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Office of Pollution
Prevention and Toxics
(TS-779)

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May 1992
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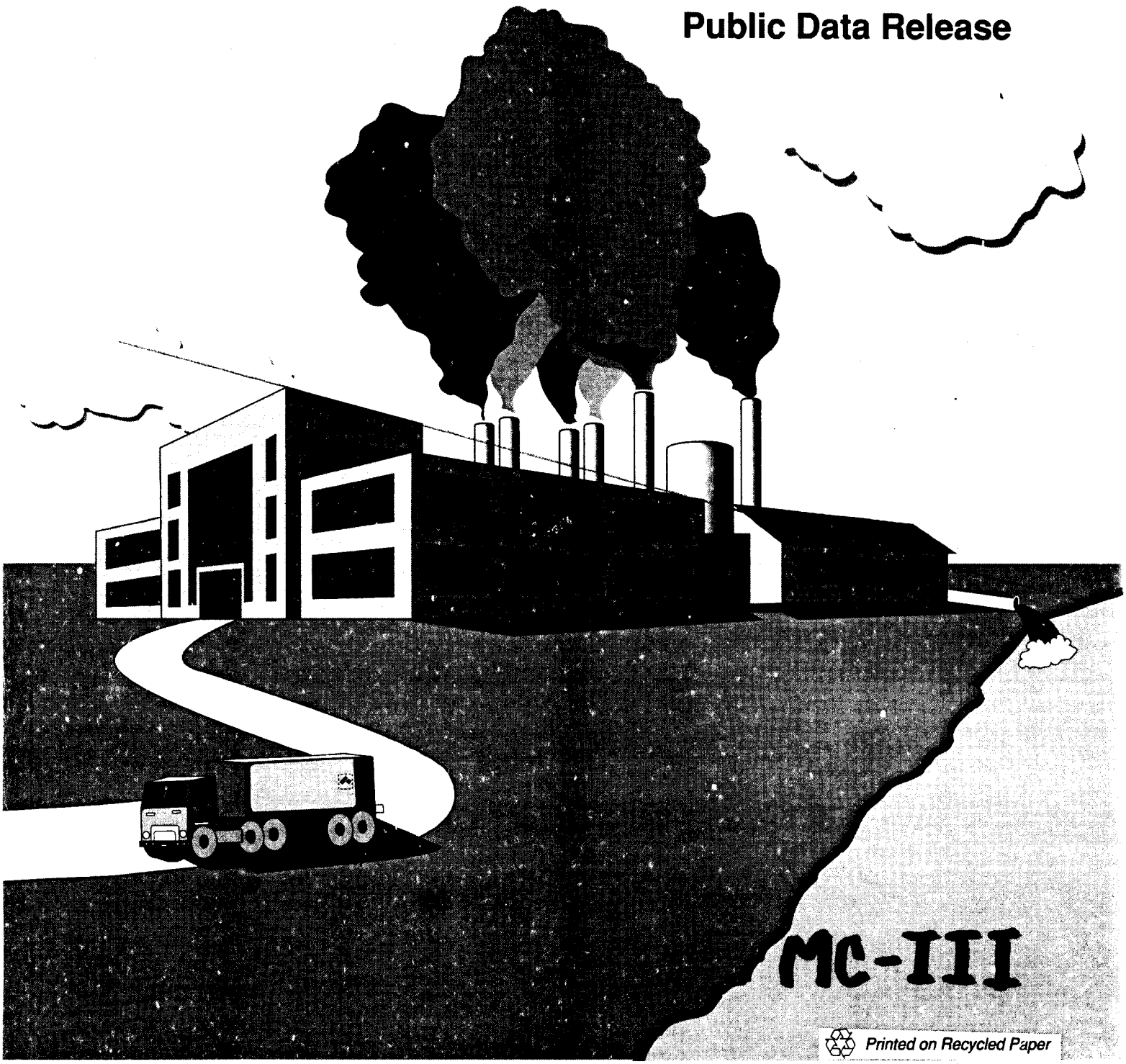
EPA

1990 Toxics Release Inventory

Public Data Release

12-19-92
EPCRA HOTLINE SAYS
EPA PLANS NO ADDITIONAL
REPORTS ANALYZING
1987-1990 TRI DATA,
HKH



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1990
Toxics Release Inventory

Public Data Release

U.S. Environmental Protection Agency

Office of Pollution Prevention and Toxics (TS-779)

Washington, D.C. 20460

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THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

Background Information

TOXICS RELEASE INVENTORY 1990 DATA RELEASE: BACKGROUND INFORMATION

WHAT IS THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT?

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA, also known as Title III of the Superfund Amendments and Reauthorization Act of 1986) provides for the collection and public release of a great deal of information about the presence and release of hazardous or toxic chemicals in the nation's communities. The law requires industries to participate in emergency planning and to notify their communities of the presence and routine and accidental releases of hazardous chemicals. In addition, section 313 of the Act requires EPA to establish a Toxics Release Inventory (TRI) of toxic chemical emissions from thousands of manufacturing facilities throughout the United States.

WHAT IS THE TOXICS RELEASE INVENTORY?

EPCRA section 313 gave EPA the responsibility to compile and make available to the public information on the annual toxic chemical emissions from U.S. manufacturing facilities. EPA has made this environmental data directly available to citizens through a publicly accessible database as well as through a variety of other means.

Starting in 1987 facilities covered by section 313 were required to submit annually a report to their state and to EPA listing their releases of any of more than 300 chemicals and 20 chemical categories into the air, water, or soil, or injected into underground wells. The TRI annual reports are due on July 1 following each calendar year of coverage. These reports also contain information on EPCRA section 313 chemicals that were sent off-site for treatment or disposal.

The TRI reports also show the maximum amounts of the chemicals stored at reporting facilities during the year; the names and locations of off-site facilities to which toxic wastes were shipped; and the treatment or disposal methods used for wastes, along with estimates of their efficiency. Some facilities also reported on their efforts to reduce their toxic chemical releases.

In 1989, EPA created the TRI database and on June 19th, made the first year's (1987) reports available on-line through the National Library of Medicine's (NLM) TOXNET computer system. In April of 1990, the Agency made available the 1988 reports on NLM's

TOXNET system; the following spring EPA released the 1989 reports. In addition, EPA has released three national reports titled, *The Toxics Release Inventory: A National Perspective* (1989), *Toxics in the Community: National and Local Perspectives* (1990), and *Toxics in the Community: National and Local Perspectives* (1991). The first report summarized the first year of TRI data, and analyzed where toxic chemicals are being released, along with the amounts and types of releases. The second and third reports expand on the first and include analyses of the 1987, 1988, and 1989 data.

Who Must Submit TRI Reports?

Manufacturing facilities (those in Standard Industrial Classification codes 20-39) with ten or more employees are required to file toxic chemical release reports if they:

1. **Manufacture** or **process** more than 25,000 pounds of any of the reportable chemicals in calendar year 1990. In 1987, this reporting threshold was 75,000 pounds; in 1988, the reporting threshold dropped to 50,000 pounds; in 1989, the reporting threshold decreased to 25,000 pounds. For the following years, the reporting threshold will continue to be 25,000 pounds.

2. **Use** more than 10,000 pounds of any reportable chemicals. This threshold does not change.

What Release and Transfer Information was Reported in 1990?

For the 1990 reporting year, EPA received more than 83,387 reports from 23,638 facilities. According to these reports, 4.83 billion pounds of toxic chemicals were released or transferred off-site for treatment and disposal: 2.20 billion pounds of toxic chemicals were emitted into the air; 197 million pounds were released to streams and other bodies of water; 441 million pounds were released to land; and 725 million pounds were injected underground. Chemical transfers included an estimated 448 million pounds of toxic chemicals which were sent to municipal wastewater treatment plants for processing and disposal and 815 million pounds were transported to other off-site locations for treatment, storage or disposal.

Can Comparisons Be Made Between the 1987, 1988, 1989, and 1990 TRI Data?

The TRI is a dynamic set of data. Before comparisons are considered it should be recognized that the public is dealing with an ever changing database. For example, chemicals that are identified as toxic can be added to the list at any time and chemicals on the list identified as nontoxic may be taken off.

Since the release of the 1987 data, several chemicals have been deleted from the list of toxic chemicals because they do not meet EPA's toxicity criteria to warrant further reporting. The chemicals deleted from the EPCRA section 313 list are sodium sulfate (solution), sodium hydroxide (solution), aluminum oxide (nonfibrous forms), titanium dioxide, Color Index (C.I.)

Acid Blue 9 diammonium salt, C. I. Acid Blue 9 disodium salt, melamine, terephthalic acid, and three members of the copper compounds category: C.I. Pigment Blue 15, C.I. Pigment Green 7, and C.I. Pigment Green 36.

On December 1, 1989, EPA added nine chemicals that were reportable for the 1990 year: allyl alcohol, creosote, 2,3-dichloropropene, m-dinitrobenzene, o-dinitrobenzene, p-dinitrobenzene, dinitrotoluene (mixed isomers), isosafrole, and toluenediisocyanate (mixed isomers).

