	1	0	0	0	1	0	1
			98n	No reports							
			99o	1	1	0	0	0	1	0	1
			99n	2	255	0	0	0	255	158	413
1649-08-7		1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	890	20	0	0	910	89	999
			98o	2	837	48	0	0	885	0	885
			98n	1	5	0	0	0	5	0	5
			99o	2	17,310	45	0	0	17,355	0	17,355
			99n	1	10	0	0	0	10	5	15
75-71-8	*	Dichlorodifluoromethane (CFC-12)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	137	3,249,946	17,172	89	0	3,267,207	320	3,267,527
			98o	55	722,844	13,005	0	0	735,849	0	735,849
			98n	5	24,607	0	250	0	24,857	107	24,964
			99o	45	716,249	5	0	0	716,254	0	716,254
			99n	5	18,579	1	0	0	18,580	32	18,612

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	3,3'-Dichlorobenzidine dihydrochloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	12,797	22,000	0	34,797	0
		98o	0	0	0	0	6,716	48,000	6,801	61,517	0
		98n	No reports								
		99o	0	0	0	0	4,644	85,002	3,402	93,048	0
		99n	No reports								
**	3,3'-Dichlorobenzidine sulfate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,300	2,400	0	3,700	0
		98o	0	0	0	0	0	6,000	260	6,260	0
		98n	No reports								
		99o	0	0	0	0	0	12,000	0	12,000	0
		99n	No reports								
	Dichlorobromomethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	2,300	2,300	0
		98o	0	0	0	0	0	0	2,400	2,400	0
		98n	No reports								
		99o	0	0	0	0	470	4	3,501	3,975	1
		99n	No reports								
	1,4-Dichloro-2-butene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	13,000	3,300,000	312,500	8,450	3,633,950	0
		98o	1,800,000	0	0	0	3,753,000	124,000	7,413	5,684,413	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	5,800,000	13,390	2,110	5,815,500	0
		99n	0	0	0	0	60,000	0	26	60,026	0
	trans-1,4-Dichloro-2-butene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	137	137	0
		98o	0	0	0	0	12,000	0	1	12,001	0
		98n	No reports								
		99o	0	0	0	0	13,000	0	1	13,001	0
		99n	0	0	0	0	129,737	0	205	129,942	0
	1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	98,000	22,000	1,000	121,000	0
		98o	0	0	0	0	320,000	61,573	880	382,453	0
		98n	0	0	0	0	39,584	0	3	39,587	0
		99o	0	0	0	0	370,000	91,532	17,010	478,542	0
		99n	0	0	0	0	27,318	0	2	27,320	0
*	Dichlorodifluoromethane (CFC-12)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	552,377	466,714	408,747	225	126,167	114,628	3,241,865	4,910,723	18,435
		98o	80,253	213,260	0	0	38,976	67,036	738,467	1,137,992	4
		98n	0	0	0	0	199,704	8	24,723	224,435	0
		99o	246,309	178,692	0	0	170	132,003	657,567	1,214,741	10,654
		99n	0	0	0	0	292,534	135	18,607	311,276	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
107-06-2 *,**	1,2-Dichloroethane	88	110	4,615,179	40,527	1,452,084	2,166	6,109,956	166,131	6,276,087
		95	83	1,292,842	5,194	24,339	256	1,322,631	23,671	1,346,302
		98o	71	708,117	2,337	2,178	886	713,518	105,862	819,380
		98n	19	284	271	56,816	0	57,371	23,011	80,382
		99o	72	545,225	833	1,171	2,983	550,212	666,493	1,216,705
		99n	16	814	71	64,294	0	65,179	2,299	67,478
540-59-0	1,2-Dichloroethylene	88	10	126,478	95	0	1	126,574	87,614	214,188
		95	10	8,527	270	0	0	8,797	0	8,797
		98o	11	5,383	44	0	0	5,427	0	5,427
		98n	7	533	0	0	0	533	387	920
		99o	9	4,901	390	0	0	5,291	0	5,291
		99n	8	1,539	1	0	0	1,540	13,282	14,822
1717-00-6	1,1-Dichloro-1-fluoroethane (HCFC-141b)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	296	11,677,933	580	26	35,767	11,714,306	165,777	11,880,083
		98o	232	8,908,815	54	0	33,556	8,942,425	230,925	9,173,350
		98n	11	31,419	0	0	0	31,419	1,096	32,515
		99o	223	7,807,666	419	0	20,128	7,828,213	278,640	8,106,853
		99n	11	23,516	0	0	0	23,516	1,662	25,178
75-43-4	Dichlorofluoromethane (HCFC-21)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	4	173,117	2	0	0	173,119	31,000	204,119
		98o	3	129,467	0	0	0	129,467	8,975	138,442
		98n	4	4	0	0	0	4	9	13
		99o	3	105,565	0	0	0	105,565	10,910	116,475
		99n	2	5	0	0	75,231	75,236	0	75,236
75-09-2 *,**	Dichloromethane	88	1,675	129,124,529	349,960	1,478,833	157,156	131,110,478	7,806,328	138,916,806
		95	1,012	58,305,923	28,620	1,140,335	2,064	59,476,942	180,137	59,657,079
		98o	642	40,302,462	15,492	456,962	173,592	40,948,508	262,922	41,211,430
		98n	198	469,904	262	33,702	10,127	513,995	99,836	613,831
		99o	531	35,556,474	12,056	107,386	8,344	35,684,260	153,884	35,838,144
		99n	161	220,397	16	59,473	53,605	333,491	383,828	717,319
127564-92-5	Dichloropentafluoropropane	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	No reports							
		98o	1	6,520	0	0	0	6,520	8,900	15,420
		98n	No reports							
		99o	1	9,890	0	0	0	9,890	4,600	14,490
		99n	No reports							
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	255	0	0	0	255	0	255
		98o	2	34,043	0	0	0	34,043	0	34,043
		98n	1	1,000	0	0	0	1,000	0	1,000
		99o	3	77,310	0	0	0	77,310	0	77,310
		99n	1	1,000	0	0	0	1,000	0	1,000

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*,**	1,2-Dichloroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	59,314,824	16,921,135	32,535,232	787,622	74,650,467	1,630,158	1,325,188	187,164,626	23,301
		98o	435,903,074	11,350,396	49,197,699	194,842	59,612,529	1,892,410	833,090	558,984,040	69,871
		98n	0	0	2,617	338	1,389,729	4,384	59,112	1,456,180	8
		99o	397,977,917	14,982,020	35,619,138	266,614	75,760,698	2,137,851	1,072,904	527,817,142	11,341
		99n	213	0	1,707	47,058	3,251,128	144,444	68,188	3,512,738	0
	1,2-Dichloroethylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	310,000	6,100	2,871,400	0	4,680,089	1,984	8,761	7,878,334	122
		98o	1,560,000	1,617,199	621,000	0	3,946,600	2,803	5,304	7,752,906	143
		98n	0	0	0	0	1,163,150	0	631	1,163,781	0
		99o	4,250,000	1,463,455	313,000	0	14,301,329	7,070	7,511	20,342,365	121
		99n	255,988	0	0	411,928	1,745,805	165	1,279	2,415,165	10
	1,1-Dichloro-1-fluoroethane (HCFC-141b)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,429,772	381,393	0	99,548	2,018,829	846,290	11,819,111	20,594,943	38,962
		98o	155,007	147,221	0	647,826	801,429	418,974	8,960,363	11,130,820	75,875
		98n	357,028	3,660	0	148	271,622	4,671	32,162	669,291	0
		99o	176,231	186,250	0	742,001	993,727	843,360	8,029,685	10,971,254	9
		99n	274,970	4,238	0	1,379	238,799	31,708	22,740	573,834	0
	Dichlorofluoromethane (HCFC-21)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	7,200	1,586	23,800	204,492	237,078	0
		98o	0	0	0	0	0	5,487	138,067	143,554	0
		98n	0	0	0	0	288,607	183	13	288,803	1
		99o	0	0	0	0	16,463	365	116,561	133,389	1
		99n	0	0	0	0	21,850	0	75,234	97,084	0
*,**	Dichloromethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	84,723,606	14,116,539	5,240,223	3,234,456	25,614,610	11,966,476	59,554,639	204,450,549	72,752
		98o	136,285,791	15,127,026	8,885,675	3,028,379	26,836,797	14,262,405	41,190,460	245,616,533	102,531
		98n	18,334,527	2,100,136	728	5,293,429	2,646,686	7,338,183	555,330	36,269,019	271
		99o	149,782,371	11,326,297	7,937,093	4,696,123	455,912,875	15,172,393	35,464,508	680,291,660	700,444
		99n	10,243,603	1,252,643	2,351	10,060,265	5,050,496	5,186,404	490,264	32,286,026	5,564
	Dichloropentafluoropropane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	8,900	6,500	15,400	0
		98n	No reports								
		99o	0	0	0	0	0	4,600	9,900	14,500	0
		99n	No reports								
	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	100	0	0	0	0	0	400	500	0
		98o	4,337	0	0	0	0	0	34,043	38,380	0
		98n	0	500	0	0	0	0	1,275	1,775	0
		99o	40,085	0	0	390	0	1,700	77,310	119,485	7,000
		99n	0	450	0	0	0	0	850	1,300	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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.

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Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
422-56-0		3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	255	0	0	0	255	0	255
			98o	3	56,258	0	0	0	56,258	0	56,258
			98n	1	1,000	0	0	0	1,000	0	1,000
			99o	2	35,012	0	0	0	35,012	0	35,012
			99n	1	1,000	0	0	0	1,000	0	1,000
120-83-2		2,4-Dichlorophenol	88	8	1,403	107	17,700	2	19,212	350	19,562
			95	3	3,580	245	15,900	0	19,725	0	19,725
			98o	5	490	0	9,000	0	9,490	0	9,490
			98n	3	108	0	0	0	108	0	108
			99o	4	465	30	9,700	1	10,196	0	10,196
			99n	3	57	1	0	0	58	19	77
78-87-5	*	1,2-Dichloropropane	88	12	1,395,304	23,785	0	3,400	1,422,489	1,131	1,423,620
			95	11	616,470	4,344	0	20	620,834	1,371	622,205
			98o	11	298,150	1,122	0	32	299,304	267	299,571
			98n	4	8	0	0	0	8	0	8
			99o	11	249,656	9,242	0	30	258,928	6,856	265,784
			99n	4	23	1	0	0	24	13	37
10061-02-6	**	trans-1,3-Dichloropropene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	256	0	0	0	256	0	256
			98o	3	1,670	0	0	1	1,671	0	1,671
			98n	1	70	0	0	0	70	0	70
			99o	6	512	0	0	0	512	0	512
			99n	1	85	0	0	0	85	0	85
78-88-6	*	2,3-Dichloropropene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	4,253	0	0	0	4,253	0	4,253
			98o	5	612	490	0	0	1,102	1,200	2,302
			98n	1	32	0	0	0	32	0	32
			99o	5	357	900	0	0	1,257	0	1,257
			99n	No reports							
542-75-6	*,**	1,3-Dichloropropylene	88	8	54,590	250	0	0	54,840	0	54,840
			95	11	32,977	193	0	0	33,170	0	33,170
			98o	12	11,139	61	0	1	11,201	0	11,201
			98n	6	427	0	0	0	427	0	427
			99o	14	6,111	67	0	0	6,178	0	6,178
			99n	6	489	1	0	0	490	168	658
76-14-2	*	Dichlorotetrafluoroethane (CFC-114)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	20	1,017,652	4,936	0	0	1,022,588	136	1,022,724
			98o	13	827,113	5	0	0	827,118	1	827,119
			98n	No reports							
			99o	12	930,592	5	0	0	930,597	0	930,597
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	3,3-Dichloro-1,1,1,2,2-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	pentafluoropropane	95	60	0	0	0	0	0	300	360	0
	(HCFC-225ca)	98o	3,851	0	0	0	0	0	56,558	60,409	5,700
		98n	0	410	0	0	0	0	1,040	1,450	0
		99o	32,023	0	0	400	0	1,400	35,013	68,836	0
		99n	0	365	0	0	0	0	1,040	1,405	0
	2,4-Dichlorophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,460	0	3	0	336,936	0	19,720	358,119	0
		98o	1,400	0	3	0	190,400	600	9,435	201,838	0
		98n	0	0	0	48,026	25,817	0	108	73,951	0
		99o	1,100	0	0	0	216,300	0	10,141	227,541	0
		99n	0	0	0	8,497	115,864	181	74	124,616	0
*	1,2-Dichloropropane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	56,000,000	0	28,380,000	0	11,573,182	7,768	620,353	96,581,303	1,200
		98o	26,800,000	0	10,700,000	0	15,610,350	1,161,416	301,901	54,573,667	10
		98n	0	0	0	0	689,377	22	4	689,403	1
		99o	9,200,000	0	5,109,000	2	22,414,813	3,604,795	260,892	40,589,502	11
		99n	0	0	0	0	347,173	0	35	347,208	0
**	trans-1,3-Dichloropropene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	11,000,000	0	0	0	250	11,000,250	1
		98o	7,900	0	5,210,238	9	20,505	430	1,640	5,240,722	0
		98n	0	0	0	0	0	0	70	70	0
		99o	50,000	0	0	180	6,845,015	242	510	6,895,947	1
		99n	0	0	0	0	0	0	85	85	0
*	2,3-Dichloropropene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	6,100,000	1	4,200,000	0	1,960,000	510,000	4,253	12,774,254	0
		98o	960,000	0	1,100,000	0	639,000	1,086,000	1,102	3,786,102	0
		98n	0	0	0	0	73,306	0	32	73,338	0
		99o	2,300,000	0	0	0	3,670,000	410,000	1,290	6,381,290	0
		99n	No reports								
*,**	1,3-Dichloropropylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,892,986	470	11,930,000	123	969,916	2,481	33,404	17,829,380	241
		98o	1,932,000	0	6,000,000	16,645	1,084,262	42,734	10,800	9,086,441	1
		98n	0	0	0	14,109	89,306	80	427	103,922	0
		99o	870,000	0	0	26,166	890,170	120,870	8,687	1,915,893	0
		99n	0	0	0	0	296,500	20	653	297,173	0
*	Dichlorotetrafluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(CFC-114)	95	19,819	14,634	0	0	1,608,479	38,271	1,018,687	2,699,890	1
		98o	231,484	17,299	0	0	1,022,895	34,717	827,120	2,133,515	0
		98n	No reports								
		99o	195,012	13,065	0	0	38,821	124,763	915,638	1,287,299	18,960
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
34077-87-7		Dichlorotrifluoroethane	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	1,000	0	0	0	1,000	0	1,000
			98o	1	1,699	0	0	0	1,699	0	1,699
			98n	1	5	0	0	0	5	2	7
			99o	No reports							
			99n	1	12	0	0	0	12	2	14
354-23-4		1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	101,118	5	0	0	101,123	0	101,123
			98n	No reports							
			99o	1	107,479	5	0	0	107,484	0	107,484
			99n	No reports							
306-83-2		2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	12	155,006	251	0	0	155,257	0	155,257
			98o	13	206,073	10	0	0	206,083	0	206,083
			98n	3	457	0	0	0	457	226	683
			99o	10	86,172	5	0	0	86,177	0	86,177
			99n	2	977	0	0	0	977	0	977
62-73-7	*,**	Dichlorvos	88	7	1,050	0	0	0	1,050	505	1,555
			95	4	255	5	0	0	260	250	510
			98o	4	255	5	0	0	260	0	260
			98n	1	0	0	0	0	0	9	9
			99o	4	255	5	0	0	260	0	260
			99n	2	3	1	0	0	4	5	9
115-32-2	*	Dicofol	88	8	1,343	0	0	0	1,343	15,786	17,129
			95	4	750	0	0	0	750	250	1,000
			98o	4	1,000	0	0	0	1,000	0	1,000
			98n	No reports							
			99o	5	1,008	0	0	0	1,008	0	1,008
			99n	1	3	0	0	0	3	0	3
77-73-6		Dicyclopentadiene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	71	340,455	5,464	0	475	346,394	6,888	353,282
			98o	85	350,062	14,943	0	597	365,602	6,162	371,764
			98n	3	15	0	1,081,201	0	1,081,216	0	1,081,216
			99o	91	350,645	11,817	0	10	362,472	2,906	365,378
			99n	5	281	1	973,928	0	974,210	256	974,466
1464-53-5		Diepoxybutane	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	70	0	0	0	70	0	70
			99o	No reports							
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Dichlorotrifluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	716,409	0	968	717,377	0
		98o	0	0	0	0	35,000	0	1,699	36,699	0
		98n	0	0	0	0	29,974	0	7	29,981	0
		99o	No reports								
		99n	0	0	0	0	47,879	0	14	47,893	0
	1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	0	101,123	101,123	0
		98n	No reports								
		99o	0	0	0	0	0	0	107,484	107,484	0
		99n	No reports								
	2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	253,000	1,304	0	0	18,400	24,465	155,218	452,387	0
		98o	0	0	0	0	38,337	4,901	204,475	247,713	955
		98n	0	0	0	0	32,848	0	683	33,531	0
		99o	0	0	0	0	25,641	11,761	85,822	123,224	1
		99n	0	0	0	0	0	0	977	977	0
*,**	Dichlorvos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	33	0	0	297	10	536	550	1,426	24
		98o	0	0	0	0	11	1,130	508	1,649	0
		98n	0	0	0	0	14,957	0	9	14,966	0
		99o	0	0	0	0	14	1,984	260	2,258	0
		99n	0	97	0	0	26,895	0	5	26,997	0
*	Dicofol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	150	0	0	0	0	95	282	527	0
		98o	0	0	0	0	0	895	229	1,124	0
		98n	No reports								
		99o	148	0	0	0	0	1,166	131	1,445	0
		99n	0	0	0	0	28,375	0	3	28,378	0
	Dicyclopentadiene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	514,277	128,273	1,782,272	635,023	471,016	201,368	348,234	4,080,463	309
		98o	457,481	43,182	1,055,862	790,262	535,711	226,565	401,577	3,510,640	7,573
		98n	0	0	0	0	22,604	0	1,081,217	1,103,821	0
		99o	341,739	20,448	4,454,966	684,673	713,953	93,130	370,793	6,679,702	3,509
		99n	0	0	0	333,931	459,410	0	974,025	1,767,366	0
	Diepoxybutane	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	148,733	0	0	70	148,803	1
		99o	No reports								
		99n	0	0	0	0	11,634	0	0	11,634	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
111-42-2		Diethanolamine	88	333	642,418	438,213	238,317	133,456	1,452,404	376,037	1,828,441
			95	350	369,625	287,582	18,502	40,399	716,108	456,391	1,172,499
			98o	331	436,529	63,158	24,000	113,340	637,027	208,501	845,528
			98n	99	2,761	0	316,517	169,345	488,623	3,653	492,276
			99o	318	373,698	35,086	26,905	79,789	515,478	204,144	719,622
			99n	96	531	0	327,701	65,000	393,232	2,694	395,926
117-81-7	*,**	Di(2-ethylhexyl) phthalate	88	304	1,217,329	2,781	3,091	20,748	1,243,949	3,630,612	4,874,561
			95	318	504,167	921	0	19,705	524,793	3,041,389	3,566,182
			98o	302	215,583	669	0	24,184	240,436	1,114,867	1,355,303
			98n	59	1,986	0	0	0	1,986	1,798	3,784
			99o	285	226,926	2,629	0	4,685	234,240	916,774	1,151,014
			99n	66	960	251	0	27,649	28,860	9,247	38,107
64-67-5	**	Diethyl sulfate	88	24	10,627	0	0	250	10,877	0	10,877
			95	31	6,978	0	0	0	6,978	250	7,228
			98o	33	6,188	0	0	0	6,188	177	6,365
			98n	2	0	0	0	0	0	0	0
			99o	29	3,727	0	0	0	3,727	34,518	38,245
			99n	2	10	0	0	0	10	0	10
35367-38-5	*	Diflubenzuron	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
101-90-6	**	Diglycidyl resorcinol ether	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	2	20	0	0	0	20	0	20
			98n	1	0	0	0	0	0	0	0
			99o	2	20	0	0	0	20	0	20
			99n	1	0	0	0	0	0	0	0
94-58-6	**	Dihydrosafrole	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	255	0	0	0	255	0	255
			98o	4	12,018	0	0	0	12,018	0	12,018
			98n	1	0	0	0	0	0	0	0
			99o	3	268	0	0	0	268	0	268
			99n	3	5	0	0	0	5	167	172
—		Diisocyanates	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1,096	502,504	1,370	0	31,977	535,851	598,995	1,134,846
			98o	1,362	539,718	28	0	158,920	698,666	1,266,323	1,964,989
			98n	17	750	0	0	900,000	900,750	2,760	903,510
			99o	1,361	354,597	21	0	198,911	553,529	1,182,951	1,736,480
			99n	19	365	1	0	514,005	514,371	10,687	525,058

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Diethanolamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	23,518	160,987	102,766	732,863	2,828,593	1,617,435	1,137,284	6,603,446	25,357
		98o	3	289,382	280,874	119,918	2,935,508	2,570,010	2,592,385	8,788,080	86
		98n	311,138	62,678	0	636,227	21,411	23,223	495,252	1,549,929	4
		99o	0	72,617	509,443	354,310	2,798,392	1,477,487	1,093,650	6,305,899	55,485
		99n	0	5	0	34,183	32,523	14,749	395,455	476,915	3
*,**	Di(2-ethylhexyl) phthalate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,644,796	4,057,967	116,013	258,725	557,557	357,115	3,676,763	11,668,936	365
		98o	4,985,166	1,879,565	464,843	222,093	403,536	260,191	1,090,724	9,306,118	574
		98n	0	0	0	1,452,492	0	2,318	1,614	1,456,424	1
		99o	3,843,690	3,106,109	344,691	193,711	244,510	180,691	1,080,324	8,993,726	7,050
		99n	0	0	0	9,101	179,924	1,961	33,064	224,050	3,118
**	Diethyl sulfate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	6,400,000	0	415	3,370	4,702	7,131	6,415,618	2
		98o	0	0	0	6,887,586	4,488	2,460	6,508	6,901,042	5
		98n	0	0	0	50	1	50	1	102	0
		99o	0	0	0	7,659,130	3,704	459	42,667	7,705,960	0
		99n	0	0	0	1,780	1	0	1	1,782	0
*	Diflubenzuron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
**	Diglycidyl resorcinol ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	300	0	0	6	306	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	1,100	0	0	6	1,106	0
		99n	0	0	0	0	0	0	0	0	0
**	Dihydrosafrole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	10	999	0	1,009	0
		98o	0	0	0	0	0	10	12,028	12,038	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	10	78	88	0
		99n	0	0	0	0	189,324	0	171	189,495	0
	Diisocyanates	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	816,798	343,867	143,840	343,308	710,457	1,182,587	1,088,763	4,629,620	4,204
		98o	1,352,830	493,865	573,125	608,093	1,919,545	1,567,728	1,575,017	8,090,203	9,947
		98n	0	0	0	1,352,236	1,247,948	782	903,028	3,503,994	1
		99o	112,052	511,409	125,596	549,395	2,045,507	1,678,188	1,650,688	6,672,835	20,436
		99n	0	0	0	0	4,229,041	970	527,146	4,757,157	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
55290-64-7 *	Dimethipin	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	0	0	0	0	0	0	0
		98o	1	0	0	0	0	0	0	0
		98n	No reports							
		99o	1	0	0	0	0	0	0	0
		99n	No reports							
60-51-5 *	Dimethoate	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	4	270	5	0	250	525	1,500	2,025
		98o	6	42	5	0	19,975	20,022	0	20,022
		98n	2	15	0	0	0	15	69	84
		99o	5	27	5	0	0	32	0	32
		99n	4	24	0	0	0	24	177	201
119-90-4	3,3'-Dimethoxybenzidine	88	No reports							
		95	3	0	0	0	0	0	0	0
		98o	No reports							
		98n	1	0	0	0	0	0	0	0
		99o	No reports							
		99n	3	7	1	0	0	8	162	170
20325-40-0 **	3,3'-Dimethoxybenzidine dihydrochloride	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	5	10	0	0	0	10	0	10
		98o	7	0	0	0	0	0	0	0
		98n	No reports							
		99o	8	12	220	0	0	232	0	232
		99n	No reports							
124-40-3	Dimethylamine	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	71	453,915	26,490	45,250	3,140	528,795	38,146	566,941
		98o	75	443,982	35,629	11,250	3,788	494,649	119	494,768
		98n	5	892	0	0	0	892	8	900
		99o	73	414,435	30,068	11,250	2,735	458,488	18	458,506
		99n	7	567	1	0	0	568	422	990
2300-66-5 *	Dimethylamine dicamba	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	3	505	0	0	0	505	154	659
		98o	3	250	0	0	0	250	0	250
		98n	No reports							
		99o	5	250	0	0	0	250	0	250
		99n	No reports							
121-69-7	N,N-Dimethylaniline	88	20	98,905	19,967	0	250	119,122	772	119,894
		95	21	36,932	388	0	0	37,320	465	37,785
		98o	21	32,294	850	0	0	33,144	7,523	40,667
		98n	1	0	0	0	0	0	0	0
		99o	21	27,624	349	0	0	27,973	2,577	30,550
		99n	3	5	0	0	0	5	167	172

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Dimethipin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Dimethoate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	200	0	0	0	0	242	1,900	2,342	0
		98o	433	0	0	0	0	4,105	27,957	32,495	0
		98n	0	0	0	0	63,138	0	84	63,222	0
		99o	0	0	0	0	0	8,691	4,865	13,556	1
		99n	0	0	0	0	210,152	0	202	210,354	0
	3,3'-Dimethoxybenzidine	88	No reports								
		95	0	0	0	0	0	0	0	0	0
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	178,511	0	164	178,675	0
**	3,3'-Dimethoxybenzidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	dihydrochloride	95	0	0	0	0	50	1	10	61	0
		98o	0	0	0	0	15	0	0	15	0
		98n	No reports								
		99o	0	0	0	0	1,115	0	232	1,347	0
		99n	No reports								
	Dimethylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,095,202	0	21,170	1,800	2,157,170	224,513	564,664	4,064,519	4
		98o	574,603	0	28,500	1,600	3,739,186	450,423	494,037	5,288,349	66
		98n	0	0	0	149,823	231,726	50	1,199	382,798	1
		99o	716,804	0	8,510	6,127	2,885,224	537,560	461,481	4,615,706	78
		99n	0	0	0	0	432,882	750	1,228	434,860	0
*	Dimethylamine dicamba	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	7,981	0	0	0	0	0	803	8,784	0
		98o	0	0	0	0	0	0	88	88	0
		98n	No reports								
		99o	0	0	0	0	0	0	32	32	0
		99n	No reports								
	N,N-Dimethylaniline	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	50,535	0	0	745,242	12,768	201,372	107,732	1,117,649	2
		98o	46,000	21,000	0	807,221	19,620	166,522	31,090	1,091,453	2
		98n	0	0	0	0	0	0	0	0	0
		99o	52,678	19,000	33,536	703,600	23,751	167,707	27,833	1,028,105	4
		99n	0	0	0	0	148,990	0	172	149,162	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
119-93-7		3,3'-Dimethylbenzidine	88	No reports							
			95	No reports							
			98o	No reports							
			98n	2	10	0	0	0	10	0	10
			99o	No reports							
			99n	4	17	1	0	0	18	171	189
79-44-7		Dimethylcarbamyl chloride	88	No reports							
			95	No reports							
			98o	1	98	0	0	0	98	0	98
			98n	1	0	0	0	0	0	0	0
			99o	1	90	0	0	0	90	0	90
			99n	3	9	1	0	0	10	173	183
2524-03-0		Dimethyl chlorothiophosphate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	10	0	51,677	20	51,707	0	51,707
			98o	3	77	0	4,300	0	4,377	0	4,377
			98n	No reports							
			99o	No reports							
			99n	1	2	1	0	0	3	4	7
68-12-2	*,**	N,N-Dimethylformamide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	143	2,352,993	73,106	1,099,000	1,710	3,526,809	286,326	3,813,135
			98o	169	987,602	43,057	272,325	14,976	1,317,960	693,504	2,011,464
			98n	46	4,480	0	11,857	0	16,337	720	17,057
			99o	169	768,838	28,303	127,125	5	924,271	766,430	1,690,701
			99n	41	9,977	1	0	0	9,978	85,371	95,349
57-14-7	*,**	1,1-Dimethyl hydrazine	88	4	4,323	10	0	0	4,333	8,855	13,188
			95	4	299	0	0	0	299	5	304
			98o	4	496	0	0	0	496	0	496
			98n	1	0	0	0	0	0	0	0
			99o	4	408	0	0	0	408	7	415
			99n	3	25	1	0	0	26	557	583
105-67-9	*	2,4-Dimethylphenol	88	13	11,588	484	24,703	399	37,174	1,500	38,674
			95	19	52,797	33	79,000	5	131,835	17	131,852
			98o	25	36,023	56	187,076	0	223,155	1,177	224,332
			98n	3	2	0	0	0	2	0	2
			99o	26	31,402	122	156,587	0	188,111	2,202	190,313
			99n	4	37	1	5	0	43	14	57
131-11-3	*	Dimethyl phthalate	88	57	535,056	4,335	390	504	540,285	93,358	633,643
			95	89	375,121	275	1,000	5	376,401	2,524	378,925
			98o	99	263,736	627	2,950	825	268,138	35,211	303,349
			98n	24	259	0	0	0	259	2,077	2,336
			99o	95	432,199	805	1,900	7,356	442,260	32,484	474,744
			99n	19	78	1	0	7,658	7,737	6,384	14,121

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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	3,3'-Dimethylbenzidine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	505	48,005	0	5	48,515	0
		99o	No reports								
		99n	0	0	0	0	207,475	146	173	207,794	0
	Dimethylcarbamyl chloride	88	No reports								
		95	No reports								
		98o	0	0	0	0	27,113	0	98	27,211	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	42,084	0	90	42,174	0
		99n	0	0	0	0	205,715	0	181	205,896	0
	Dimethyl chlorothiophosphate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	51,727	51,727	0
		98o	0	0	0	0	1,960	0	4,331	6,291	0
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	16,000	0	1	16,001	0
*,**	N,N-Dimethylformamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,738,418	389,337	8,565,430	3,642,854	14,738,051	3,084,481	3,689,071	38,847,642	246
		98o	9,700,653	260,139	9,778,803	7,673,464	13,669,610	5,171,667	2,185,829	48,440,165	1,455
		98n	346,389	91	0	688,975	345,236	36,877	21,389	1,438,957	2
		99o	8,526,815	190,989	11,042,710	9,593,945	12,205,473	5,281,729	2,242,239	49,083,900	2,069
		99n	255,227	68	0	3,143,031	773,294	3,243,649	81,767	7,497,036	3
*,**	1,1-Dimethyl hydrazine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	57	0	0	3,639	10	302	4,008	0
		98o	0	0	0	300	1,218	3,913	493	5,924	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	320	670	7,687	412	9,089	0
		99n	0	0	0	0	549,099	0	578	549,677	0
*	2,4-Dimethylphenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	37,140	30,368	1,573,273	50,362	397,965	75,967	131,351	2,296,426	24
		98o	6,240	93,314	1,491,389	42,851	530,961	29,711	224,073	2,418,539	193
		98n	0	0	0	0	18,158	0	2	18,160	0
		99o	19,796	65,907	2,259,859	20,085	602,600	23,241	188,116	3,179,604	183
		99n	0	0	0	0	140,677	0	45	140,722	0
*	Dimethyl phthalate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,288	800	253,605	76,579	369,897	221,729	378,344	1,305,242	3
		98o	1,300	11	401,458	89,612	1,027,440	23,677	320,489	1,863,987	264
		98n	0	0	0	152,247	104,268	1,810	267	258,592	1
		99o	22,721	274	1,514,650	187,467	1,254,329	18,822	375,819	3,374,082	2
		99n	0	0	0	2,798	456,783	2,066	11,879	473,526	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
77-78-1	**	Dimethyl sulfate	88	33	10,806	610	0	50	11,466	0	11,466
			95	40	6,712	1	0	0	6,713	0	6,713
			98o	35	10,831	46	0	0	10,877	1,010	11,887
			98n	1	0	0	0	0	0	0	0
			99o	31	9,828	3	0	0	9,831	0	9,831
			99n	3	45	1	0	0	46	187	233
99-65-0		m-Dinitrobenzene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	547	849	0	1,066	2,462	0	2,462
			98o	2	383	517	0	516	1,416	0	1,416
			98n	No reports							
			99o	2	382	442	0	49	873	0	873
			99n	2	3	0	0	0	3	100	103
528-29-0		o-Dinitrobenzene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	65	109	0	136	310	0	310
			98o	2	49	66	0	66	181	0	181
			98n	No reports							
			99o	2	49	63	0	0	112	0	112
			99n	No reports							
100-25-4		p-Dinitrobenzene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	16	30	0	37	83	0	83
			98o	1	13	18	0	18	49	0	49
			98n	No reports							
			99o	1	14	17	0	0	31	0	31
			99n	No reports							
88-85-7	*	Dinitrobutyl phenol	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	879	2	0	0	881	0	881
			98o	5	1,051	0	0	0	1,051	6,843	7,894
			98n	2	6	0	0	0	6	45	51
			99o	5	1,005	0	0	50	1,055	16,848	17,903
			99n	1	0	0	0	0	0	0	0
534-52-1	*	4,6-Dinitro-o-cresol	88	10	274	266	0	2	542	46,648	47,190
			95	5	130	0	4,649	0	4,779	7,220	11,999
			98o	7	104	0	0	1,101	1,205	123,944	125,149
			98n	1	130	0	0	9,700	9,830	1,388	11,218
			99o	7	102	0	0	0	102	137,066	137,168
			99n	3	157	0	0	43,655	43,812	23,599	67,411
51-28-5	*	2,4-Dinitrophenol	88	11	20,825	98,692	86,200	257	205,974	110,285	316,259
			95	4	112	2,000	0	0	2,112	0	2,112
			98o	6	183	23,617	0	0	23,800	0	23,800
			98n	2	341	0	0	11,000	11,341	1,632	12,973
			99o	6	7	23,287	0	0	23,294	0	23,294
			99n	3	190	0	0	46,938	47,128	26,063	73,191