In order to represent accurately all releases and transfers and to allow comparisons to be made between years, the following modifications have been made to the 1987-1990 data presented in this report:

- Data on the above-mentioned chemicals that have been deleted from EPCRA section 313 have been expunged from the 1987, 1988, 1989, and 1990 release and transfer figures; and

- Data on the nine chemicals that have been added to EPCRA section 313 are included in the 1990 release and transfer numbers that are presented in the section entitled "1990 Releases and Transfers," but have been excluded from the section entitled "1987-1990 Releases and Transfers."

The manufacturing and processing reporting threshold has dropped from 75,000 pounds for 1987 to 50,000 pounds for 1988 to 25,000 pounds for 1989. This increases the potential number of facilities regulated under this statute. However, some facilities that reported releases of a chemical in 1987 or 1988 that was subsequently deleted may not have had to report in 1989 or 1990. Facilities may be substituting chemicals that are not on the EPCRA section 313 list for chemicals that are. Facilities may be making more knowledgeable estimates of their releases so that releases reported last year may be much different than the reported releases this year. There are many other factors which make year to year comparisons of the TRI data difficult.

In addition, it should be noted that ammonium sulfate (solution) was the number one released chemical (by volume) in 1989 but is ranked number 36 for 1990. This difference does not represent an actual decrease, but rather is the result of revised technical guidance that EPA provided to the reporting community. Facilities that manufacture, process or otherwise use ammonium sulfate (solution) were given the option of reporting their releases and transfers either as ammonium sulfate (solution) or as ammonia. EPA believes that reporting releases of aqueous solutions of ammonium salts such as ammonium sulfate as ammonia more properly represents the moiety of concern. Ammonium sulfate (solution) primarily affects water quality by the introduction of ammonia to a water body. EPA has low concern for sulfate as evidenced by its deletion of sodium sulfate (solution) from EPCRA section 313. The ammonia moiety constitutes 27 percent of ammonium sulfate. Decreases in reported releases of ammonium sulfate (solution), particularly to surface waters and underground injection, are matched by proportional increases in releases of ammonia to these media.

EPA is analyzing the impact of these types of changes to the TRI data to distinguish them from genuine changes in industrial processes and chemical handling practices which lead to genuinely lower releases. These analyses will be reported by EPA in autumn 1991.

? 1993?

What Are the Limitations of the TRI Data?

First, not all releases of toxic chemicals are covered by this statute. The TRI only covers manufacturing industries (Standard Industrial Classification Codes 20-39). Only releases of those toxic chemicals on the EPCRA section 313 list must be reported and they must be reported only if they are released by those facilities covered under this law.

Users of the 1987-1990 TRI data should also be aware that in many cases, the releases are based on estimates, not measurements. This means the accuracy of the data will vary from facility to facility. The accuracy of the estimates may also vary from year to year at each facility as estimation techniques improve.

Some high-volume releases of not-significantly toxic chemicals may appear to be a more serious problem than lower-volume releases of highly toxic chemicals, when just the opposite may be true.

Finally, it is important to realize that the reports reflect **releases** of chemicals, not **exposures** of those chemicals to the public. Some chemicals are rapidly dispersed or transformed when they are released into the environment which completely, or nearly completely, eliminates their threat to public health or the environment. On the other hand, a chemical "hot spot" can be created if many small releases of highly toxic chemicals are released into one environment. For those involved in risk-screening it is important to look at all the variables involved.

In order to reach some understanding of the problem, the public should look beyond just the numbers and look at other factors. For example, just knowing there are large quantities of a chemical being released in a community can be a big concern. Therefore, looking at how the chemical is released to the environment is important in understanding potential exposure to the chemical. An example of some of the variables that must be taken into account follows.

The practice of underground injection of hazardous waste, the Underground Injection Control (UIC) program, has been established by the Safe Drinking Water Act (SDWA) of 1974. EPA establishes minimum requirements for effective state underground injection control programs. In several areas of the United States, there are rock deposits below the earth's surface that over millions of years have remained relatively undisturbed. Class I injection wells penetrate many thousands of feet into rock formations where the waste cannot contaminate underground sources of drinking water. The underground injection of a hazardous waste into a Class I well may be a better alternative than releases to receiving streams or surface disposal to land.

In fact, it is likely that exposure to human health and the environment is much greater when releases go directly to a receiving stream or to land than when it is injected into a Class I well.

What Improvements Have Been Made or Are Planned?

EPA has worked hard to improve the consistency and reliability of the reports on toxic chemical releases. The entire system is evolving to provide even more comprehensive and useful data. Below are descriptions of some TRI limitations and what EPA has done or is doing to improve the system.

Limitation	Not all facilities who should have reported did so.
Improvement	EPA is going after non-reporters. Since Fiscal Year 1989, EPA has conducted approximately 2,330 on-site inspections, issued close to 550 civil complaints against non-reporters, and proposed penalties in excess of 16 million dollars. EPA also conducts workshops and has created and distributed a number of guidance documents on EPCRA section 313 for the regulated community.
Limitation	Not all sources of toxic chemicals emissions are included in TRI. TRI is currently limited to industrial manufacturers.
Improvement	EPA has begun evaluating other sources for inclusion under the EPCRA section 313. Such operations being considered for addition include waste management firms, mining, public sewage treatment facilities, chemical warehouses, commercial launders, photo processing facilities, and other operations which may represent substantial sources of toxic chemical releases.
Limitation	There are toxic chemicals that are not on the TRI list.
Improvement	The TRI list of chemicals is continually changing, toxic chemicals are added and non-toxic chemicals are deleted. EPA continues to evaluate chemicals for addition to or deletion from the list. On August 3, 1990, EPA added 7 chlorofluorocarbons (CFCs) and Halons. These chemicals will be subject to 1991 reporting and EPA will receive these reports by July 1, 1992. EPA currently is in the process of evaluating other chemicals for addition to the list.

New Source Reduction and Recycling Data

For the 1991 reporting year (for reports due July 1, 1992) facilities subject to the reporting requirements of EPCRA section 313 are required to report on pollution prevention and recycling activities. This modification of the EPCRA section 313 reporting requirements was mandated by the Pollution Prevention Act of 1990.

How Can the Public Obtain TRI Data?

See the section of this report entitled "Public Access."

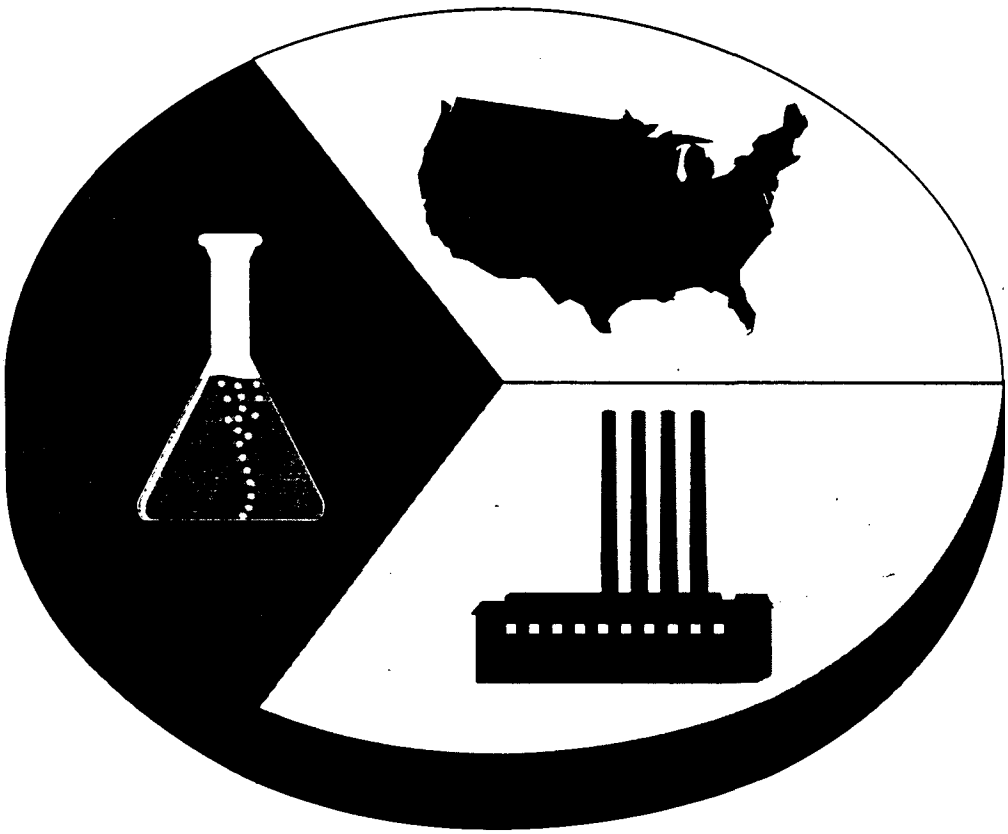
Is Additional Information Available?

EPA has prepared a number of documents to assist citizens, the news media, local and state government officials and others in using the TRI and other EPCRA data. These materials describe where the information can be obtained, its strengths and limitations, and how various government agencies can use it in their programs to protect public health and enhance environmental quality. Members of the public may wish to obtain these documents and consult with their Local Emergency Planning Committees, State Emergency Response Commissions, State Section 313 Contact, or the environmental and public health professionals in their community or state for advice on how best to make use of this information.

To request copies of TRI and EPCRA documents or to obtain information about state and local officials familiar with the TRI program, citizens should call their State Section 313 Contact or the toll-free Emergency Planning and Community Right-to-Know Information Hotline at 1-800-535-0202 (in Virginia and Alaska, 703-920-9877.)

THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

Data Section



AN EXPLANATION OF RELEASES AND TRANSFERS

RELEASES

Releases to Air

Releases to air are reported either as fugitive or stack emissions. Stack emissions are releases to air that 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.

Releases to Water

Releases to water include releases to receiving streams or other water bodies.

Releases to Land

Releases to land occur within the boundaries of the reporting facility. Releases to land include disposal of wastes in a landfill, in which waste is buried, land treatment/application farming in which a waste containing a listed chemical is applied onto or incorporated into soil, and surface impoundment which is an uncovered holding area used to volatilize and/or settle waste materials.

Underground Injection

Underground injection is the disposal of fluids by the subsurface placement of the fluids in a well. Wastes containing EPCRA section 313 chemicals are either injected into Class I wells or Class V wells. Class I wells are wells used to inject liquid hazardous wastes or dispose of industrial and municipal waste waters beneath the lowermost underground source of drinking water. Class V wells are generally used to inject non-hazardous fluid into or above an underground source of drinking water. Wastes containing EPCRA section 313 chemicals are not disposed of in other classes of wells (i.e., Class II-IV).

Publically Owned Treatment Works (POTW)

A POTW is a wastewater treatment facility that is owned by a state or local municipality. Wastewaters from facilities reporting under TRI are transferred through pipes or sewers to the POTW. The chemicals contained in those wastewaters are treated at the POTW through a variety of methods. Treatment of chemicals in a POTW is determined by several factors. In general chemicals which are easily utilized as nutrients by microorganisms, are volatile, or have a low solubility in water are likely to be removed to some extent. Not all chemicals on EPCRA section 313 can be treated by a POTW. Those that are not removed by treatment are released by the POTW to surface waters.

Off-site Transfers

An off-site transfer is a transfer of wastes for treatment or disposal to a facility that is geographically or physically separate from the facility which is reporting under TRI. Chemicals reported under TRI are sent to off-site facilities for the purposes of either treatment, such as incineration, or disposal, such as release to land or underground injection.

1990 RELEASES AND TRANSFERS

This section contains release information on all chemicals currently listed on EPCRA section 313, including the following chemicals that were first reportable in the 1990 reporting year:

Allyl alcohol
Creosote
2,3-Dichloropropene
m-Dinitrobenzene
o-Dinitrobenzene
p-Dinitrobenzene
Dinitrotoluene (mixed isomers)
Isosafrole
Toluenediisocyanate (mixed isomers)

and

Aluminum oxide (fibrous forms)*

This section does not contain information on chemicals that were deleted in previous years.

* Non-fibrous forms of aluminum oxide were deleted from EPCRA section 313 beginning with the 1989 reporting year. TRI data indicate that facilities continued to report both the non-fibrous and fibrous forms of aluminum oxide for the 1989 reporting year, but reported only fibrous forms of aluminum oxide in the 1990 reporting year. Thus, aluminum oxide (fibrous forms) is treated as if it were a newly added chemical reportable beginning with the 1990 reporting year.

Table 1. TRI Releases and Transfers, 1990.

1990 Releases	3.57 Billion Pounds	1990 Transfers	1.26 Billion Pounds
Air Emissions	2.20 billion	Transfers to POTWs	448 million
Surface Water Discharges	197 million	Transfers to Other Off-site Locations	815 million
Underground Injection	725 million		
Releases to Land	441 million		

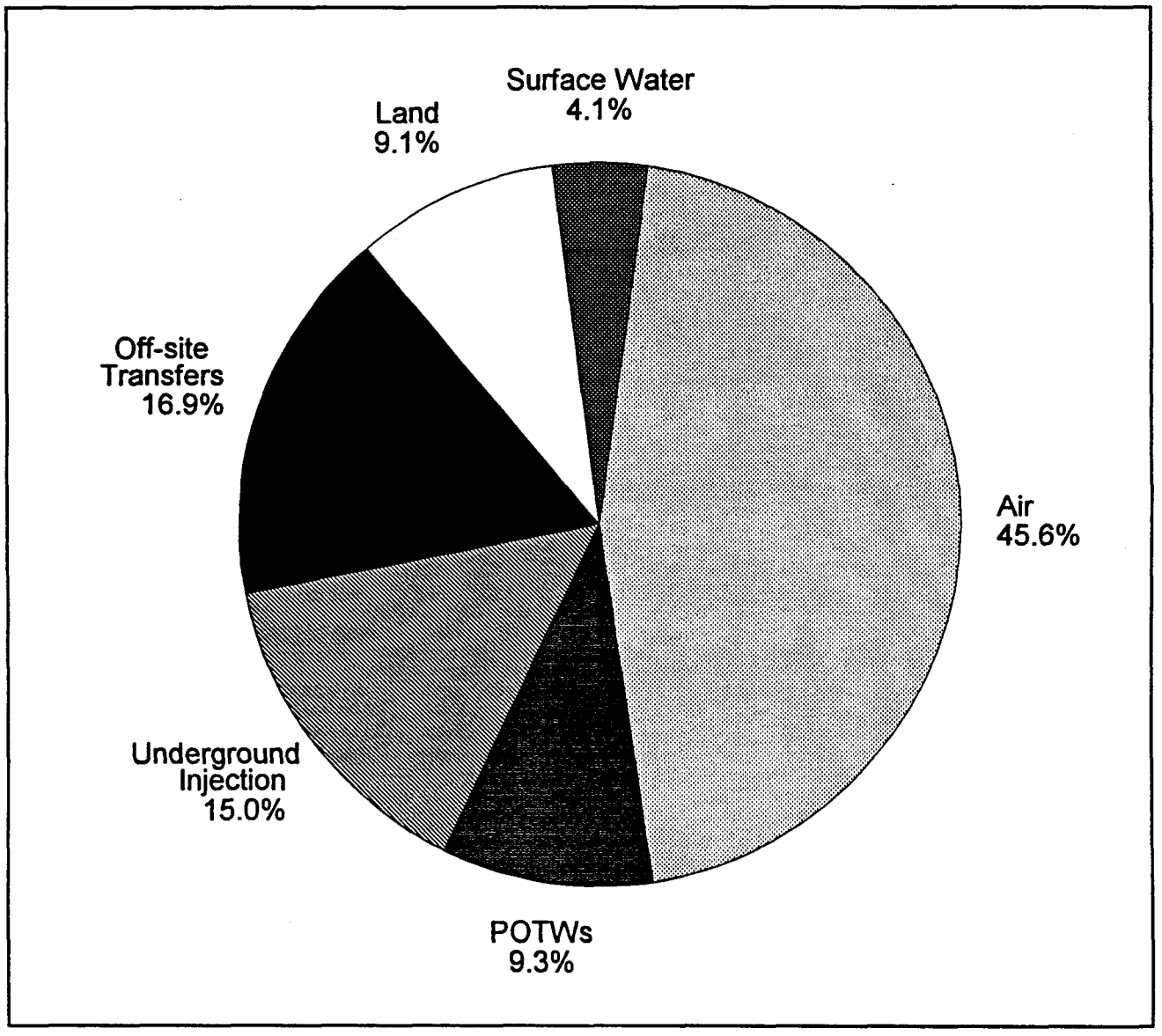
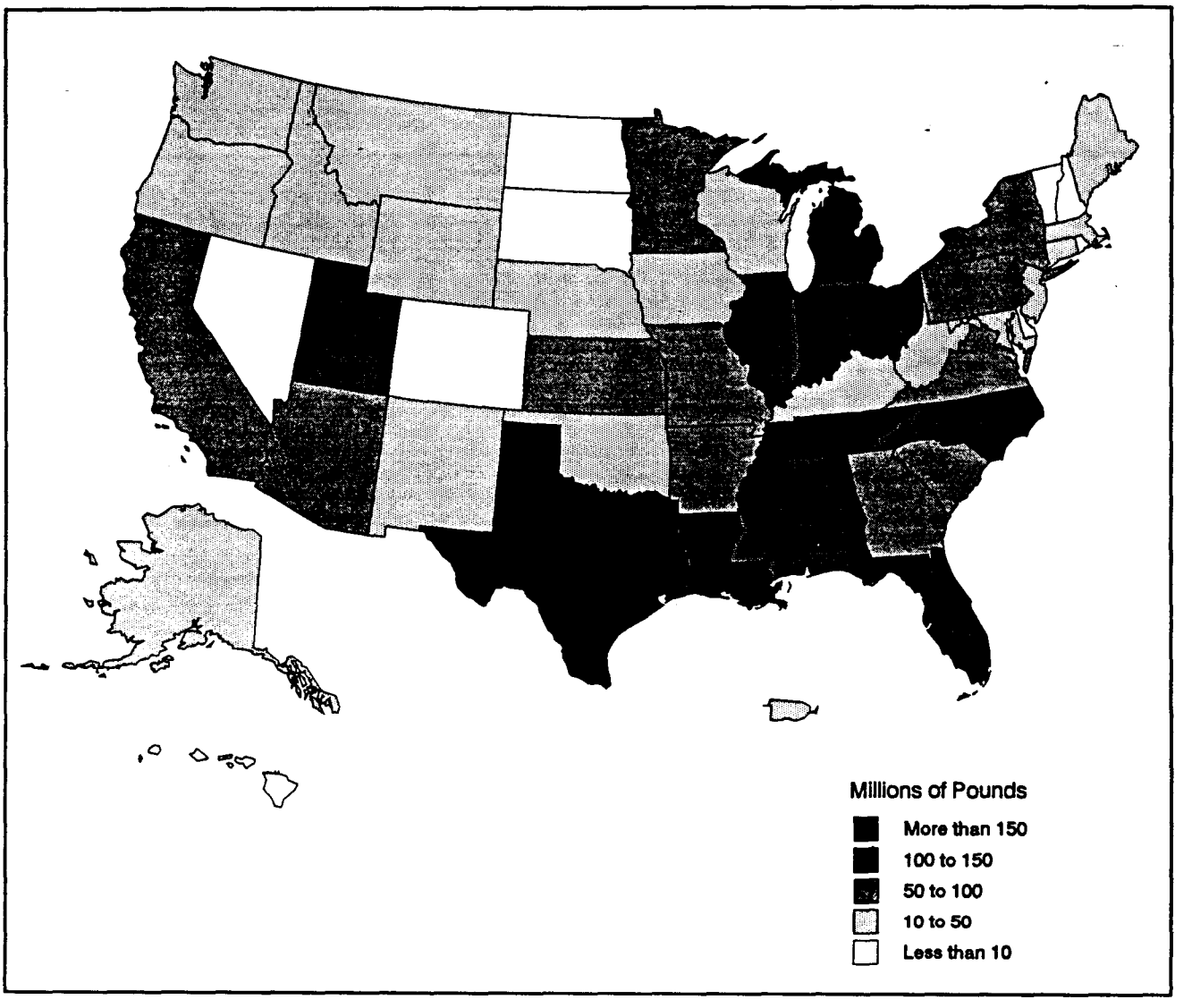