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Dimethyl sulfate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	171,230	1	0	402,841	3	5,815	579,890	0
		98o	0	260,865	32,693	0	221,659	861	10,613	526,691	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	131,338	0	0	95,710	9,400	9,722	246,170	0
		99n	0	0	0	0	234,930	0	230	235,160	0
	m-Dinitrobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	848,213	0	2,462	850,675	0
		98o	0	0	0	0	516,692	0	1,416	518,108	0
		98n	No reports								
		99o	0	0	0	0	490,539	0	873	491,412	0
		99n	0	0	0	0	124,420	0	102	124,522	0
	o-Dinitrobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	445,133	0	310	445,443	0
		98o	0	0	0	0	66,089	0	181	66,270	0
		98n	No reports								
		99o	0	0	0	0	62,743	0	112	62,855	0
		99n	No reports								
	p-Dinitrobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	29,589	0	83	29,672	0
		98o	0	0	0	0	18,024	0	49	18,073	0
		98n	No reports								
		99o	0	0	0	0	17,112	0	31	17,143	0
		99n	No reports								
*	Dinitrobutyl phenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	263,629	0	34,226	110	881	298,846	0
		98o	0	0	310,000	0	12,003	0	7,891	329,894	0
		98n	0	0	0	0	47,850	0	51	47,901	0
		99o	0	0	323,000	0	15,011	1,000	17,898	356,909	0
		99n	0	0	0	0	54,836	0	0	54,836	0
*	4,6-Dinitro-o-cresol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	844,907	410	18,000	13,950	7,365	884,632	0
		98o	0	0	1,466,262	10,696	31,000	6,029	123,791	1,637,778	0
		98n	0	0	0	0	360	46	11,000	11,406	0
		99o	0	0	1,664,037	165,913	29,000	18,681	124,717	2,002,348	0
		99n	0	0	0	0	68,669	0	67,411	136,080	0
*	2,4-Dinitrophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	556,712	9	1,160,000	220	2,103	1,719,044	0
		98o	0	0	562,709	29,118	1,770,236	0	23,800	2,385,863	1
		98n	0	0	0	0	246,877	53	13,191	260,121	0
		99o	0	0	301,737	317,192	1,642,419	72	23,290	2,284,710	1
		99n	0	0	0	0	240,644	0	73,191	313,835	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
121-14-2	**	2,4-Dinitrotoluene	88	13	93,257	12,055	106,400	14,961	226,673	124,281	350,954
			95	4	1,874	231	0	0	2,105	94	2,199
			98o	5	1,829	187	0	0	2,016	0	2,016
			98n	8	166	0	0	10,000	10,166	1,408	11,574
			99o	7	1,858	168	0	0	2,026	25,489	27,515
			99n	8	429	1	0	43,420	43,850	23,806	67,656
606-20-2	**	2,6-Dinitrotoluene	88	7	87,597	957	27,000	0	115,554	30,882	146,436
			95	1	469	126	0	0	595	0	595
			98o	1	467	62	0	0	529	0	529
			98n	2	5	0	0	0	5	0	5
			99o	3	593	42	0	0	635	8,663	9,298
			99n	4	67	1	0	15,287	15,355	8,246	23,601
25321-14-6		Dinitrotoluene (mixed isomers)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	6	14,811	284	17,000	0	32,095	6	32,101
			98o	8	26,639	1	36,000	0	62,640	1,402	64,042
			98n	4	0	0	5	0	5	1	6
			99o	12	10,571	0	1,100	0	11,671	316	11,987
			99n	2	2	1	0	0	3	6	9
39300-45-3	*	Dinocap	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	255	0	0	0	255	0	255
			98n	No reports							
			99o	No reports							
			99n	No reports							
123-91-1	**	1,4-Dioxane	88	73	612,633	203,320	0	11,702	827,655	10,954	838,609
			95	54	223,144	216,689	0	5,736	445,569	352,998	798,567
			98o	47	111,761	144,534	0	4,405	260,700	476,533	737,233
			98n	7	836	0	250	10,000	11,086	1,608	12,694
			99o	56	164,563	168,127	0	4,903	337,593	639,854	977,447
			99n	8	320	1	250	48,069	48,640	26,267	74,907
122-39-4	*	Diphenylamine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	23	50,706	200	9,060	65	60,031	34,727	94,758
			98o	26	61,958	25	9,665	250	71,898	43,509	115,407
			98n	4	20	0	0	0	20	90	110
			99o	32	51,013	32	5,772	250	57,067	45,948	103,015
			99n	5	13	0	0	10,130	10,143	419	10,562
122-66-7		1,2-Diphenylhydrazine	88	No reports							
			95	No reports							
			98o	No reports							
			98n	2	5	0	0	0	5	0	5
			99o	1	5	0	0	0	5	0	5
			99n	1	2	1	0	0	3	4	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	2,4-Dinitrotoluene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	42,345	9	27,115	1,381	2,200	73,050	0
		98o	0	0	41,135	9,706	53,539	1,100	2,059	107,539	0
		98n	0	0	0	0	107,067	685	12,031	119,783	1
		99o	0	0	32,234	952	40,983	21,382	22,933	118,484	2
		99n	0	0	0	0	1,030,736	0	67,249	1,097,985	0
**	2,6-Dinitrotoluene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	6,160	1	9,180	118	595	16,054	0
		98o	0	0	0	0	44,509	118	529	45,156	0
		98n	0	0	0	0	3,755	37	1	3,793	1
		99o	0	0	3,451	0	33,205	5,200	825	42,681	1
		99n	0	0	0	0	94,476	0	23,592	118,068	0
	Dinitrotoluene (mixed isomers)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	9,100	181,321	882,089	32,321	1,104,831	2,500
		98o	0	202,569	0	6	114,686	587,330	63,375	967,966	8,701
		98n	0	0	0	6	86,495	0	4	86,505	0
		99o	0	0	0	0	716,160	697,028	12,224	1,425,412	3,203
		99n	0	0	0	0	143,316	0	3	143,319	0
*	Dinocap	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	109	8	117	0
		98n	No reports								
		99o	No reports								
		99n	No reports								
**	1,4-Dioxane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	74,293	11,324	1,975,960	1,196,352	1,019,104	305,315	790,118	5,372,466	232
		98o	1,120,000	4,101	595,806	672,324	1,800,876	421,792	832,719	5,447,618	20
		98n	0	0	0	454,236	26,614	3,549	12,814	497,213	1
		99o	1,519,000	13,401	1,811,182	1,286,086	1,995,984	368,480	1,061,089	8,055,222	12
		99n	30,078	0	0	225,348	372,025	8,283	74,549	710,283	0
*	Diphenylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	976,755	11,600	1,100,115	264,471	46,428	722,296	95,833	3,217,498	0
		98o	199,400	35,131	4,769,102	823,607	21,971	77,905	86,252	6,013,368	5,700
		98n	0	0	0	0	224,324	0	104	224,428	0
		99o	155,450	229	5,216,863	754,400	279,900	83,588	83,710	6,574,140	4
		99n	0	0	0	46,894	205,207	0	10,386	262,487	0
	1,2-Diphenylhydrazine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	5,485	55	1	5,541	1
		99o	0	0	0	0	5,267	53	1	5,321	1
		99n	0	0	0	0	32,000	0	1	32,001	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
2164-07-0	*	Dipotassium endothall	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	2	20	0	0	0	20	0	20
			98n	No reports							
			99o	1	10	0	0	0	10	0	10
			99n	No reports							
136-45-8	*	Dipropyl. isocinchomeronate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
138-93-2	*	Disodium cyanodi-thioimidocarbonate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	0	0	0	0	0	0	0
			98o	5	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
541-53-7	*	2,4-Dithiobiuret	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	2	11	0	0	0	11	333	344
330-54-1	*	Diuron	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	8	2,765	10	0	5	2,780	1,950	4,730
			98o	11	3,323	260	0	0	3,583	14,100	17,683
			98n	1	0	0	0	35,756	35,756	0	35,756
			99o	8	4,919	260	0	0	5,179	0	5,179
			99n	1	0	0	0	0	0	2	2
2439-10-3	*	Dodine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	10	0	0	0	10	0	10
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
120-36-5	*,**	2,4-DP	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	260	0	0	0	260	17	277
			98o	3	0	0	0	0	0	0	0
			98n	No reports							
			99o	5	68	0	0	0	68	0	68
			99n	1	2	0	0	0	2	54	56

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Dipotassium-endothall	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	1,900	5,400	201	7,501	0
		98n	No reports								
		99o	0	0	0	0	0	3,400	400	3,800	0
		99n	No reports								
*	Dipropyl isocin-chomeronate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Disodium cyanodi-thioimidocarbonate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	2,4-Dithiobiuret	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	122,493	0	342	122,835	0
*	Diuron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	300	0	0	2	0	5,711	6,568	12,581	0
		98o	250	0	0	0	0	20,767	7,292	28,309	126
		98n	0	0	0	0	0	0	35,756	35,756	0
		99o	250	0	0	0	0	4,336	26,196	30,782	5
		99n	0	0	0	0	18,317	0	2	18,319	0
*	Dodine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	270	5	275	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*,**	2,4-DP	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	5,633	0	0	0	0	11	536	6,180	1
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	68	68	0
		99n	0	0	0	0	9,954	0	56	10,010	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
2702-72-9	*,**	2,4-D sodium salt	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	30	0	0	30	0	30
			99n	No reports							
106-89-8	*,**	Epichlorohydrin	88	78	707,107	4,917	68,750	2,524	783,298	307	783,605
			95	69	321,450	26,937	0	19,035	367,422	893	368,315
			98o	75	198,155	434	0	2,167	200,756	7,751	208,507
			98n	8	45	0	12,162	0	12,207	8,852	21,059
			99o	73	146,482	305	0	1,745	148,532	2,173	150,705
			99n	9	60	1	0	0	61	719	780
13194-48-4	*	Ethoprop	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	6	506	0	0	174,290	174,796	0	174,796
			98o	6	34	0	0	116,444	116,478	0	116,478
			98n	1	0	0	0	0	0	6	6
			99o	7	1	0	0	121,886	121,887	0	121,887
			99n	1	0	0	0	0	0	27	27
110-80-5		2-Ethoxyethanol	88	110	2,431,310	120,164	0	52	2,551,526	71,142	2,622,668
			95	40	222,940	891	0	0	223,831	12,595	236,426
			98o	26	88,954	1	0	0	88,955	2,013	90,968
			98n	15	565	0	0	0	565	976	1,541
			99o	25	139,412	377	0	17	139,806	1,000	140,806
			99n	21	1,138	1	0	0	1,139	83,634	84,773
140-88-5	**	Ethyl acrylate	88	105	245,982	1,211	0	265	247,458	7,110	254,568
			95	106	221,362	542	0	523	222,427	10,182	232,609
			98o	100	123,762	110	0	524	124,396	12,016	136,412
			98n	10	3,372	0	0	0	3,372	267	3,639
			99o	97	129,276	111	810	516	130,713	28,772	159,485
			99n	12	1,844	1	0	14,649	16,494	880	17,374
100-41-4	**	Ethylbenzene	88	564	7,718,781	15,970	72,914	175,180	7,982,845	421,334	8,404,179
			95	1,036	10,273,428	9,343	475,234	19,174	10,777,179	165,756	10,942,935
			98o	1,025	8,466,984	7,284	763,279	200,692	9,438,239	148,388	9,586,627
			98n	618	129,343	2,746	913	14,229	147,231	23,576	170,807
			99o	1,033	8,590,322	7,408	868,615	7,245	9,473,590	173,776	9,647,366
			99n	586	114,904	1,805	11,684	32,615	161,008	165,740	326,748
541-41-3		Ethyl chloroformate	88	5	13,903	0	0	0	13,903	0	13,903
			95	3	2,020	5	0	5	2,030	0	2,030
			98o	5	2,259	5	0	5	2,269	0	2,269
			98n	No reports							
			99o	4	2,200	5	0	5	2,210	0	2,210
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*,**	2,4-D sodium salt	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	5,139	0	0	5,139	0
		98o	0	0	0	0	4,600	0	0	4,600	0
		98n	No reports								
		99o	0	0	0	0	20,000	0	30	20,030	0
		99n	No reports								
*,**	Epichlorohydrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	13,263,282	0	4,331,319	171,461	4,190,667	952,542	343,764	23,253,035	20,516
		98o	10,499,178	17,715	4,809,942	77,141	24,705,268	953,525	201,067	41,263,836	2
		98n	0	0	49,900	8,069	546,631	0	23,091	627,691	0
		99o	11,169,456	0	4,120,790	103,015	32,646,933	489,049	151,387	48,680,630	0
		99n	0	0	303	0	849,911	0	811	851,025	0
*	Ethoprop	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	9	0	0	0	0	9,404	174,442	183,855	2
		98o	95	0	0	0	0	4,943	116,478	121,516	2
		98n	0	0	0	0	12,176	0	6	12,182	0
		99o	69	0	0	0	0	20,347	137,041	157,457	2
		99n	0	0	0	0	50,057	0	27	50,084	0
	2-Ethoxyethanol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,300	1,720	434,164	142,160	1,332,131	438,878	222,188	2,573,541	36,529
		98o	1,400	0	584,971	93,670	507,214	847,586	112,530	2,147,371	10,517
		98n	125,525	26,052	0	2,960,338	77,858	15,482	1,524	3,206,779	0
		99o	1,200	0	12,992,481	93,097	882,595	906,595	150,784	15,026,752	1
		99n	1,245,636	87,571	0	1,956,055	1,168,105	1,528,555	1,906	5,987,828	10
**	Ethyl acrylate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	79	32,449	8,159,796	1,356,852	487,880	96,769	231,219	10,365,044	24,065
		98o	381,888	191	8,430,381	1,518,284	1,178,908	353,939	138,413	12,002,004	4,154
		98n	0	9,269	0	887,313	252,221	45	3,633	1,152,481	2
		99o	606,528	260	10,064,209	1,717,979	887,528	368,981	168,304	13,813,789	2,512
		99n	0	0	0	8,908	454,088	33,550	17,120	513,666	1
**	Ethylbenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	25,033,644	6,766,192	40,932,118	11,370,779	19,482,390	1,784,871	10,844,606	116,214,600	13,446
		98o	28,773,321	6,330,695	36,760,025	10,124,853	15,975,930	2,288,654	9,512,291	109,765,769	53,235
		98n	2,613,939	382,495	42,357	18,809,613	2,401,346	1,389,141	575,447	26,214,338	101,987
		99o	24,787,296	5,588,009	33,364,869	8,424,482	17,277,117	1,697,966	9,839,531	100,979,270	46,343
		99n	3,373,608	86,497	111,775	6,079,702	2,712,916	938,249	149,952	13,452,699	12,911
	Ethyl chloroformate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3,300	0	1,980	5,280	10
		98o	0	0	0	0	53,660	0	2,035	55,695	0
		98n	No reports								
		99o	0	0	0	0	21,445	0	1,998	23,443	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
759-94-4	*	Ethyl dipropylthio-carbamate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	2,363	291	373	0	3,027	9,366	12,393
			98o	5	2,008	115	2,088	0	4,211	4,565	8,776
			98n	1	0	0	0	0	0	0	0
			99o	4	2,574	156	903	0	3,633	3,570	7,203
			99n	No reports							
74-85-1	*	Ethylene	88	274	50,503,039	15,214	17,203	13,250	50,548,706	11,432	50,560,138
			95	289	35,261,213	27,574	0	16	35,288,803	1,771	35,290,574
			98o	313	31,002,313	3,059	4,217	83	31,009,672	1,815	31,011,487
			98n	9	46,345	0	0	0	46,345	0	46,345
			99o	302	25,487,756	918	65,158	71,624	25,625,456	361	25,625,817
			99n	9	42,756	0	0	0	42,756	0	42,756
—		Ethylenebisdithiocar-bamic acid, salts and esters	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	1,630	0	0	0	1,630	0	1,630
			98o	4	164	0	0	0	164	513	677
			98n	1	0	0	0	0	0	0	0
			99o	4	256	0	0	0	256	0	256
			99n	2	5	0	0	0	5	159	164
107-21-1	*	Ethylene glycol	88	1,455	13,218,339	3,747,561	7,927,570	736,344	25,629,814	2,595,276	28,225,090
			95	1,313	7,224,374	869,708	12,554,675	853,550	21,502,307	1,480,855	22,983,162
			98o	1,274	5,992,249	828,275	327,030	426,720	7,574,274	1,236,029	8,810,303
			98n	390	31,993	1,215	215,158	473,025	721,391	658,721	1,380,112
			99o	1,231	5,904,980	542,567	732,545	343,582	7,523,674	2,191,347	9,715,021
			99n	398	25,438	1,480	492,264	643,972	1,163,154	255,700	1,418,854
151-56-4	**	Ethyleneimine	88	1	500	0	0	0	500	0	500
			95	1	3	0	0	0	3	0	3
			98o	1	21	0	0	0	21	0	21
			98n	1	13	0	0	0	13	0	13
			99o	1	6	0	0	0	6	0	6
			99n	2	4	0	0	0	4	153	157
75-21-8	*,**	Ethylene oxide	88	203	4,640,310	44,851	11,125	54,700	4,750,986	20,663	4,771,649
			95	169	939,303	5,230	130,000	2,208	1,076,741	8,663	1,085,404
			98o	136	584,924	372	22,561	1,751	609,608	1,860	611,468
			98n	19	105,764	0	0	0	105,764	0	105,764
			99o	130	446,800	1,157	10,796	1,750	460,503	60,920	521,423
			99n	18	37,038	1	0	0	37,039	4	37,043
96-45-7	*,**	Ethylene thiourea	88	6	500	0	0	0	500	2,250	2,750
			95	11	775	0	0	0	775	19,665	20,440
			98o	14	299	5	0	0	304	6,387	6,691
			98n	2	0	0	0	0	0	0	0
			99o	13	269	5	0	0	274	5,422	5,696
			99n	4	24	0	0	0	24	773	797

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Ethyl dipropylthio-carbamate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	6,500	33,010	12,476	51,986	0
		98o	0	0	0	0	70,619	33,089	8,528	112,236	524
		98n	0	0	0	0	11,716	0	0	11,716	0
		99o	0	0	0	0	859	14,694	7,119	22,672	1,508
		99n	No reports								
*	Ethylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	196,803,539	3	403,745,755	10,615,177	495,602,266	2,116,568	34,809,790	1,143,693,098	765,804
		98o	123,871,793	0	608,832,745	12,978,078	509,119,560	3,013,379	29,288,019	1,287,103,574	1,428,760
		98n	0	0	0	0	540	0	46,087	46,627	0
		99o	146,760,300	317	411,077,331	11,136,191	672,311,331	4,761,444	26,593,836	1,272,640,750	393,959
		99n	0	0	0	0	8,080	0	42,624	50,704	0
	Ethylenebisdithiocar-bamic acid, salts and esters	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	7,250	1,500	8,750	1
		98o	0	0	0	0	0	3,329	672	4,001	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	8,070	356	8,426	0
		99n	0	0	0	0	129,960	0	164	130,124	0
*	Ethylene glycol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	366,424,640	101,902,466	5,926,147	13,194,374	65,597,774	34,533,840	22,580,362	610,159,603	305,209
		98o	461,217,302	49,728,089	6,683,532	18,937,602	64,431,563	31,349,445	9,756,044	642,103,577	819,151
		98n	10,539,705	10,238,097	12,386	3,186,484	1,914,090	516,636	812,855	27,220,253	12,633
		99o	470,136,680	59,418,281	7,811,770	15,053,619	51,158,755	27,746,846	10,702,215	642,028,166	931,568
		99n	7,186,483	12,269,886	615,919	1,408,570	2,157,663	1,736,953	1,243,185	26,618,659	846
**	Ethyleneimine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	34,000	0	3	34,003	0
		98o	0	0	0	0	24,000	0	21	24,021	0
		98n	0	0	0	31,069	0	0	13	31,082	1
		99o	0	0	0	0	23,000	0	6	23,006	0
		99n	0	0	0	0	107,040	0	157	107,197	0
*,**	Ethylene oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	127,110	307	16,940	0	9,974,540	70,255	1,073,275	11,262,427	15,974
		98o	16,698	1,140	13,121	10	8,006,017	179,253	555,898	8,772,137	54,314
		98n	0	0	0	1,043,180	2,998,788	10,810	105,044	4,157,822	108
		99o	33,020	7,400	148,002	16	8,220,522	154,693	514,119	9,077,772	4,035
		99n	0	0	0	0	3,154,065	11,920	37,729	3,203,714	588
*,**	Ethylene thiourea	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1	840	0	0	1	6,282	19,877	27,001	1
		98o	430	565	0	0	0	8,632	6,635	16,262	1
		98n	0	0	0	0	0	0	0	0	0
		99o	2,700	800	0	0	0	3,650	5,726	12,876	4
		99n	0	0	0	0	690,152	0	795	690,947	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
75-34-3		Ethylidene dichloride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	40,471	16	0	0	40,487	0	40,487
			98o	7	43,977	0	0	0	43,977	0	43,977
			98n	6	393	0	0	0	393	8	401
			99o	9	84,205	0	0	3	84,208	0	84,208
			99n	2	92	1	0	0	93	9	102
52-85-7	*	Famphur	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	9,200	9,200
			98n	1	5	0	0	0	5	0	5
			99o	2	0	0	0	0	0	5,612	5,612
			99n	1	5	0	0	0	5	0	5
60168-88-9	*	Fenarimol	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	1,000	0	0	0	1,000	0	1,000
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
13356-08-6	*	Fenbutatin oxide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	2	664	0	660	0	1,324	0	1,324
			98n	No reports							
			99o	2	664	0	660	0	1,324	0	1,324
			99n	No reports							
72490-01-8	*	Fenoxycarb	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	1	1
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
39515-41-8	*	Fenpropathrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
55-38-9	*	Fenthion	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	1	0	0	0	1	0	1
			98n	No reports							
			99o	No reports							
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Ethylidene dichloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,300,000	0	92,000	0	1,532,000	19,149	40,156	2,983,305	15,005
		98o	1,600,000	0	1,431,278	0	2,332,070	23,768	43,948	5,431,064	89
		98n	0	0	0	10,275	35,933	4,528,132	395	4,574,735	1
		99o	2,190,000	0	2,712,610	456	3,522,136	10,830	84,125	8,520,157	81
		99n	0	0	0	0	117,269	0	99	117,368	0
*	Famphur	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	3,758	0	3,758	0
		98o	0	0	0	0	0	46,000	0	46,000	9
		98n	0	0	0	0	25,761	0	7	25,768	0
		99o	0	0	0	0	0	2,200	0	2,200	5,612
		99n	0	0	0	0	25,757	0	4	25,761	0
*	Fenarimol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	310	650	960	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Fenbutatin oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	1,324	1,324	0
		98n	No reports								
		99o	0	0	0	33,822	0	0	1,324	35,146	0
		99n	No reports								
*	Fenoxycarb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	40,000	0	1	40,001	0
		98n	No reports								
		99o	0	0	0	0	28,000	0	0	28,000	0
		99n	No reports								
*	Fenpropathrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Fenthion	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	960	1	961	0
		98n	No reports								
		99o	No reports								
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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.

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Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
51630-58-1	*	Fenvalerate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
69806-50-4	*	Fluazifop butyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
2164-17-2	*	Fluometuron	88	2	500	0	0	0	500	3,700	4,200
			95	6	796	0	0	0	796	2,355	3,151
			98o	5	782	0	0	0	782	745	1,527
			98n	No reports							
			99o	4	263	0	0	0	263	0	263
			99n	No reports							
7782-41-4		Fluorine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	7	18,319	15,000	0	0	33,319	0	33,319
			98o	10	81,938	49,857	0	0	131,795	0	131,795
			98n	2	39,082	0	0	90,778	129,860	0	129,860
			99o	13	86,302	54,153	0	0	140,455	0	140,455
			99n	3	427	0	0	105,417	105,844	0	105,844
51-21-8		Fluorouracil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	0	0	0	250	250	250	500
			98n	No reports							
			99o	1	0	0	0	250	250	500	750
			99n	No reports							
69409-94-5	*	Fluvalinate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
133-07-3	*	Folpet	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	16	5	0	0	21	1,941	1,962
			98o	8	56	10	0	0	66	4,103	4,169
			98n	No reports							
			99o	6	36	10	0	0	46	3,023	3,069
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Fenvalerate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
*	Fluazifop butyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Fluometuron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	2	0	16,900	5,646	22,548	13,000
		98o	0	0	0	0	25,000	8,541	1,385	34,926	0
		98n	No reports								
		99o	0	0	0	0	37,000	2,512	1,680	41,192	0
		99n	No reports								
	Fluorine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	15,000	0	33,300	48,300	0
		98o	0	0	0	0	17,450	36,510	131,795	185,755	3
		98n	0	0	0	0	0	0	129,859	129,859	0
		99o	0	0	0	0	26,581	20,435	140,495	187,511	33
		99n	0	0	0	0	31,839	0	105,844	137,683	0
	Fluorouracil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	964	0	0	0	0	0	0	964	0
		98n	No reports								
		99o	1,188	0	0	0	0	0	0	1,188	0
		99n	No reports								
*	Fluvalinate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Folpet	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	80	0	0	801	290	1,962	3,133	0
		98o	2	0	0	0	2,100	0	4,121	6,223	0
		98n	No reports								
		99o	943	0	0	0	2,000	627	3,069	6,639	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
72178-02-0		Fomesafen	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	10	0	0	0	10	750	760
			98o	2	884	1,532	0	0	2,416	9,191	11,607
			98n	1	0	0	0	0	0	0	0
			99o	2	1,210	1,149	0	0	2,359	7,976	10,335
			99n	1	0	0	0	0	0	0	0
50-00-0	*,**	Formaldehyde	88	823	12,459,138	904,547	9,608,524	494,111	23,466,320	1,409,999	24,876,319
			95	799	11,741,591	279,255	7,313,034	132,453	19,466,333	209,916	19,676,249
			98o	828	11,801,377	300,780	9,648,556	204,227	21,954,940	355,281	22,310,221
			98n	38	143,166	0	76,238	83,190	302,594	6,228	308,822
			99o	818	12,324,161	350,933	10,849,428	302,910	23,827,432	191,642	24,019,074
			99n	33	85,118	1	31,437	0	116,556	6,264	122,820
64-18-6	*	Formic acid	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	268	592,409	15,759	11,492,418	3,210	12,103,796	26,377	12,130,173
			98o	274	955,683	95,918	10,842,580	3,299	11,897,480	47,935	11,945,415
			98n	51	3,053	19	326,344	65,624	395,040	3,175	398,215
			99o	263	763,783	175,284	11,424,031	3,610	12,366,708	49,940	12,416,648
			99n	47	1,839	11	31,000	0	32,850	2,819	35,669
76-13-1		Freon 113	88	1,438	70,382,591	32,894	5,965	27,799	70,449,249	1,924,043	72,373,292
			95	138	2,608,115	3,829	6	0	2,611,950	2,560	2,614,510
			98o	32	941,033	1,627	0	0	942,660	4,287	946,947
			98n	17	1,016	0	0	0	1,016	746	1,762
			99o	24	744,932	1,932	0	0	746,864	88	746,952
			99n	12	1,178	1	0	9,955	11,134	5,392	16,526
—		Glycol ethers	88	1,628	48,881,581	285,937	362,198	105,185	49,634,901	1,547,840	51,182,741
			95	2,188	45,285,377	188,537	132,064	27,695	45,633,673	778,577	46,412,250
			98o	2,046	38,186,292	193,191	1,370	41,413	38,422,266	833,968	39,256,234
			98n	259	31,027	0	0	16,900	47,927	17,995	65,922
			99o	1,960	36,049,499	104,389	716	49,181	36,203,785	845,084	37,048,869
			99n	241	33,708	0	0	24,398	58,106	105,135	163,241
76-44-8	*,**	Heptachlor	88	2	54,295	2	0	0	54,297	0	54,297
			95	1	203	6	0	0	209	0	209
			98o	No reports							
			98n	6	137	0	5	0	142	12	154
			99o	No reports							
			99n	4	5	1	0	0	6	14	20
118-74-1	*,**	Hexachlorobenzene	88	9	4,045	4	410	0	4,459	443,541	448,000
			95	9	566	6,458	480	0	7,504	6,975	14,479
			98o	12	371	4	0	96	471	13,251	13,722
			98n	5	15	0	0	0	15	77	92
			99o	14	1,524	7	0	23	1,554	1,497	3,051
			99n	6	11	1	0	13,000	13,012	9	13,021