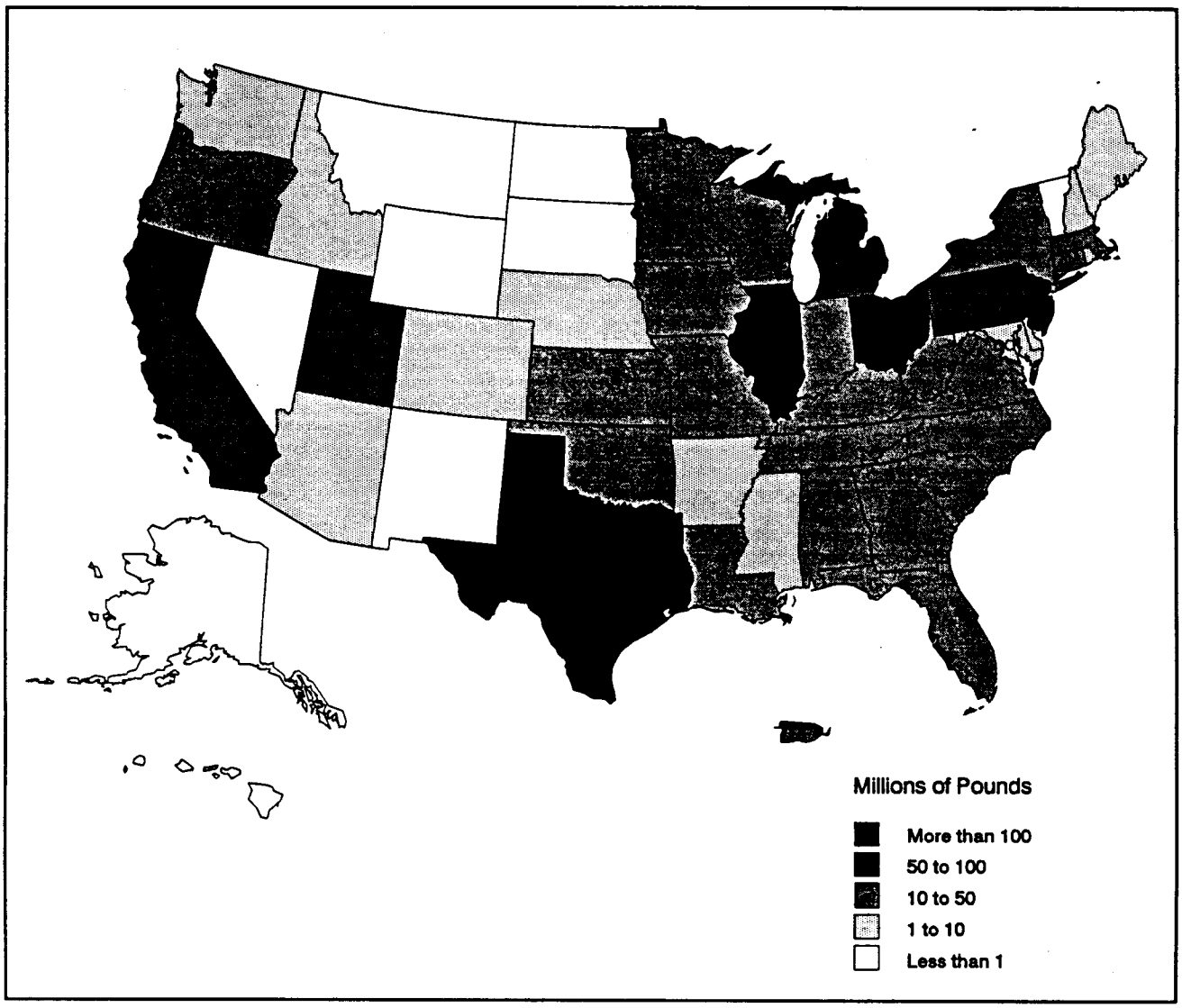
Figure 1. TRI Releases and Transfers, 1990.

THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

1990 Releases and Transfers by State



Map 1. TRI Releases by State, 1990.



Map 2. TRI Transfers by State, 1990.

Table 2. TRI Releases and Transfers by State, 1990 (Alphabetically Ordered).

State	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Alabama	17,039,757	83,228,365	2,797,183	6,317,242	3,192,540	112,575,087
Alaska	396,347	14,577,730	5,569,839	20	29,076	20,573,012
American Samoa	19,300	0	5	0	0	19,305
Arizona	4,194,813	8,794,458	158	30	59,023,323	72,012,782
Arkansas	9,220,903	21,988,517	2,607,620	20,554,009	3,459,961	57,831,010
California	31,187,937	47,749,728	11,086,247	1,769,286	5,107,349	96,900,547
Colorado	3,053,928	3,707,549	175,972	280	478,011	7,415,740
Connecticut	8,170,945	8,994,643	4,012,127	0	165,742	21,343,457
Delaware	1,762,984	4,254,882	431,506	0	130,349	6,579,721
Florida	23,445,364	21,772,997	2,781,622	21,536,061	37,022,470	106,558,514
Georgia	16,794,876	55,737,630	4,277,692	810	1,063,632	77,874,640
Hawaii	550,617	138,744	15,990	111,500	34,009	850,860
Idaho	1,940,866	3,743,919	474,398	0	5,434,670	11,593,853
Illinois	32,172,714	55,746,559	6,260,825	9,449,680	15,364,536	118,994,314
Indiana	40,588,385	67,560,102	2,849,018	9,192,193	48,598,082	168,787,780
Iowa	6,970,217	31,122,209	2,313,802	20	283,079	40,689,327
Kansas	8,667,036	20,151,745	1,044,876	58,706,062	1,323,496	89,893,215
Kentucky	11,449,246	29,168,785	683,285	50	1,099,460	42,400,826
Louisiana	23,507,811	82,799,447	101,001,833	218,554,054	1,519,373	427,382,518
Maine	2,277,759	11,418,712	625,878	0	504,946	14,827,295
Maryland	5,705,312	7,202,589	1,279,056	55	1,868,993	16,056,005
Massachusetts	8,475,033	12,021,982	264,175	50	77,738	20,838,978
Michigan	23,116,474	61,963,793	818,096	8,390,267	25,566,285	119,854,915
Minnesota	8,219,892	41,424,666	852,499	20	1,544,178	52,041,255
Mississippi	14,386,744	41,376,569	2,252,717	40,396,040	5,241,015	103,653,085
Missouri	11,459,829	32,831,094	1,518,912	30	22,887,547	68,697,412
Montana	1,694,767	781,592	105,362	0	40,095,368	42,677,089
Nebraska	4,613,943	12,145,352	562,466	10	60,890	17,382,661
Nevada	384,560	337,720	251	0	2,547,192	3,269,723
New Hampshire	2,257,225	5,680,888	254,243	35	106,210	8,298,601
New Jersey	8,759,034	15,620,185	475,408	115	1,101,908	25,956,650
New Mexico	550,623	1,914,586	14	20	30,183,583	32,648,826
New York	21,708,394	35,327,874	1,613,734	145	1,740,192	60,390,339
North Carolina	24,621,087	64,920,545	1,384,177	85	33,021,887	123,947,781
North Dakota	480,221	1,526,131	334	0	101,401	2,108,087
Ohio	36,655,299	77,123,354	5,974,430	25,426,150	23,213,043	168,392,276
Oklahoma	6,045,161	22,025,184	539,528	4,171,702	330,986	33,112,561
Oregon	4,839,316	13,578,546	561,559	25	3,718,295	22,697,741
Pennsylvania	29,943,776	42,675,682	1,584,412	115	15,116,671	89,320,656
Puerto Rico	7,339,484	8,056,424	118,849	738	25,457	15,540,952
Rhode Island	2,946,965	2,253,600	61,683	0	1,272	5,263,520
South Carolina	18,778,984	45,993,191	972,205	67	1,492,753	67,237,200
South Dakota	468,002	2,424,153	44,867	0	1	2,937,023
Tennessee	50,976,198	88,433,634	4,874,245	54,068,496	9,129,838	207,482,411
Texas	75,519,522	87,771,231	4,422,713	239,769,502	11,309,467	418,792,435
Utah	11,686,651	100,750,989	278,735	45	12,716,701	125,433,121
Vermont	250,480	630,922	91,158	5	44,038	1,016,603
Virgin Islands	831,913	380,552	195,751	0	75,224	1,483,440
Virginia	21,265,391	54,271,301	2,156,971	859	1,912,450	79,606,972
Washington	11,689,766	16,576,793	12,514,439	35	647,467	41,428,500
West Virginia	11,567,861	16,727,850	2,009,079	5	7,879,311	38,184,106
Wisconsin	10,000,714	31,136,858	460,928	20	3,403,004	45,001,524
Wyoming	834,691	3,483,087	120,097	6,818,227	325,763	11,581,865
Total	681,485,117	1,522,025,638	197,372,969	725,234,160	441,320,232	3,567,438,116

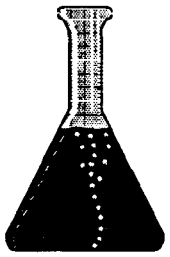
State	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
Alabama	996,844	17,873,317	18,870,161
Alaska	4	90	94
American Samoa	0	0	0
Arizona	1,336,730	1,178,004	2,514,734
Arkansas	2,169,950	7,752,439	9,922,389
California	31,948,898	26,015,855	57,964,753
Colorado	677,984	3,368,753	4,046,737
Connecticut	2,117,634	11,131,549	13,249,183
Delaware	4,003,760	1,697,856	5,701,616
Florida	17,292,584	7,070,522	24,363,106
Georgia	7,874,116	14,999,531	22,873,647
Hawaii	388,060	8,459	396,519
Idaho	2,864,047	209,897	3,073,944
Illinois	62,680,448	50,589,270	113,269,718
Indiana	7,102,996	35,722,844	42,825,840
Iowa	7,225,667	4,084,301	11,309,968
Kansas	2,703,128	8,354,971	11,058,099
Kentucky	2,218,064	23,656,532	25,874,596
Louisiana	53,776	15,537,940	15,591,716
Maine	898,682	1,353,032	2,251,714
Maryland	4,434,876	2,937,960	7,372,836
Massachusetts	7,164,378	13,226,579	20,390,957
Michigan	13,995,825	61,600,971	75,596,796
Minnesota	6,863,998	4,456,035	11,320,033
Mississippi	1,266,384	3,837,294	5,103,678
Missouri	30,356,538	9,821,584	40,178,122
Montana	30,042	343,162	373,204
Nebraska	1,189,130	7,239,710	8,428,840
Nevada	15,277	141,481	156,758
New Hampshire	450,275	1,263,123	1,713,398
New Jersey	56,375,986	32,489,956	88,865,942
New Mexico	69,430	271,391	340,821
New York	12,797,572	23,823,181	36,620,753
North Carolina	5,710,056	8,811,202	14,521,258
North Dakota	222,855	75,165	298,020
Ohio	24,831,867	78,417,406	103,249,273
Oklahoma	141,875	14,053,044	14,194,919
Oregon	7,548,585	2,471,360	10,019,945
Pennsylvania	17,104,183	72,944,912	90,049,095
Puerto Rico	8,205,082	4,610,687	12,815,769
Rhode Island	1,222,729	1,822,315	3,045,044
South Carolina	3,044,064	10,533,161	13,577,225
South Dakota	211,803	402,146	613,949
Tennessee	16,476,858	15,766,615	32,243,473
Texas	38,278,686	78,584,462	116,863,148
Utah	895,732	88,099,619	88,995,351
Vermont	43,208	202,167	245,375
Virgin Islands	0	13,200	13,200
Virginia	17,104,859	9,021,136	26,125,995
Washington	1,296,824	3,739,265	5,036,089
West Virginia	3,057,250	12,434,061	15,491,311
Wisconsin	13,138,471	21,358,651	34,497,122
Wyoming	250	26,222	26,472
Total	448,098,320	815,444,385	1,263,542,705

Table 3. TRI Releases by State, 1990 (Ordered by Total Release).

State	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Louisiana	23,507,811	82,799,447	101,001,833	218,554,054	1,519,373	427,382,518
Texas	75,519,522	87,771,231	4,422,713	239,769,502	11,309,467	418,792,435
Tennessee	50,976,198	88,433,634	4,874,245	54,068,496	9,129,838	207,482,411
Indiana	40,588,385	67,560,102	2,849,018	9,192,193	48,598,082	168,787,780
Ohio	36,655,299	77,123,354	5,974,430	25,426,150	23,213,043	168,392,276
Utah	11,686,651	100,750,989	278,735	45	12,716,701	125,433,121
North Carolina	24,621,087	64,920,545	1,384,177	85	33,021,887	123,947,781
Michigan	23,116,474	61,963,793	818,096	8,390,267	25,566,285	119,854,915
Illinois	32,172,714	55,746,559	6,260,825	9,449,680	15,364,536	118,994,314
Alabama	17,039,757	83,228,365	2,797,183	6,317,242	3,192,540	112,575,087
Florida	23,445,364	21,772,997	2,781,622	21,536,061	37,022,470	106,558,514
Mississippi	14,386,744	41,376,569	2,252,717	40,396,040	5,241,015	103,653,085
California	31,187,937	47,749,728	11,086,247	1,769,286	5,107,349	96,900,547
Kansas	8,667,036	20,151,745	1,044,876	58,706,062	1,323,496	89,893,215
Pennsylvania	29,943,776	42,675,682	1,584,412	115	15,116,671	89,320,656
Virginia	21,265,391	54,271,301	2,156,971	859	1,912,450	79,606,972
Georgia	16,794,876	55,737,630	4,277,692	810	1,063,632	77,874,640
Arizona	4,194,813	8,794,458	158	30	59,023,323	72,012,782
Missouri	11,459,829	32,831,094	1,518,912	30	22,887,547	68,697,412
South Carolina	18,778,984	45,993,191	972,205	67	1,492,753	67,237,200
New York	21,708,394	35,327,874	1,613,734	145	1,740,192	60,390,339
Arkansas	9,220,903	21,988,517	2,607,620	20,554,009	3,459,961	57,831,010
Minnesota	8,219,892	41,424,666	852,499	20	1,544,178	52,041,255
Wisconsin	10,000,714	31,136,858	460,928	20	3,403,004	45,001,524
Montana	1,694,767	781,592	105,362	0	40,095,368	42,677,089
Kentucky	11,449,246	29,168,785	683,285	50	1,099,460	42,400,826
Washington	11,689,766	16,576,793	12,514,439	35	647,467	41,428,500
Iowa	6,970,217	31,122,209	2,313,802	20	283,079	40,689,327
West Virginia	11,567,861	16,727,850	2,009,079	5	7,879,311	38,184,106
Oklahoma	6,045,161	22,025,184	539,528	4,171,702	330,986	33,112,561
New Mexico	550,623	1,914,586	14	20	30,183,583	32,648,826
New Jersey	8,759,034	15,620,185	475,408	115	1,101,908	25,956,650
Oregon	4,839,316	13,578,546	561,559	25	3,718,295	22,697,741
Connecticut	8,170,945	8,994,643	4,012,127	0	165,742	21,343,457
Massachusetts	8,475,033	12,021,982	264,175	50	77,738	20,838,978
Alaska	396,347	14,577,730	5,569,839	20	29,076	20,573,012
Nebraska	4,613,943	12,145,352	562,466	10	60,890	17,382,661
Maryland	5,705,312	7,202,589	1,279,056	55	1,868,993	16,056,00
Puerto Rico	7,339,484	8,056,424	118,849	738	25,457	15,540,95
Maine	2,277,759	11,418,712	625,878	0	504,946	14,827,29
Idaho	1,940,866	3,743,919	474,398	0	5,434,670	11,593,85
Wyoming	834,691	3,483,087	120,097	6,818,227	325,763	11,581,86
New Hampshire	2,257,225	5,680,888	254,243	35	106,210	8,298,60
Colorado	3,053,928	3,707,549	175,972	280	478,011	7,415,74
Delaware	1,762,984	4,254,882	431,506	0	130,349	6,579,72
Rhode Island	2,946,965	2,253,600	61,683	0	1,272	5,263,52
Nevada	384,560	337,720	251	0	2,547,192	3,269,72
South Dakota	468,002	2,424,153	44,867	0	1	2,937,02
North Dakota	480,221	1,526,131	334	0	101,401	2,108,08
Virgin Islands	831,913	380,552	195,751	0	75,224	1,483,44
Vermont	250,480	630,922	91,158	5	44,038	1,016,60
Hawaii	550,617	138,744	15,990	111,500	34,009	850,86
American Samoa	19,300	0	5	0	0	19,30
Total	681,485,117	1,522,025,638	197,372,969	725,234,160	441,320,232	3,567,438,1