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Fomesafen	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	200	200	0
		98o	0	0	0	0	56,080	8,845	12,776	77,701	0
		98n	0	0	0	0	12,741	0	0	12,741	0
		99o	0	0	0	0	64,083	1,522	11,035	76,640	0
		99n	0	0	0	0	15,000	0	0	15,000	0
*,**	Formaldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	75,909,072	56,999	6,758,262	423,718	68,740,738	2,918,602	19,522,873	174,330,264	268,362
		98o	101,303,291	591,297	14,709,147	372,961	92,664,308	3,670,967	21,773,888	235,085,859	16,039
		98n	189	0	5,866	1,582,146	531,568	14,648	306,176	2,440,593	2
		99o	106,756,307	466,490	15,544,496	386,987	81,454,127	4,319,695	23,699,737	232,627,839	15,243
		99n	45,284	0	2,110	114,378	1,316,978	16,496	117,708	1,612,954	11
*	Formic acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	95,200	28	7,215,445	236,018	113,989,498	1,522,252	12,253,648	135,312,089	14
		98o	808,843	14	5,818,086	1,774,563	155,384,846	3,587,939	12,186,094	179,560,385	6
		98n	0	0	0	1,973,764	242,133	11,082	395,995	2,622,974	4
		99o	710,746	10	6,613,867	1,731,510	137,622,016	1,392,044	12,624,529	160,694,722	110
		99n	0	0	0	2	507,537	485	35,102	543,126	2
	Freon 113	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,355,210	913,898	0	103,937	260,926	582,454	2,612,917	6,829,342	30,141
		98o	407,512	73,959	39,916	12,608	3,372	139,670	936,926	1,613,963	6,307
		98n	75,808	67	0	106,221	1,167,895	5,166,938	1,778	6,518,707	2
		99o	179,917	97,641	37,035	16,184	4,064	135,979	680,569	1,151,389	65,287
		99n	75,298	117	0	11,418	858,798	17,969	16,578	980,178	0
	Glycol ethers	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	191,651,289	3,543,301	42,789,982	13,212,104	32,546,584	9,163,285	47,371,160	340,277,705	35,391
		98o	141,591,008	3,987,510	32,890,636	13,184,421	33,149,649	9,868,039	40,464,138	275,135,401	377,569
		98n	974,147	164,569	135,664	2,034,482	837,402	101,280	75,787	4,323,331	5,277
		99o	165,270,650	4,122,030	44,173,570	12,748,292	44,098,174	9,737,420	38,228,498	318,378,634	11,200
		99n	1,330,939	39,774	763,444	1,936,635	671,775	462,849	74,635	5,280,051	1,280
*,**	Heptachlor	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3,850	851	209	4,910	0
		98o	No reports								
		98n	0	0	0	0	443,474	35	153	443,662	0
		99o	No reports								
		99n	0	0	0	0	217,288	114	15	217,417	0
*,**	Hexachlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	6,200	1	0	0	2,865,008	428,747	18,549	3,318,505	19
		98o	8,100	1	114,000	54,632	1,577,157	18,214	13,636	1,785,740	0
		98n	0	0	0	0	86,605	38	88	86,731	1
		99o	6,601	26,253	98,000	40,950	5,231,018	22,285	15,205	5,440,312	8
		99n	0	0	0	0	399,458	699	13,013	413,170	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
87-68-3		Hexachloro-1,3-butadiene	88	9	2,508	153	220	0	2,881	19,640	22,521
			95	7	3,310	661	434	0	4,405	252	4,657
			98o	7	2,380	5	0	0	2,385	510	2,895
			98n	7	280	250	5	0	535	480	1,015
			99o	8	5,003	1	0	22	5,026	4	5,030
			99n	4	268	1	0	0	269	96	365
77-47-4	*	Hexachlorocyclo-pentadiene	88	5	78,317	6	2,131	0	80,454	28,470	108,924
			95	4	8,311	6	250	0	8,567	2,995	11,562
			98o	4	5,791	0	250	5,520	11,561	567	12,128
			98n	4	10	0	0	0	10	500	510
			99o	4	1,098	1	0	0	1,099	903	2,002
			99n	3	16	1	0	0	17	293	310
67-72-1	*	Hexachloroethane	88	22	19,077	11	520	1	19,609	128,504	148,113
			95	21	14,551	3,330	1,378	0	19,259	1,208	20,467
			98o	15	44,950	0	295	0	45,245	696	45,941
			98n	7	862	0	0	0	862	628	1,490
			99o	15	42,174	0	320	10	42,504	0	42,504
			99n	9	1,326	1	0	9,264	10,591	18,389	28,980
70-30-4	*	Hexachlorophene	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	7	1	0	0	8	165	173
110-54-3		n-Hexane	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	731	82,152,368	46,402	5,380	11,559	82,215,709	120,420	82,336,129
			98o	810	67,317,657	14,106	26,506	19,592	67,377,861	104,309	67,482,170
			98n	657	958,660	1,667	0	2,491	962,818	38,702	1,001,520
			99o	788	55,057,176	11,114	36,511	7,424	55,112,225	47,692	55,159,917
			99n	642	1,013,334	2,778	5,483	564	1,022,159	28,783	1,050,942
51235-04-2	*	Hexazinone	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	760	6,322	0	0	7,082	2,973	10,055
			98o	5	266	2,215	0	0	2,481	750	3,231
			98n	No reports							
			99o	5	264	6,297	0	0	6,561	250	6,811
			99n	No reports							
67485-29-4	*	Hydramethylnon	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	20	0	0	0	20	0	20
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	10	0	0	750	760	0	760
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Hexachloro-1,3-butadiene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	13	133,000	0	6,778,662	164,970	4,444	7,081,089	660,211
		98o	0	0	15,200	0	4,289,000	162,314	2,650	4,469,164	410
		98n	0	0	0	0	283,141	40	363	283,544	1
		99o	280,000	0	0	0	8,715,965	52,784	5,249	9,053,998	36,001
		99n	0	0	0	0	554,740	0	362	555,102	0
*	Hexachlorocyclo-pentadiene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	272,865	24,908	11,478	309,251	76
		98o	0	0	0	552	882,835	100,678	6,611	990,676	4,800
		98n	0	0	0	0	21,880	2,695,206	151	2,717,237	1
		99o	0	0	0	388	392,082	10,812	1,980	405,262	84,001
		99n	0	0	0	0	145,509	1	177	145,687	0
*	Hexachloroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,800	0	1,232,400	75,132	4,875,108	109,188	30,153	6,326,781	129,205
		98o	1,100,000	0	1,134,700	85,401	3,887,000	52,877	45,206	6,305,184	36
		98n	0	0	0	2,214	543,137	2	1,138	546,491	0
		99o	1,930,000	164,072	740,000	87,890	2,756,485	44,622	42,275	5,765,344	357
		99n	138,553	0	0	123,769	576,027	162	15,427	853,938	10
*	Hexachlorophene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	219,953	0	168	220,121	0
	n-Hexane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,125,732,524	7,008,154	25,411,631	14,640,456	50,038,708	8,044,644	82,573,862	4,313,449,979	80,385
		98o	985,817,721	13,482,100	42,461,972	19,657,395	65,463,658	5,169,506	66,618,641	1,198,670,993	73,597
		98n	4,957,135	392,648	79,618	11,276,001	5,850,748	1,111,403	1,327,085	24,994,638	28,210
		99o	659,983,814	11,483,629	54,779,642	21,338,150	60,988,140	4,763,576	54,269,832	867,606,783	330,281
		99n	2,754,933	152,971	132,470	6,852,351	6,215,513	2,609,634	1,027,469	19,745,341	27,680
*	Hexazinone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	50	0	0	0	6,954	216,172	9,410	232,586	0
		98o	0	0	0	0	110,000	201,891	8,580	320,471	0
		98n	No reports								
		99o	0	0	0	0	71,000	164,269	13,155	248,424	0
		99n	No reports								
*	Hydramethylnon	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	3	17	20	0
		98o	0	0	0	0	0	0	24	24	0
		98n	No reports								
		99o	0	0	0	0	0	0	5	5	5
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
302-01-2	**	Hydrazine	88	55	35,199	2,149	0	29	37,377	24,522	61,899
			95	47	13,940	3	0	5	13,948	23,504	37,452
			98o	46	10,908	188	695	251	12,042	336	12,378
			98n	18	290	0	26,116	120	26,526	824	27,350
			99o	47	10,011	641	0	252	10,904	46	10,950
			99n	15	267	1	88,378	120	88,766	476	89,242
10034-93-2	**	Hydrazine sulfate	88	4	1,172	0	355,000	0	356,172	0	356,172
			95	3	0	0	260,000	0	260,000	0	260,000
			98o	1	0	0	200,000	0	200,000	0	200,000
			98n	No reports							
			99o	1	0	0	190,000	0	190,000	0	190,000
			99n	No reports							
7647-01-0	*	Hydrochloric acid	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1,960	69,969,121	6,871	788,214	24,091	70,788,297	2,369,337	73,157,634
			98o	970	54,510,115	2,575	100,099	21,860	54,634,649	1,226,418	55,861,067
			98n	529	555,674,688	1	0	406	555,675,095	510	555,675,605
			99o	984	50,706,145	495	36,795	65,434	50,808,869	2,399,208	53,208,077
			99n	517	615,487,369	11	0	5	615,487,385	23	615,487,408
74-90-8	*	Hydrogen cyanide	88	35	1,109,277	2,300	1,737,850	1,761	2,851,188	1,001	2,852,189
			95	51	2,481,956	763	683,154	3	3,165,876	326	3,166,202
			98o	50	1,456,583	308	590,597	18	2,047,506	2,729	2,050,235
			98n	27	612,155	0	0	112,505	724,660	0	724,660
			99o	47	1,353,897	290	1,433,776	483	2,788,446	1,371	2,789,817
			99n	23	279,102	0	0	1,452	280,554	0	280,554
7664-39-3	*	Hydrogen fluoride	88	536	14,732,294	189,928	250	13,002	14,935,474	3,467,471	18,402,945
			95	575	11,616,575	8,702	3,845	24,078	11,653,200	1,020,034	12,673,234
			98o	626	15,612,197	23,194	0	12,740	15,648,131	55,434	15,703,565
			98n	403	64,074,150	6	2,900,000	151,228	67,125,384	50,701	67,176,085
			99o	626	14,434,432	16,983	0	5,353	14,456,768	31,399	14,488,167
			99n	400	58,265,750	12	4,100,000	130,120	62,495,882	60,094	62,555,976
123-31-9		Hydroquinone	88	61	10,334	7,211	375,400	530	393,475	6,835	400,310
			95	64	17,706	5,093	340,005	43	362,847	4,406	367,253
			98o	59	13,867	1,558	332,000	0	347,425	27,893	375,318
			98n	3	0	0	15,309	0	15,309	0	15,309
			99o	59	58,145	2,260	367,000	5	427,410	14,504	441,914
			99n	4	505	0	0	0	505	2,255	2,760
35554-44-0	*	Imazalil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	0	0	0	0	0	10	10
			98n	No reports							
			99o	No reports							
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Hydrazine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	300	452	0	0	31,538	8,966	37,225	78,481	2
		98o	25	0	0	297	99,831	302,545	37,526	440,224	1
		98n	0	0	0	1,762	179,583	0	27,126	208,471	0
		99o	25	0	5	0	61,611	142,341	53,354	257,336	3
		99n	0	0	0	45	455,640	10	88,759	544,454	0
**	Hydrazine sulfate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,900	1,900	260,000	263,800	0
		98o	0	0	0	0	0	0	200,000	200,000	0
		98n	No reports								
		99o	0	0	0	0	0	0	190,000	190,000	0
		99n	No reports								
*	Hydrochloric acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	175,235,762	15,821,343	100,650	1,510	1,041,628,574	26,254,628	71,483,581	1,330,526,048	114,031
		98o	85,368,494	2,681,128	190,000	12,782	718,724,495	6,548,885	54,954,361	868,480,145	53,158
		98n	0	0	0	231,145	200,833,658	1,567	556,111,318	757,177,688	120,530
		99o	65,963,382	1,283,791	190,000	16,118	802,018,290	9,650,266	51,015,558	930,137,405	223,575
		99n	0	0	0	1	211,816,503	41,474	627,959,096	839,817,074	159,083
*	Hydrogen cyanide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	72,134	0	33,141,239	70	25,143,135	10,443	3,141,004	61,508,025	27,155
		98o	57,228	0	24,442,117	0	21,259,696	473	2,044,055	47,803,569	288
		98n	53,473	0	0	0	42,101	0	728,335	823,909	7
		99o	117,205	0	27,900,378	0	19,447,535	2,675	2,765,799	50,233,592	186
		99n	29,774	0	0	0	98,104	0	280,102	407,980	6
*	Hydrogen fluoride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	92,491,171	222,387	0	9,201	103,217,512	2,489,439	12,865,119	211,294,829	11,499
		98o	135,034,314	147,393	0	4,910	113,576,035	2,309,902	15,485,434	266,557,988	11,219
		98n	7,522	8,852	0	0	33,587,444	47,627	67,491,164	101,142,609	56
		99o	141,841,605	140,373	0	1,614	100,863,244	2,380,036	14,677,632	259,904,504	63,502
		99n	0	5,600	0	0	28,937,660	43,274	62,064,081	91,050,615	28
	Hydroquinone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	960	0	986,933	37,786	417,185	86,342	363,576	1,892,782	45
		98o	3,200	0	848,845	10,066	405,144	126,922	359,750	1,753,927	2
		98n	0	0	0	0	85,610	0	15,309	100,919	0
		99o	1,300	0	927,893	36,525	656,620	157,583	445,098	2,225,019	0
		99n	30,660	0	1,563	13,050	105,812	1,624	326	153,035	10
*	Imazalil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	15	0	15	15
		98n	No reports								
		99o	No reports								
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
55406-53-6 *	3-Iodo-2-propynyl butylcarbamate	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	11	3,959	10	0	265	4,234	12,763	16,997
		98o	21	3,393	10	0	291	3,694	7,352	11,046
		98n	No reports							
		99o	23	3,145	10	0	286	3,441	249,941	253,382
		99n	1	0	0	0	42,000	42,000	0	42,000
13463-40-6	Iron pentacarbonyl	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	1,530	0	0	0	1,530	0	1,530
		98o	1	1,475	0	0	0	1,475	0	1,475
		98n	No reports							
		99o	1	1,517	0	0	0	1,517	0	1,517
		99n	No reports							
78-84-2	Isobutyraldehyde	88	15	685,918	773	60	1	686,752	0	686,752
		95	24	256,279	752	44,075	47	301,153	0	301,153
		98o	20	254,460	1,182	0	0	255,642	172,233	427,875
		98n	2	165	0	0	0	165	5	170
		99o	20	259,971	966	0	0	260,937	124,062	384,999
		99n	No reports							
25311-71-1 *	Isofenphos	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	4	2,907	0	0	9,000	11,907	11,300	23,207
		98o	2	10	0	0	0	10	0	10
		98n	No reports							
		99o	2	205	0	0	0	205	0	205
		99n	No reports							
67-63-0 *	Isopropyl alcohol (manufacturing)	88	91	2,001,397	1,900	0	14	2,003,311	247,039	2,250,350
		95	72	937,246	0	0	0	937,246	2,577	939,823
		98o	68	586,639	250	0	0	586,889	16,101	602,990
		98n	11	2,326	0	192,117	0	194,443	43,548	237,991
		99o	73	588,377	165	0	9	588,551	6,005	594,556
		99n	9	768	0	0	0	768	88,470	89,238
80-05-7	4,4'-Isopropyli-denediphenol	88	80	226,986	126,385	0	426,065	779,436	444,560	1,223,996
		95	114	155,659	5,809	82,000	86,697	330,165	425,671	755,836
		98o	122	188,260	7,658	0	67,097	263,015	581,074	844,089
		98n	6	262	0	0	56,423	56,685	99	56,784
		99o	117	169,523	4,783	72	3,282	177,660	564,465	742,125
		99n	4	255	0	0	36,740	36,995	424	37,419
120-58-1	Isosafrole	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	No reports							
		98o	No reports							
		98n	1	0	0	0	0	0	0	0
		99o	No reports							
		99n	1	2	1	0	0	3	38	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	3-Iodo-2-propynyl-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	butylcarbamate	95	1,755	2	0	1	300	62,552	5,151	69,761	2
		98o	30,906	0	400	5,561	334	123,399	6,271	166,871	1
		98n	No reports								
		99o	21,705	0	0	974	329	340,696	11,345	375,049	2
		99n	0	0	0	0	0	0	42,000	42,000	0
	Iron pentacarbonyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	1,379	1,379	0
		98o	0	0	0	0	0	0	1,475	1,475	0
		98n	No reports								
		99o	0	0	0	0	0	0	1,517	1,517	0
		99n	No reports								
	Isobutyraldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	9,647	1,193,119	567,515	609,409	76,894	300,129	2,756,713	4
		98o	0	48,000	1,509,037	550,059	1,118,885	118,174	429,051	3,773,206	221
		98n	0	0	0	32,119	15,206	659	165	48,149	0
		99o	10,188	3,800	2,902,392	539,410	1,180,083	36,804	403,453	5,076,130	0
		99n	No reports								
*	Isofenphos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	690	0	0	0	0	20,300	11,612	32,602	1
		98o	2,000	0	0	0	0	114	10	2,124	0
		98n	No reports								
		99o	20,000	0	0	0	0	0	210	20,210	0
		99n	No reports								
*	Isopropyl alcohol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(manufacturing)	95	62,894	48,179	2,684,671	93,871	178,156	232,658	743,206	4,043,635	9
		98o	11,355	146,022	3,681,484	123,138	148,574	63,213	627,994	4,801,780	8
		98n	122,891	0	0	925,705	174,862	56,137	193,515	1,473,110	1
		99o	883,141	32,237	8,862,061	172,520	200,129	15,056	594,825	10,759,969	9
		99n	1,076,491	0	0	824,910	197,271	97,618	768	2,197,058	10
	4,4'-Isopropylid-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	enediphenol	95	56,348	2,377	5,024,865	28,758	824,095	127,796	647,242	6,711,481	121,312
		98o	104,158	71,832	9,043,549	98,999	1,636,775	175,248	843,692	11,974,253	3,477
		98n	0	0	0	0	137,341	2,035	56,554	195,930	0
		99o	225,885	52,709	24,844,350	421,160	576,435	748,818	697,896	27,567,253	3,884
		99n	0	0	0	0	282,439	8,222	36,755	327,416	0
	Isosafrole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	77,000	0	37	77,037	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
77501-63-4	*	Lactofen	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	787	0	0	0	787	250	1,037
			98o	1	3	0	0	0	3	0	3
			98n	No reports							
			99o	2	406	0	0	0	406	9	415
			99n	No reports							
7439-92-1	**	Lead	88	865	1,128,042	61,776	0	6,648,926	7,838,744	12,274,686	20,113,430
			95	857	729,998	10,644	0	2,361,516	3,102,158	2,550,311	5,652,469
			98o	810	339,433	13,105	8,613	3,265,491	3,626,642	5,379,837	9,006,479
			98n	52	4,788	138	23,068	12,705,039	12,733,033	1,030,338	13,763,371
			99o	788	350,046	8,336	0	1,234,157	1,592,539	3,123,113	4,715,652
			99n	42	4,004	32	13,250	9,206,640	9,223,926	1,509,420	10,733,346
—		Lead compounds	88	736	1,555,082	180,368	2,755	20,035,359	21,773,564	15,929,201	37,702,765
			95	862	1,228,687	54,994	183,912	13,519,498	14,987,091	19,362,403	34,349,494
			98o	848	854,133	38,804	171,660	16,358,443	17,423,040	16,876,173	34,299,213
			98n	258	350,359	77,080	7,280,139	240,468,619	248,176,197	5,115,886	253,292,083
			99o	814	871,608	31,794	182,869	16,308,361	17,394,632	22,369,198	39,763,830
			99n	234	352,456	33,806	7,959,140	295,159,401	303,504,803	6,900,198	310,405,001
58-89-9	*,**	Lindane	88	3	258	0	0	0	258	56	314
			95	10	510	0	0	0	510	20	530
			98o	10	26	5	0	0	31	3	34
			98n	6	53	0	0	25,654	25,707	126	25,833
			99o	9	15	5	0	0	20	18	38
			99n	5	15	1	0	0	16	351	367
330-55-2	*	Linuron	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	270	5	0	5	280	1,250	1,530
			98o	2	1,010	5	0	0	1,015	750	1,765
			98n	1	5	0	0	0	5	0	5
			99o	2	1,010	5	0	0	1,015	750	1,765
			99n	2	5	0	0	0	5	0	5
554-13-2		Lithium carbonate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	29	15,824	0	0	0	15,824	601,200	617,024
			98o	43	8,144	250	114	32,284	40,792	292,407	333,199
			98n	No reports							
			99o	44	12,006	501	0	250	12,757	192,891	205,648
			99n	1	0	0	0	11,382	11,382	0	11,382
121-75-5	*	Malathion	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	21	2,512	0	0	0	2,512	31	2,543
			98o	17	2,017	255	0	0	2,272	1,004	3,276
			98n	6	10	0	0	20,222	20,232	159	20,391
			99o	17	5,097	5	0	0	5,102	38	5,140
			99n	3	1	0	0	0	1	0	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Lactofen	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	100	0	0	0	0	1	520	621	1,044
		98o	0	0	0	0	0	89	3	92	0
		98n	No reports								
		99o	0	0	0	0	0	156	406	562	0
		99n	No reports								
**	Lead	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	208,823,623	59,492,972	49,836	5,662	1,631,361	1,918,683	4,462,867	276,385,004	19,118
		98o	249,087,516	36,680,738	242,740	8,259	1,620,234	747,986	7,317,540	295,705,013	424,985
		98n	414	32,124	0	12,582	0	135,054	13,890,898	14,071,072	71
		99o	213,586,064	49,825,513	0	2,724	1,703,934	561,736	5,174,385	270,854,356	7,737
		99n	3,747	275,832	0	0	340,717	165,312	10,228,676	11,014,284	17
	Lead compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	501,647,569	297,656,594	0	62,073	28,890,703	7,378,330	27,393,141	863,028,410	3,713,960
		98o	420,776,967	296,081,977	0	20,817	158,767	3,049,869	42,883,366	762,971,763	1,494,519
		98n	8,472,755	1,141,555	0	31,345	149,746	82,511	255,435,859	265,313,771	62,562
		99o	442,182,690	279,831,652	700	15,768	117,175	2,546,697	38,424,728	763,119,410	29,089,501
		99n	482,650	2,860,198	0	0	424,100	55,538	277,508,918	281,331,404	39,001,932
*,**	Lindane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	326	0	0	0	0	3,206	272	3,804	0
		98o	168	0	0	0	0	8,164	126	8,458	1
		98n	0	0	0	100,903	118,134	222	25,833	245,092	1
		99o	1,131	0	0	0	0	60	44	1,235	0
		99n	0	0	0	0	350,078	2,659	193	352,930	0
*	Linuron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	1	0	734	797	1,532	0
		98o	25	0	0	0	0	500	550	1,075	0
		98n	0	0	0	2,214	14,516	0	4	16,734	0
		99o	25	0	0	0	0	500	550	1,075	0
		99n	0	0	0	0	33,900	699	3	34,602	0
	Lithium carbonate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	18,000	0	0	0	2,200	690	169,247	190,137	446,000
		98o	48,373	0	0	0	1,400	3,266	301,392	354,431	0
		98n	No reports								
		99o	94,352	0	0	0	5,258	3,109	204,542	307,261	17
		99n	0	0	0	0	0	0	11,382	11,382	0
*	Malathion	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	197	0	0	0	0	819	1,073	2,089	1
		98o	1,187	0	0	0	0	1,841	1,649	4,677	1
		98n	0	0	0	0	180,176	0	20,390	200,566	0
		99o	418	0	0	0	0	4,118	4,628	9,164	1
		99n	0	97	0	0	240,221	0	1	240,319	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
108-31-6	Maleic anhydride	88	199	676,778	12,580	240,000	250	929,608	132,148	1,061,756
		95	211	347,371	18	5	1,406	348,800	14,429	363,229
		98o	210	357,365	11	0	4,430	361,806	35,131	396,937
		98n	8	35	0	0	150,000	150,035	10	150,045
		99o	206	378,592	5	0	4,449	383,046	5,555	388,601
		99n	9	161	1	0	62,000	62,162	431	62,593
109-77-3	Malononitrile	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	2	0	0	432,956	0	432,956	0	432,956
		98o	4	510	0	111,100	0	111,610	0	111,610
		98n	1	0	0	0	0	0	0	0
		99o	2	10	5	150,985	5	151,005	0	151,005
		99n	3	7	1	0	0	8	163	171
12427-38-2 *	Maneb	88	6	2,265	250	0	0	2,515	5,285	7,800
		95	6	273	0	0	0	273	2,461	2,734
		98o	7	5	0	0	0	5	2,288	2,293
		98n	No reports							
		99o	6	0	0	0	0	0	0	0
		99n	No reports							
7439-96-5	Manganese	88	954	1,586,929	321,993	255	20,229,826	22,139,003	20,087,660	42,226,663
		95	1,605	780,503	117,291	17	8,280,318	9,178,129	13,138,298	22,316,427
		98o	1,806	977,741	260,263	3	10,038,944	11,276,951	15,018,024	26,294,975
		98n	61	24,751	147,150	0	10,771,082	10,942,983	1,053,019	11,996,002
		99o	1,825	802,914	136,695	5	9,661,263	10,600,877	12,832,774	23,433,651
		99n	51	12,131	140,505	0	8,123,209	8,275,845	999,489	9,275,334
—	Manganese compounds	88	545	1,801,453	681,469	6,816,070	84,227,842	93,526,834	20,670,921	114,197,755
		95	1,062	2,925,313	1,655,180	10,403,590	39,732,058	54,716,141	28,748,657	83,464,798
		98o	1,250	1,599,063	4,538,943	7,762,910	52,395,059	66,295,975	42,664,297	108,960,272
		98n	376	537,761	1,015,935	858,700	446,827,046	449,239,442	7,779,405	457,018,847
		99o	1,283	1,880,530	4,853,311	7,011,627	44,913,717	58,659,185	42,990,491	101,649,676
		99n	386	578,324	544,928	1,186,500	411,502,060	413,811,812	8,052,544	421,864,356
93-65-2 **	Mecoprop	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	9	1,816	0	0	0	1,816	2,304	4,120
		98o	10	1,150	0	0	250	1,400	3,968	5,368
		98n	No reports							
		99o	12	1,123	0	0	250	1,373	2,368	3,741
		99n	1	2	0	0	0	2	64	66
149-30-4 *	2-Mercaptoben-zothiazole	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	28	34,857	5	97,000	260	132,122	376,420	508,542
		98o	37	5,404	100,823	45,000	250	151,477	131,778	283,255
		98n	1	0	0	0	250,000	250,000	0	250,000
		99o	34	5,211	66,893	37,000	0	109,104	122,993	232,097
		99n	1	0	0	0	176,304	176,304	0	176,304

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Maleic anhydride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,940	242	3,222,121	102,238	38,356,328	1,154,869	355,050	43,195,788	22,344
		98o	7,607	250	3,857,500	163,967	50,635,701	1,404,589	387,975	56,457,589	12,601
		98n	0	0	0	55,466	79,450	0	150,041	284,957	0
		99o	4,507	272	2,724,748	101,555	43,347,192	1,426,535	376,491	47,981,300	1,533
		99n	0	0	0	222,133	456,582	37,000	62,368	778,083	0
	Malononitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	432,956	432,956	0
		98o	0	0	0	0	336,000	0	111,214	447,214	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	22,000	0	151,009	173,009	0
		99n	0	0	0	0	191,547	0	166	191,713	0
*	Maneb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	525	0	0	3	0	8,800	7,861	17,189	0
		98o	35	0	0	0	0	8,521	2,058	10,614	0
		98n	No reports								
		99o	0	0	0	0	0	10,113	2,853	12,966	0
		99n	No reports								
	Manganese	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	30,253,675	74,115,194	0	141	173,632	1,894,554	21,471,565	127,908,761	715
		98o	39,006,919	49,624,830	0	543	531,918	1,054,488	23,783,167	114,001,865	623,874
		98n	960	171,563	0	0	113,857	0	11,998,782	12,285,162	8
		99o	42,755,189	69,660,944	0	1	152,697	691,840	22,024,517	135,285,188	18,810,107
		99n	330	179,140	0	0	49,506	0	7,834,732	8,063,708	10
	Manganese	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	compounds	95	145,391,027	88,055,551	0	199,783	1,021,862	5,903,439	78,070,750	318,642,412	1,350,559
		98o	22,746,875	47,858,333	22,153	35,980	1,924,058	5,367,241	113,573,597	191,528,237	332,380
		98n	87,296	140,909	0	0	74,724	73,171	456,349,921	456,726,021	70,966
		99o	18,775,581	45,394,140	2,876	58,511	1,536,543	7,046,679	100,965,013	173,779,343	158,189
		99n	769,091	792,731	0	0	16,286	83,200	374,672,667	376,333,975	47,000,046
**	Mecoprop	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	15,614	0	0	0	940	1,037	3,659	21,250	1
		98o	872	0	0	1,000	500	451	4,887	7,710	0
		98n	No reports								
		99o	2,611	0	0	0	440	632	3,587	7,270	0
		99n	0	0	0	0	11,879	0	67	11,946	0
*	2-Mercaptobe	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	nzothiazole	95	5,405	104,645	0	931,100	128,323	136,948	516,905	1,823,326	632
		98o	1,780	8,475	0	800,961	513,059	76,774	282,961	1,684,010	0
		98n	0	0	0	0	0	0	250,000	250,000	0
		99o	207,850	50,116	0	601,890	527,221	11,170	237,876	1,636,123	1
		99n	0	0	0	0	0	0	176,304	176,304	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
7439-97-6	*	Mercury	88	37	22,905	1,397	0	13,279	37,581	258,718	296,299
			95	24	13,262	192	0	1,016	14,470	14,228	28,698
			98o	24	12,591	134	0	3,069	15,794	14,827	30,621
			98n	10	9,416	0	0	236,003	245,419	14,418	259,837
			99o	33	11,275	133	0	2,419	13,827	6,575	20,402
			99n	14	9,426	0	0	98,316	107,742	14,956	122,698
—		Mercury compounds	88	15	2,376	9	27	0	2,412	17,916	20,328
			95	10	3,156	136	6	0	3,298	207,097	210,395
			98o	11	2,372	34	0	2,550	4,956	19,848	24,804
			98n	11	5,277	22	0	8,969,110	8,974,409	72,802	9,047,211
			99o	13	2,110	36	0	5,700	7,846	53,046	60,892
			99n	17	3,666	9	0	3,059,271	3,062,946	89,129	3,152,075
150-50-5	*	Merphos	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	186	0	0	0	186	0	186
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	13	0	0	13	0	13
			99n	No reports							
126-98-7		Methacrylonitrile	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	6	945	0	606,939	0	607,884	0	607,884
			98o	6	900	0	107,076	0	107,976	0	107,976
			98n	2	800	0	0	0	800	0	800
			99o	6	950	0	102,418	0	103,368	0	103,368
			99n	3	112	1	0	22,932	23,045	12,387	35,432
137-42-8	*	Metham sodium	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	11	4,387	1	0	252	4,640	13,050	17,690
			98o	9	5,714	40	0	110	5,864	800	6,664
			98n	2	824	0	0	22,248	23,072	0	23,072
			99o	9	6,357	40	0	110	6,507	220	6,727
			99n	1	3,627	0	0	0	3,627	0	3,627
67-56-1	*	Methanol	88	2,507	259,691,589	17,139,114	26,587,686	11,911,136	315,329,525	15,290,643	330,620,168
			95	2,486	217,605,051	9,223,362	27,738,543	1,776,256	256,343,212	1,956,802	258,300,014
			98o	2,238	190,456,559	5,859,092	16,681,250	1,800,269	214,797,170	877,673	215,674,843
			98n	371	944,235	5,144	1,125,538	605,659	2,680,576	90,540	2,771,116
			99o	2,161	183,874,487	3,864,475	14,190,039	1,211,207	203,140,208	1,366,054	204,506,262
			99n	354	945,704	8,905	1,992,807	707,037	3,654,453	116,658	3,771,111
2032-65-7	*	Methiocarb	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Mercury	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	413,832	58,151	0	0	6,307	11,009	17,996	507,295	2
		98o	455,629	34,068	0	0	4,315	1,165	20,609	515,786	1
		98n	0	0	0	0	0	0	260,436	260,436	0
		99o	471,573	37,688	0	0	4,021	5,495	18,720	537,497	12
		99n	0	307	0	0	0	0	122,294	122,601	1
	Mercury compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	125,287	0	0	61	0	4,597	25,638	155,583	179,000
		98o	573,026	5	0	0	0	5,411	18,413	596,855	860
		98n	65,400	114,138	0	0	0	236	9,046,771	9,226,545	2
		99o	390,415	2,789	0	0	0	187	57,982	451,373	2,400
		99n	43,155	87,463	0	0	0	550	3,133,514	3,264,682	15,002
*	Merphos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	186	186	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	155	12	13	180	0
		99n	No reports								
	Methacrylonitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3,189	0	607,884	611,073	0
		98o	0	0	0	0	500	0	107,976	108,476	0
		98n	0	0	0	1,891,340	0	0	800	1,892,140	1
		99o	0	0	0	0	320	0	103,368	103,688	0
		99n	0	0	0	0	73,099	0	35,431	108,530	0
*	Metham sodium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	33,520	0	0	0	102	362	15,378	49,362	0
		98o	100	0	0	0	355	3,324	6,354	10,133	1,000
		98n	0	0	0	0	0	0	24,392	24,392	0
		99o	100	0	0	0	748	10,472	6,866	18,186	100
		99n	9,000	0	0	0	0	5,970	3,600	18,570	0
*	Methanol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	441,801,827	28,205,153	376,980,271	94,135,080	955,830,551	119,880,621	262,620,706	2,279,454,209	295,175
		98o	620,419,622	13,003,212	299,098,472	93,547,811	1,065,010,404	125,152,243	216,866,982	2,433,098,746	110,258
		98n	3,746,596	130,289	8,256,769	33,838,262	15,712,702	2,607,799	2,871,641	67,164,058	1,926
		99o	621,790,741	23,751,988	435,290,112	102,913,751	1,114,616,616	113,217,331	206,036,612	2,617,617,151	189,597
		99n	3,882,000	32,667	5,534,648	21,781,897	17,730,075	2,397,843	3,686,694	55,045,824	5,733
*	Methiocarb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
94-74-6	*,**	Methoxone	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	1,261	0	0	0	1,261	1,810	3,071
			98o	6	1,255	0	0	250	1,505	3,749	5,254
			98n	No reports							
			99o	5	780	0	0	250	1,030	2,887	3,917
			99n	2	2	0	0	0	2	314	316
72-43-5	*	Methoxychlor	88	12	131,031	252	0	258	131,541	8	131,549
			95	2	0	0	0	0	0	0	0
			98o	4	0	0	0	0	0	0	0
			98n	4	12	0	0	25,474	25,486	0	25,486
			99o	5	0	0	0	0	0	0	0
			99n	3	29	0	0	0	29	14	43
109-86-4	*	2-Methoxyethanol	88	95	5,899,669	40,520	750	7	5,940,946	57,362	5,998,308
			95	48	898,128	12,407	0	5	910,540	536	911,076
			98o	52	1,019,820	16,882	0	400	1,037,102	84	1,037,186
			98n	14	329	0	51,963	0	52,292	884	53,176
			99o	41	972,375	20,648	0	17,098	1,010,121	16,545	1,026,666
			99n	14	121	1	0	56,000	56,122	889	57,011
96-33-3		Methyl acrylate	88	61	443,496	1,687	200	30,260	475,643	4,765	480,408
			95	71	335,178	5,962	159	0	341,299	865	342,164
			98o	64	246,310	761	53,244	0	300,315	50,575	350,890
			98n	8	24,273	0	0	14,000	38,273	3,680	41,953
			99o	63	303,175	624	51,742	267	355,808	28,796	384,604
			99n	4	2,216	0	0	0	2,216	498,922	501,138
1634-04-4		Methyl tert-butyl ether	88	90	2,588,247	21,499	14,400	370	2,624,516	4,602	2,629,118
			95	184	3,300,759	78,555	15,238	3,800	3,398,352	47,841	3,446,193
			98o	207	2,624,981	60,650	47,357	325	2,733,313	216,391	2,949,704
			98n	328	1,554,325	7,161	250	2,884	1,564,620	46,503	1,611,123
			99o	188	2,469,175	118,824	20,477	5,586	2,614,062	235,645	2,849,707
			99n	298	1,243,847	2,286	0	1,020	1,247,153	22,627	1,269,780
79-22-1		Methyl chlorocarbonate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	2,895	5	0	5	2,905	0	2,905
			98o	4	2,352	5	0	5	2,362	0	2,362
			98n	1	0	0	0	0	0	0	0
			99o	4	3,203	5	0	5	3,213	0	3,213
			99n	3	31	1	0	0	32	162	194
101-14-4	**	4,4'-Methylenebis (2-chloroaniline)	88	8	250	0	0	0	250	0	250
			95	23	260	0	0	0	260	5	265
			98o	23	20	0	0	0	20	0	20
			98n	1	0	0	0	0	0	0	0
			99o	17	10	0	0	0	10	0	10
			99n	3	30	1	0	8,189	8,220	4,419	12,639

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*,**	Methoxone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	19,510	0	0	0	58	27	3,144	22,739	0
		98o	6,670	0	0	0	0	1,301	5,417	13,388	0
		98n	No reports								
		99o	1,092	0	0	0	0	723	4,226	6,041	0
		99n	0	0	0	0	110,530	0	97	110,627	0
*	Methoxychlor	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	30,194	0	25,486	55,680	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	206,422	0	43	206,465	0
*	2-Methoxyethanol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,925,200	74,000	240,658	1,885,948	3,357,857	1,228,013	904,103	11,615,779	728
		98o	279,700	151,007	742,247	1,760,218	3,343,057	466,416	1,093,500	7,836,145	403
		98n	137	0	0	1,275,726	150,702	0	53,249	1,479,814	1
		99o	710,480	200,000	1,236,963	507,350	3,591,280	466,905	1,019,215	7,732,193	0
		99n	573	0	0	34,972	254,416	0	57,116	347,077	0
	Methyl acrylate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	910,001	40,769	736,924	249,260	2,132,688	51,535	346,087	4,467,264	249
		98o	1,067,301	0	702,681	458,653	3,323,941	75,468	422,545	6,050,589	3
		98n	0	0	0	291,314	88,974	163	18,343	398,794	25,189
		99o	942,001	140	545,151	648,816	2,397,322	232,417	380,856	5,146,703	2
		99n	0	0	0	6,441	43,108	38	2,201	51,788	498,922
	Methyl tert-butyl ether	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	847,069	32,815	228,033	1,360,313	3,020,968	522,838	3,430,405	9,442,441	117,520
		98o	2,207,480	170,245	1,798,255	3,330,091	6,337,891	1,233,832	2,984,663	18,062,457	1,771
		98n	2,462,506	1,800,430	0	188,044	2,628,152	193,278	3,422,976	10,695,386	32,739
		99o	2,998,495	682	2,063,051	3,391,282	17,686,628	1,081,736	2,580,818	29,802,692	297,865
		99n	5,250,530	135,600	5,519	1,091,655	3,183,495	208,396	1,242,529	11,117,724	5,594
	Methyl chloro-carbonate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3,610	0	2,897	6,507	0
		98o	0	0	0	0	51,910	0	3,030	54,940	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	39,801	0	3,023	42,824	0
		99n	0	0	0	0	173,861	0	190	174,051	0
**	4,4'-Methylenebis (2-chloroaniline)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	720	0	0	1,872	36	10,345	37	13,010	0
		98o	0	0	0	4,169	0	9,787	10	13,966	1
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	2,997	0	9,305	6	12,308	1
		99n	0	0	0	0	133,212	0	12,635	145,847	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
101-61-1	**	4,4'-Methylenebis	88	1	250	0	0	7,000	7,250	1,150	8,400
		(N,N-dimethyl)	95	2	10	0	0	0	10	0	10
		benzeneamine	98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
74-95-3		Methylene bromide	88	9	57,723	0	0	0	57,723	0	57,723
			95	5	63,091	0	0	0	63,091	0	63,091
			98o	5	46,153	0	0	0	46,153	0	46,153
			98n	3	160	0	0	0	160	0	160
			99o	3	12,352	0	0	0	12,352	29	12,381
			99n	1	15	1	0	0	16	7	23
101-77-9	**	4,4'-Methylenedianiline	88	31	130,265	2,599	460,250	1,140	594,254	141,538	735,792
			95	25	10,337	63	23,110	0	33,510	9,423	42,933
			98o	25	9,073	5,041	51,200	0	65,314	6,867	72,181
			98n	1	0	0	0	0	0	0	0
			99o	23	9,199	4,248	33,000	8	46,455	31,768	78,223
			99n	1	0	0	0	0	0	0	0
78-93-3	*	Methyl ethyl ketone	88	2,534	141,566,241	92,216	255,955	166,688	142,081,100	5,014,726	147,095,826
			95	2,322	70,270,116	65,782	581,632	172,000	71,089,530	260,891	71,350,421
			98o	1,906	46,487,938	54,732	343,418	116,504	47,002,592	844,925	47,847,517
			98n	290	220,956	7	52,251	130	273,344	215,904	489,248
			99o	1,738	38,218,669	34,304	426,252	81,521	38,760,746	745,597	39,506,343
			99n	276	190,677	15	65,858	168,607	425,157	648,957	1,074,114
60-34-4		Methyl hydrazine	88	3	2,927	1	0	0	2,928	1,450	4,378
			95	3	500	0	0	0	500	0	500
			98o	3	265	0	0	0	265	0	265
			98n	No reports							
			99o	4	401	0	0	0	401	0	401
			99n	2	6	0	0	0	6	195	201
74-88-4		Methyl iodide	88	3	8,944	5	250	0	9,199	250	9,449
			95	6	21,618	0	10,000	0	31,618	8,600	40,218
			98o	10	65,167	45	131	1,357	66,700	329	67,029
			98n	2	0	0	0	0	0	0	0
			99o	10	67,682	7	24	742	68,455	0	68,455
			99n	3	215	1	0	17,745	17,961	9,575	27,536
108-10-1	*	Methyl isobutyl ketone	88	1,011	32,035,833	762,108	116,650	31,770	32,946,361	1,966,488	34,912,849
			95	1,025	21,962,743	51,292	158,600	7,041	22,179,676	86,438	22,266,114
			98o	834	14,933,309	17,655	75,950	13,846	15,040,760	166,344	15,207,104
			98n	208	33,691	0	250	45	33,986	37,568	71,554
			99o	783	14,233,870	19,591	79,800	21,724	14,354,985	170,604	14,525,589
			99n	208	32,070	1	0	26,815	58,886	66,631	125,517