Table 4. TRI Releases to Air, Water, and Land by State, 1990 (Ordered by Total Air, Water, and Land Releases).

State	Air Emissions Pounds	Surface Water Discharges Pounds	Releases to Land Pounds	Total Air/Water/Land Releases Pounds
Louisiana	106,307,258	101,001,833	1,519,373	208,828,464
Texas	163,290,753	4,422,713	11,309,467	179,022,933
Indiana	108,148,487	2,849,018	48,598,082	159,595,587
Tennessee	139,409,832	4,874,245	9,129,838	153,413,915
Ohio	113,778,653	5,974,430	23,213,043	142,966,126
Utah	112,437,640	278,735	12,716,701	125,433,076
North Carolina	89,541,632	1,384,177	33,021,887	123,947,696
Michigan	85,080,267	818,096	25,566,285	111,464,648
Illinois	87,919,273	6,260,825	15,364,536	109,544,634
Alabama	100,268,122	2,797,183	3,192,540	106,257,845
California	78,937,665	11,086,247	5,107,349	95,131,261
Pennsylvania	72,619,458	1,584,412	15,116,671	89,320,541
Florida	45,218,361	2,781,622	37,022,470	85,022,453
Virginia	75,536,692	2,156,971	1,912,450	79,606,113
Georgia	72,532,506	4,277,692	1,063,632	77,873,830
Arizona	12,989,271	158	59,023,323	72,012,752
Missouri	44,290,923	1,518,912	22,887,547	68,697,382
South Carolina	64,772,175	972,205	1,492,753	67,237,133
Mississippi	55,763,313	2,252,717	5,241,015	63,257,045
New York	57,036,268	1,613,734	1,740,192	60,390,194
Minnesota	49,644,558	852,499	1,544,178	52,041,235
Wisconsin	41,137,572	460,928	3,403,004	45,001,504
Montana	2,476,359	105,362	40,095,368	42,677,089
Kentucky	40,618,031	683,285	1,099,460	42,400,776
Washington	28,266,559	12,514,439	647,467	41,428,465
Iowa	38,092,426	2,313,802	283,079	40,689,307
West Virginia	28,295,711	2,009,079	7,879,311	38,184,101
Arkansas	31,209,420	2,607,620	3,459,961	37,277,001
New Mexico	2,465,209	14	30,183,583	32,648,806
Kansas	28,818,781	1,044,876	1,323,496	31,187,153
Oklahoma	28,070,345	539,528	330,986	28,940,859
New Jersey	24,379,219	475,408	1,101,908	25,956,535
Oregon	18,417,862	561,559	3,718,295	22,697,716
Connecticut	17,165,588	4,012,127	165,742	21,343,457
Massachusetts	20,497,015	264,175	77,738	20,838,928
Alaska	14,974,077	5,569,839	29,076	20,572,992
Nebraska	16,759,295	562,466	60,890	17,382,651
Maryland	12,907,901	1,279,056	1,868,993	16,055,950
Puerto Rico	15,395,908	118,849	25,457	15,540,214
Maine	13,696,471	625,878	504,946	14,827,295
Idaho	5,684,785	474,398	5,434,670	11,593,853
New Hampshire	7,938,113	254,243	106,210	8,298,566
Colorado	6,761,477	175,972	478,011	7,415,460
Delaware	6,017,866	431,506	130,349	6,579,721
Rhode Island	5,200,565	61,683	1,272	5,263,520
Wyoming	4,317,778	120,097	325,763	4,763,638
Nevada	722,280	251	2,547,192	3,269,723
South Dakota	2,892,155	44,867	1	2,937,023
North Dakota	2,006,352	334	101,401	2,108,087
Virgin Islands	1,212,465	195,751	75,224	1,483,440
Vermont	881,402	91,158	44,038	1,016,598
Hawaii	689,361	15,990	34,009	739,360
American Samoa	19,300	5	0	19,305
Total	2,203,510,755	197,372,969	441,320,232	2,842,203,956



THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

1990 Releases and Transfers by Chemical

Table 5. The 15 Chemicals with the Largest Emissions to Air, 1990.

CAS Number	Chemical	Air Emissions Pounds
108-88-3	Toluene	233,825,522
7664-41-7	Ammonia	208,616,060
67-56-1	Methanol	183,103,117
67-64-1	Acetone	180,290,480
71-55-6	1,1,1-Trichloroethane	161,399,580
1330-20-7	Xylene (mixed isomers)	139,976,798
78-93-3	Methyl ethyl ketone	121,327,056
7782-50-5	Chlorine	104,917,890
75-15-0	Carbon disulfide	98,222,679
75-09-2	Dichloromethane	92,497,116
7647-01-0	Hydrochloric acid	73,446,926
	Glycol ethers	46,981,049
76-13-1	Freon 113	45,359,909
74-85-1	Ethylene	38,543,316
79-01-6	Trichloroethylene	37,897,948
	Total	1,766,405,446

Table 6. The 15 Chemicals with the Largest Discharges to Surface Water, 1990.

CAS Number	Chemical	Surface Water Discharges Pounds
7664-38-2	Phosphoric acid	74,733,560
7664-41-7	Ammonia	44,437,803
7664-93-9	Sulfuric acid	25,855,900
67-56-1	Methanol	18,171,884
7783-20-2	Ammonium sulfate (solution)	9,171,794
6484-52-2	Ammonium nitrate (solution)	7,629,700
7647-01-0	Hydrochloric acid	2,769,970
107-21-1	Ethylene glycol	2,695,768
67-64-1	Acetone	1,280,863
7782-50-5	Chlorine	1,280,604
	Zinc compounds	1,087,346
67-66-3	Chloroform	1,001,446
50-00-0	Formaldehyde	759,567
	Manganese compounds	722,676
	Chromium compounds	405,831
	Total	192,004,712

Table 7. The 15 Chemicals with the Largest Releases to Land, 1990.

CAS Number	Chemical	Releases to Land Pounds
	Zinc compounds	109,649,130
	Manganese compounds	83,444,913
7664-38-2	Phosphoric acid	57,480,518
	Copper compounds	55,687,136
	Chromium compounds	18,174,599
	Lead compounds	14,725,761
7664-41-7	Ammonia	13,793,828
7440-50-8	Copper	11,419,098
7440-66-6	Zinc (fume or dust)	11,297,832
7439-96-5	Manganese	10,840,007
	Barium compounds	8,134,325
67-56-1	Methanol	5,505,842
7439-92-1	Lead	5,338,494
6484-52-2	Ammonium nitrate (solution)	4,168,380
	Nickel compounds	3,051,580
	Total	412,711,443

Table 8. The 15 Chemicals with the Largest Underground Injection, 1990.

CAS Number	Chemical	Underground Injection Pounds
7664-41-7	Ammonia	259,071,166
7647-01-0	Hydrochloric acid	154,098,891
7664-93-9	Sulfuric acid	112,116,692
6484-52-2	Ammonium nitrate (solution)	38,912,210
7697-37-2	Nitric acid	31,912,662
67-56-1	Methanol	25,370,822
79-10-7	Acrylic acid	21,525,000
75-05-8	Acetonitrile	19,445,260
50-00-0	Formaldehyde	8,184,829
7783-20-2	Ammonium sulfate (solution)	5,221,981
107-13-1	Acrylonitrile	4,925,276
67-64-1	Acetone	4,662,386
108-95-2	Phenol	4,421,439
79-06-1	Acrylamide	4,214,315
71-36-3	n-Butyl alcohol	3,529,441
	Total	697,612,370

Table 9. The 15 Chemicals with the Largest Transfers to Publicly Owned Treatment Works, 1990.