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	4,4'-Methylenebis	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(N,N-dimethyl)	95	0	0	0	0	0	0	10	10	0
	benzeneamine	98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	Methylene bromide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	677,059	0	0	0	51,903	979	62,284	792,225	0
		98o	1,500,000	0	0	0	0	0	46,135	1,546,135	0
		98n	0	0	0	64,300	354,774	0	160	419,234	1
		99o	40	0	0	0	0	0	12,348	12,388	0
		99n	0	0	0	0	37,000	0	19	37,019	0
**	4,4'-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Methylenedianiline	95	2,300	0	17,801	17,405	87,919	94,872	35,337	255,634	10
		98o	2,830	0	311,271	11,793	407,691	56,581	66,591	856,757	1
		98n	0	0	0	0	11,263	0	0	11,263	0
		99o	6,205	0	45,995	4,157	263,766	99,971	48,589	468,683	8
		99n	0	0	0	0	12,386	0	0	12,386	0
*	Methyl ethyl ketone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	67,669,904	21,215,191	112,592,049	43,763,276	71,390,260	6,395,059	70,181,202	393,206,941	229,659
		98o	56,938,489	19,736,392	80,609,200	33,340,694	80,552,807	7,723,606	48,458,539	327,359,727	169,435
		98n	16,578,184	1,888,930	119,057	41,297,790	5,164,871	5,030,850	323,283	70,402,965	12,267
		99o	52,596,106	16,568,581	96,034,050	32,174,014	85,279,339	9,174,989	39,418,158	331,245,237	436,890
		99n	17,623,465	6,917	140,361	32,590,870	7,267,122	6,720,764	481,209	64,830,708	39,430
	Methyl hydrazine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	20	5	400	425	0
		98o	0	0	0	0	6,508	192	370	7,070	0
		98n	No reports								
		99o	0	0	0	0	3,405	5,967	506	9,878	0
		99n	0	0	0	0	127,742	0	201	127,943	0
	Methyl iodide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	140	0	19,376	760	40,187	60,463	59
		98o	0	0	0	0	184,842	31,143	66,328	282,313	421
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	4,300	0	24,001	358	68,906	97,565	0
		99n	0	0	0	0	118,249	0	27,535	145,784	0
*	Methyl isobutyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	ketone	95	52,705,598	16,396,008	27,176,665	18,129,738	17,804,641	1,902,661	22,220,141	156,335,452	50,004
		98o	58,935,157	10,827,382	28,641,669	10,705,754	14,320,793	2,734,198	15,213,236	141,378,189	166,714
		98n	5,155,390	110,732	21,764	15,671,143	1,875,406	1,569,508	51,396	24,455,339	1,756
		99o	45,929,749	11,479,787	28,129,923	9,939,821	14,297,402	1,985,317	14,591,319	126,353,318	333,768
		99n	5,833,896	144,852	16,000	15,461,505	3,538,063	2,403,011	88,173	27,485,500	5,146

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
624-83-9		Methyl isocyanate	88	12	10,235	0	0	64	10,299	8,400	18,699
			95	5	1,658	0	0	0	1,658	0	1,658
			98o	5	507	0	0	5	512	0	512
			98n	No reports							
			99o	3	438	0	0	1	439	0	439
			99n	2	4	0	0	0	4	153	157
556-61-6	*	Methyl isothiocyanate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	1,586	0	0	0	1,586	0	1,586
			98o	3	1,359	0	0	0	1,359	0	1,359
			98n	No reports							
			99o	3	1,091	0	0	0	1,091	0	1,091
			99n	No reports							
75-86-5		2-Methyllactonitrile	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	3,852	0	0	0	3,852	0	3,852
			98o	7	3,973	0	56,698	0	60,671	0	60,671
			98n	2	10	0	24,000	0	24,010	147	24,157
			99o	6	3,772	0	55,487	0	59,259	0	59,259
			99n	3	3	0	15,000	0	15,003	169	15,172
80-62-6		Methyl methacrylate	88	218	3,630,569	28,437	327,220	8,119	3,994,345	276,567	4,270,912
			95	267	2,113,207	1,672	120,000	1,056	2,235,935	124,867	2,360,802
			98o	283	2,233,520	437,470	150,000	1,872	2,822,862	332,939	3,155,801
			98n	14	11,821	0	17,206	9,700	38,727	1,418	40,145
			99o	290	4,360,784	3,343	62,000	7,904	4,434,031	508,265	4,942,296
			99n	19	6,086	1	0	43,660	49,747	24,584	74,331
924-42-5		N-Methylolacrylamide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	29	2,835	1,171	0	38	4,044	13	4,057
			98o	36	5,473	1,245	0	45	6,763	24,987	31,750
			98n	No reports							
			99o	35	6,178	1,259	0	53	7,490	3,648	11,138
			99n	No reports							
298-00-0	*	Methyl parathion	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	1,442	0	0	0	1,442	2,684	4,126
			98o	5	189	0	0	0	189	0	189
			98n	No reports							
			99o	5	15	0	0	0	15	0	15
			99n	1	0	0	0	0	0	0	0
109-06-8		2-Methylpyridine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	8	89,938	0	61,720	0	151,658	40	151,698
			98o	7	2,934	0	38,900	0	41,834	813	42,647
			98n	1	0	0	0	0	0	0	0
			99o	7	16,802	0	50,100	0	66,902	6	66,908
			99n	3	13	1	0	0	14	258	272

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Methyl isocyanate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	0	0	0	0	66,939	0	1,658	68,597	0
	98o	0	0	0	3,450	90,771	0	497	94,718	5
	98n	No reports								
	99o	0	0	0	0	6,393	32	2,310	8,735	0
	99n	0	0	0	0	111,931	0	157	112,088	0
* Methyl isothiocyanate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	0	0	0	62	0	82	1,586	1,730	0
	98o	0	0	0	0	0	120	1,359	1,479	0
	98n	No reports								
	99o	0	0	0	48	0	72	1,091	1,211	0
	99n	No reports								
2-Methyllactonitrile	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	0	0	0	0	24,052	0	3,853	27,905	0
	98o	0	0	0	0	9,268	0	61,231	70,499	1
	98n	0	0	0	0	0	6	24,010	24,016	1
	99o	0	0	0	0	9,280	5	59,252	68,537	0
	99n	0	0	0	0	98,944	3	15,105	114,052	0
Methyl methacrylate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	4,665,497	20,746	2,049,934	1,396,720	5,135,771	697,747	2,258,315	16,224,730	3,255
	98o	1,483,426	58,753	2,254,439	1,793,672	4,004,435	578,962	3,175,808	13,349,495	8,256
	98n	63,000	0	0	942,771	962,274	9,146	34,953	2,012,144	2
	99o	1,766,009	47,419	1,979,196	2,109,271	5,487,258	786,030	3,340,095	15,515,278	17,410
	99n	76,679	0	0	225,772	703,641	3,836	73,830	1,083,758	2
N-Methylolacrylamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	360	0	0	294	14,277	4,373	3,096	22,400	4
	98o	0	113	0	0	12,400	7,425	31,759	51,697	99
	98n	No reports								
	99o	0	120	0	0	12,607	8,373	11,151	32,251	1
	99n	No reports								
* Methyl parathion	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	29	0	0	0	0	0	3,664	3,693	1
	98o	0	0	0	0	0	47,000	8,531	55,531	0
	98n	No reports								
	99o	0	0	0	0	0	23,992	6,501	30,493	1
	99n	0	0	0	0	21,609	0	0	21,609	0
2-Methylpyridine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	0	57,000	19,000	470	37,000	98,212	150,962	362,644	930
	98o	0	140,000	42,139	12	3	330	42,674	225,158	0
	98n	0	0	0	0	0	0	0	0	0
	99o	0	170,000	34,963	5,110	40,610	1,475	66,951	319,109	1,000
	99n	0	0	0	0	267,046	0	267	267,313	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
872-50-4		N-Methyl-2-pyrrolidone	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	277	2,719,267	201,221	779,477	135,050	3,835,015	367,111	4,202,126
			98o	400	3,009,700	42,961	2,865,692	99,411	6,017,764	494,760	6,512,524
			98n	79	19,299	0	0	0	19,299	3,165	22,464
			99o	400	3,324,415	35,538	2,945,457	96,877	6,402,287	518,208	6,920,495
			99n	83	18,640	0	0	43,322	61,962	88,106	150,068
21087-64-9	*	Metribuzin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	1,936	9	0	0	1,945	0	1,945
			98o	8	339	26	0	0	365	255	620
			98n	No reports							
			99o	9	397	68	0	1	466	250	716
			99n	1	0	0	0	0	0	0	0
7786-34-7	*	Mevinphos	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
90-94-8	**	Michler's ketone	88	4	1,100	0	0	0	1,100	0	1,100
			95	1	1,577	0	0	0	1,577	0	1,577
			98o	1	511	0	0	0	511	0	511
			98n	No reports							
			99o	2	869	0	0	0	869	0	869
			99n	No reports							
2212-67-1	*	Molinate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	695	502	0	0	1,197	6,363	7,560
			98o	3	1,063	113	0	0	1,176	8,305	9,481
			98n	No reports							
			99o	4	1,698	116	0	0	1,814	7,997	9,811
			99n	1	2	0	0	0	2	60	62
1313-27-5		Molybdenum trioxide	88	102	111,195	139,021	197,115	97,238	544,569	573,624	1,118,193
			95	162	179,060	27,305	333,730	77,604	617,699	1,029,058	1,646,757
			98o	169	198,560	36,018	302,000	48,888	585,466	579,619	1,165,085
			98n	20	22,062	312	5	899,506	921,885	148,188	1,070,073
			99o	172	100,444	36,086	117,120	111,465	365,115	1,020,663	1,385,778
			99n	20	14,619	758	0	549,738	565,115	179,240	744,355
76-15-3		Monochloropenta-fluoroethane (CFC-115)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	14	275,259	2,854	3	0	278,116	7	278,123
			98o	7	76,256	5	0	0	76,261	0	76,261
			98n	1	6,852	0	0	0	6,852	0	6,852
			99o	5	65,485	5	0	0	65,490	0	65,490
			99n	1	11,129	0	0	0	11,129	0	11,129

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	N-Methyl-2-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	pyrrolidone	95	1,477,378	6,548,234	182,638	2,482,544	5,116,412	3,415,140	4,463,576	23,685,922	994
		98o	404,233	7,402,797	2,802,735	3,563,334	5,279,633	3,758,376	6,627,271	29,838,379	4,499
		98n	8,842,325	6	391	2,519,825	874,778	336,833	22,223	12,596,381	3
		99o	674,557	6,525,196	5,737,630	4,322,405	4,675,190	3,580,302	6,928,552	32,443,832	473
		99n	6,486,530	970,518	1,850	3,876,145	940,859	1,335,324	63,131	13,674,357	12
*	Metribuzin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3,502	5,423	3,519	12,444	0
		98o	0	0	0	0	4,596	48,209	140	52,945	0
		98n	No reports								
		99o	0	0	0	0	19,899	63,938	7,849	91,686	0
		99n	0	0	0	0	19,614	0	0	19,614	0
*	Mevinphos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
**	Michler's ketone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	436	0	0	1,577	2,013	0
		98o	0	0	0	305	14,098	0	511	14,914	0
		98n	No reports								
		99o	0	0	290,000	309	11,720	86	632	302,747	0
		99n	No reports								
*	Molinate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	3,312	128,004	6,450	137,766	0
		98o	0	0	0	0	9,646	67,166	10,483	87,295	0
		98n	No reports								
		99o	0	0	0	0	4,732	16,348	7,211	28,291	2,504
		99n	0	0	0	0	11,125	0	62	11,187	0
	Molybdenum trioxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	6,201,074	2,454,463	0	3,530	51,382	346,576	1,614,949	10,671,974	21,640
		98o	3,589,437	3,019,402	0	0	132,214	466,140	1,725,386	8,932,579	110
		98n	0	0	0	0	42,786	0	1,557,562	1,600,348	5
		99o	3,286,213	1,694,027	511	46,400	36,387	329,180	1,589,089	6,981,807	1,898
		99n	0	0	0	0	63,467	0	779,849	843,316	3
	Monochloropenta-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	fluoroethane (CFC-115)	95	8,600	2,200	0	0	257,501	24,651	278,151	571,103	2
		98o	2,000	36,230	0	0	3,137	258	76,257	117,882	1
		98n	0	0	0	0	0	0	5,340	5,340	1,512
		99o	0	34,344	0	0	4,683	0	28,190	67,217	37,300
		99n	0	0	0	0	0	0	11,129	11,129	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
88671-89-0	*	Myclobutanil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	0	0
			98o	3	1,000	0	0	0	1,000	0	1,000
			98n	No reports							
			99o	5	1,000	0	0	0	1,000	0	1,000
			99n	No reports							
142-59-6	*	Nabam	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	0	0	0	0	0	0	0
			98o	5	0	4,864	0	0	4,864	0	4,864
			98n	1	0	0	0	0	0	0	0
			99o	4	0	0	0	0	0	0	0
			99n	No reports							
300-76-5	*	Naled	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	50	0	0	0	50	2,200	2,250
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
91-20-3	*	Naphthalene	88	420	5,165,426	22,518	50,946	123,697	5,362,587	1,359,184	6,721,771
			95	539	2,720,145	43,352	44,318	44,782	2,852,597	474,106	3,326,703
			98o	536	3,366,712	34,180	191,677	1,262,478	4,855,047	824,557	5,679,604
			98n	221	91,949	296	5	11,028	103,278	122,188	225,466
			99o	539	2,584,505	38,374	166,054	51,279	2,840,212	640,923	3,481,135
			99n	199	101,346	580	5	93,832	195,763	100,248	296,011
134-32-7	**	alpha-Naphthylamine	88	3	590	101	0	0	691	0	691
			95	1	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	1	0	0	0	0	0	0	0
			99o	2	0	0	0	0	0	0	0
			99n	3	7	1	0	0	8	164	172
91-59-8		beta-Naphthylamine	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	1	2	1	0	0	3	5	8
7440-02-0	**	Nickel	88	1,182	452,669	90,636	14,295	1,225,251	1,782,851	7,661,144	9,443,995
			95	1,993	325,693	25,512	6,370	371,521	729,096	3,977,835	4,706,931
			98o	2,184	421,504	27,123	19,654	305,710	773,991	3,273,758	4,047,749
			98n	59	42,295	4,286	110,158	4,908,158	5,064,897	4,510,891	9,575,788
			99o	2,172	270,983	25,082	16,689	268,497	581,251	3,815,020	4,396,271
			99n	45	39,761	1,496	250	4,044,509	4,086,016	3,695,504	7,781,520

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Myclobutanil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	794	243	1,037	0
		98n	No reports								
		99o	0	0	0	0	0	2,116	455	2,571	0
		99n	No reports								
*	Nabam	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	14,218	253	0	14,471	1
		98o	0	0	192	0	7,352	0	4,864	12,408	1
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	0	0	0	1
		99n	No reports								
*	Naled	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,000	2,600	0	3,600	9
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Naphthalene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	10,707,785	290,167	5,301,914	1,882,043	8,473,426	1,219,590	3,089,853	30,964,778	351,893
		98o	5,092,370	474,960	6,774,298	1,682,298	4,683,384	1,010,148	4,790,729	24,508,187	81,897
		98n	1,181,526	33,469	5,104	22,735,868	846,984	94,138	108,993	25,006,082	57,356
		99o	14,439,008	528,949	71,190,742	2,364,095	6,298,339	671,103	3,519,377	99,011,613	31,400
		99n	432,197	43,131	4,485	856,986	2,647,239	130,326	219,729	4,334,093	11,733
**	alpha-Naphthylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	243,339	0	165	243,504	0
	beta-Naphthylamine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	118,000	0	3	118,003	0
**	Nickel	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	38,218,815	80,925,603	127	767	1,537,254	1,016,815	3,426,329	125,125,710	19,229
		98o	36,514,243	78,058,365	38,720	1,899	319,356	550,986	3,710,365	119,193,934	10,743
		98n	18,430	122,923	0	0	20,200	3,187	10,096,021	10,260,761	5
		99o	27,380,098	79,458,074	0	575	849,109	544,791	4,161,135	112,393,782	160,779
		99n	16,954	169,110	0	0	72,021	4,325	8,092,504	8,354,914	4

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases					Off-site Releases	Total On- and Off-site Releases
					Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Transfers Off-site to Disposal	
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—	**	Nickel compounds	88	580	274,176	132,233	224,968	2,384,594	3,015,971	6,210,073	9,226,044
			95	921	268,510	61,711	146,886	2,478,360	2,955,467	6,294,090	9,249,557
			98o	1,051	380,608	131,897	146,481	5,696,069	6,355,055	5,109,524	11,464,579
			98n	324	729,850	292,411	337,213	50,626,213	51,985,687	6,035,387	58,021,074
			99o	1,070	465,624	83,621	209,998	2,687,583	3,446,826	5,256,783	8,703,609
			99n	313	726,201	160,443	181,012	53,474,317	54,541,973	5,585,304	60,127,277
—		Nicotine and salts	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	22	365,639	755	0	135	366,529	288,712	655,241
			98o	31	325,882	706	0	0	326,588	287,471	614,059
			98n	2	3	0	0	0	3	250	253
			99o	34	286,683	586	0	0	287,269	758,433	1,045,702
			99n	3	19	0	0	0	19	889	908
1929-82-4	*	Nitrapyrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	7	119,451	0	0	119,458	0	119,458
			98o	3	1	0	0	0	1	0	1
			98n	No reports							
			99o	5	1	0	0	0	1	0	1
			99n	No reports							
—		Nitrate compounds	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1,289	424,384	163,486,435	48,046,406	8,240,682	220,197,907	5,955,429	226,153,336
			98o	1,516	369,417	211,792,053	47,186,839	6,148,536	265,496,845	3,875,049	269,371,894
			98n	101	5,994	2,921,416	5,936,287	5,534,253	14,397,950	696,696	15,094,646
			99o	1,724	2,029,922	229,551,038	42,176,345	7,002,519	280,759,824	10,488,727	291,248,551
			99n	92	751	1,816,127	4,565,634	6,379,679	12,762,191	540,798	13,302,989
7697-37-2	*	Nitric acid	88	1,921	8,277,993	1,380,565	25,485,680	580,695	35,724,933	7,929,318	43,654,251
			95	1,845	2,595,864	46,586	18,755,717	293,009	21,691,176	4,348,694	26,039,870
			98o	1,839	2,384,260	47,650	18,869,510	228,430	21,529,850	922,139	22,451,989
			98n	149	369,560	13,005	5,300,750	63,544	5,746,859	212,902	5,959,761
			99o	1,789	2,240,309	60,181	16,482,141	347,611	19,130,242	7,982,894	27,113,136
			99n	141	594,480	0	6,328,468	60,018	6,982,966	207,213	7,190,179
139-13-9	**	Nitrilotriacetic acid	88	14	2,500	5,100	0	5,100	12,700	250	12,950
			95	7	1	34	2,900	0	2,935	0	2,935
			98o	14	1,407	10,202	2,400	0	14,009	0	14,009
			98n	1	0	0	0	11,617	11,617	0	11,617
			99o	12	600	6,320	1,600	0	8,520	0	8,520
			99n	No reports							
100-01-6		p-Nitroaniline	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	11,205	2	0	0	11,207	0	11,207
			98o	4	12,053	0	0	0	12,053	0	12,053
			98n	1	5	0	0	0	5	500	505
			99o	4	11,950	0	0	0	11,950	0	11,950
			99n	1	27	0	0	7,644	7,671	4,119	11,790

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Nickel compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	14,059,034	36,140,048	0	2,120	5,609,537	1,144,655	7,853,299	64,808,693	332,672
		98o	7,709,418	29,672,749	5,035	357	651,048	764,503	11,769,938	50,573,048	710,361
		98n	255,905	1,054,608	0	1,330	197,447	110,741	58,014,875	59,634,906	4,759
		99o	6,666,754	31,037,792	2,900	27,271	625,947	808,942	8,891,601	48,061,207	416,161
		99n	982,507	1,274,770	0	0	35,156	99,979	54,840,209	57,232,621	5,230,053
	Nicotine and salts	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	34,602	0	0	275,790	297,376	652,796	1,260,564	0
		98o	0	7,611	0	0	827,884	645,409	621,865	2,102,769	8,449
		98n	0	0	0	0	148,971	0	54	149,025	0
		99o	2,877	4,692	0	0	797,497	541,900	547,463	1,894,429	0
		99n	0	0	0	0	613,391	0	717	614,108	0
*	Nitrapyrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	7,100	0	380	128,628	136,108	0
		98o	0	0	0	0	0	140	1	141	0
		98n	No reports								
		99o	0	0	0	0	0	140	1	141	0
		99n	No reports								
	Nitrate compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	95,092,956	2,841,878	0	0	52,526,430	103,042,941	246,388,238	499,892,443	110,098
		98o	113,724,099	2,184,126	0	59,241	100,734,013	131,680,250	283,368,903	631,750,632	132,931
		98n	3,653,825	8,473	0	0	2,780,478	1,019,036	16,384,222	23,846,034	876
		99o	95,489,390	1,853,837	0	55,902	112,459,069	138,992,642	318,427,444	667,278,284	560,708
		99n	2,904,592	17,342	0	0	3,482,309	1,467,961	13,711,593	21,583,797	1,278
*	Nitric acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	28,683,640	3,881,357	250,245	255	245,373,000	17,477,013	27,100,441	322,765,951	119,089
		98o	49,798,305	3,817,017	0	148	303,790,960	17,725,571	22,347,015	397,479,016	27,600
		98n	1,907	365	0	14,386	9,396,283	468,458	6,302,073	16,183,472	11
		99o	48,883,250	2,808,384	14,434	0	335,720,018	15,145,057	27,257,843	429,828,986	4,672
		99n	0	0	0	0	10,534,260	538,110	7,181,493	18,253,863	15
**	Nitrilotriacetic acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,500	0	0	0	969,141	1,872	2,935	976,448	0
		98o	0	0	0	0	1,070,287	27,440	14,009	1,111,736	0
		98n	0	0	0	0	0	0	11,617	11,617	0
		99o	0	0	0	0	727,119	142	8,520	735,781	0
		99n	No reports								
	p-Nitroaniline	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	7	0	266	93,016	12,007	105,296	0
		98o	0	0	0	0	0	169,426	12,253	181,679	0
		98n	0	0	0	0	28,500	1	150	28,651	0
		99o	0	0	0	0	0	86,550	12,200	98,750	1
		99n	0	0	0	0	1,249	0	11,790	13,039	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
99-59-2		5-Nitro-o-anisidine	88	No reports							
			95	1	10	0	0	0	10	0	10
			98o	1	10	5	0	0	15	0	15
			98n	No reports							
			99o	1	10	5	0	0	15	0	15
			99n	No reports							
98-95-3	*,**	Nitrobenzene	88	19	41,279	7,283	819,000	3,538	871,100	69,570	940,670
			95	17	25,529	874	330,344	43	356,790	961	357,751
			98o	17	79,943	902	407,090	62	487,997	11,324	499,321
			98n	10	504	250	15,529	0	16,283	1,059	17,342
			99o	21	76,723	372	160,441	65	237,601	50,035	287,636
			99n	13	551	0	50,906	0	51,457	13,877	65,334
55-63-0		Nitroglycerin	88	22	52,383	2,746	0	11,640	66,769	2	66,771
			95	20	26,087	13,300	0	0	39,387	0	39,387
			98o	22	52,414	4,713	0	0	57,127	266	57,393
			98n	1	0	0	0	0	0	0	0
			99o	26	15,507	1	0	0	15,508	1,014	16,522
			99n	4	3	0	0	0	3	111	114
88-75-5		2-Nitrophenol	88	4	33,689	1	0	2	33,692	13,100	46,792
			95	5	38	50	0	0	88	0	88
			98o	5	45	35	0	0	80	0	80
			98n	1	129	0	0	0	129	0	129
			99o	6	52	48	0	0	100	0	100
			99n	No reports							
100-02-7	*	4-Nitrophenol	88	7	7,855	0	6,300	7	14,162	70	14,232
			95	6	945	0	0	0	945	0	945
			98o	5	855	0	0	0	855	0	855
			98n	3	35	0	0	0	35	500	535
			99o	6	867	0	0	0	867	0	867
			99n	4	201	1	0	21,924	22,126	4,272	26,398
79-46-9	*,**	2-Nitropropane	88	15	389,385	4,300	257,000	0	650,685	4,785	655,470
			95	5	31,265	3,000	0	0	34,265	0	34,265
			98o	3	23,479	558	0	0	24,037	0	24,037
			98n	6	359	0	0	0	359	192	551
			99o	2	20,844	285	0	0	21,129	0	21,129
			99n	4	98	1	0	0	99	1,146	1,245
924-16-3		N-Nitrosodi-n-butylamine	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	1	2	1	0	0	3	4	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	5-Nitro-o-anisidine	88	No reports								
		95	0	0	0	0	0	0	5	5	0
		98o	0	0	0	0	0	0	1	1	0
		98n	No reports								
		99o	0	0	0	0	0	0	1	1	0
		99n	No reports								
*,**	Nitrobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,277,200	0	1,554,583	79,781	1,297,305	639,061	354,552	5,202,482	649
		98o	419,863	0	1,847,505	590,234	1,743,632	1,056,242	497,174	6,154,650	7,024
		98n	0	0	0	663,888	778,054	0	16,670	1,458,612	1
		99o	13,245,570	1	1,773,033	1,431,993	3,005,001	2,334,493	327,531	22,117,622	9,089
		99n	150,901	0	0	250,049	1,240,915	732	51,127	1,693,724	10
	Nitroglycerin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	24,151	0	0	0	428,538	59,598	39,389	551,676	6
		98o	18,000	15,198	0	21,685	270,572	134,991	60,217	520,663	0
		98n	0	0	0	0	0	0	0	0	0
		99o	33,366	790	0	32,958	6,630,605	59,363	15,647	6,772,729	98
		99n	0	0	0	0	88,569	0	114	88,683	0
	2-Nitrophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	28,000	6	120,000	23,311	83	171,400	0
		98o	0	0	82,000	0	61,000	24,000	85	167,085	0
		98n	0	0	0	0	352,946	0	129	353,075	0
		99o	0	0	65,000	0	324,516	18,545	101	408,162	1
		99n	No reports								
*	4-Nitrophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	10,469	3	65,000	574,800	950	651,222	0
		98o	0	0	0	0	139,944	633,083	860	773,887	0
		98n	0	0	0	591,228	31,000	1	180	622,409	1
		99o	0	0	10,300	0	200,296	526,451	850	737,897	1
		99n	0	0	0	0	84,842	380	26,389	111,611	0
*,**	2-Nitropropane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	520	140,000	81	63,028	0	34,023	237,652	0
		98o	0	0	9,835	23	10,598	31,114	24,037	75,607	1
		98n	0	0	0	519,228	203,826	11,854	551	735,459	1
		99o	0	0	90	0	5,411	65	21,099	26,665	0
		99n	0	0	0	0	888,259	0	1,246	889,505	0
	N-Nitrosodi-n-butylamine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	32,000	0	2	32,002	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
55-18-5		N-Nitrosodiethylamine	88	No reports							
			95	No reports							
			98o	No reports							
			98n	2	2	0	0	0	2	0	2
			99o	No reports							
			99n	3	30	1	0	7,640	7,671	4,123	11,794
62-75-9	**	N-Nitrosodimethylamine	88	1	0	0	0	0	0	0	0
			95	No reports							
			98o	No reports							
			98n	1	129	0	0	0	129	0	129
			99o	1	5	0	0	0	5	0	5
			99n	No reports							
86-30-6		N-Nitrosodiphenylamine	88	2	0	27	34,000	0	34,027	0	34,027
			95	3	10	0	0	0	10	0	10
			98o	4	12	0	0	0	12	0	12
			98n	1	63	0	0	0	63	0	63
			99o	5	16	0	0	0	16	0	16
			99n	1	17	0	0	0	17	0	17
156-10-5		p-Nitrosodiphenylamine	88	2	15	0	2,000	0	2,015	180	2,195
			95	2	24	0	0	0	24	520	544
			98o	2	24	0	0	0	24	0	24
			98n	No reports							
			99o	2	24	0	0	0	24	0	24
			99n	No reports							
621-64-7		N-Nitrosodi-n-propylamine	88	No reports							
			95	No reports							
			98o	1	750	0	0	0	750	1,500	2,250
			98n	1	129	0	0	0	129	0	129
			99o	1	5	0	0	0	5	0	5
			99n	No reports							
759-73-9		N-Nitroso-N-ethylurea	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	7	1	0	0	8	161	169
684-93-5		N-Nitroso-N-methylurea	88	No reports							
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	7	1	0	0	8	162	170

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
N-Nitrosodiethylamine	88	No reports								
	95	No reports								
	98o	No reports								
	98n	0	0	0	0	23,708	0	2	23,710	0
	99o	No reports								
	99n	0	0	0	0	54,242	0	11,791	66,033	0
** N-Nitrosodimethylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	No reports								
	98o	No reports								
	98n	0	0	0	0	352,946	0	129	353,075	0
	99o	0	0	0	0	3,978	40	1	4,019	1
	99n	No reports								
N-Nitrosodiphenylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	0	0	0	0	30,815	340,005	10	370,830	0
	98o	0	0	0	340,000	77,702	34,298	12	452,012	0
	98n	0	0	0	0	80,769	0	63	80,832	0
	99o	0	0	0	410,000	66,647	35,279	11	511,937	1
	99n	0	0	0	0	348,042	0	17	348,059	0
p-Nitrosodiphenylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	95	0	0	8,600	15,000	0	65	544	24,209	0
	98o	0	0	9,300	16,500	0	0	24	25,824	0
	98n	No reports								
	99o	0	0	10,000	18,000	0	0	24	28,024	0
	99n	No reports								
N-Nitrosodi-n-propylamine	88	No reports								
	95	No reports								
	98o	0	0	25,000	1,500	25,000	0	600	52,100	0
	98n	0	0	0	0	352,946	0	129	353,075	0
	99o	0	0	0	0	3,605	36	1	3,642	1
	99n	No reports								
N-Nitroso-N-ethylurea	88	No reports								
	95	No reports								
	98o	No reports								
	98n	0	0	0	0	0	0	0	0	0
	99o	No reports								
	99n	0	0	0	0	161,322	0	164	161,486	0
N-Nitroso-N-methylurea	88	No reports								
	95	No reports								
	98o	No reports								
	98n	0	0	0	0	0	0	0	0	0
	99o	No reports								
	99n	0	0	0	0	162,480	0	165	162,645	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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.

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Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
4549-40-0	N-Nitrosomethyl-vinylamine	88	No reports							
		95	No reports							
		98o	No reports							
		98n	No reports							
		99o	No reports							
		99n	2	4	0	0	0	4	153	157
59-89-2	N-Nitrosomorpholine	88	No reports							
		95	1	0	0	0	0	0	0	0
		98o	No reports							
		98n	No reports							
		99o	No reports							
		99n	No reports							
100-75-4	N-Nitrosopiperidine	88	No reports							
		95	No reports							
		98o	No reports							
		98n	1	0	0	0	0	0	0	0
		99o	No reports							
		99n	3	38	1	0	9,557	9,596	5,159	14,755
99-55-8	5-Nitro-o-toluidine	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	3	5	0	0	0	5	30	35
		98o	2	0	0	0	0	0	0	0
		98n	1	0	0	0	0	0	0	0
		99o	2	0	0	0	0	0	0	0
		99n	3	27	0	0	7,644	7,671	4,139	11,810
27314-13-2 *	Norflurazon	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	2	5	0	0	0	5	54,000	54,005
		98o	4	15	76	0	229	320	14,850	15,170
		98n	No reports							
		99o	2	5	2	0	4	11	1,850	1,861
		99n	No reports							
19044-88-3 *	Oryzalin	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	2	5	0	0	0	5	0	5
		98o	3	98	0	0	0	98	0	98
		98n	1	5	0	0	0	5	0	5
		99o	4	48	0	0	0	48	0	48
		99n	1	5	0	0	0	5	0	5
20816-12-0	Osmium tetroxide	88	No reports							
		95	No reports							
		98o	No reports							
		98n	No reports							
		99o	No reports							
		99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	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
	N-Nitrosomethyl-vinylamine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	94,353	0	157	94,510	0
	N-Nitrosomorpholine	88	No reports								
		95	0	0	0	0	0	0	0	0	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
	N-Nitrosopiperidine	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	73,025	0	14,753	87,778	0
	5-Nitro-o-toluidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	35	35	0
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	71,394	0	11,808	83,202	0
*	Norflurazon	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,000	54,010	55,010	0
		98o	0	0	0	0	12,700	59,780	340	72,820	0
		98n	No reports								
		99o	0	0	0	0	0	46,850	15	46,865	0
		99n	No reports								
*	Oryzalin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	40,000	2	40,002	0
		98o	0	0	0	0	3,500	42,000	93	45,593	0
		98n	0	0	0	0	19,472	0	5	19,477	0
		99o	0	0	0	0	46	67,000	48	67,094	0
		99n	0	0	0	0	19,472	0	0	19,472	0
	Osmium tetroxide	88	No reports								
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	37,606	0	0	37,606	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

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Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
301-12-2	*	Oxydemeton methyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
19666-30-9	*	Oxydiazon	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	665	0	0	0	665	0	665
			98o	5	1,160	0	0	0	1,160	750	1,910
			98n	No reports							
			99o	6	770	0	0	0	770	2,207	2,977
			99n	No reports							
42874-03-3	*	Oxyfluorfen	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	87	3	0	0	90	0	90
			98o	2	10	0	0	0	10	0	10
			98n	No reports							
			99o	2	1,305	0	0	0	1,305	0	1,305
			99n	1	0	0	0	17,690	17,690	0	17,690
10028-15-6		Ozone	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	29	571,182	0	0	0	571,182	0	571,182
			98o	36	655,550	0	0	0	655,550	0	655,550
			98n	2	3	0	0	0	3	0	3
			99o	36	609,468	0	0	5	609,473	0	609,473
			99n	2	1	0	0	0	1	0	1
123-63-7		Paraldehyde	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	33	0	0	0	33	0	33
			98o	3	26	0	0	0	26	0	26
			98n	1	0	0	0	0	0	0	0
			99o	3	31	71	0	0	102	0	102
			99n	3	23	1	0	0	24	268	292
1910-42-5	*	Paraquat dichloride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	1,000	0	0	0	1,000	0	1,000
			98o	3	500	0	0	0	500	0	500
			98n	No reports							
			99o	3	0	0	0	0	0	0	0
			99n	No reports							
56-38-2	*	Parathion	88	13	3,265	750	0	250	4,265	3,959	8,224
			95	2	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	1	0	0	0	0	0	85	85
			99o	1	0	0	0	0	0	0	0
			99n	2	0	0	0	0	0	28	28

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Oxydemeton methyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Oxydiazon	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,012	0	0	0	2,400	100	611	6,123	0
		98o	28,500	0	0	0	960	287	900	30,647	0
		98n	No reports								
		99o	31,000	0	0	0	1,000	4,092	4,641	40,733	0
		99n	No reports								
*	Oxyfluorfen	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	130	15,093	90	15,313	0
		98o	0	0	0	0	2,800	2,900	1	5,701	0
		98n	No reports								
		99o	0	0	0	0	1,300	15,599	2	16,901	0
		99n	0	0	0	0	0	0	17,690	17,690	0
	Ozone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	2,402,564	0	569,989	2,972,553	2
		98o	0	0	0	0	2,940,204	0	654,453	3,594,657	0
		98n	0	0	0	0	0	0	3	3	0
		99o	0	0	0	0	2,655,193	0	640,340	3,295,533	3
		99n	0	0	0	0	0	0	1	1	0
	Paraldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	47,460	11	250,000	0	33	297,504	1
		98o	0	0	18,414	7	140,002	0	26	158,449	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	43,482	0	110,445	8	102	154,037	0
		99n	0	0	0	0	299,520	0	289	299,809	0
*	Paraquat dichloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	68	0	0	0	0	170	206	444	0
		98o	0	0	0	0	0	6	112	118	0
		98n	No reports								
		99o	0	0	0	0	0	10	0	10	0
		99n	No reports								
*	Parathion	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	32,638	0	85	32,723	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	69,806	0	28	69,834	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1114-71-2	*	Pebulate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	507	122	0	0	629	811	1,440
			98o	2	520	98	0	0	618	1,501	2,119
			98n	No reports							
			99o	1	500	0	0	0	500	500	1,000
			99n	No reports							
40487-42-1	*	Pendimethalin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	1,250	250	0	500	2,000	0	2,000
			98o	6	3,000	15	0	5	3,020	560	3,580
			98n	3	3	0	0	0	3	123	126
			99o	9	2,465	40	0	5	2,510	5,651	8,161
			99n	2	3	0	0	0	3	111	114
76-01-7	*	Pentachloroethane	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	1,534	22	0	0	1,556	0	1,556
			98o	7	1,550	0	0	0	1,550	0	1,550
			98n	3	60	0	0	0	60	0	60
			99o	7	785	1	0	0	786	2	788
			99n	3	23	1	0	0	24	242	266
87-86-5	*,**	Pentachlorophenol	88	55	14,029	2,465	20,000	3,717	40,211	518,105	558,316
			95	37	6,256	2,896	0	250	9,402	23,942	33,344
			98o	35	4,343	1,057	0	250	5,650	23,118	28,768
			98n	9	287	250	250	240,000	240,787	1,940	242,727
			99o	33	1,279	1,276	0	250	2,805	1,918	4,723
			99n	14	27	1	5	98,587	98,620	463	99,083
57-33-0		Pentobarbital sodium	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	No reports							
			99n	No reports							
79-21-0	*	Peracetic acid	88	8	5,453	55	0	0	5,508	0	5,508
			95	24	7,847	15	0	1,144	9,006	0	9,006
			98o	27	8,330	5	0	1,150	9,485	0	9,485
			98n	No reports							
			99o	28	13,557	755	0	1,095	15,407	0	15,407
			99n	No reports							
594-42-3	*	Perchloromethyl-mercaptan	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	541	0	0	0	541	0	541
			98o	3	894	0	0	0	894	0	894
			98n	No reports							
			99o	3	899	0	0	0	899	0	899
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Pebulate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	600	4,600	270	5,470	0
		98o	0	0	0	0	89	2,809	1,523	4,421	0
		98n	No reports								
		99o	0	0	0	0	0	0	680	680	0
		99n	No reports								
*	Pendimethalin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	300	0	0	0	190,000	6,774	1,498	198,572	56
		98o	2,000	0	0	0	160,000	104,946	2,532	269,478	0
		98n	0	0	0	0	86,483	0	126	86,609	0
		99o	6,000	0	0	0	150,000	64,385	4,555	224,940	0
		99n	0	0	0	0	32,171	0	115	32,286	0
*	Pentachloroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	220,000	0	5,972,374	75,431	1,552	6,269,357	0
		98o	620,000	0	0	0	5,007,683	107,405	1,551	5,736,639	0
		98n	0	0	0	134,821	47,064	0	60	181,945	1
		99o	670,000	16,407	0	0	5,699,574	43,357	627	6,429,965	168
		99n	0	0	0	0	149,751	0	353	150,104	0
*,**	Pentachlorophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,888,603	334	9,151	14,606	6,780	87,462	25,551	2,032,487	9
		98o	76,838	227,808	1,680	4,416	4,790	127,928	25,948	469,408	5,815
		98n	0	0	1,002	0	105,151	5	242,089	348,247	0
		99o	148,940	4,773	39,000	2,907	7,766	154,388	16,096	373,870	1,762
		99n	0	0	2,837	21	321,684	674	97,586	422,802	2,000
	Pentobarbital sodium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	No reports								
		99n	No reports								
*	Peracetic acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	13,833	0	0	0	12,884	12,396	8,889	48,002	3
		98o	0	0	0	0	47,536	17,732	9,971	75,239	1
		98n	No reports								
		99o	0	0	0	0	20,329	5,860	27,481	53,670	0
		99n	No reports								
*	Perchloromethyl mercaptan	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	540	0	541	1,081	0
		98o	0	0	0	0	120,000	15	891	120,906	0
		98n	No reports								
		99o	0	0	0	0	112,000	8	898	112,906	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
52645-53-1 *	Permethrin	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	13	1,299	37	0	250	1,586	751	2,337
		98o	18	4,435	7	0	0	4,442	17,549	21,991
		98n	1	0	0	0	0	0	0	0
		99o	19	2,593	0	0	0	2,593	1,004	3,597
		99n	3	0	0	0	31,000	31,000	9	31,009
85-01-8	Phenanthrene	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	36	72,633	19	0	4,008	76,660	74,560	151,220
		98o	64	238,895	214	0	77,577	316,686	80,258	396,944
		98n	10	26,006	0	0	0	26,006	606	26,612
		99o	73	253,888	172	0	15,800	269,860	107,667	377,527
		99n	11	3,577	0	0	59,013	62,590	10,682	73,272
108-95-2 *	Phenol	88	635	10,712,736	259,230	4,661,319	1,882,485	17,515,770	2,536,030	20,051,800
		95	759	9,369,262	70,566	3,823,235	174,581	13,437,644	1,327,795	14,765,439
		98o	779	8,978,452	60,884	1,648,446	436,649	11,124,431	1,228,494	12,352,925
		98n	32	1,627	1,277	432,901	67,000	502,805	6,204	509,009
		99o	749	7,413,944	46,003	1,575,395	1,419,125	10,454,467	1,269,972	11,724,439
		99n	29	12,716	1	267,782	19,587	300,086	7,891	307,977
26002-80-2 *	Phenothrin	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	1	0	0	0	0	0	0	0
		98o	2	0	0	0	0	0	0	0
		98n	No reports							
		99o	3	0	0	0	0	0	0	0
		99n	No reports							
95-54-5	1,2-Phenylenediamine	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	8	977	41,100	0	2,176	44,253	31	44,284
		98o	7	528	51	0	0	579	1,631	2,210
		98n	1	37	0	0	0	37	10	47
		99o	7	518	30	0	4,033	4,581	7	4,588
		99n	No reports							
108-45-2	1,3-Phenylenediamine	88	NR	NR	NR	NR	NR	NR	NR	NR
		95	20	6,621	43,343	0	63,153	113,117	80	113,197
		98o	23	8,938	727	0	18,668	28,333	20,559	48,892
		98n	2	37	0	0	0	37	10	47
		99o	19	2,358	237	0	31,534	34,129	37	34,166
		99n	1	0	0	0	0	0	0	0
106-50-3	p-Phenylenediamine	88	13	113,890	826	4,716	0	119,432	64,452	183,884
		95	10	4,440	856	0	653	5,949	0	5,949
		98o	12	1,517	114	0	0	1,631	1,816	3,447
		98n	No reports							
		99o	11	1,781	184	0	1,100	3,065	2,978	6,043
		99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Permethrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	5	651	665	543	1,864	0
		98o	0	0	0	0	277	22,529	5,379	28,185	0
		98n	0	0	0	0	10,538	0	0	10,538	0
		99o	0	0	0	0	215	17,999	4,383	22,597	1
		99n	0	0	0	0	26,033	0	31,235	57,268	0
	Phenanthrene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	162,334	1,190	35,001	197,478	1,123,105	2,410	153,880	1,675,398	42,530
		98o	326,966	98,267	53,336	165,155	526,904	170,536	341,494	1,682,658	7,313
		98n	0	0	0	32,000	234,397	0	27,212	293,609	2
		99o	1,082,986	83,544	340,620	216,420	43,339	112,080	391,635	2,270,624	12
		99n	0	0	0	33,800	347,738	0	73,753	455,291	1
*	Phenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	41,534,425	556,968	28,742,254	3,686,272	34,989,078	6,364,238	14,554,069	130,427,304	72,199
		98o	42,421,572	133,242	32,544,506	4,372,598	26,229,489	5,249,876	11,948,022	122,899,305	49,213
		98n	0	0	0	4,914,898	4,715,602	1,557	571,501	10,203,558	9
		99o	41,857,920	593,038	29,778,402	3,610,043	28,108,118	6,294,228	10,454,395	120,696,144	7,064
		99n	6,895	0	627	405,878	2,240,850	8,768	306,349	2,969,367	10
*	Phenothrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	1,2-Phenylenediamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	504,896	7,316	44,052	556,264	320
		98o	0	0	0	0	176,437	50,690	2,208	229,335	0
		98n	0	0	0	0	0	0	37	37	0
		99o	0	0	0	0	178,620	47,156	4,588	230,364	0
		99n	No reports								
	1,3-Phenylenediamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	493	676,332	134,187	112,936	923,948	1
		98o	650	114,558	20	2,300	674,477	1,734,329	46,449	2,572,783	1,520
		98n	0	0	0	0	12,604	0	37	12,641	0
		99o	760	0	0	2,901	256,562	1,730,750	35,231	2,026,204	2
		99n	0	0	0	0	19,738	0	0	19,738	0
	p-Phenylenediamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	364,868	20,082	5,757	390,707	1
		98o	0	0	0	111	337,520	66,661	3,045	407,337	0
		98n	No reports								
		99o	0	0	0	8	413,800	104,497	4,093	522,398	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
90-43-7	*	2-Phenylphenol	88	15	10,630	480	0	0	11,110	250	11,360
			95	17	27,063	10	0	5	27,078	5,656	32,734
			98o	14	23	20	0	250	293	1,363	1,656
			98n	1	0	0	0	0	0	0	0
			99o	19	14	10	0	253	277	1,755	2,032
			99n	1	0	0	0	0	0	0	0
57-41-0	**	Phenytoin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	19,300	19,300
			98o	1	1	0	0	0	1	7,510	7,511
			98n	1	3	0	0	0	3	143	146
			99o	1	1	0	0	0	1	9,400	9,401
			99n	No reports							
75-44-5		Phosgene	88	37	21,603	500	250	0	22,353	480	22,833
			95	29	15,894	0	5	0	15,899	0	15,899
			98o	34	20,247	0	0	3	20,250	0	20,250
			98n	No reports							
			99o	31	16,604	0	0	0	16,604	0	16,604
			99n	2	3	0	0	0	3	93	96
7803-51-2	*	Phosphine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	1,491	0	0	0	1,491	0	1,491
			98o	5	38,368	0	0	0	38,368	0	38,368
			98n	No reports							
			99o	5	54,385	0	0	0	54,385	0	54,385
			99n	2	3	0	0	0	3	92	95
7723-14-0	*	Phosphorus (yellow or white)	88	73	20,608	11,322	0	3,893,674	3,925,604	195,013	4,120,617
			95	53	28,621	3,661	0	1,871,801	1,904,083	23,650	1,927,733
			98o	52	23,590	3,761	0	2,273,118	2,300,469	7,637	2,308,106
			98n	3	14	0	0	0	14	568	582
			99o	53	9,748	4,990	0	2,715,672	2,730,410	6,739	2,737,149
			99n	3	75,125	0	0	0	75,125	108	75,233
85-44-9		Phthalic anhydride	88	180	549,909	1,040	0	1,265	552,214	3,976,682	4,528,896
			95	184	604,993	711	0	674	606,378	76,916	683,294
			98o	162	303,603	193	0	0	303,796	3,827,768	4,131,564
			98n	6	21	0	31,039	0	31,060	386	31,446
			99o	152	276,527	67	0	300	276,894	2,954,374	3,231,268
			99n	7	538	1	0	7,640	8,179	6,099	14,278
1918-02-1	*	Picloram	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	220	1	0	0	221	0	221
			98o	2	460	380,006	0	0	380,466	0	380,466
			98n	No reports							
			99o	2	2,800	10	0	0	2,810	0	2,810
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	2-Phenylphenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	530	0	1,027,544	2,104	32,551	1,062,729	1
		98o	197	0	300	0	120,000	332	456	121,285	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	1	0	125,000	2,970	313	128,284	1
		99n	0	0	0	0	0	0	0	0	0
**	Phenytoin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	19,000	19,000	0
		98o	0	0	0	0	140	15,000	7,500	22,640	0
		98n	0	0	0	0	20,629	0	146	20,775	0
		99o	0	0	0	0	152	17,500	9,400	27,052	0
		99n	No reports								
	Phosgene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	430,034	0	15,138,316	2,414	15,867	15,586,631	7
		98o	3,173,304	0	0	330	7,417,424	735	20,288	10,612,081	43
		98n	No reports								
		99o	10,150,418	0	0	0	11,339,630	543	16,440	21,507,031	34
		99n	0	0	0	0	112,537	0	95	112,632	0
*	Phosphine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	2,491	2,491	10
		98o	0	0	0	0	328,000	0	38,368	366,368	135
		98n	No reports								
		99o	0	0	0	0	385,101	0	54,385	439,486	0
		99n	0	0	0	0	54,236	0	95	54,331	0
*	Phosphorus (yellow or white)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,091	26,089	0	0	5,052	147,342	1,929,173	2,108,747	1,080
		98o	1	236,289	0	0	900,878	1,235	2,306,947	3,445,350	4,401
		98n	0	0	0	0	80,274	0	576	80,850	0
		99o	1	202,852	0	0	570,350	1,771	2,737,051	3,512,025	4
		99n	75,121	0	0	0	19,836	0	112	95,069	1
	Phthalic anhydride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	421,574	1,317	2,420,922	4,951,573	18,689,501	446,526	670,336	27,601,749	26,167
		98o	169,533	49,603	3,110,037	2,975,259	16,603,832	560,162	4,128,871	27,597,297	15,049
		98n	0	0	0	13,502	177,000	0	31,446	221,948	1
		99o	79,831	29,939	2,993,912	1,871,113	15,571,615	153,837	3,201,920	23,902,167	72,442
		99n	0	0	0	33,034	322,550	492	12,199	368,275	5
*	Picloram	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	23,208	0	221	23,429	0
		98o	0	0	0	0	59,000	0	380,006	439,006	0
		98n	No reports								
		99o	0	0	0	0	51,940	0	2,810	54,750	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
88-89-1		Picric acid	88	5	252	251	1,362,180	250	1,362,933	0	1,362,933
			95	9	221	0	49,256	0	49,477	0	49,477
			98o	8	0	1	63,950	0	63,951	0	63,951
			98n	No reports							
			99o	8	0	1	129,398	0	129,399	0	129,399
			99n	No reports							
51-03-6	*	Piperonyl butoxide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	12	775	0	0	0	775	750	1,525
			98o	12	501	0	0	0	501	0	501
			98n	No reports							
			99o	12	1,005	0	0	0	1,005	0	1,005
			99n	1	0	0	0	0	0	0	0
29232-93-7	*	Pirimiphos methyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	1	1	0	0	0	1	0	1
			99n	No reports							
—	**	Polybrominated biphenyls	88	1	250	0	0	0	250	0	250
			95	2	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	No reports							
—		Polychlorinated alkanes	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	72	23,250	6,206	0	0	29,456	197,607	227,063
			98o	69	4,085	4,131	0	0	8,216	109,932	118,148
			98n	2	0	0	0	0	0	0	0
			99o	66	5,788	4,805	0	0	10,593	110,943	121,536
			99n	3	0	0	0	16,065	16,065	8,713	24,778
1336-36-3	*,**	Polychlorinated biphenyls (PCBs)	88	120	6	10	0	752	768	410,996	411,764
			95	9	0	0	0	0	0	34,432	34,432
			98o	7	0	0	0	134,160	134,160	135	134,295
			98n	14	446	251	5	3,607,976	3,608,678	4,192	3,612,870
			99o	8	0	0	0	0	0	108	108
			99n	16	531	2	0	10,630,427	10,630,960	1,533	10,632,493
—	**	Polycyclic aromatic compounds	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	158	433,980	4,995	0	39,551	478,526	1,226,135	1,704,661
			98o	186	1,478,696	1,987	0	169,011	1,649,694	1,750,357	3,400,051
			98n	78	1,377	21	0	115,530	116,928	3,206	120,134
			99o	192	1,338,751	1,720	0	16,958	1,357,429	2,071,022	3,428,451
			99n	84	41,139	43	0	186,055	227,237	6,931	234,168

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

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Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Picric acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	53,393	2	1,261,618	0	49,477	1,364,490	0
		98o	0	0	129,412	12,941	1,627,444	0	63,951	1,833,748	0
		98n	No reports								
		99o	0	0	582	0	1,582,234	0	129,399	1,712,215	1
		99n	No reports								
*	Piperonyl butoxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	5	0	16,290	1,099	17,394	1
		98o	0	0	0	0	0	3,412	426	3,838	0
		98n	No reports								
		99o	0	0	0	0	0	3,432	595	4,027	0
		99n	0	0	0	0	21,382	0	0	21,382	0
*	Pirimiphos methyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	0	0	0	0	0	0	1	1	0
		99n	No reports								
**	Polybrominated biphenyls	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	2,720	0	0	0	0	0	2,720	0
		98o	0	1,000	0	0	0	0	0	1,000	0
		98n	No reports								
		99o	0	448	0	0	0	0	0	448	0
		99n	No reports								
	Polychlorinated alkanes	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	229,803	208,674	0	137,632	335,520	489,977	242,014	1,643,620	7
		98o	110,100	469,915	32,400	83,293	36,201	232,498	145,365	1,109,772	633
		98n	0	0	0	0	11,325	846	0	12,171	0
		99o	127,200	425,913	28,000	94,229	340	227,335	137,900	1,040,917	4
		99n	0	0	0	0	29,848	0	24,823	54,671	0
	Polychlorinated biphenyls (PCBs)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	64,494	8,242	72,736	1
		98o	0	0	0	0	0	261,979	0	261,979	1
		98n	0	140,018	0	0	8,446,718	428,113	3,626,637	12,641,486	2
		99o	0	0	0	0	0	644,531	0	644,531	111
		99n	0	92,003	0	0	11,690,585	388,219	7,095,524	19,266,331	1
**	Polycyclic aromatic compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,473,048	116,093	10,499,200	59,223	2,502,982	13,825	1,734,470	16,398,841	22,303
		98o	1,900,617	246,834	3,835,404	259,788	4,695,159	37,484	3,292,953	14,268,239	43,947
		98n	312	216	0	0	48,107,002	1,345	120,494	48,229,369	110
		99o	3,440,747	218,251	4,126,035	80,493	3,953,604	63,552	3,564,705	15,447,387	131,636
		99n	59	2,099	0	10	68,390,656	2,522	233,319	68,628,665	337

Note: Data from Section 8 (Current Year) of Form R.

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Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
7758-01-2	**	Potassium bromate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	5	0	0	0	5	0	5
			98o	4	10	0	0	0	10	0	10
			98n	No reports							
			99o	2	5	0	0	0	5	0	5
			99n	No reports							
128-03-0	*	Potassium dimethyldithio-carbamate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	11	224	10,170	0	0	10,394	0	10,394
			98o	19	533	43,088	0	5	43,626	5	43,631
			98n	No reports							
			99o	18	10,523	18,417	0	5	28,945	676	29,621
			99n	No reports							
137-41-7	*	Potassium N-methyldithiocarbamate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	35	0	0	0	35	0	35
			98o	5	0	0	0	0	0	0	0
			98n	No reports							
			99o	5	10	5,680	0	0	5,690	0	5,690
			99n	No reports							
41198-08-7	*	Profenofos	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	10	0	0	0	10	0	10
			98n	No reports							
			99o	1	10	0	0	0	10	0	10
			99n	No reports							
7287-19-6	*	Prometryn	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	6	1,481	159	0	0	1,640	890	2,530
			98o	5	725	8	0	0	733	1,047	1,780
			98n	No reports							
			99o	5	502	4	0	0	506	0	506
			99n	No reports							
23950-58-5	*	Pronamide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	255	0	0	0	255	0	255
			98o	2	255	0	0	0	255	0	255
			98n	2	110	0	0	0	110	0	110
			99o	2	330	0	0	0	330	0	330
			99n	1	2	1	0	0	3	16	19
1918-16-7	*	Propachlor	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	331	0	0	0	331	777	1,108
			98o	4	62	0	0	0	62	600	662
			98n	No reports							
			99o	2	60	0	0	0	60	0	60
			99n	2	21	0	0	14,208	14,229	10	14,239

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Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Potassium bromate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	51,447	1	0	0	13	51,461	0
		98n	No reports								
		99o	0	0	0	0	0	0	10	10	0
		99n	No reports								
*	Potassium dimethyldithio-carbamate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	19,317	161,362	10,394	191,073	0
		98o	0	0	0	0	23,596	120,325	54,888	198,809	1
		98n	No reports								
		99o	0	0	0	0	40,169	72,363	45,669	158,201	1
		99n	No reports								
*	Potassium N-methyldithio-carbamate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	35	35	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	4,647	0	5,690	10,337	0
		99n	No reports								
*	Profenofos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	109	0	0	109	0
		98o	0	0	0	0	0	0	7,270	7,270	0
		98n	No reports								
		99o	0	0	0	0	0	0	6,420	6,420	0
		99n	No reports								
*	Prometryn	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	1	1,314	7,603	4,028	12,946	0
		98o	0	0	0	0	30,035	38,455	789	69,279	0
		98n	No reports								
		99o	0	0	0	0	51,018	6,238	4,342	61,598	0
		99n	No reports								
*	Pronamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,700	0	0	0	0	1,200	260	5,160	0
		98o	5,500	0	0	0	0	2,095	290	7,885	0
		98n	0	0	0	234,265	0	0	110	234,375	1
		99o	14,000	0	0	0	0	2,393	1,613	18,006	0
		99n	0	0	0	0	33,000	0	15	33,015	0
*	Propachlor	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	7,270	1,237	8,507	14,000
		98o	0	0	0	0	0	91,800	662	92,462	0
		98n	No reports								
		99o	0	0	0	0	0	85,700	660	86,360	0
		99n	0	0	0	0	77,027	0	14,224	91,251	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1120-71-4	**	Propane sultone	88	2	0	0	0	0	0	0	0
			95	1	0	0	0	0	0	0	0
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	2	5	0	5	0	10	157	167
709-98-8	*	Propanil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	4	2,357	250	0	0	2,607	3,723	6,330
			98o	5	2,505	750	0	0	3,255	11,250	14,505
			98n	1	2	0	0	0	2	270	272
			99o	5	2,010	750	0	0	2,760	26,250	29,010
			99n	No reports							
2312-35-8	*	Propargite	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	426	0	0	0	426	0	426
			98o	3	525	0	0	0	525	3,546	4,071
			98n	No reports							
			99o	3	739	0	0	0	739	9,446	10,185
			99n	No reports							
107-19-7	*	Propargyl alcohol	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	11	10,245	0	290,680	0	300,925	936	301,861
			98o	14	15,675	0	418,223	7,620	441,518	253	441,771
			98n	2	5	0	0	0	5	0	5
			99o	12	9,960	0	545,399	0	555,359	10,085	565,444
			99n	3	14	0	0	0	14	152	166
31218-83-4	*	Propetamphos	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	500	0	0	0	500	750	1,250
			98o	1	10	0	0	0	10	250	260
			98n	No reports							
			99o	1	10	0	0	0	10	250	260
			99n	No reports							
60207-90-1	*	Propiconazole	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	0	0	0	0	0	0	0
			98o	5	10	0	0	0	10	0	10
			98n	No reports							
			99o	3	10	0	0	0	10	0	10
			99n	No reports							
123-38-6	*	Propionaldehyde	88	15	1,267,839	1,156	930	0	1,269,925	0	1,269,925
			95	24	263,349	27,012	101,432	0	391,793	0	391,793
			98o	26	311,153	6,017	92,183	78	409,431	14	409,445
			98n	3	192	0	0	0	192	0	192
			99o	24	426,111	2,604	97,144	0	525,859	331	526,190
			99n	3	11	0	15,576	0	15,587	0	15,587

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Propane sultone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	16	0	0	16	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	129,321	0	165	129,486	0
*	Propanil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	402	4,468	4,870	0
		98o	200,000	0	0	0	0	86,745	12,552	299,297	50
		98n	0	0	0	0	202,192	0	272	202,464	0
		99o	0	0	0	0	0	270,452	3,357	273,809	50
		99n	No reports								
*	Propargite	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	544	0	4,365	426	5,335	0
		98o	0	0	0	2,216	0	76,189	3,896	82,301	0
		98n	No reports								
		99o	0	0	0	4,164	255	13,305	564	18,288	0
		99n	No reports								
*	Propargyl alcohol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	198,867	344,704	56,027	78,003	301,422	979,023	0
		98o	0	0	60,400	520,327	109,142	41,800	444,545	1,176,214	1
		98n	0	0	0	909	13,178	1,000	2	15,089	0
		99o	0	0	13,091	4	94,786	62,376	591,893	762,150	5
		99n	0	0	0	0	137,838	0	159	137,997	0
*	Propetamphos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	1,067	1,067	1
		98o	0	0	0	0	0	0	482	482	0
		98n	No reports								
		99o	0	0	0	0	0	0	490	490	0
		99n	No reports								
*	Propiconazole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,026	0	1,026	0
		98o	0	0	0	0	25,000	0	2,943	27,943	0
		98n	No reports								
		99o	0	0	0	0	22,000	0	2,001	24,001	0
		99n	No reports								
*	Propionaldehyde	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	898,697	5,565	2,348,820	79,790	387,308	3,720,180	24
		98o	0	0	2,021,614	4,648	5,082,153	46,283	411,365	7,566,063	402
		98n	0	0	0	442,609	3	15	192	442,819	1
		99o	440,000	0	2,311,283	6,236	3,030,972	34,933	518,997	6,342,421	1
		99n	0	0	0	270	17	0	15,578	15,865	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
114-26-1	*	Propoxur	88	5	250	0	0	0	250	250	500
			95	5	5	0	0	0	5	0	5
			98o	2	0	0	0	0	0	0	0
			98n	1	0	0	0	0	0	10	10
			99o	1	0	0	0	0	0	0	0
			99n	1	11	0	0	0	11	10	21
115-07-1		Propylene	88	334	32,200,231	10,003	0	0	32,210,234	3,320	32,213,554
			95	353	27,576,252	4,047	0	169	27,580,468	298	27,580,766
			98o	368	16,332,670	3,104	2,870	389	16,339,033	897	16,339,930
			98n	41	79,765	0	0	0	79,765	0	79,765
			99o	385	13,496,827	1,023	136,393	396	13,634,639	118	13,634,757
			99n	47	63,996	0	0	0	63,996	0	63,996
75-55-8	**	Propyleneimine	88	1	500	0	0	0	500	0	500
			95	7	600	0	0	0	600	0	600
			98o	4	385	5	0	0	390	5	395
			98n	No reports							
			99o	4	104	0	0	0	104	0	104
			99n	2	4	0	0	0	4	153	157
75-56-9	*,**	Propylene oxide	88	128	3,680,215	112,503	1,113,780	11,630	4,918,128	16,626	4,934,754
			95	137	839,153	29,934	22,577	4,403	896,067	10,633	906,700
			98o	115	740,027	1,124	1,923	691	743,765	5,687	749,452
			98n	7	32	0	13,380	0	13,412	0	13,412
			99o	119	704,873	10,847	4,580	715	721,015	5,266	726,281
			99n	8	4	0	10,491	28,649	39,144	0	39,144
110-86-1	*	Pyridine	88	31	251,799	2,158	491,775	1,125	746,857	40,699	787,556
			95	42	100,190	830	532,497	4	633,521	433	633,954
			98o	50	70,262	1,056	593,199	0	664,517	13,854	678,371
			98n	16	697	0	5	0	702	2,292	2,994
			99o	52	68,647	1,074	953,995	0	1,023,716	378	1,024,094
			99n	14	899	1	0	0	900	52,862	53,762
91-22-5		Quinoline	88	34	49,350	502	0	896	50,748	6,242	56,990
			95	23	11,412	20	13,000	405	24,837	3,744	28,581
			98o	21	15,415	32	29,350	265	45,062	2,553	47,615
			98n	1	1	0	0	0	1	73	74
			99o	19	11,813	26	25,205	7	37,051	21,715	58,766
			99n	No reports							
106-51-4	*	Quinone	88	5	11,300	140	0	0	11,440	0	11,440
			95	4	7,101	1,500	0	0	8,601	0	8,601
			98o	6	482	1,600	0	0	2,082	0	2,082
			98n	1	0	0	0	0	0	0	0
			99o	6	415	1,400	0	0	1,815	0	1,815
			99n	3	24	1	0	0	25	161	186

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

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Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Propoxur	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,081	4	1,085	0
		98o	0	0	0	0	0	435	0	435	0
		98n	0	0	0	0	0	0	25	25	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	56,411	0	11	56,422	0
	Propylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	6,713,304	0	463,253,246	3,132,285	254,254,014	80,239	26,886,689	754,319,777	1,008,723
		98o	74,791,416	23,152	456,059,665	2,218	299,247,194	2,896,808	14,962,907	847,983,360	1,239,982
		98n	0	0	0	0	14,440	0	79,097	93,537	13
		99o	105,899,757	28	395,331,079	10,337,809	387,944,876	1,579,785	13,370,607	914,463,941	267,586
		99n	0	0	0	0	33,620	0	63,403	97,023	6
**	Propyleneimine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,433	0	600	2,033	3
		98o	0	0	0	0	2,788	6	680	3,474	0
		98n	No reports								
		99o	0	0	0	0	4,319	0	104	4,423	0
		99n	0	0	0	0	106,854	0	157	107,011	0
*,**	Propylene oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	3,091	0	17,981,778	282,917	14,410,159	192,373	1,138,346	34,008,664	20,210
		98o	1,081,157	0	13,924,312	79,248	14,397,389	475,463	754,076	30,711,645	1,417
		98n	0	0	0	18,634	40,509	0	13,412	72,555	0
		99o	508,380	619	12,895,870	13,529	12,243,188	192,824	730,161	26,584,571	1,260
		99n	0	0	0	5,232	58,302	7,414	39,184	110,132	0
*	Pyridine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	4,074,830	14,008	1,713,719	186,855	348,378	483,295	631,050	7,452,135	1,077
		98o	616,015	0	1,756,718	470,128	765,210	720,123	689,534	5,017,728	1,112
		98n	0	0	16,073	620,143	1,333,326	28,086	2,577	2,000,205	1
		99o	637,004	8,071	984,135	450,440	681,114	451,088	1,021,864	4,233,716	1,001
		99n	278,231	44	5,645	189,439	1,915,397	598,710	1,020	2,988,486	10
	Quinoline	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,750	2,243	302,003	22	222,705	16,120	27,181	572,024	253
		98o	27,147	1,713	122,038	11,582	109,680	961	47,741	320,862	300
		98n	0	0	0	0	10,461	0	74	10,535	0
		99o	12,831	1,137	87,056	11,353	135,351	4,200	58,429	310,357	0
		99n	No reports								
*	Quinone	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	179,870	1,328	130,500	30,173	8,601	350,472	0
		98o	0	0	1,400	17,747	567,300	10,917	2,101	599,465	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	340	162,544	116,001	135,984	1,805	416,674	0
		99n	0	0	0	0	176,005	0	182	176,187	0