CAS Number	Chemical	Transfers to POTWs Pounds
67-56-1	Methanol	125,203,885
7664-41-7	Ammonia	80,031,200
7783-20-2	Ammonium sulfate (solution)	63,040,033
7664-93-9	Sulfuric acid	30,460,264
7647-01-0	Hydrochloric acid	24,272,295
107-21-1	Ethylene glycol	15,206,867
7697-37-2	Nitric acid	13,218,392
67-64-1	Acetone	12,237,581
	Glycol ethers	9,909,482
7664-38-2	Phosphoric acid	7,837,294
6484-52-2	Ammonium nitrate (solution)	7,726,117
	Manganese compounds	6,550,657
50-00-0	Formaldehyde	6,270,359
108-95-2	Phenol	5,059,604
71-36-3	n-Butyl alcohol	4,237,281
	Total	411,261,311

Table 10. The 15 Chemicals with the Largest Transfers to Other Off-site Locations, 1990.

CAS Number	Chemical	Transfers to Other Off-site Locations Pounds
	Zinc compounds	81,709,236
7664-93-9	Sulfuric acid	73,210,682
	Copper compounds	45,070,491
	Lead compounds	43,967,983
7647-01-0	Hydrochloric acid	43,692,876
67-56-1	Methanol	43,353,675
108-88-3	Toluene	38,374,945
	Manganese compounds	29,873,260
67-64-1	Acetone	22,278,953
1330-20-7	Xylene (mixed isomers)	21,386,050
7697-37-2	Nitric acid	20,954,662
78-93-3	Methyl ethyl ketone	18,640,870
	Barium compounds	18,171,224
	Arsenic compounds	16,747,829
	Chromium compounds	15,670,892
	Total	533,103,628

Table 11. Releases and Transfers of All TRI Chemicals, 1990 (Ordered Alphabetically).

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
75-07-0	Acetaldehyde	2,504,978	4,375,685	78,345	1,963,498	29,665	8,952,171
60-35-5	Acetamide	12	23	5	0	0	40
67-64-1	Acetone	89,412,951	90,877,529	1,280,863	4,662,386	235,174	186,468,903
75-05-8	Acetonitrile	805,851	857,666	10,726	19,445,260	248	21,119,751
107-02-8	Acrolein	5,816	16,213	5	103,059	5	125,098
79-06-1	Acrylamide	42,632	7,336	3,814	4,214,315	565	4,268,662
79-10-7	Acrylic acid	228,357	198,582	44,133	21,525,000	94,333	22,090,405
107-13-1	Acrylonitrile	641,310	2,506,739	3,877	4,925,276	268	8,077,470
107-18-6	Allyl alcohol	13,368	7,478	2,205	0	0	23,071
107-05-1	Allyl chloride	169,368	36,656	135	1,200	0	207,359
7429-90-5	Aluminum (fume or dust)	631,284	1,491,561	56,805	10	1,328,181	3,507,841
1344-28-1	Aluminum oxide	158,803	597,264	9,086	20	772,934	1,538,107
7664-41-7	Ammonia	52,121,470	156,494,590	44,437,803	259,071,166	13,793,828	525,918,857
6484-52-2	Ammonium nitrate (solution)	381,380	2,325,754	7,629,700	38,912,210	4,168,380	53,417,424
7783-20-2	Ammonium sulfate (solution)	18,850	355,717	9,171,794	5,221,981	2,531,338	17,299,680
62-53-3	Aniline	210,969	263,870	36,008	2,435,752	3,099	2,949,698
90-04-0	o-Anisidine	500	1,341	141	0	250	2,232
104-94-9	p-Anisidine	5	10	5	0	0	20
120-12-7	Anthracene	27,065	38,373	1,359	0	4,806	71,603
7440-36-0	Antimony	6,974	45,384	4,714	165	182,272	239,509
7440-38-2	Arsenic	1,964	3,872	1,640	5	50,530	58,011
1332-21-4	Asbestos (friable)	6,870	10,458	515	5	302,282	320,130
7440-39-3	Barium	46,054	32,157	54,201	15	359,704	492,131
98-87-3	Benzal chloride	1,744	11	0	0	0	1,755
71-43-2	Benzene	13,511,366	10,895,483	24,943	654,068	724,429	25,810,289
98-07-7	Benzoic trichloride	8,310	25	0	0	0	8,335
98-88-4	Benzoyl chloride	17,667	5,657	0	67,501	260	91,085
94-36-0	Benzoyl peroxide	12,927	1,708	5	5	16,025	30,670
100-44-7	Benzyl chloride	26,024	7,521	265	315	270	34,395
7440-41-7	Beryllium	9	1,361	42	0	6,517	7,929
92-52-4	Biphenyl	752,690	368,315	21,409	63,219	35,577	1,241,210
111-44-4	Bis(2-chloroethyl) ether	3,205	573	83	0	0	3,861
542-88-1	Bis(chloromethyl) ether	2	3	0	0	0	5
108-60-1	Bis(2-chloro-1-methylethyl)ether	3,800	2,430	12,000	0	0	18,230
103-23-1	Bis(2-ethylhexyl) adipate	51,004	55,124	6,919	0	4,074	117,121
75-25-2	Bromoform	48,205	0	0	0	72,000	120,205
74-83-9	Bromomethane	431,397	1,774,422	0	28,000	0	2,233,819
106-99-0	1,3-Butadiene	3,089,320	1,948,311	111,234	1,610	6,448	5,156,923
141-32-2	Butyl acrylate	134,707	166,796	28,231	0	68	329,802
71-36-3	n-Butyl alcohol	6,725,819	25,919,186	323,555	3,529,441	112,062	36,610,063
78-92-2	sec-Butyl alcohol	205,755	475,424	4,315	171,484	51	857,029
75-65-0	tert-Butyl alcohol	1,240,753	326,265	271,260	995,382	24,962	2,858,622
85-68-7	Butyl benzyl phthalate	42,753	184,940	925	260	9,774	238,652
106-88-7	1,2-Butylene oxide	54,696	24,769	4,625	0	5	84,095
123-72-8	Butyraldehyde	214,984	310,692	3,423	1,937	371	531,407
569-64-2	C.I. Basic Green 4	9	7	250	0	0	266
989-38-8	C.I. Basic Red 1	0	0	0	0	0	0
2832-40-8	C.I. Disperse Yellow 3	364	0	26	0	843	1,233
81-88-9	C.I. Food Red 15	0	2	0	0	0	2
97-56-3	C.I. Solvent Yellow 3	0	0	5	0	0	5
7440-43-9	Cadmium	5,115	11,922	1,106	10	91,792	109,945
156-62-7	Calcium cyanamide	12,000	620	0	0	40,000	52,620
133-06-2	Captan	1,783	17,469	505	5,500	505	25,762
63-25-2	Carbaryl	2,299	6,871	505	0	5,555	15,230
75-15-0	Carbon disulfide	3,291,871	94,930,808	40,565	3,900	500	98,267,644
56-23-5	Carbon tetrachloride	403,326	1,267,766	4,644	31,557	1,005	1,708,298
463-58-1	Carbonyl sulfide	12,249	18,622,615	0	0	0	18,634,864
120-80-9	Catechol	2,517	25,220	224,903	0	89,076	341,716
133-90-4	Chloramben	5	5	0	0	0	10
57-74-9	Chlordane	4,244	178	1	0	0	4,423
7782-50-5	Chlorine	2,292,442	102,625,448	1,280,604	73,919	308,254	106,580,667
10049-04-4	Chlorine dioxide	261,702	5,149,849	785	15	20	5,412,371