Note: Data from Section 8 (Current Year) of Form R.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
82-68-8	*	Quintozene	88	6	1,064	0	0	0	1,064	12,625	13,689
			95	10	1,424	0	0	800	2,224	192	2,416
			98o	11	1,788	0	0	0	1,788	2	1,790
			98n	2	10	0	0	0	10	0	10
			99o	14	408	0	0	0	408	5,007	5,415
			99n	3	14	1	0	0	15	15	30
76578-14-8	*	Quizalofop-ethyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	6	0	0	0	6	0	6
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
10453-86-8	*	Resmethrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	3	22	0	0	0	22	0	22
			99n	No reports							
81-07-2	**	Saccharin (manufacturing)	88	4	750	0	0	0	750	750	1,500
			95	1	99	0	0	0	99	1,500	1,599
			98o	2	160	0	0	0	160	940	1,100
			98n	No reports							
			99o	2	63	0	0	0	63	940	1,003
			99n	1	0	0	0	0	0	0	0
94-59-7	*,**	Safrole	88	2	500	0	0	0	500	0	500
			95	1	255	0	0	0	255	0	255
			98o	2	10	0	0	0	10	0	10
			98n	1	0	0	0	0	0	0	0
			99o	2	260	0	0	0	260	0	260
			99n	2	21	0	0	6,005	6,026	3,239	9,265
7782-49-2	*	Selenium	88	24	16,282	1,168	0	127,508	144,958	4,367	149,325
			95	15	1,450	92	0	23	1,565	3,501	5,066
			98o	15	34,028	58	0	2,010	36,096	15,800	51,896
			98n	11	807	0	17,937	254,259	273,003	185,901	458,904
			99o	16	69,012	285	0	3,113	72,410	11,509	83,919
			99n	9	790	0	0	264,804	265,594	531	266,125
—		Selenium compounds	88	18	14,506	250	3,400	45,750	63,906	63,226	127,132
			95	40	61,960	2,184	3,640	264,759	332,543	124,185	456,728
			98o	52	74,716	3,373	38,030	360,694	476,813	75,214	552,027
			98n	80	527,771	32,727	8	4,809,151	5,369,657	371,330	5,740,987
			99o	50	82,408	4,106	33,509	305,342	425,365	94,026	519,391
			99n	73	508,214	40,960	0	5,647,927	6,197,101	558,772	6,755,873

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Quintozene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	863	0	0	0	0	759,587	2,251	762,701	110
		98o	515	0	0	342,800	0	13,168	1,790	358,273	0
		98n	0	0	0	0	44,515	0	3	44,518	0
		99o	2,371	0	0	214,728	0	8,126	451	225,676	30
		99n	0	0	0	0	126,058	0	21	126,079	0
*	Quizalofop-ethyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	5	5	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Resmethrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	46	0	46	0
		99n	No reports								
**	Saccharin (manufacturing)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	9,700	10	1,600	11,310	74
		98o	0	0	0	0	7,300	7	1,100	8,407	0
		98n	No reports								
		99o	0	0	0	0	6,800	7	1,000	7,807	0
		99n	0	0	0	0	117,930	0	0	117,930	0
*,**	Safrole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1	5	0	6	0
		98o	0	0	0	0	0	10	30	40	0
		98n	0	0	0	0	0	0	0	0	0
		99o	0	0	0	0	0	10	110	120	0
		99n	0	0	0	0	61,981	0	9,263	71,244	0
*	Selenium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,604	4,604	0	0	23	2,271	1,524	10,026	1
		98o	0	0	86,174	3,902	156	920	45,019	136,171	0
		98n	0	0	0	0	0	185,504	273,341	458,845	0
		99o	4	800	0	0	1,166	50	81,686	83,706	47
		99n	0	0	0	0	0	0	265,869	265,869	0
	Selenium compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	590,805	158,278	0	10	2	49,853	356,404	1,155,352	49,259
		98o	595,899	68,632	0	0	2,040	9,743	511,927	1,188,241	76,445
		98n	53,228	9	0	0	4	23	5,750,788	5,804,052	12
		99o	574,215	22,862	0	0	2,410	10,343	408,122	1,017,952	109,657
		99n	56,980	4	0	0	0	20	6,176,689	6,233,693	670,007

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
74051-80-2	*	Sethoxydim	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	2	10	0	0	0	10	0	10
			98n	1	0	0	0	0	0	0	0
			99o	2	10	0	0	0	10	0	10
			99n	No reports							
7440-22-4	*	Silver	88	72	47,988	1,654	0	39,510	89,152	8,482	97,634
			95	76	9,552	166	0	255	9,973	17,676	27,649
			98o	83	11,418	171	2	2,026	13,617	69,049	82,666
			98n	14	60	0	15,380	400,306	415,746	35,826	451,572
			99o	82	11,063	96	0	2,660	13,819	80,794	94,613
			99n	12	894	0	17,000	220,096	237,990	257,060	495,050
—		Silver compounds	88	46	15,406	8,684	250	11,550	35,890	15,803	51,693
			95	59	15,573	6,284	380	35,325	57,562	7,575	65,137
			98o	64	6,636	5,704	109	76,755	89,204	194,916	284,120
			98n	21	847	676	140,000	4,091,351	4,232,874	163,250	4,396,124
			99o	68	8,705	7,218	222	64,399	80,544	32,480	113,024
			99n	16	1,309	322	160,000	3,519,852	3,681,483	40,061	3,721,544
122-34-9	*	Simazine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	7	4,990	232	0	5	5,227	26,231	31,458
			98o	7	3,321	332	0	0	3,653	4,497	8,150
			98n	No reports							
			99o	6	3,928	385	0	0	4,313	2,385	6,698
			99n	No reports							
26628-22-8	*	Sodium azide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	14	35,575	200	0	255	36,030	133,837	169,867
			98o	11	15,392	20	0	250	15,662	10,891	26,553
			98n	3	14	0	0	190,646	190,660	180	190,840
			99o	9	5,946	15	0	0	5,961	5,652	11,613
			99n	3	11	0	0	33,542	33,553	318	33,871
1982-69-0	*	Sodium dicamba	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	14,350	0	750	0	15,100	0	15,100
			98o	2	8,560	0	750	0	9,310	0	9,310
			98n	No reports							
			99o	2	5,150	0	250	0	5,400	0	5,400
			99n	No reports							
128-04-1	*	Sodium dimethyldithio-carbamate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	63	2,746	20	0	0	2,766	152,357	155,123
			98o	83	22,024	4,868	0	13,367	40,259	306,193	346,452
			98n	10	7	0	0	482,268	482,275	12,564	494,839
			99o	74	13,211	4	0	51,994	65,209	276,157	341,366
			99n	8	487	0	0	433,202	433,689	33,498	467,187

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Sethoxydim	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	293	20	313	0
		98n	0	0	0	0	17,391	0	0	17,391	0
		99o	0	0	0	0	0	0	20	20	0
		99n	No reports								
*	Silver	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	563,590	1,266,487	0	1	87,462	531	20,608	1,938,679	619
		98o	622,401	1,197,977	0	32	4,917	44,958	235,364	2,105,649	4
		98n	400	0	0	0	0	17	415,721	416,138	1
		99o	380,453	1,794,552	90,601	11	87	40,121	25,342	2,331,167	12
		99n	0	124,430	0	0	0	143,364	237,610	505,404	10
	Silver compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	327,832	1,064,906	0	0	3,966,504	23,221	56,206	5,438,669	272
		98o	236,220	1,053,421	0	0	52,854	2,248	444,517	1,789,260	5,418
		98n	2,532	251	0	0	0	2,396	4,395,708	4,400,887	6
		99o	3,855,024	1,201,930	0	0	2,090	1,470	287,351	5,347,865	9,972
		99n	612	331	0	0	0	651	3,187,191	3,188,785	540,002
*	Simazine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	150,000	24,000	4,970	178,970	0
		98o	50	0	0	0	68,000	1,500	6,294	75,844	0
		98n	No reports								
		99o	50	0	0	0	77,000	8,251	14,154	99,455	0
		99n	No reports								
*	Sodium azide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	190,310	556,000	0	0	93,341	3,906,934	166,060	4,912,645	112
		98o	34,600	439,942	0	0	11,732	609,400	26,186	1,121,860	5
		98n	0	0	0	0	36,074	0	191,601	227,675	1
		99o	15,800	148,200	0	0	12,180	297,891	11,616	485,687	3
		99n	0	0	0	0	160,650	16	33,887	194,553	0
*	Sodium dicamba	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	800	15,200	16,000	0
		98o	0	0	0	0	414,800	46,680	9,546	471,026	0
		98n	No reports								
		99o	0	0	0	0	248,383	0	5,400	253,783	0
		99n	No reports								
*	Sodium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	dimethyldithio-	95	250	199,200	0	0	462,188	511,438	28,169	1,201,245	5,006
	carbamate	98o	250	183,221	192	0	741,898	663,564	280,326	1,869,451	3
		98n	0	1	0	3	0	430	497,268	497,702	2
		99o	250	196,401	0	0	780,422	576,882	153,080	1,707,035	5
		99n	0	0	0	0	42,326	0	467,037	509,363	1

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
62-74-8	*	Sodium fluoroacetate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	2	4	0	0	0	4	153	157
7632-00-0	*	Sodium nitrite	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	356	291,951	1,384,082	1,004,363	81,948	2,762,344	291,378	3,053,722
			98o	412	137,796	1,009,077	841,400	538,533	2,526,806	474,212	3,001,018
			98n	24	1,016	500	27,801	14,910	44,227	78	44,305
			99o	418	155,107	1,556,633	807,410	260,917	2,780,067	404,423	3,184,490
			99n	17	811	36,579	0	12,010	49,400	0	49,400
132-27-4	*,**	Sodium	88	NR	NR	NR	NR	NR	NR	NR	NR
		o-phenylphenoxide	95	3	0	0	0	0	0	0	0
			98o	4	0	0	0	0	0	0	0
			98n	No reports							
			99o	5	0	0	0	0	0	0	0
			99n	No reports							
—		Strychnine and salts	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	5	0	0	0	5	171	176
100-42-5	**	Styrene	88	1,259	34,309,811	59,069	165	242,941	34,611,986	2,013,696	36,625,682
			95	1,573	42,059,571	4,570	209,945	96,078	42,370,164	2,741,458	45,111,622
			98o	1,563	54,259,569	243,133	345,945	322,736	55,171,383	2,053,921	57,225,304
			98n	106	22,243	15	161,738	14,398	198,394	10,577	208,971
			99o	1,549	54,731,130	3,168	191,124	369,150	55,294,572	2,098,614	57,393,186
			99n	89	13,000	266	0	22,064	35,330	86,622	121,952
96-09-3	**	Styrene oxide	88	6	2,314	0	0	0	2,314	750	3,064
			95	5	13	0	0	0	13	0	13
			98o	2	9	0	0	0	9	0	9
			98n	No reports							
			99o	1	7	0	0	0	7	0	7
			99n	No reports							
7664-93-9	*	Sulfuric acid	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1,600	22,617,822	5,363	30,035	134,812	22,788,032	4,733,342	27,521,374
			98o	830	27,428,323	22,608	690,900	55,837	28,197,668	347,593	28,545,261
			98n	483	166,197,401	1	0	85,501	166,282,903	20,000	166,302,903
			99o	780	25,960,113	13,426	1,075,050	203,550	27,252,139	99,389	27,351,528
			99n	485	153,888,058	6	0	53,789	153,941,853	20,200	153,962,053

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Sodium fluoroacetate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	124,717	0	157	124,874	0
*	Sodium nitrite	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	374,426	4,657	0	0	17,461,874	5,813,965	3,946,119	27,601,041	280
		98o	391,745	17,741	0	17	38,822,470	7,404,374	4,469,556	51,105,903	9,052
		98n	46,249	0	0	0	779,173	176,991	44,292	1,046,705	2
		99o	511,277	45,498	0	20	47,232,908	2,717,121	5,020,458	55,527,282	89,024
		99n	0	0	0	0	1,169,880	200,126	49,634	1,419,640	0
*,**	Sodium	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	o-phenylphenoxide	95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	Strychnine and salts	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	31,974	0	0	31,974	0
		99o	No reports								
		99n	0	0	0	0	161,966	0	177	162,143	0
**	Styrene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	9,297,615	820,377	20,677,749	9,261,346	14,069,737	4,187,657	44,302,260	102,616,741	171,055
		98o	14,407,655	1,417,181	29,679,770	8,531,514	9,924,466	4,972,665	56,075,998	125,009,249	181,614
		98n	163,600	482,410	0	2,877,212	1,307,660	163,076	676,686	5,670,644	967
		99o	14,016,160	799,390	43,228,207	11,327,385	12,286,214	3,570,873	60,970,893	146,199,122	161,295
		99n	341,558	37,258	0	698,514	2,203,112	508,366	36,398	3,825,206	561
**	Styrene oxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	35,337	0	0	0	13	35,350	0
		98o	0	0	30,000	0	0	0	9	30,009	0
		98n	No reports								
		99o	0	0	70,000	0	0	0	7	70,007	0
		99n	No reports								
*	Sulfuric acid	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	686,624,536	5,892,020	66,777	24,524	652,611,988	11,622,000	24,070,854	1,380,912,699	86,027
		98o	242,489,671	1,193,466	43,000	41	166,391,954	4,589,826	28,293,387	443,001,345	42,086
		98n	1	15	0	17,184	152,227,525	327	165,301,643	317,546,695	1,893
		99o	252,112,029	1,012,934	28,000	1,680	151,138,271	2,105,677	27,733,672	434,132,263	41,025
		99n	0	1,595	0	0	171,822,760	85,332	153,898,955	325,808,642	302

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
2699-79-8	*	Sulfuryl fluoride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	355,007	0	0	0	355,007	0	355,007
			98o	3	466,000	0	0	0	466,000	0	466,000
			98n	No reports							
			99o	3	505,600	0	0	0	505,600	0	505,600
			99n	No reports							
35400-43-2	*	Sulprofos	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	247	0	0	0	247	0	247
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
34014-18-1	*	Tebuthiuron	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	5	0	0	0	5	0	5
			98o	1	10	0	0	0	10	750	760
			98n	No reports							
			99o	1	755	0	0	0	755	750	1,505
			99n	No reports							
3383-96-8	*	Temephos	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	1	7	0	0	0	7	0	7
			99o	1	0	0	0	0	0	0	0
			99n	1	0	0	0	0	0	0	0
5902-51-2	*	Terbacil	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	4,608	0	0	4,608	0	4,608
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
630-20-6		1,1,1,2-Tetrachloroethane	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	8	7,011	0	0	0	7,011	2	7,013
			98o	7	8,612	5	0	0	8,617	2	8,619
			98n	5	952	0	0	0	952	67	1,019
			99o	11	5,232	0	0	0	5,232	1	5,233
			99n	3	141	1	0	0	142	734	876
79-34-5	*	1,1,2,2-Tetrachloroethane	88	13	43,865	1,903	0	29	45,797	128,750	174,547
			95	16	8,275	2,222	0	0	10,497	7	10,504
			98o	15	7,247	19	0	0	7,266	6,458	13,724
			98n	6	52	250	5	0	307	45	352
			99o	13	5,183	0	0	15	5,198	10	5,208
			99n	5	32	1	0	0	33	20	53

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Sulfuryl fluoride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	371,500	371,500	0
		98o	0	0	0	0	0	0	461,000	461,000	5,700
		98n	No reports								
		99o	0	0	0	0	0	0	505,600	505,600	0
		99n	No reports								
*	Sulprofos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,137	0	249	1,386	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
*	Tebuthiuron	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1	0	0	0	1,000	1,100	1	2,102	0
		98o	4	0	0	0	860	870	1	1,735	0
		98n	No reports								
		99o	3	0	0	0	680	700	1	1,384	0
		99n	No reports								
*	Temephos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	31,269	0	7	31,276	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	51,378	0	0	51,378	0
*	Terbacil	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	5,070	7,558	4,608	17,236	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
	1,1,1,2-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tetrachloroethane	95	2,600,000	0	0	0	4,234,676	379,203	8,341	7,222,220	40
		98o	6,600,180	0	0	120,700	2,930,017	43,074	8,535	9,702,506	18
		98n	0	0	0	0	158,326	2,580,168	1,015	2,739,509	1
		99o	6,500,001	0	0	147,754	4,022,583	50,056	4,603	10,724,997	386
		99n	0	0	0	0	708,087	12,991	807	721,885	0
*	1,1,2,2-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tetrachloroethane	95	6,200,000	2,233,342	846,600	880	13,754,898	150,324	10,503	23,196,547	40
		98o	6,692,000	2,339,618	597,000	0	10,254,173	119,300	8,847	20,010,938	803
		98n	0	0	0	2,214	479,168	2,560,430	125	3,041,937	0
		99o	6,492,000	3,095,391	0	0	11,976,729	53,056	4,773	21,621,949	294
		99n	0	0	0	0	386,882	0	39	386,921	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
127-18-4	*,**	Tetrachloroethylene	88	748	36,124,485	33,314	72,250	82,144	36,312,193	1,385,378	37,697,571
			95	442	9,674,185	2,407	20,481	6	9,697,079	78,953	9,776,032
			98o	363	5,463,597	1,490	5,916	2,992	5,473,995	130,444	5,604,439
			98n	162	202,717	250	644	18,986	222,597	30,635	253,232
			99o	316	3,648,732	1,793	8,897	19,885	3,679,307	27,966	3,707,273
			99n	144	205,035	1	288	85,000	290,324	176,367	466,691
354-11-0		1,1,1,2-Tetrachloro-	88	NR	NR	NR	NR	NR	NR	NR	NR
		2-fluoroethane	95	No reports							
			98o	1	23,275	1	0	0	23,276	0	23,276
			98n	No reports							
			99o	No reports							
			99n	No reports							
354-14-3		1,1,2,2-Tetrachloro-	88	NR	NR	NR	NR	NR	NR	NR	NR
		1-fluoroethane	95	1	0	0	0	0	0	0	0
			98o	1	10	0	0	0	10	0	10
			98n	No reports							
			99o	1	10	0	0	0	10	0	10
			99n	No reports							
961-11-5	*	Tetrachlorvinphos	88	6	251	0	0	0	251	9,270	9,521
			95	5	626	5	0	0	631	4,200	4,831
			98o	4	360	5	0	0	365	0	365
			98n	No reports							
			99o	4	196	5	0	0	201	1,037	1,238
			99n	2	5	0	0	0	5	809	814
64-75-5	*	Tetracycline	88	NR	NR	NR	NR	NR	NR	NR	NR
		hydrochloride	95	2	754	0	0	0	754	112	866
			98o	2	525	0	0	0	525	1,800	2,325
			98n	No reports							
			99o	3	0	0	0	0	0	4,300	4,300
			99n	No reports							
7696-12-0	*	Tetramethrin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	0	0
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	4	10,080	0	0	0	10,080	0	10,080
			99n	No reports							
7440-28-0		Thallium	88	No reports							
			95	1	255	0	0	755	1,010	195	1,205
			98o	5	15	0	0	3,400	3,415	3,665	7,080
			98n	5	533	65	0	96,339	96,937	5	96,942
			99o	4	2,137	0	0	4,355	6,492	4,578	11,070
			99n	3	1,020	600	0	72,700	74,320	99,000	173,320

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*,**	Tetrachloroethylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	46,318,487	6,830,809	8,865,647	781,602	26,279,022	2,315,885	9,666,477	101,057,929	14,474
		98o	127,767,543	15,593,463	3,641,487	603,157	25,248,412	1,088,051	5,464,380	179,406,493	36,279
		98n	5,857,745	975,944	434	2,898,228	1,516,150	4,609,315	248,825	16,106,641	130
		99o	109,300,986	9,663,877	3,140,705	306,463	10,455,129	913,107	3,685,756	137,466,023	30,551
		99n	12,178,051	442,582	887	4,858,731	4,189,196	6,145,006	323,794	28,138,247	86
	1,1,1,2-Tetrachloro-2-fluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	6,600	270	0	0	0	0	21,000	27,870	0
		98n	No reports								
		99o	No reports								
		99n	No reports								
	1,1,2,2-Tetrachloro-1-fluoroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	0	26,387	15	26,402	0
		98n	No reports								
		99o	0	0	0	0	0	67,130	15	67,145	0
		99n	No reports								
*	Tetrachlorvinphos	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	330	0	17,000	47,000	1,020	4,244	4,395	73,989	0
		98o	350	0	44,000	26,700	870	11,640	211	83,771	0
		98n	No reports								
		99o	375	0	14,000	98,900	1,131	13,640	435	128,481	0
		99n	0	0	0	0	36,510	0	61	36,571	0
*	Tetracycline hydrochloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,736	677	2,413	0
		98o	0	0	0	0	0	700	2,160	2,860	0
		98n	No reports								
		99o	0	0	0	0	0	2,001	4,501	6,502	0
		99n	No reports								
*	Tetramethrin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	437	0	437	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	260	10,080	10,340	0
		99n	No reports								
	Thallium	88	No reports								
		95	688,093	3,852	0	0	0	190	31	692,166	0
		98o	0	0	52,353	1	0	9	3,406	55,769	0
		98n	0	0	0	0	21,600	1	96,826	118,427	0
		99o	9	0	0	0	0	51	6,437	6,497	0
		99n	0	0	0	0	0	0	173,000	173,000	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—		Thallium compounds	88	4	253	0	0	250	503	1,256	1,759
			95	No reports							
			98o	4	1,060	250	0	409,000	410,310	259	410,569
			98n	28	34,505	749	0	10,756,608	10,791,862	2,302	10,794,164
			99o	4	654	750	0	252,800	254,204	1,583	255,787
			99n	31	4,617	2,129	0	3,029,157	3,035,903	60,062	3,095,965
148-79-8	*	Thiabendazole	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	3,929	0	0	0	3,929	0	3,929
			98o	3	0	0	0	0	0	0	0
			98n	No reports							
			99o	3	255	0	0	0	255	0	255
			99n	No reports							
62-55-5	**	Thioacetamide	88	1	500	0	0	0	500	0	500
			95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	7	1	0	0	8	164	172
28249-77-6	*	Thiobencarb	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	510	0	0	0	510	3,032	3,542
			98o	2	286	0	0	0	286	760	1,046
			98n	No reports							
			99o	2	343	0	0	0	343	832	1,175
			99n	No reports							
59669-26-0	*	Thiodicarb	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	376	0	0	0	376	500	876
			98o	3	359	0	0	0	359	5,966	6,325
			98n	No reports							
			99o	3	438	0	0	6,843	7,281	239	7,520
			99n	No reports							
23564-05-8	*	Thiophanate-methyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	502	0	0	0	502	0	502
			98o	7	431	0	0	0	431	442	873
			98n	No reports							
			99o	10	493	0	0	0	493	7,165	7,658
			99n	No reports							
79-19-6		Thiosemicarbazide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	2	3	0	0	0	3	98	101

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Thallium compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	250	310,000	310,250	100,000
		98n	2,133	0	0	0	0	1	10,794,136	10,796,270	653
		99o	0	0	0	0	0	315	194,746	195,061	60,000
		99n	1,884	0	0	0	0	0	2,929,108	2,930,992	120,001
*	Thiabendazole	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1	0	0	2,160	1,200	1,931	3,740	9,032	0
		98o	0	0	0	0	0	747	0	747	0
		98n	No reports								
		99o	0	0	0	0	1,500	5,094	75	6,669	0
		99n	No reports								
**	Thioacetamide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	181,229	0	167	181,396	0
*	Thiobencarb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	620	3,162	3,782	0
		98o	747	0	0	0	0	198	1,772	2,717	1
		98n	No reports								
		99o	0	0	0	0	0	105	120	225	0
		99n	No reports								
*	Thiodicarb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,500	0	0	0	41,139	160	180	42,979	1
		98o	108,880	0	0	0	34,243	19,476	362	162,961	0
		98n	No reports								
		99o	84,500	0	0	0	35,246	11,073	1,200	132,019	0
		99n	No reports								
*	Thiophanate-methyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	320	0	0	0	0	2,677	507	3,504	0
		98o	10,000	0	0	0	0	3,431	436	13,867	0
		98n	No reports								
		99o	11,800	0	0	0	0	13,725	2,810	28,335	0
		99n	No reports								
	Thiosemicarbazide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	67,904	0	101	68,005	0

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
62-56-6	*,**	Thiourea	88	26	2,004	16,951	5,940	750	25,645	2,303	27,948
			95	26	1,630	1,487	5,000	250	8,367	4,269	12,636
			98o	27	1,422	358	1,250	250	3,280	5,895	9,175
			98n	4	0	0	0	0	0	0	0
			99o	23	789	257	0	250	1,296	1,108	2,404
			99n	6	213	1	0	0	214	189	403
137-26-8	*	Thiram	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	61	2,856	50	0	0	2,906	98,617	101,523
			98o	64	3,279	22	0	1,751	5,052	81,375	86,427
			98n	3	15	0	0	0	15	25	40
			99o	58	3,231	30	0	589	3,850	64,788	68,638
			99n	5	42	1	0	0	43	222	265
1314-20-1		Thorium dioxide	88	3	1,580	0	0	0	1,580	677,549	679,129
			95	1	1	0	0	0	1	0	1
			98o	2	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
7550-45-0		Titanium tetrachloride	88	41	78,668	0	0	1,400	80,068	0	80,068
			95	33	20,299	0	0	0	20,299	32,282	52,581
			98o	34	31,991	0	0	0	31,991	380	32,371
			98n	3	0	0	0	0	0	0	0
			99o	33	27,302	0	0	0	27,302	260,390	287,692
			99n	1	0	0	0	0	0	0	0
108-88-3	*	Toluene	88	4,008	300,007,182	196,957	1,473,666	644,168	302,321,973	9,620,391	311,942,364
			95	3,489	148,078,878	53,493	310,643	177,343	148,620,357	888,765	149,509,122
			98o	3,026	97,949,543	38,849	590,241	71,205	98,649,838	1,335,393	99,985,231
			98n	826	937,585	5,568	133,774	30,106	1,107,033	361,079	1,468,112
			99o	2,815	89,105,643	29,670	612,896	93,997	89,842,206	1,290,634	91,132,840
			99n	781	806,016	14,231	125,489	209,517	1,155,253	774,936	1,930,189
584-84-9	**	Toluene-2,4-diisocyanate	88	257	165,062	0	0	1,040	166,102	36,178	202,280
			95	64	7,802	0	0	0	7,802	611	8,413
			98o	54	6,849	5	0	0	6,854	4,402	11,256
			98n	6	2	0	0	0	2	0	2
			99o	50	4,386	5	0	0	4,391	14,442	18,833
			99n	11	456	1	0	14,201	14,658	531	15,189
91-08-7	**	Toluene-2,6-diisocyanate	88	189	492,192	0	0	510	492,702	9,444	502,146
			95	40	3,043	0	0	0	3,043	153	3,196
			98o	24	1,560	0	0	0	1,560	1,079	2,639
			98n	1	0	0	0	0	0	0	0
			99o	25	2,395	0	0	0	2,395	1,258	3,653
			99n	3	5	0	0	0	5	160	165

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*,**	Thiourea	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	7,082	0	0	0	18,535	11,867	10,652	48,136	1
		98o	0	245	0	0	54,525	16,111	8,822	79,703	1
		98n	0	0	0	0	0	0	0	0	1
		99o	0	0	0	0	48,133	6,349	2,191	56,673	0
		99n	0	0	0	0	284,371	0	400	284,771	0
*	Thiram	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	18,712	31,501	0	5	407	10,622	101,354	162,601	6
		98o	25,341	31,339	0	870	0	19,988	84,505	162,043	3
		98n	0	0	0	0	42,192	0	40	42,232	0
		99o	34,797	32,375	0	3,656	0	25,446	68,044	164,318	5
		99n	0	0	0	0	261,724	0	260	261,984	0
	Thorium dioxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	26,000	0	0	0	0	2,600	1	28,601	0
		98o	3,100	0	0	0	0	0	330	3,430	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	Titanium tetrachloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	129,787	0	0	23,836,598	2,928	52,646	24,021,959	13
		98o	0	196,905	0	1	27,810,226	142,054	32,619	28,181,805	266
		98n	0	0	0	0	122,039	0	0	122,039	0
		99o	55,446,637	176,544	0	1	25,242,487	268,223	22,374	81,156,266	33
		99n	0	0	0	0	17,391	0	0	17,391	0
*	Toluene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,003,613,351	25,307,195	214,670,733	78,806,874	192,185,056	19,537,051	145,298,684	1,679,418,944	370,444
		98o	1,062,804,514	24,129,747	238,757,500	77,001,628	245,631,750	23,615,937	99,929,853	1,771,870,929	621,102
		98n	30,295,476	3,635,211	303,316	76,869,911	19,686,833	11,314,621	4,234,873	146,340,241	350,349
		99o	986,797,975	25,860,200	226,221,212	84,625,376	255,666,630	22,101,062	90,774,344	1,692,046,799	425,170
		99n	32,381,067	425,958	618,910	72,640,417	29,935,236	13,277,239	1,237,129	150,515,956	206,312
**	Toluene-2,4-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	diisocyanate	95	427	0	37,664	16,408	3,311	20,201	6,224	84,235	13
		98o	393	440	1,410	9,546	13,193	23,162	9,398	57,542	389
		98n	0	0	0	40	8,723	0	302	9,065	300
		99o	80	0	0	24,316	10,188	43,135	7,907	85,626	16
		99n	0	0	0	418	1,304,958	944	14,975	1,321,295	0
**	Toluene-2,6-	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	diisocyanate	95	107	0	9,416	3,705	652	1,542	7,510	22,932	7
		98o	98	0	0	1,276	501	2,613	1,546	6,034	0
		98n	0	0	0	0	0	0	0	0	0
		99o	220	0	0	48	648	8,890	3,275	13,081	0
		99n	0	0	0	0	133,019	0	166	133,185	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases					Off-site Releases	
					Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
26471-62-5	**	Toluenediisocyanate	88	NR	NR	NR	NR	NR	NR	NR	NR
		(mixed isomers)	95	196	48,856	105	0	275	49,236	26,263	75,499
			98o	176	55,406	0	0	534	55,940	32,450	88,390
			98n	4	0	0	0	0	0	0	0
			99o	176	35,162	2,500	0	256	37,918	29,085	67,003
			99n	7	38	1	0	0	39	6,985	7,024
95-53-4	**	o-Toluidine	88	18	46,922	1,902	250	5,024	54,098	670	54,768
			95	23	13,499	256	22,140	12	35,907	55	35,962
			98o	19	7,750	5	17,020	5	24,780	11	24,791
			98n	No reports							
			99o	20	7,714	1	10,010	0	17,725	15	17,740
			99n	5	22	1	0	0	23	620	643
636-21-5		o-Toluidine	88	No reports							
		hydrochloride	95	No reports							
			98o	No reports							
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	10	1	0	0	11	164	175
8001-35-2		Toxaphene	88	No reports							
			95	No reports							
			98o	No reports							
			98n	5	13	0	0	25,476	25,489	113	25,602
			99o	No reports							
			99n	4	16	1	0	0	17	14	31
43121-43-3	*	Triadimefon	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	4	3	0	0	1	4	0	4
			98n	No reports							
			99o	4	0	0	0	0	0	0	0
			99n	No reports							
2303-17-5	*	Triallate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	588	0	0	0	588	24,076	24,664
			98o	2	519	0	0	0	519	21,640	22,159
			98n	No reports							
			99o	3	511	0	0	0	511	436	947
			99n	1	2	0	0	0	2	60	62
101200-48-0	*	Tribenuron methyl	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	1	0	0	0	1	0	1
			98o	1	1	0	0	0	1	0	1
			98n	No reports							
			99o	1	1	0	0	0	1	0	1
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Toluenediisocyanate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(mixed isomers)	95	15,224	2,784	5,800,065	60,045	2,876,258	195,978	60,100	9,010,454	11,617
		98o	7,260	1,996	7,812,428	2,054,210	1,029,937	299,050	71,319	11,276,200	17,918
		98n	0	0	0	40	188,824	0	1	188,865	0
		99o	13,350	438	5,076,288	67,400	4,084,948	178,241	39,603	9,460,268	18,380
		99n	0	0	0	0	501,918	4,530	4,997	511,445	0
**	o-Toluidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	49	0	95,623	139,297	98,950	127,937	35,498	497,354	0
		98o	220	198	303,180	120,352	150,729	105,606	24,800	705,085	461
		98n	No reports								
		99o	0	0	1,953,205	501,259	150,020	67,511	17,689	2,689,684	5,132
		99n	0	0	2	24	607,614	0	639	608,279	0
	o-Toluidine	88	No reports								
	hydrochloride	95	No reports								
		98o	No reports								
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	191,883	0	168	192,051	0
	Toxaphene	88	No reports								
		95	No reports								
		98o	No reports								
		98n	0	0	0	0	103,929	1	25,602	129,532	0
		99o	No reports								
		99n	0	0	0	0	134,998	28	27	135,053	0
*	Triadimefon	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	280	1,984	4	2,268	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
*	Triallate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	19,838	0	0	0	93,000	52,830	24,149	189,817	0
		98o	0	0	0	0	6,480	97,751	22,410	126,641	0
		98n	No reports								
		99o	840	0	0	0	1,700	47,151	1,446	51,137	0
		99n	0	0	0	0	11,125	0	62	11,187	0
*	Tribenuron methyl	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	5,144	1	5,145	0
		98o	0	0	0	0	0	13,016	1	13,017	0
		98n	No reports								
		99o	0	0	0	0	0	14,832	1	14,833	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
1983-10-4	*	Tributyltin fluoride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	23	0	0	23	0	23
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	No reports							
2155-70-6	*	Tributyltin methacrylate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	25	23	0	0	48	0	48
			98o	2	14	10	0	0	24	0	24
			98n	No reports							
			99o	3	510	0	0	0	510	0	510
			99n	No reports							
78-48-8	*	S,S,S-Tributyltrithio-phosphate	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	1,730	2	0	0	1,732	0	1,732
			98o	2	250	36	0	0	286	0	286
			98n	No reports							
			99o	2	250	161	0	0	411	0	411
			99n	No reports							
52-68-6	*	Trichlorfon	88	5	253	0	0	0	253	487	740
			95	2	0	0	0	0	0	0	0
			98o	5	2	0	0	0	2	0	2
			98n	No reports							
			99o	2	0	0	0	0	0	0	0
			99n	1	39	0	0	11,242	11,281	6,058	17,339
76-02-8		Trichloroacetyl chloride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	1	0	0	0	1	0	1
			98o	1	1	0	0	0	1	0	1
			98n	No reports							
			99o	1	1	0	0	0	1	0	1
			99n	No reports							
120-82-1	*	1,2,4-Trichlorobenzene	88	57	1,532,913	31,628	7,408	3,073	1,575,022	164,144	1,739,166
			95	31	168,490	259	12,500	0	181,249	41,648	222,897
			98o	26	159,689	191	8,960	20	168,860	1,651	170,511
			98n	8	775	250	5	0	1,030	507	1,537
			99o	27	168,783	266	7,100	10	176,159	1,409	177,568
			99n	6	1,142	1	0	0	1,143	543	1,686
71-55-6	*	1,1,1-Trichloroethane	88	3,921	180,841,849	95,624	1,000	204,923	181,143,396	5,947,625	187,091,021
			95	812	23,587,848	1,118	126	38,690	23,627,782	124,778	23,752,560
			98o	129	816,617	417	0	4,980	822,014	12,219	834,233
			98n	39	24,491	250	0	0	24,741	19,180	43,921
			99o	60	407,051	45	0	276	407,372	521	407,893
			99n	36	8,715	0	0	15,705	24,420	52,572	76,992

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	Tributyltin fluoride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	250	0	23	273	0
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	No reports								
*	Tributyltin methacrylate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	25	9,096	4,320	48	13,489	0
		98o	253	0	0	419	0	0	34	706	0
		98n	No reports								
		99o	3,458	0	0	3,218	0	3,100	3,330	13,106	0
		99n	No reports								
*	S,S,S-Tributyltrithio-phosphate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	2,541	316	1,717	4,574	0
		98o	0	0	0	0	10,276	691	367	11,334	0
		98n	No reports								
		99o	0	0	0	0	13,441	694	292	14,427	0
		99n	No reports								
*	Trichlorfon	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	213	2,831	2	3,046	0
		98n	No reports								
		99o	0	0	0	0	0	890	890	1,780	0
		99n	0	0	0	0	1,331	0	17,339	18,670	0
	Trichloroacetyl chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	1	1	0
		98o	0	0	0	0	0	0	1	1	0
		98n	No reports								
		99o	0	0	0	0	0	0	1	1	0
		99n	No reports								
*	1,2,4-Trichlorobenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	40,745	10,541	2,400	108,129	1,137,925	393,319	183,352	1,876,411	6,387
		98o	1,115,301	22,393	66,119	15,718	601,733	199,720	170,025	2,191,009	35
		98n	3,951	22,068	0	12,172	88,370	216	699	127,476	3
		99o	1,262,006	6,595	1,494,567	59,115	1,020,948	234,017	177,034	4,254,282	182
		99n	0	0	0	2,963	469,316	1	698	472,978	0
*	1,1,1-Trichloroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	60,033,102	3,743,437	3,718,698	1,058,904	1,108,250	1,338,934	23,404,962	94,406,287	14,559
		98o	1,173,558	157,496	2,508,207	489,624	455,010	236,114	781,290	5,801,299	19,818
		98n	1,098,055	7,057	474,196	2,246,894	1,424,735	661,718	28,588	5,941,243	35
		99o	580,713	61,748	1,537,877	506,102	1,635,948	134,998	407,002	4,864,388	851
		99n	1,096,513	144,831	505,336	978,273	2,695,365	317,689	30,340	5,768,347	137

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
79-00-5	*	1,1,2-Trichloroethane	88	29	1,741,442	5,303	0	89	1,746,834	19,810	1,766,644
			95	22	280,352	870	0	0	281,222	113	281,335
			98o	22	279,470	540	0	1	280,011	1,203	281,214
			98n	13	743	250	5	0	998	1,123	2,121
			99o	25	198,539	925	0	123	199,587	91	199,678
			99n	10	633	1	0	13,665	14,299	393	14,692
79-01-6	*,**	Trichloroethylene	88	953	55,943,736	13,801	390	21,186	55,979,113	1,466,469	57,445,582
			95	747	26,265,512	1,477	550	3,577	26,271,116	74,145	26,345,261
			98o	578	13,137,700	867	588	800	13,139,955	98,024	13,237,979
			98n	150	30,270	10	5	0	30,285	28,029	58,314
			99o	498	10,510,064	1,043	0	138,522	10,649,629	113,378	10,763,007
			99n	139	25,542	1	0	10,345	35,888	52,705	88,593
75-69-4	*	Trichlorofluoro-methane (CFC-11)	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	54	959,461	410	22	0	959,893	272	960,165
			98o	28	440,509	1,484	0	0	441,993	1	441,994
			98n	14	2,258	250	250	0	2,758	108	2,866
			99o	29	392,445	1,000	0	0	393,445	2	393,447
			99n	11	7,141	1	0	10,078	17,220	14,674	31,894
95-95-4	*	2,4,5-Trichlorophenol	88	1	91	0	0	0	91	20	111
			95	No reports							
			98o	1	198	36	0	69	303	0	303
			98n	2	3	0	0	0	3	0	3
			99o	1	263	41	0	78	382	0	382
			99n	4	15	1	0	21,844	21,860	269	22,129
88-06-2	*,**	2,4,6-Trichlorophenol	88	3	250	50	12,000	0	12,300	10	12,310
			95	1	161	210	0	0	371	0	371
			98o	1	114	26	0	0	140	0	140
			98n	3	4	0	0	0	4	10	14
			99o	2	86	38	0	2	126	0	126
			99n	3	6	1	0	2,000	2,007	6	2,013
96-18-4	**	1,2,3-Trichloropropane	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	5	11,081	1,600	0	0	12,681	0	12,681
			98o	8	13,837	300	0	0	14,137	6,758	20,895
			98n	No reports							
			99o	9	13,931	2,300	0	0	16,231	0	16,231
			99n	3	28	0	0	8,189	8,217	4,412	12,629
57213-69-1	*	Triclopyr triethyl-ammonium salt	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	3	0	0	0	3	0	3
			98o	3	6	0	0	0	6	0	6
			98n	No reports							
			99o	1	37	0	0	0	37	0	37
			99n	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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
*	1,1,2-Trichloroethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	18,699,000	11,817,647	12,091,000	200,596	24,559,416	3,265,021	275,059	70,907,739	482
		98o	55,855,000	12,399,585	4,961,599	47	43,283,780	2,017,174	284,126	118,801,311	48
		98n	0	0	0	33,005	1,166,146	38,490	1,550	1,239,191	2
		99o	50,477,000	16,038,204	189,669	3,866	43,700,428	754,218	201,266	111,364,651	893
		99n	0	0	0	208,583	2,586,183	54	14,082	2,808,902	0
*,**	Trichloroethylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	153,698,396	8,519,411	2,624,155	1,112,208	5,218,927	2,316,428	25,982,621	199,472,146	221,357
		98o	133,098,282	4,792,168	2,418,830	654,278	6,221,614	1,211,680	13,074,138	161,470,990	123,617
		98n	3,921,526	3,302	3,559	816,314	1,338,616	6,251,209	37,307	12,371,833	382
		99o	132,198,261	3,977,967	3,511,302	703,687	4,516,041	1,274,976	10,375,103	156,557,337	50,295
		99n	5,188,985	34,859	4,093	571,104	2,345,598	652,482	63,344	8,860,465	115
*	Trichlorofluoro-methane (CFC-11)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	138,712	227,287	618,422	170,699	4,200	291,955	961,314	2,412,589	1,038
		98o	0	138,866	210,039	10,519	63,773	280,199	441,666	1,145,062	27
		98n	0	0	0	117,603	569,323	13,150	2,135	702,211	1
		99o	36,075	92,780	1,189,772	31,000	39,251	441,197	400,283	2,230,358	8,689
		99n	47,450	0	0	93,082	578,508	10,859	22,108	752,007	0
*	2,4,5-Trichlorophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	23,152	5	303	23,460	0
		98n	0	0	0	0	28,000	0	3	28,003	0
		99o	0	0	0	0	26,020	0	382	26,402	0
		99n	0	0	0	0	275,626	40	22,152	297,818	0
*,**	2,4,6-Trichlorophenol	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	1,294,115	0	371	1,294,486	0
		98o	0	0	0	0	1,100,000	0	140	1,100,140	0
		98n	0	0	0	0	28,000	0	10	28,010	0
		99o	0	0	0	0	1,264,603	46	120	1,264,769	1
		99n	0	0	0	0	177,026	0	9	177,035	2,000
**	1,2,3-Trichloropropane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	88,000	9	460,000	0	1,330,000	10,000,000	12,551	11,890,560	0
		98o	7,100,000	0	870,000	0	2,553,000	5,949,995	14,187	16,487,182	0
		98n	No reports								
		99o	9,300,000	0	678,000	0	46,789,300	660,000	16,243	57,443,543	0
		99n	0	0	0	0	495,664	0	12,629	508,293	0
*	Triclopyr triethyl-ammonium salt	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	4	110	3	117	0
		98o	0	0	0	0	0	70	6	76	0
		98n	No reports								
		99o	0	0	0	0	55	68	37	160	0
		99n	No reports								

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
121-44-8		Triethylamine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	153	2,138,526	27,705	309,512	14,010	2,489,753	17,181	2,506,934
			98o	174	1,580,464	26,281	186,190	23,755	1,816,690	56,293	1,872,983
			98n	22	1,641	0	0	0	1,641	20	1,661
			99o	168	1,868,060	17,937	28,659	35,032	1,949,688	289,541	2,239,229
			99n	17	3,139	0	0	0	3,139	264	3,403
1582-09-8	*	Trifluralin	88	17	3,277	601	0	0	3,878	40,557	44,435
			95	23	17,144	92	0	8,250	25,486	24,490	49,976
			98o	18	9,180	250	0	5	9,435	29,888	39,323
			98n	2	13	0	0	0	13	0	13
			99o	19	5,183	0	0	0	5,183	14,631	19,814
			99n	1	2	0	0	0	2	0	2
26644-46-2	*	Triforine	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	755	0	0	0	755	0	755
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	No reports							
			99n	No reports							
95-63-6		1,2,4-Trimethylbenzene	88	294	4,265,650	10,088	7,964	61,583	4,345,285	200,616	4,545,901
			95	817	7,701,951	8,822	2,886	43,921	7,757,580	53,456	7,811,036
			98o	887	7,764,901	7,582	6,650	14,751	7,793,884	167,577	7,961,461
			98n	634	136,060	940	0	3,045	140,045	13,533	153,578
			99o	888	7,731,735	5,226	2,295	9,318	7,748,574	100,280	7,848,854
			99n	597	153,057	1,611	0	1,054	155,722	10,377	166,099
639-58-7	*	Triphenyltin chloride	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	1	0	0	0	0	0	0	0
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	1	3	0	0	0	3	0	3
			99n	No reports							
76-87-9	*	Triphenyltin hydroxide	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	3	21	0	0	0	21	250	271
			98o	3	7	0	0	0	7	235	242
			99o	5	1,001	0	0	0	1,001	1,085	2,086
			98n	1	0	0	0	0	0	0	0
			99n	1	2	1	0	0	3	5	8
72-57-1	**	Trypan blue	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	1	0	0	0	0	0	0	0
			98n	1	0	0	0	0	0	0	0
			99o	No reports							
			99n	3	5	0	0	0	5	163	168

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

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**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Triethylamine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	488,423	428,122	34,114	531,959	1,615,455	1,052,880	2,619,129	6,770,082	12
		98o	332,653	670,856	380,472	406,920	4,290,600	870,481	2,144,682	9,096,664	123
		98n	0	0	0	12,584	112,632	3,831	1,748	130,795	1
		99o	113,198	737,914	479,881	461,495	3,662,859	1,095,986	2,564,180	9,115,513	377
		99n	0	0	6,865	2,386	192,036	818	2,782	204,887	107
*	Trifluralin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	2,107	0	0	3	99,980	76,583	54,675	233,348	9,313
		98o	80,000	0	0	0	6,880	75,025	30,415	192,320	0
		98n	0	0	0	0	29,827	0	10	29,837	0
		99o	89,000	0	0	0	1,700	71,489	23,220	185,409	0
		99n	0	0	0	0	38,510	0	2	38,512	0
*	Triforine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	300	890	1,190	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	No reports								
		99n	No reports								
	1,2,4-Trimethylbenzene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	15,823,608	1,477,380	5,089,783	2,992,920	9,502,994	470,799	7,927,617	43,285,101	11,102
		98o	14,389,987	1,864,096	8,156,093	3,654,699	10,397,545	674,090	8,004,511	47,141,021	4,438
		98n	1,750,455	614,296	12,446	196,546	617,270	115,464	832,097	4,138,574	149,373
		99o	19,070,696	1,573,546	11,602,529	3,417,205	10,669,320	543,438	7,932,184	54,808,918	5,784
		99n	2,786,953	103,691	15,322	1,458,587	341,872	33,778	136,315	4,876,518	25,772
*	Triphenyltin chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	2,555	0	0	2,555	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	26,226	0	3	26,229	0
		99n	No reports								
*	Triphenyltin hydroxide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	1	109,816	390	401	110,608	0
		98o	0	0	0	0	16,465	1,273	237	17,975	0
		99o	0	0	0	0	6,900	2,867	609	10,376	0
		98n	0	0	0	0	0	0	0	0	0
		99n	0	0	0	0	33,000	0	2	33,002	0
**	Trypan blue	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	0	0	0	0	0	0	0	0	0
		98n	0	0	0	0	0	0	0	0	0
		99o	No reports								
		99n	0	0	0	0	192,524	0	168	192,692	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases					Off-site Releases	Total On- and Off-site Releases
					Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Transfers Off-site to Disposal	
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
51-79-6	**	Urethane	88	11	145,123	0	0	0	145,123	1,350	146,473
			95	4	124	0	0	0	124	3,750	3,874
			98o	2	1,413	22	0	0	1,435	0	1,435
			98n	1	4	0	0	0	4	2,224	2,228
			99o	1	0	0	0	0	0	0	0
			99n	6	90	1	0	14,249	14,340	929	15,269
7440-62-2		Vanadium (fume or dust)	88	33	17,178	4,704	0	87,296	109,178	93,417	202,595
			95	19	14,649	5	0	144,086	158,740	28,780	187,520
			98o	20	16,018	16	0	128,809	144,843	4,749	149,592
			98n	9	38,102	600	0	573,228	611,930	89,250	701,180
			99o	27	15,105	283	0	100,235	115,623	17,242	132,865
			99n	8	3,000	400	0	414,925	418,325	169,011	587,336
50471-44-8	*	Vinclozolin	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	2	0	0	0	0	0	0	0
			98o	2	10	0	0	0	10	750	760
			98n	No reports							
			99o	1	0	0	0	0	0	0	0
			99n	No reports							
108-05-4	**	Vinyl acetate	88	146	6,087,497	10,021	2,109,851	18,889	8,226,258	21,811	8,248,069
			95	156	4,106,027	8,269	783,829	1,717	4,899,842	45,052	4,944,894
			98o	195	3,344,047	3,665	285,141	1,125	3,633,978	108,410	3,742,388
			98n	12	35,943	0	0	55,000	90,943	18,957	109,900
			99o	185	3,354,275	3,948	286,764	2,029	3,647,016	35,406	3,682,422
			99n	12	28,832	0	0	36,311	65,143	336,802	401,945
593-60-2	**	Vinyl bromide	88	2	4,950	400	0	0	5,350	0	5,350
			95	2	54,930	0	0	0	54,930	0	54,930
			98o	1	0	0	0	0	0	0	0
			98n	No reports							
			99o	2	500	0	0	0	500	0	500
			99n	No reports							
75-01-4	**	Vinyl chloride	88	53	1,439,189	2,051	53	4,409	1,445,702	4,555	1,450,257
			95	48	1,044,665	525	33	1	1,045,224	15,645	1,060,869
			98o	46	884,214	78	149	0	884,441	68,039	952,480
			98n	9	1,473	0	5	0	1,478	1,175	2,653
			99o	45	846,885	105	405	1	847,396	477	847,873
			99n	6	1,691	1	0	0	1,692	13,538	15,230
75-35-4	*	Vinylidene chloride	88	21	296,353	3,462	170	429	300,414	44,281	344,695
			95	24	193,550	642	0	0	194,192	260	194,452
			98o	25	179,391	311	218	0	179,920	3	179,923
			98n	8	1,903	250	45,812	82,000	129,965	12,354	142,319
			99o	25	155,891	132	99	0	156,122	8	156,130
			99n	8	6,644	1	0	14,945	21,590	929	22,519

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
**	Urethane	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,165	4,742	5,907	2,500
		98o	0	0	0	0	26,432	0	1,435	27,867	0
		98n	0	0	0	0	142,049	0	2,228	144,277	0
		99o	0	0	0	0	0	0	0	0	0
		99n	0	0	518	1,473	680,048	0	14,765	696,804	0
	Vanadium (fume or dust)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	191,454	54,731	217	0	0	820	188,573	435,795	0
		98o	29,920	44,826	0	0	0	0	146,404	221,150	0
		98n	0	0	0	0	0	0	683,751	683,751	0
		99o	113,633	35,862	0	0	0	2,809	132,442	284,746	27
		99n	0	0	0	0	0	0	479,721	479,721	90,000
*	Vinclozolin	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	1,030	0	1,030	0
		98o	0	0	0	0	650	660	1	1,311	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
**	Vinyl acetate	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	311,385	533,356	15,379,353	6,544,593	19,205,133	9,194,987	5,196,125	56,364,932	14,797
		98o	993,710	86,990	18,008,261	14,361,541	27,164,709	1,452,870	3,577,202	65,645,283	62,311
		98n	0	1	0	2,444,457	741,302	45,992	109,100	3,340,852	1
		99o	1,158,990	13,249	21,815,185	12,228,901	18,156,883	697,009	3,693,357	57,763,574	2,313,487
		99n	0	0	0	1,345,712	2,516,017	393,581	66,430	4,321,740	0
**	Vinyl bromide	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	36	0	54,910	54,946	0
		98o	0	0	0	0	0	0	0	0	0
		98n	No reports								
		99o	0	0	0	0	0	0	50	50	1
		99n	No reports								
**	Vinyl chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	318,121,038	90,685	23,368,507	20,853	40,034,145	55,842	1,051,733	382,742,803	31,509
		98o	377,999,298	857,715	40,383,408	14,028	36,705,295	275,230	873,395	457,108,369	19,820
		98n	0	0	0	6,752	320,294	315,826	1,421	644,293	1
		99o	421,183,195	785,132	28,607,150	13,644	35,675,866	439,386	888,888	487,593,261	57,478
		99n	139,884	0	0	124,028	378,842	101	1,587	644,442	10
*	Vinylidene chloride	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,438,000	55	190,253	102,442	6,754,873	85,282	177,394	8,748,299	16,577
		98o	1,830,000	8,605	125,000	82,946	3,494,987	15,029	180,378	5,736,945	82
		98n	0	1	0	8,069	799,244	2,116	142,052	951,482	1
		99o	3,977,000	21,860	100,000	65,165	1,498,463	40,816	156,102	5,859,406	146
		99n	0	0	0	1,799	1,046,020	194	56,156	1,104,169	0

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). 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 and, therefore, not reported when in a mixture at a concentration level below the de minimis level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number		Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	On-site Releases: Surface Water Discharges	On-site Releases: Underground Injection	On-site Releases: Releases to Land	On-site Releases: Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
				Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—		Warfarin and salts	88	NR	NR	NR	NR	NR	NR	NR	NR
			95	No reports							
			98o	No reports							
			98n	No reports							
			99o	No reports							
			99n	4	10	0	0	0	10	327	337
108-38-3		m-Xylene	88	68	2,463,043	2,566	0	18,045	2,483,654	107,746	2,591,400
			95	61	1,151,489	892	569	13,838	1,166,788	8,650	1,175,438
			98o	74	1,192,267	4,292	4,199	860	1,201,618	29,929	1,231,547
			98n	12	4,315	5	0	0	4,320	10	4,330
			99o	70	929,445	85	3,578	3,945	937,053	45,753	982,806
			99n	14	14,881	0	0	3	14,884	0	14,884
95-47-6		o-Xylene	88	66	2,241,814	2,786	250	22,461	2,267,311	52,881	2,320,192
			95	67	1,384,483	869	569	485	1,386,406	1,152	1,387,558
			98o	82	1,345,071	960	3,088	41,350	1,390,469	101,998	1,492,467
			98n	22	1,885	5	0	0	1,890	779	2,669
			99o	80	871,321	82	3,379	44,284	919,066	138,162	1,057,228
			99n	19	11,910	0	0	3	11,913	0	11,913
106-42-3		p-Xylene	88	48	5,992,743	3,200	0	49,226	6,045,169	31,108	6,076,277
			95	39	2,937,312	532	569	29,401	2,967,814	1,261	2,969,075
			98o	51	1,841,632	725	3,227	55	1,845,639	18,212	1,863,851
			98n	8	13,269	5	0	0	13,274	0	13,274
			99o	45	1,799,010	87	3,578	280	1,802,955	22,692	1,825,647
			99n	10	22,169	0	0	290	22,459	2,106	24,565
1330-20-7	*	Xylene (mixed isomers)	88	3,469	158,986,408	204,480	144,728	558,257	159,893,873	6,455,911	166,349,784
			95	3,323	97,708,785	33,834	123,396	99,686	97,965,701	583,967	98,549,668
			98o	2,863	68,714,039	51,887	121,085	41,455	68,928,466	818,947	69,747,413
			98n	818	573,493	5,328	2,788	70,548	652,157	690,535	1,342,692
			99o	2,712	66,131,554	24,818	49,979	42,882	66,249,233	1,079,734	67,328,967
			99n	774	502,625	4,940	37,541	211,146	756,252	1,042,463	1,798,715
87-62-7	*,**	2,6-Xylidine	88	2	337	1,537	0	0	1,874	0	1,874
			95	4	304	0	0	0	304	0	304
			98o	2	453	0	0	0	453	0	453
			98n	1	0	0	0	0	0	0	0
			99o	1	1	0	0	0	1	0	1
			99n	1	0	0	0	0	0	0	0
7440-66-6	*	Zinc (fume or dust)	88	644	3,455,937	849,544	140,010	25,617,365	30,062,856	31,450,587	61,513,443
			95	437	2,047,893	45,159	0	6,402,574	8,495,626	9,629,895	18,125,521
			98o	419	1,318,346	9,556	1	7,677,150	9,005,053	8,201,172	17,206,225
			98n	39	2,647,359	31,044	294,942	66,841,176	69,814,521	261,445	70,075,966
			99o	405	1,227,091	15,306	1	2,322,910	3,565,308	13,770,162	17,335,470
			99n	26	2,411,681	7,900	0	53,878,527	56,298,108	182,685	56,480,793

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 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 and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Warfarin and salts	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	No reports								
		98o	No reports								
		98n	No reports								
		99o	No reports								
		99n	0	0	0	0	309,501	1	338	309,840	0
	m-Xylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	1,917,515	27,006	4,141,480	245,136	3,100,716	131,806	1,160,477	10,724,136	1,434
		98o	1,912,614	162,262	9,462,285	241,065	1,084,879	124,993	1,226,352	14,214,450	19,072
		98n	2,913	80	0	194,683	0	1,045	4,129	202,850	0
		99o	1,333,398	110,315	11,882,415	307,105	925,163	93,300	950,775	15,602,471	15,147
		99n	2,311	2,357	0	178,261	35,289	10,616	14,997	243,831	134
	o-Xylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	317,695	59,486	15,563,897	1,859,258	2,219,346	814,980	1,448,714	22,283,376	11,493
		98o	102,107	14,743	6,965,568	1,756,281	2,049,794	815,174	1,401,232	13,104,899	14,902
		98n	1,260	475	0	192,004	49,441	552	1,999	245,731	3
		99o	75,426	7,358	7,989,008	1,838,625	2,063,253	409,431	1,151,419	13,534,520	13,451
		99n	972,480	1,406	0	181,552	0	4,662	11,963	1,172,063	67
	p-Xylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	468,689	8,192	2,168,729	3,563	645,579	8,722	2,958,765	6,262,239	17,281
		98o	125,970	395	4,670,124	7,322	2,866,722	156,678	1,861,654	9,688,865	10,987
		98n	870	0	0	182,126	0	0	10,070	193,066	3,200
		99o	147,153	7	683,856	57,153	1,902,287	69,312	1,851,844	4,711,612	8,634
		99n	693	0	0	177,081	35,289	8,309	21,566	242,938	3,200
*	Xylene	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(mixed isomers)	95	135,260,404	41,489,747	141,804,106	70,025,436	55,806,217	9,880,737	97,056,001	551,322,648	239,363
		98o	101,018,976	35,322,088	140,723,082	58,328,397	63,502,224	13,603,886	71,036,122	483,534,775	179,438
		98n	29,465,352	3,616,563	730,790	85,960,710	10,113,113	8,961,696	3,806,685	142,654,909	75,797
		99o	102,068,245	34,015,903	118,627,966	56,045,748	59,080,021	9,062,560	67,283,081	446,183,524	160,291
		99n	30,948,750	601,639	990,581	52,241,890	10,032,127	11,364,163	848,122	107,027,272	204,117
*,**	2,6-Xylidine	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	8,000	0	300	258	254	8,812	0
		98o	0	0	22,235	0	0	0	453	22,688	0
		98n	0	4	0	0	0	0	0	4	0
		99o	0	0	0	2,900	17	0	1	2,918	0
		99n	0	0	0	4	0	0	0	4	0
*	Zinc (fume or dust)	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	27,847,425	78,625,090	0	53,501	3,815,022	6,476,716	10,750,762	127,568,516	35,494
		98o	28,252,595	49,723,575	0	125,059	654,672	741,490	29,383,456	108,880,847	2,282,691
		98n	0	69,000	0	0	0	0	70,053,321	70,122,321	6
		99o	6,124,363	54,872,983	0	58,144	606,425	606,257	27,748,480	90,016,652	44
		99n	0	290,000	0	0	0	0	56,474,807	56,764,807	9

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

CAS Number	Chemical	Year	Total Forms	On-site Releases: Total Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Total On-site Releases	Off-site Releases: Transfers Off-site to Disposal	Total On- and Off-site Releases
			Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
—	Zinc compounds	88	1,667	7,265,829	1,201,410	109,555	113,361,611	121,938,405	84,389,611	206,328,016
		95	2,707	4,836,050	1,091,335	397,844	113,660,632	119,985,861	107,101,733	227,087,594
		98o	2,907	6,927,992	1,252,934	246,175	122,700,579	131,127,680	111,772,118	242,899,798
		98n	458	1,568,284	555,882	21,751,486	664,325,790	688,201,442	12,270,400	700,471,842
		99o	2,928	5,521,766	1,002,707	228,062	129,657,798	136,410,333	130,151,560	266,561,893
		99n	459	2,488,568	370,455	21,940,510	715,810,240	740,609,773	15,101,370	755,711,143
12122-67-7 *	Zineb	88	2	1,250	0	0	0	1,250	2,600	3,850
		95	1	0	0	0	0	0	0	0
		98o	1	100	0	0	0	100	0	100
		98n	1	1	0	0	0	1	1	2
		99o	1	10	0	0	0	10	0	10
		99n	No reports							
—	Mixtures and other	88	176	3,450,870	59,460	0	18,699	3,529,029	10,662,177	14,191,206
	trade name products	95	30	334,194	3,171	0	0	337,365	4,400	341,765
		98o	50	116,270	0	0	9	116,279	86,098	202,377
		98n	7	7,550	0	0	0	7,550	0	7,550
		99o	46	222,430	0	0	500	222,930	20,717	243,647
		99n	5	665	0	0	0	665	0	665
—	Trade secrets	88	4	0	0	0	0	0	0	0
		95	11	0	0	0	0	0	0	0
		98o	11	30	0	0	0	30	0	30
		98n	No reports							
		99o	3	0	0	0	0	0	0	0
		99n	No reports							
	Total	88	60,312	2,180,639,873	41,919,468	161,915,411	405,909,382	2,790,384,134	422,713,934	3,213,098,068
		95	74,465	1,590,651,239	191,919,759	248,927,637	284,190,539	2,315,689,174	320,730,208	2,636,419,382
		98o	70,975	1,270,193,503	238,483,036	209,711,433	343,781,378	2,062,169,350	324,059,939	2,386,229,289
		98n	15,142	811,010,244	7,553,237	56,708,764	4,022,499,616	4,897,771,861	100,060,679	4,997,832,540
		99o	69,471	1,175,054,932	253,591,816	199,547,803	323,667,851	1,951,862,402	374,647,596	2,326,509,998
		99n	14,597	854,309,491	5,289,960	58,097,341	4,423,054,923	5,340,751,715	104,775,858	5,445,527,573

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or 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 standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Table A–1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) *(continued)*

	Chemical	Year	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
			On-site	Off-site	On-site	Off-site	On-site	Off-site			
			Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	Zinc compounds	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	130,342,228	252,508,296	446,100	365,736	4,084,591	26,382,764	213,836,910	627,966,625	11,143,290
		98o	66,816,553	271,001,524	367,541	266,041	4,065,652	12,444,558	302,640,006	657,601,875	1,360,367
		98n	9,220,552	1,797,539	0	5,747	1,569,443	143,209	701,887,578	714,624,068	48,595
		99o	80,840,858	280,480,195	142,280	173,258	23,547,168	26,504,817	305,850,743	717,539,319	233,011,755
		99n	9,808,546	2,375,741	0	0	66,270	292,548	762,076,323	774,619,428	34,034,404
*	Zineb	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	100	0	0	100	200	0
		98n	0	0	0	0	11,715	0	2	11,717	0
		99o	0	0	0	0	0	320	9	329	0
		99n	No reports								
	Mixtures and	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
	other trade	95	8,025	19,282	96,280,793	375,381	72,738,249	294,743	384,186	170,100,659	1
	name products	98o	6,651,848	9,249	1,367,661	14,955	23,598	67,846	143,441	8,278,598	16
		98n	3,775,989	0	0	0	0	0	7,392	3,783,381	1
		99o	39,297	0	700	43,758	239,015	8,465	267,533	598,768	7
		99n	0	0	0	0	0	2,599	665	3,264	0
	Trade secrets	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	0	0	0	0	0	0	0	0	0
		98o	0	0	0	0	2,700	0	30	2,730	0
		98n	No reports								
		99o	0	0	0	0	0	0	0	0	0
		99n	No reports								
	Total	88	NA	NA	NA	NA	NA	NA	NA	NA	NA
		95	11,253,331,442	2,340,012,471	2,740,693,446	504,296,260	6,504,643,933	604,897,307	2,588,477,206	26,536,352,065	30,108,369
		98o	8,407,381,641	2,071,439,013	2,827,695,743	487,588,775	5,913,717,613	592,216,295	2,475,386,574	22,775,425,654	26,311,489
		98n	204,380,355	37,327,609	11,399,201	413,103,773	629,209,581	90,988,751	5,118,407,472	6,504,816,742	1,613,324
		99o	7,839,852,848	2,134,897,467	2,806,098,993	511,631,406	6,850,326,119	571,669,556	2,384,303,476	23,098,779,865	305,727,127
		99n	198,496,815	35,157,658	10,762,603	267,664,335	754,327,458	72,630,384	5,056,288,914	6,395,328,167	506,658,122

Note: Data from Section 8 (Current Year) of Form R.
98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
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 and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Appendix B

TRI Release and Waste Management Data for Metals and Metal Compounds, 1999

Table B–1. TRI On-site and Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999

Chemical		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 Landfills	Land Treatment	Surface Impound-ments	Other Disposal	Total On-site Releases	Transfers Off-site to Disposal	
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Aluminum* (CAS Number 7429-09-5)	O	5,634,715	4,753	0	0	47,925	597,309	19,883	180,000	500,941	6,985,526	13,809,568	20,795,094
	N	1,144,097	0	0	0	4,072,525	1,053	0	99,052	111,277	5,428,004	18,368	5,446,372
Antimony and antimony compounds	O	125,905	44,785	62,911	0	58,202	297,499	308	280,855	400,964	1,271,429	3,365,688	4,637,117
	N	14,157	31,354	0	610,086	973,119	436,457	2	10,445,341	15,971,462	28,481,978	392,921	28,874,899
Arsenic and arsenic compounds	O	92,874	16,131	198,310	0	150,111	2,993,418	5	5,674,927	536,035	9,661,811	2,073,922	11,735,733
	N	205,423	168,578	250	880,034	2,788,158	2,367,618	13,711	187,517,056	398,708,824	592,649,652	1,987,448	594,637,100
Barium and barium compounds	O	930,150	1,122,361	268	0	181,833	3,984,180	130,273	956,082	1,319,760	8,624,907	7,687,710	16,312,617
	N	2,405,305	1,117,404	24,403	1,982,400	7,065,244	77,002,235	940,204	72,195,924	94,081,078	256,814,197	37,662,423	294,476,620
Beryllium and beryllium compounds	O	1,242	84	4,100	0	2,650	50,529	5	32	74	58,716	25,109	83,825
	N	7,343	3,483	0	0	288,832	253,640	1	274,750	5,705	833,754	49,840	883,594
Cadmium and cadmium compounds	O	32,215	2,192	23	0	3,680	65,868	5	358,306	260,037	722,326	746,769	1,469,095
	N	20,688	765	61,000	100,000	2,989,490	12,343	12	2,269,906	6,290,816	11,745,020	472,327	12,217,347
Chromium and chromium compounds	O	767,885	108,615	816,768	5	431,728	1,714,091	36,291	24,472,106	3,652,262	31,999,751	26,931,218	58,930,969
	N	285,275	117,535	720,250	38,000	4,877,156	4,951,964	61,231	11,394,334	112,027,121	134,472,866	6,723,106	141,195,972
Cobalt and cobalt compounds	O	58,186	64,426	30,421	0	34,768	21,785	8,320	48,861	386,670	653,437	831,930	1,485,367
	N	45,046	24,948	0	17,001	204,595	1,351,441	8,725	3,349,556	9,938,544	14,939,856	401,287	15,341,143
Copper and copper compounds	O	3,700,149	118,477	310,117	5	401,462	3,361,484	87,227	6,534,444	35,244,654	49,758,019	18,767,102	68,525,121
	N	741,296	279,810	68,005	1,205,581	9,092,867	8,200,446	51,550	398,746,700	1,328,496,172	1,746,882,427	5,882,850	1,752,765,277
Lead and lead compounds	O	1,221,654	40,130	182,869	0	678,818	3,828,990	3,866	3,624,266	9,406,578	18,987,171	25,492,311	44,479,482
	N	356,460	33,838	13,250	7,959,140	21,090,031	7,795,339	13,822	117,181,330	158,285,519	312,728,729	8,409,618	321,138,347
manganese compounds	O	2,683,444	4,990,006	7,011,377	255	2,047,723	32,060,876	375,419	14,852,268	5,238,694	69,260,062	55,823,265	125,083,327
	N	590,455	685,433	36,000	1,150,500	8,399,165	20,657,640	259,278	33,091,283	357,217,903	422,087,657	9,052,033	431,139,690
Mercury and mercury compounds	O	13,385	169	0	0	1,453	3,358	5	3,300	3	21,673	59,621	81,294
	N	13,092	9	0	0	455,855	1,698	0	1,014,029	1,686,005	3,170,688	104,085	3,274,773
Nickel and nickel compounds	O	736,607	108,703	226,687	0	59,827	863,807	5,178	1,252,131	775,137	4,028,077	9,071,803	13,099,880
	N	765,962	161,939	140,250	41,012	3,725,386	4,534,018	62,526	10,912,205	38,284,691	58,627,989	9,280,808	67,908,797

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.

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

O: Original Industries.

N: New Industries.

*Only fume or dust forms are reportable.

Table B–1. TRI On-site and Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999 *(continued)*

Chemical		On-site Releases										Off-site Releases	
				Underground Injection		On-site Land Releases							
		Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other Landfills	Land Treatment	Surface Impound-ments	Other Disposal	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Selenium and selenium compounds	O	151,420	4,391	33,509	0	3,103	115,507	5	71,010	118,830	497,775	105,535	603,310
	N	509,004	40,960	0	0	1,595,481	572,455	267	400,499	3,344,029	6,462,695	559,303	7,021,998
Silver and silver compounds	O	19,768	7,314	222	0	2,650	9,665	380	5,107	49,257	94,363	113,274	207,637
	N	2,203	322	17,000	160,000	644,846	2,010	0	335,133	2,757,959	3,919,473	297,121	4,216,594
Thallium and thallium compounds	O	2,791	750	0	0	4,350	82,805	0	170,000	0	260,696	6,161	266,857
	N	5,637	2,729	0	0	306,458	687,889	0	713,772	1,393,738	3,110,223	159,062	3,269,285
Vanadium* (CAS Number 7440-62-2)	O	15,105	283	0	0	6,200	94,000	9	0	26	115,623	17,242	132,865
	N	3,000	400	0	0	202,925	0	0	212,000	0	418,325	169,011	587,336
Zinc* and zinc compounds	O	6,748,857	1,018,013	222,563	5,500	7,834,748	32,783,281	125,988	9,444,787	81,791,904	139,975,641	143,921,722	283,897,363
	N	4,900,249	378,355	850,750	21,089,760	84,578,153	18,860,487	239,070	297,804,020	368,207,037	796,907,881	15,284,055	812,191,936
Total	**O**	**22,936,352**	**7,651,583**	**9,100,145**	**5,765**	**11,951,231**	**82,928,452**	**793,167**	**67,928,482**	**139,681,826**	**342,977,003**	**308,849,950**	**651,826,953**
	N	**12,014,692**	**3,047,862**	**1,931,158**	**35,233,514**	**153,350,286**	**147,688,733**	**1,650,399**	**1,147,956,890**	**2,896,807,880**	**4,399,681,414**	**96,905,666**	**4,496,587,080**

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

Table B-2. TRI Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999

Chemical		Storage Only[a]	Solidification/ Stabilization Metals Only[b]	Wastewater Treatment (Excluding POTWs) Metals Only[c]	Transfers to POTWs Metals Only[d]	Under-ground Injection	Landfills/ Disposal Surface Impound-ments	Land Treatment	Other Land Disposal	Other Off-site Management	Transfers to Waste Broker for Disposal	Unknown[e]	Off-site Releases: Transfers Off-site to Disposal
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Aluminum*	O	3,105,861	6,370,192	5	6,290	0	3,665,170	0	23,794	850,205	13,813	6,568	14,041,898
(CAS Number 7429-09-5)	N	0	17,852	0	0	0	0	0	0	828	0	0	18,680
Antimony and	O	7,221	562,686	16,685	104,977	5,800	2,596,182	6,664	50,744	130,451	79,759	67,615	3,628,784
antimony compounds	N	250	195,856	1,558	860	505	86,642	37,303	30,127	35,066	4,005	930	393,102
Arsenic and	O	22,629	801,204	291	1,070	425,893	1,052,314	262	40,375	45,312	78,686	8,657	2,476,693
arsenic compounds	N	0	545,584	23,478	33	750	1,252,911	32,530	104,924	120,965	3,327	645	2,085,147
Barium and	O	76,642	1,399,960	99,402	326,691	268	5,475,106	135,855	478,870	681,977	246,152	152,938	9,073,861
barium compounds	N	1	862,926	117,570	1,622	750	24,288,889	91,217	7,091,175	6,975,816	204,278	67,967	39,702,211
Beryllium and	O	0	10,762	150	11	0	14,086	0	0	0	100	0	25,109
beryllium compounds	N	0	0	0	0	0	40,367	0	25,968	755	0	0	67,090
Cadmium and	O	70	373,550	270	3,386	920	758,137	3,500	38,172	30,722	58,454	7,198	1,274,379
cadmium compounds	N	0	370,937	10	305	25	98,970	0	0	40,035	1,787	16,373	528,442
Chromium and	O	312,628	3,547,397	838,181	329,950	400,665	16,196,426	14,264	6,937,101	420,569	828,738	150,230	29,976,149
chromium compounds	N	3,242	1,293,092	23,102	1,734	62,970	4,639,148	73,206	409,728	306,361	118,402	96,085	7,027,070
Cobalt and	O	18,333	58,218	9,573	13,217	250	590,618	140	6,787	22,899	43,698	110,028	873,761
cobalt compounds	N	0	3,587	0	1	1	299,703	12,629	84,087	22,917	0	0	422,925
Copper and	O	229,879	4,014,202	1,051,343	751,414	21,621	10,673,303	19,364	497,678	1,428,936	1,655,368	464,659	20,807,767
copper compounds	N	0	441,455	5,849	2,715	970	4,364,132	40,444	437,345	1,193,896	62,020	77,952	6,626,778
Lead and	O	67,092	16,550,183	45,776	202,338	12,869	17,201,718	1,245,454	126,736	304,603	879,465	105,986	36,742,220
lead compounds	N	68,723	1,065,604	10,844	41,435	105	3,497,323	23,356	187,464	3,584,490	447,641	46,532	8,973,517

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

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

O: Original Industries. **N**: New Industries.

* Only fume or dust forms are reportable.

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

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

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

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

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

Table B-2. TRI Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999 *(continued)*

Chemical		Storage Only[a]	Solidification/ Stabilization Metals Only[b]	Wastewater Treatment (Excluding POTWs) Metals Only[c]	Transfers to POTWs Metals Only[d]	Under ground Injection	Landfills/ Disposal Surface Impound-ments	Land Treatment	Other Land Disposal	Other Off-site Management	Transfers to Waste Broker for Disposal	Unknown[e]	Off-site Releases: Transfers Off-site to Disposal
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Manganese and manganese compounds	O	156,297	14,841,207	3,081,900	753,310	7,017	31,880,458	241,339	2,201,184	8,243,036	574,424	196,410	62,176,582
	N	82,778	537,086	338	1,771	1	6,948,636	120,399	1,041,277	555,748	27,163	6,356	9,321,553
Mercury and mercury compounds	O	20	20,603	191	69	9	37,450	0	16	178	1,585	0	60,121
	N	0	96,589	0	0	0	662	0	0	1,922	532	4,384	104,089
Nickel and nickel compounds	O	79,183	2,384,001	376,445	193,765	72,288	6,702,695	3,611	192,215	145,108	471,421	95,427	10,716,159
	N	50,005	408,343	2,238	4,780	1,253	7,339,809	75,551	423,158	190,402	1,403,493	27,027	9,926,059
Selenium and selenium compounds	O	0	19,807	6,617	259	0	35,656	2	4,932	42,757	0	6,790	116,820
	N	0	86,828	124	0	15	494,892	0	6,479	1,825	230	292	590,685
Silver and silver compounds	O	7,700	1,796	11	2,838	0	99,498	635	2,062	52	758	283	115,633
	N	0	298,175	3	5	0	10,790	0	0	1,133	6,681	84	316,871
Thallium and thallium compounds	O	0	571	0	0	0	6,090	0	0	5	0	0	6,666
	N	0	40,916	12	0	0	114,320	0	2,050	1,601	0	163	159,062
Vanadium* (CAS Number 7440-62-2)	O	0	10,620	0	1,521	0	17,486	0	0	0	0	0	29,627
	N	0	107,000	0	0	0	62,011	0	0	0	0	0	169,011
Zinc* and zinc compounds	O	115,687	88,466,751	955,957	654,218	2,441,072	106,458,928	82,822	1,188,670	18,549,348	1,031,693	319,527	220,264,673
	N	195,505	719,688	3,527	3,122	280	9,514,436	92,227	920,377	4,128,196	75,727	72,258	15,725,343
Total	**O**	**4,199,242**	**139,433,710**	**6,482,797**	**3,345,324**	**3,388,672**	**203,461,321**	**1,753,912**	**11,789,336**	**30,896,158**	**5,964,114**	**1,692,316**	**412,406,902**
	N	**400,504**	**7,091,518**	**188,653**	**58,383**	**67,625**	**63,053,641**	**598,862**	**10,764,159**	**17,161,956**	**2,355,286**	**417,048**	**102,157,635**

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

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

O: Original Industries. **N**: New Industries.

* Only fume or dust forms are reportable.

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

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

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

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

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

Table B-3. Quantities of TRI Metals and Metal Compounds in Waste, Original and New Industries, 1999

Chemical		Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-Production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Aluminum* (CAS Number 7429-09-5)	O	15,508,535	28,604,288	0	5,058	21,798,263	425,726	19,199,937	85,541,807	25
	N	1,013,539	0	0	0	289,500	127,156	4,320,550	5,750,745	1
Antimony and antimony compounds	O	10,326,707	5,026,225	0	53,103	822,211	630,099	3,969,220	20,827,565	213,269
	N	11,713	14,752	0	0	0	470	28,571,356	28,598,291	300,004
Arsenic and arsenic compounds	O	5,031,994	1,655,537	300	0	153,013	205,899	8,100,640	15,147,383	2,439,811
	N	65,746	143,165	0	0	0	112,405	595,363,207	595,684,523	5,200,019
Barium and barium compounds	O	52,217,129	2,716,885	6,000	139,668	5,055,878	798,445	18,332,032	79,266,037	14,173
	N	582,193	3,031,849	0	0	1,214,330	387,170	294,985,180	300,200,722	11,321
Beryllium and beryllium compounds	O	101,065	62,538	0	0	0	2,315	74,525	240,443	2
	N	9,700	0	0	0	0	0	898,112	907,812	9
Cadmium and cadmium compounds	O	3,092,021	839,086	0	212	34,017	31,073	1,944,225	5,940,634	39,154
	N	220,837	167,099	0	0	0	1,521	8,433,009	8,822,466	120,019
Chromium and chromium compounds	O	54,619,373	121,166,954	2,000	66,394	9,443,342	2,128,928	55,812,213	243,239,204	5,331,804
	N	15,941	2,148,824	0	0	93,959	394,888	97,069,410	99,723,022	43,000,536
Cobalt and cobalt compounds	O	4,735,797	8,885,356	117	14,204	1,163,005	79,814	1,343,947	16,222,240	3,811
	N	164,666	11,144	0	0	0	10	15,339,663	15,515,483	30
Copper and copper compounds	O	687,450,913	746,609,196	1,200	324,671	3,842,961	3,101,617	61,160,208	1,502,490,766	4,641,244
	N	5,368,443	3,883,289	0	0	7,265,333	533,299	1,490,742,033	1,507,792,397	330,001,092
Lead and lead compounds	O	655,768,754	329,657,165	700	18,492	1,821,109	3,108,433	43,599,113	1,033,973,766	29,097,238
	N	486,397	3,136,030	0	0	764,817	220,850	287,737,594	292,345,688	39,001,949
Manganese and manganese compounds	O	61,530,770	115,055,084	2,876	58,512	1,689,240	7,738,519	122,989,530	309,064,531	18,968,296
	N	769,421	971,871	0	0	65,792	83,200	382,507,399	384,397,683	47,000,056
Mercury and mercury compounds	O	861,988	40,477	0	0	4,021	5,682	76,702	988,870	2,412
	N	43,155	87,770	0	0	0	550	3,255,808	3,387,283	15,003
Nickel and nickel compounds	O	34,046,852	110,495,866	2,900	27,846	1,475,056	1,353,733	13,052,736	160,454,989	576,940
	N	999,461	1,443,880	0	0	107,177	104,304	62,932,713	65,587,535	5,230,057
Selenium and selenium compounds	O	574,219	23,662	0	0	3,576	10,393	489,808	1,101,658	109,704
	N	56,980	4	0	0	0	20	6,442,558	6,499,562	670,007
Silver and silver compounds	O	4,235,477	2,996,482	90,601	11	2,177	41,591	312,693	7,679,032	9,984
	N	612	124,761	0	0	0	144,015	3,424,801	3,694,189	540,012
Thallium and thallium compounds	O	9	0	0	0	0	366	201,183	201,558	60,000
	N	1,884	0	0	0	0	0	3,102,108	3,103,992	120,001
Vanadium* (CAS Number 7440-62-2)	O	113,633	35,862	0	0	0	2,809	132,442	284,746	27
	N	0	0	0	0	0	0	479,721	479,721	90,000
Zinc and zinc compounds*	O	86,965,221	335,353,178	142,280	231,402	24,153,593	27,111,074	333,599,223	807,555,971	233,011,799
	N	9,808,546	2,665,741	0	0	66,270	292,548	818,551,130	831,384,235	34,034,413
Total	**O**	**1,677,180,457**	**1,809,223,841**	**248,974**	**939,573**	**71,461,462**	**46,776,516**	**684,390,377**	**4,290,221,200**	**294,519,693**
	N	**19,619,234**	**17,830,179**	**0**	**0**	**9,867,178**	**2,402,406**	**4,104,156,352**	**4,153,875,349**	**505,334,529**

Note: Data are from Section 8 of Form R.

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

O: Original Industries. **N**: New Industries.

* Only fume or dust forms are reportable.

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 Edition);
2. International Agency for Research on Cancer (IARC) "Monographs" (Latest Edition); or
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.

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 *1999 TRI Public Data Release,* 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	–	Catechol	2B	–	–
Acetamide	2B	–	–	Chlordane	2B	–	–
2-Acetylaminofluorene	–	P	Z	Chlorendic acid	2B	P	–
Acrylamide	2A	P	–	p-Chloroaniline	2B	–	–
Acrylonitrile	2B	P	Z	Chloroform	2B	P	–
2-Aminoanthraquinone	–	P	–	Chloromethyl methyl ether	1	K	Z
4-Aminoazobenzene	2B	–	–	3-Chloro-2-methyl-1-propene	–	P	–
4-Aminobiphenyl	1	K	Z	Chlorophenols	2B	–	–
1-Amino-2-methylanthraquinone	–	P	–	Chloroprene***	2B	P	–
Amitrole	2B	P	–	Chlorothalonil	2B	–	–
o-Anisidine	2B	–	–	p-Chloro-o-toluidine	2A	P	–
o-Anisidine hydrochloride	–	P	–	Chromium (VI) compounds	1	K	–
Arsenic and inorganic arsenic compounds	1	K*	Z	Cobalt and cobalt compounds	2B	–	–
Asbestos (friable)	1	K	Z	Creosote	2A	K	–
Atrazine**	–	–	–	p-Cresidine	2B	P	–
Benzene	1	K	Z	Cupferron	–	P	–
Benzidine	1	K	Z	2,4-D****	2B	–	–
Benzoic trichloride	2B	P	–	2,4-D butoxyethyl ester****	2B	–	–
Beryllium and beryllium compounds	1	P*	–	2,4-D butyl ester****	2B	–	–
Bis(chloromethyl)ether	1	K	Z	2,4-D chlorocrotyl ester****	2B	–	–
1,3-Butadiene	2A	K	–	2,4-D 2-ethylhexyl ester****	2B	–	–
1,2-Butylene oxide	2B	–	–	2,4-D 2-ethyl-4-methylpentyl ester****	2B	–	–
C.I. Acid Red 114	2B	–	–	2,4-Diaminoanisole	2B	–	–
C.I. Direct Black 38	2A	K	–	2,4-Diaminoanisole sulfate	–	P	–
C.I. Direct Blue 6	2A	K	–	4,4'-Diaminodiphenyl ether	2B	–	–
C.I. Direct Brown 95	2A	–	–	2,4-Diaminotoluene	2B	P	–
C.I. Food Red 5	2B	–	–	Diaminotoluene (mixed isomers)	2B	P	–
C.I. Solvent Yellow 3 (o-aminoazotoluene)	2B	P	–	1,2-Dibromo-3-chloropropane	2B	P	Z
C.I. Solvent Yellow 34 (Auramine)	2B	–	–	1,2-Dibromoethane	2A	P	–
Cadmium and cadmium compounds	1	K*	–	1,4-Dichlorobenzene	2B	P	–
Carbon tetrachloride	2B	P	–	Dichlorobenzene (mixed isomers)	2B	P	–

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, 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.
**IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).
***NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)
****Chlorophenoxy herbicides (IARC 2B).
*****IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

Table C–1 Basis of OSHA Carcinogen Listing for Individual Chemicals *(continued)*

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
3,3′-Dichlorobenzidine	2B	P	Z	2,4-D propylene glycol butyl ether ester****	2B	–	–
3,3′-Dichlorobenzidine dihydrochloride	2B	P	–	2,4-D sodium salt****	2B	–	–
3,3′-Dichlorobenzidine sulfate	2B	P	–	Epichlorohydrin	2A	P	–
Dichlorobromomethane	2B	P	–	Ethyl acrylate	2B	–	–
1,2-Dichloroethane	2B	P	–	Ethyl benzene*****	2B	–	–
Dichloromethane	2B	P	–	Ethyleneimine	–	–	Z
trans-1,3-Dichloropropene	2B	–	–	Ethylene oxide	1	K	Z
1,3-Dichloropropylene	2B	P	–	Ethylene thiourea	2B	P	–
Dichlorvos	2B	–	–	Formaldehyde	2A	P	Z
Diepoxybutane	2B	P	–	Heptachlor	2B	–	–
Di-(2-ethylhexyl)phthalate	–	P	–	Hexachlorobenzene	2B	P	–
Diethyl sulfate	2A	P	–	alpha-Hexachlorocyclohexane	2B	P	–
Diglycidyl resorcinol ether	2B	P	–	Hexachloroethane	2B	P	–
Dihydrosafrole	2B	–	–	Hexamethylphosphoramide	2B	P	–
3,3′-Dimethoxybenzidine	2B	P	–	Hydrazine	2B	P	–
3,3′-Dimethoxybenzidine dihydrochloride	2B	P	–	Hydrazine sulfate	–	P	–
3,3′-Dimethoxybenzidine hydrochloride	2B	P	–	Lead and inorganic lead compounds	2B	–	Z
4-Dimethylaminoazobenzene	2B	P	Z	Lindane	2B	P	–
3,3′-Dimethylbenzidine	2B	P	–	Mecoprop****	2B	–	–
3,3′-Dimethylbenzidine dihydrochloride	2B	P	–	Methoxone****	2B	–	–
3,3′-Dimethylbenzidine dihydrofluoride	2B	P	–	Methoxone sodium salt****	2B	–	–
Dimethylcarbamyl chloride	2A	P	–	4,4-Methylenebis (2-chloroaniline)	2A	P	–
N,N-Dimethylformamide**	–	–	–	4,4′-Methylenebis (N,N-dimethyl) benzeneamine	2B	P	–
1,1-Dimethylhydrazine	2B	P	–	4,4′-Methylenedianiline	2B	P	Z
Dimethyl sulfate	2A	P	–	Michler's ketone	–	P	–
2,4-Dinitrotoluene	2B	–	–	Mustard gas	1	K	–
2,6-Dinitrotoluene	2B	–	–	alpha-Naphthylamine	–	–	Z
1,4-Dioxane	2B	P	–	beta-Naphthylamine	1	K	Z
1,2-Diphenylhydrazine	–	P	–	Nickel	2B	P	–
2,4-D isopropyl ester****	2B	–	–	Nickel compounds	1	P*	–
2,4-DP****	2B	–	–	Nitrilotriacetic acid	–	P	–

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, 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.
**IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).
***NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)
****Chlorophenoxy herbicides (IARC 2B).
*****IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

Table C–1 Basis of OSHA Carcinogen Listing for Individual Chemicals *(continued)*

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Nitrobenzene	2B	–	–	7,12–Dimethylbenz(a)anthracene	2B	–	–
4-Nitrobiphenyl	–	–	Z	Indeno[1,2,3–cd]pyrene	2B	P	–
Nitrofen	2B	P	–	5–Methylchrysene	2B	P	–
Nitrogen mustard	2A	–	–	1–Nitropyrene	2B	P	–
2-Nitropropane	2B	P	–	Potassium bromate	2B	–	–
N-Nitrosodi-n-butylamine	2B	P	–	Propane sultone	2B	P	–
N-Nitrosodiethylamine	2A	P	–	beta-Propiolactone	2B	P	Z
N-Nitrosodimethylamine	2A	P	Z	Propyleneimine	2B	P	–
N-Nitrosodi-n-propylamine	2B	P	–	Propylene oxide	2B	P	–
N-Nitroso-N-ethylurea	2A	P	–	Saccharin (manufacturing)**	–	–	–
N-Nitroso-N-methylurea	2A	P	–	Safrole	2B	P	–
N-Nitrosomethylvinylamine	2B	P	–	Sodium o-phenylphenoxide	2B	–	–
N-Nitrosomorpholine	2B	P	–	Styrene	2B	–	–
N-Nitrosonornicotine	2B	P	–	Styrene oxide	2A	–	–
N-Nitrosopiperidine	2B	P	–	Tetrachloroethylene	2B	P	–
Pentachlorophenol	2B	–	–	Thioacetamide	2B	P	–
Phenytoin	2B	P	–	4,4′-Thiodianiline	2B	–	–
Polychlorinated alkanes (C12, 60% chlorinated)	–	P	–	Thiourea	2B	P	–
Polybrominated biphenyls (PBBs)	2B	P	–	Toluene-2,4-diisocyanate	2B	P	–
Polychlorinated biphenyls (PCBs)	2A	P	–	Toluene-2,6-diisocyanate	2B	P	–
Polycyclic aromatic compounds (PACs):				Toluene diisocyanate (mixed isomers)	2B	P	–
Benz(a)anthracene	2A	P	–	o-Toluidine	2A	P	–
Benzo(b)fluoranthene	2B	P	–	o-Toluidine hydrochloride	–	P	–
Benzo(j)fluoranthene	2B	P	–	Toxaphene	2B	P	–
Benzo(k)fluoranthene	2B	P	–	Trichloroethylene	2A	P	–
Benzo(rst)pentaphene	2B	–	–	2,4,6-Trichlorophenol	2B	P	–
Benzo(a)pyrene	2A	P	–	1,2,3-Trichloropropane	2A	P	–
Dibenz(a,h)acridine	2A	P	–	Tris(2,3-dibromopropyl) phosphate	2A	P	–
Dibenz(a,j)acridine	2B	P	–	Trypan blue	2B	–	–
Dibenzo(a,h)anthracene	2B	P	–	Urethane	2B	P	–
7H–Dibenzo(c,g)carbazole	2B	P	–	Vinyl acetate	2B	–	–
Dibenzo(a,e)pyrene	2B	P	–	Vinyl bromide	2A	–	–
Dibenzo(a,h)pyrene	2B	P	–	Vinyl chloride	1	K	Z
Dibenzo(a,l)pyrene	2B	P	–	2,6-Xylidine	2B	–	–

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, 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.

**IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).

***NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

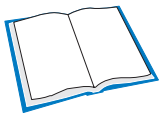
****Chlorophenoxy herbicides (IARC 2B).

*****IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

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 its Toxic Releases 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 2000, EPA released a new TRI tool—the TRI Explorer. The TRI Explorer provides access to TRI data that is both easy to understand and flexible to use. In addition to this new tool, the 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's National Service Center for Environmental Publications (NSCEP). TRI data can also be accessed online at EPA's web site, http://www.epa.gov/tri.

In addition, state officials 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 and several others.

National Service Center for Environmental Publications (NSCEP) P.O. Box 42419 Cincinnati, OH 45242-2419 Call: (800) 490-9198 (513) 489-8190 Fax: (513) 489-8695 Hours: 7:30 a.m. – 5:30 p.m., EST Order online: http://www.epa.gov/ncepihom	**TRI User Support Service (TRI-US)** U.S. EPA Ariel Rios Building 1200 Pennsylvania Avenue, NW (MC-2844) Washington, DC 20460 Call: (202) 260-1531 Fax: (202) 401-2347 Email: tri.us@epamail.epa.gov
U.S. EPA EPCRA Hotline (800) 424-9346 (703) 412-9810 Hours: 9:00 a.m. – 6:00 p.m., EST	**U.S. EPA TRI Website** http://www.epa.gov/tri http://www.epa.gov/tri/tri99

Table D–1. Toxics Release Inventory Products

Product	Supplier	Order Information
1999 TRI Public Data Release Report The 1999 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. ◆ 1999 TRI Public Data Release Report ◆ 1999 TRI State Fact Sheets ◆ 1999 TRI Executive Summary	**NSCEP** **TRI-US**	Free while supplies last Free while supplies last EPA 260-R-01-001 EPA 260-F-01-001 EPA 260-S-01-001
	These documents can be viewed, printed, or downloaded on the Internet at http://www.epa.gov/tri/tri99	
Chemicals in Your Community This pamphlet summarizes the information 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 your community.	**NSCEP**	Free EPA 550-K-99-001
Act Locally: Preventing Pollution at the Community Level with Resources that Control Pesticide and Toxic Chemical Use This catalogue describes tools, resources, and programs of EPA's Office of Prevention, Pesticides and Toxic Substances (OPPTS). It provides information on the characteristics and effects of pesticides and industrial chemicals. These "tools" include databases, computer programs for chemical screening, funding resources, access to information hotlines, and descriptions of programs and initiatives that may be useful in protecting local environments.	The catalogue can be viewed, printed, or downloaded on the Internet at http://www.epa.gov/opptintr/cbep/actlocal	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/chemfact	

Table D-2. Toxics Release Inventory 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 1200 Pennsylvania Avenue, NW (MC–2844) Washington, DC 20460 (202) 260-1531
EPCRA Hotline The Emergency Planning and Community Right-to-Know (EPCRA) Hotline 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 EPCRA. The Hotline 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 EPCRA Hotline, visit their Internet Web site at: http://www.epa.gov/epaoswer/hotline.	**EPCRA Hotline** (800) 424-9346 (703) 412-9810 TDD: (800) 553-7672 TDD: (703) 412-3323

Table D-3. Toxics Release Inventory On-line Services

On-line Services	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—provides access 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 1999 Data Release Page—provides access to information relating to the 1999 TRI data release. Includes press materials, data summary information, questions and answers, and other information about 1999 TRI data.	http://www.epa.gov/tri/tri99
◆ 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 parameters 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/

Table D-3. Toxics Release Inventory On-line Services *(continued)*

On-line Services	Web Address/Contact Information
Right-to-Know Network 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://www.rtknet.org/trisearch.html
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

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Assistance and Pollution Prevention Office
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USEPA Region 2

New Jersey, New York, Puerto Rico, Virgin Islands

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Pesticides and Toxics Substances Branch
USEPA Region 2 (MS-105)
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USEPA Region 3

Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia

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Toxics Programs and Enforcement Branch
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USEPA Region 4

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codina.thelma@epa.gov

USEPA Region 6

Arkansas, Louisiana, New Mexico, Oklahoma, Texas

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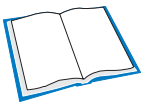

USEPA Region 7

Iowa, Kansas, Missouri, Nebraska

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Air, RCRA and Toxics Division
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USEPA Region 9

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Fax (415) 744-1073
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USEPA Region 10

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Field Operations Division
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Montgomery, AL 36130-1463
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Fax: (334) 272-8131
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Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact whom provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.

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c/o Carl Goldstein (CMD-5)
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California Environmental Protection Agency
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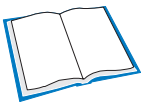
Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



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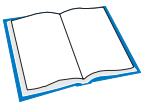

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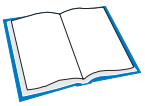

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Window Rock, AZ 86515

Nebraska

Donnie Zach
SARA Title III and NEPCRA Coordinator
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Certified Mail ONLY:
Max Johnson, Coordinator
New Mexico Emergency Response Commission
Chemical Safety Office
Emergency Management Bureau
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Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.

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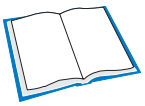
P.O. Box 1677
Oklahoma City, OK 73101-1677
(405) 702-1017
(800) 869-1400
Fax: (405) 702-1001
monty.elder@deqmail.state.ok.us

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Oregon
Bob Albers
Oregon Emergency Response Commission
Office of State Fire Marshall
4760 Portland Rd., Northeast
Salem, OR 97305-1760
(503) 378-3473, ext. 262
Fax: (503) 373-1825
Bob.ALBERS@state.or.us

Pennsylvania
Thomas J. Ward, Jr.
Bureau of PennSafe
Labor and Industry Bldg.
7th and Forster St., Rm. 1623
Harrisburg, PA 17120
(717) 783-2071
Fax: (717) 783-5099
pennsafe@dli.state.pa.us

Puerto Rico
Genaro Torres
Director of Superfund and Emergencies
Title III—SARA Section 313
Environmental Quality Board
Fernandez Junco Station
P.O. Box 11488
Santurce, PR 00910
(787) 766-2823
Fax: (787) 766-0150
jcaterr@prtc.net

Certified Mail ONLY:
Genaro Torres
Director of Superfund and Emergencies
Environmental Quality Board, Emergency Response and Remedial Office
National Plaza #431
Ponce de Leon Ave.
Hato Rey, PR 00917

Rhode Island
Karen Slattery
Rhode Island Department of Environmental Management
Division of Air Resources
235 Promenade St., Suite 230
Providence, RI 02908
Attn: Toxic Release Inventory
(401) 222-2808, ext. 7030
Fax: (401) 222-2017
kslatter@dem.state.ri.us

South Carolina
Michael Juras
Community Right-to-Know
South Carolina Department of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201
(803) 898-4385
Fax: (803) 898-4117
jurasms@columb31.dhec.state.sc.us

South Dakota
Lee Ann Smith, TRI Coordinator
South Dakota Department of Environment and Natural Resources
523 East Capitol
Pierre, SD 57501-3181
(605) 773-3296
Fax: (605) 773-6035
leeann.smith@state.sd.us

Tennessee
Betty Eaves, Administrator
Tennessee Emergency Response Council
Tennessee Emergency Management Agency
3041 Sidco Dr.
Nashville, TN 37204
(615) 741-2986
Fax: (615) 242-9635
beaves@tnema.org

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.

Texas
Kenneth Kidd
U.S. Postal Service Deliver/Certified Mail
Toxics Release Inventory Program, MC 164
Texas Natural Resource Conservation Commission
P.O. Box 13087
Austin, TX 78711-3087
(512) 239-6957
Fax: (512) 239-1515
kkidd@tnrcc.state.tx.us

Overnight Express Mail ONLY:
Kenneth Kidd
Toxics Release Inventory Program, MC 164
Texas Natural Resource Conservation Commission
12100 Park 35 Circle
Bldg. E., Third Fl.
Austin, TX 78753

Utah
Neil Taylor
Utah Division of Environmental Response and Remediation
168 North 1950 West
Salt Lake City, UT 84116
(801) 536-4102
Fax: (801) 536-4242
ntaylor@deq.state.ut.us

Vermont
Paul Van Hollebeke
Vermont Department of Environmental Conservation
Environmental Assistance Division
103 South Main St.
Waterbury, VT 05671-0411
(802) 241-3629
Fax: (802) 241-3273
paulv@dec.anr.state.vt.us

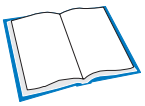
Virgin Islands
Hollis L. Griffin
Department of Planning and Natural Resources
Division of Environmental Protection
1118 Waterguthomes
Christianshead, St. Croix 00820-5965
(340) 773-0565 (St. Croix)
Fax: (340) 773-9310
(340) 777-4577 (St. Thomas)
Fax: (340) 774-5416
hlgrif12@viaccess.net

Virginia
Dona Huang
VERC
Virginia Department of Environmental Quality
SARA Title III Program
P.O. Box 10009
Richmond, VA 23240-0009
(804) 698-4489
Fax: (804) 698-4264
drhuang@deq.state.va.us

Certified or Express Mail ONLY:
Dona Huang
SARA Title III Program
Virginia Department of Environmental Quality
629 E. Main St.
Richmond, VA 23219

Washington
Idell Hansen
Department of Ecology
Community Right-to-Know Unit
P.O. Box 47659
Olympia, WA 98504-7659
(360) 407-6727 or (800) 633-7585
Fax: (360) 407-6715
ihan461@ecy.wa.gov

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Federal Express or UPS Mail:
Idell Hansen
Department of Ecology
Community Right-to-Know Unit
300 Desmond Dr.
Lacey, WA 98503

West Virginia

John W. Pack, Jr.
West Virginia Emergency Response Commission
West Virginia Office of Emergency Services
1900 Kanawna Blvd., Bldg. 1, Rm. EB-80
Charleston, WV 25305-0360
(304) 558-5380
Fax: (304) 344-4538
jpack1@wvoes.state.wv.us

Wisconsin

Tara L. Edblom
Environmental Toxicologist & WI Toxic Release Inventory Administrator
Bureau of Integrated Science Services
101 South Webster St.
P.O. Box 7921
Madison, WI 53707-7921
(608) 264-6043
Fax: (608) 267-5231
edblot@mail01.dnr.state.wi.us

Wyoming

Bobbi Tenborg
Chief, Plans Division
Wyoming Emergency Management Agency
5500 Bishop Blvd.
Cheyenne, WY 82009-3302
(307) 777-4910
Fax: (307) 635-6017
btenborg@hotmail.com

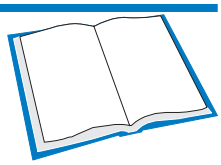
Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.

Appendix F

TRI Form R and Form A for 1999

Appendix F

TRI Form R and Form A for 1999



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 1999 reporting year.

FORM R

The 1999 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, 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 1999 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 EPCRA Information Hotline at 1-800-424-9346. Reporting software, forms, and instructions for the current reporting year are available from EPA's Web site at http://www.epa.gov/tri/report.htm.

Form Approved OMB Number: 2070-0093
Approval Expires: 01/31/2003

(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:

- **a.** ☐ Produce **b.** ☐ Import

If produce or import:

- **c.** ☐ For on-site use/processing
- **d.** ☐ For sale/distribution
- **e.** ☐ As a byproduct
- **f.** ☐ As an impurity

3.2 Process the toxic chemical:

- **a.** ☐ As a reactant
- **b.** ☐ As a formulation component
- **c.** ☐ As an article component
- **d.** ☐ Repackaging
- **e.** ☐ As an impurity

3.3 Otherwise use the toxic chemical:

- **a.** ☐ As a chemical processing aid
- **b.** ☐ As a manufacturing aid
- **c.** ☐ Ancillary or other use

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.

Form Approved OMB Number: 2070-0143
Approval Expires: 01/31/2003

(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 ☐

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.)
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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)