CAS Number	Chemical	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
75-07-0	Acetaldehyde	167,425	35,421	202,846
60-35-5	Acetamide	0	0	0
67-64-1	Acetone	12,237,581	22,278,953	34,516,534
75-05-8	Acetonitrile	731,313	1,720,806	2,452,119
107-02-8	Acrolein	5	108	113
79-06-1	Acrylamide	37,100	67,283	104,383
79-10-7	Acrylic acid	128,172	270,672	398,844
107-13-1	Acrylonitrile	342,102	862,115	1,204,217
107-18-6	Allyl alcohol	118,005	443,839	561,844
107-05-1	Allyl chloride	6,459	234,000	240,459
7429-90-5	Aluminum (fume or dust)	28,781	14,799,371	14,828,152
1344-28-1	Aluminum oxide	22,404	6,382,483	6,404,887
7664-41-7	Ammonia	80,031,200	10,460,953	90,492,153
6484-52-2	Ammonium nitrate (solution)	7,726,117	1,584,180	9,310,297
7783-20-2	Ammonium sulfate (solution)	63,040,033	4,109,890	67,149,923
62-53-3	Aniline	1,706,763	692,692	2,399,455
90-04-0	o-Anisidine	5,610	99	5,709
104-94-9	p-Anisidine	5	0	5
120-12-7	Anthracene	18,427	855,083	873,510
7440-36-0	Antimony	10,577	300,432	311,009
7440-38-2	Arsenic	1,029	371,405	372,434
1332-21-4	Asbestos (friable)	4,652	8,001,964	8,006,616
7440-39-3	Barium	13,078	498,370	511,448
98-87-3	Benzal chloride	5	37,000	37,005
71-43-2	Benzene	630,669	2,228,781	2,859,450
98-07-7	Benzoic trichloride	5	90	95
98-88-4	Benzoyl chloride	1,353	640,743	642,096
94-36-0	Benzoyl peroxide	48,028	16,527	64,555
100-44-7	Benzyl chloride	45,550	280,212	325,762
7440-41-7	Beryllium	0	1,371	1,371
92-52-4	Biphenyl	1,085,193	397,567	1,482,760
111-44-4	Bis(2-chloroethyl) ether	31,791	20,697	52,488
542-88-1	Bis(chloromethyl) ether	0	0	0
108-60-1	Bis(2-chloro-1-methylethyl)ether	0	0	0
103-23-1	Bis(2-ethylhexyl) adipate	23,637	180,182	203,819
75-25-2	Bromoform	0	0	0
74-83-9	Bromomethane	552,160	2,821	554,981
106-99-0	1,3-Butadiene	14,383	150,145	164,528
141-32-2	Butyl acrylate	127,398	122,589	249,987
71-36-3	n-Butyl alcohol	4,237,281	5,875,063	10,112,344
78-92-2	sec-Butyl alcohol	9,991	73,105	83,096
75-65-0	tert-Butyl alcohol	1,792,590	472,254	2,264,844
85-68-7	Butyl benzyl phthalate	85,732	874,735	960,467
106-88-7	1,2-Butylene oxide	250	8,185	8,435
123-72-8	Butyraldehyde	350,893	4,082	354,975
569-64-2	C.I. Basic Green 4	1,006	500	1,506
989-38-8	C.I. Basic Red 1	0	0	0
2832-40-8	C.I. Disperse Yellow 3	250	219	469
81-88-9	C.I. Food Red 15	270	0	270
97-56-3	C.I. Solvent Yellow 3	5	0	5
7440-43-9	Cadmium	4,482	250,068	254,550
156-62-7	Calcium cyanamide	0	0	0
133-06-2	Captan	255	25,730	25,985
63-25-2	Carbaryl	0	7,092	7,092
75-15-0	Carbon disulfide	121,882	244,231	366,113
56-23-5	Carbon tetrachloride	42,049	1,079,478	1,121,527
463-58-1	Carbonyl sulfide	0	0	0
120-80-9	Catechol	336,096	246,537	582,633
133-90-4	Chloramben	0	15,591	15,591
57-74-9	Chlordane	99	523	622
7782-50-5	Chlorine	1,286,370	675,588	1,961,958
10049-04-4	Chlorine dioxide	1,841	5	1,846

Table 11. Releases and Transfers of All TRI Chemicals, 1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
79-11-8	Chloroacetic acid	20,650	4,754	1,691	0	0	27,095
108-90-7	Chlorobenzene	1,845,230	2,201,569	72,893	49,406	4,267	4,173,365
75-00-3	Chloroethane	1,798,493	2,143,585	35,997	110	93	3,978,278
67-66-3	Chloroform	8,255,323	13,507,138	1,001,446	89,560	57,897	22,911,364
74-87-3	Chloromethane	1,994,876	5,649,012	144,433	199,605	92,260	8,080,186
107-30-2	Chloromethyl methyl ether	33	91	0	0	0	124
126-99-8	Chloroprene	55,032	120,102	750	0	750	176,634
1897-45-6	Chlorothalonil	2,786	9,668	9	0	0	12,463
7440-47-3	Chromium	324,729	413,023	39,746	82	2,725,304	3,502,884
7440-48-4	Cobalt	15,766	20,558	8,853	0	34,758	79,935
7440-50-8	Copper	431,567	829,627	56,009	22,351	11,419,098	12,758,652
8001-58-9	Creosote	578,173	1,439,036	3,105	5	15,582	2,035,901
120-71-8	p-Cresidine	2,607	83	0	0	250	2,940
1319-77-3	Cresol (mixed isomers)	378,803	353,801	2,336	1,634,529	3,855	2,373,324
108-39-4	m-Cresol	4,152	3,415	0	0	0	7,567
95-48-7	o-Cresol	20,824	18,322	36	0	255	39,437
106-44-5	p-Cresol	8,262	230,742	1,955	1,997	2,873	245,829
98-82-8	Cumene	1,400,080	2,703,033	1,876	13,402	19,671	4,138,062
80-15-9	Cumene hydroperoxide	97,285	13,386	427	45,518	6,670	163,286
135-20-6	Cupferron	5	480	34	0	0	519
110-82-7	Cyclohexane	6,108,055	11,107,792	25,979	327,259	34,701	17,603,786
94-75-7	2,4-D (acetic acid)	3,780	3,962	259	2,100	10,662	20,763
1163-19-5	Decabromodiphenyl oxide	15,613	48,687	2,587	48	20,698	87,633
615-05-4	2,4-Diaminoanisole	21	5	0	0	0	26
39156-41-7	2,4-Diaminoanisole sulfate	0	0	0	0	0	0
101-80-4	4,4'-Diaminodiphenyl ether	5	900	413	0	0	1,318
25376-45-8	Diaminotoluene (mixed isomers)	19,595	6,119	955	89,000	265	115,934
95-80-7	2,4-Diaminotoluene	3,801	127	250	0	0	4,178
132-64-9	Dibenzofuran	21,207	9,018	532	0	897	31,654
106-93-4	1,2-Dibromoethane	22,533	35,537	0	495	125	58,690
84-74-2	Dibutyl phthalate	60,436	47,841	558	110,000	167	219,002
25321-22-6	Dichlorobenzene (mixed isomers)	29,606	59,918	1	11	22	89,558
95-50-1	1,2-Dichlorobenzene	155,845	168,103	12,390	15,313	32,588	384,239
541-73-1	1,3-Dichlorobenzene	3,104	5,578	785	0	0	9,467
106-46-7	1,4-Dichlorobenzene	96,238	721,895	3,912	255	38	822,338
91-94-1	3,3'-Dichlorobenzidine	10	15	1	0	0	26
75-27-4	Dichlorobromomethane	632	0	0	0	0	632
107-06-2	1,2-Dichloroethane	1,166,038	4,429,935	48,763	826,672	7,351	6,478,759
540-59-0	1,2-Dichloroethylene	81,311	43,188	54	360	118	125,031
75-09-2	Dichloromethane	35,692,060	56,805,056	192,739	850,018	11,809	93,551,682
120-83-2	2,4-Dichlorophenol	255	565	95	20,400	0	21,315
78-87-5	1,2-Dichloropropane	171,862	458,651	4,253	0	0	634,766
78-88-6	2,3-Dichloropropene	89,740	870	590	37,170	0	128,370
542-75-6	1,3-Dichloropropylene	46,570	12,903	310	0	0	59,783
62-73-7	Dichlorvos	800	510	0	0	0	1,310
115-32-2	Dicofol	13	255	5	0	0	273
111-42-2	Diethanolamine	287,126	96,538	360,137	157,015	120,866	1,021,682
117-81-7	Di-(2-ethylhexyl) phthalate	147,831	1,196,864	2,378	260	19,531	1,366,864
84-66-2	Diethyl phthalate	12,824	83,573	2,697	0	37	99,131
64-67-5	Diethyl sulfate	5,058	435	10	5	280	5,788
119-90-4	3,3'-Dimethoxybenzidine	3	1	4	0	0	8
119-93-7	3,3'-Dimethylbenzidine	0	0	0	0	0	0
57-14-7	1,1-Dimethyl hydrazine	104	364	250	0	0	718
105-67-9	2,4-Dimethylphenol	2,123	5,203	13	56,900	302	64,541
131-11-3	Dimethyl phthalate	76,787	256,768	1,528	750	433	336,266
77-78-1	Dimethyl sulfate	9,303	436	375	0	0	10,114
99-65-0	m-Dinitrobenzene	505	7,361	0	0	358	8,224
528-29-0	o-Dinitrobenzene	51	1,040	0	0	49	1,140
100-25-4	p-Dinitrobenzene	50	759	0	0	14	823
534-52-1	4,6-Dinitro-o-cresol	8	39	131	0	0	178
51-28-5	2,4-Dinitrophenol	17,111	7,586	89,074	111,500	3,307	228,578
121-14-2	2,4-Dinitrotoluene	6,312	51,271	3,735	74,000	2,153	137,471

CAS Number	Chemical	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
79-11-8	Chloroacetic acid	1,785	6,768	8,553
108-90-7	Chlorobenzene	148,728	3,747,266	3,895,994
75-00-3	Chloroethane	10	436,391	436,401
67-66-3	Chloroform	799,120	1,153,889	1,953,009
74-87-3	Chloromethane	47,201	130,668	177,869
107-30-2	Chloromethyl methyl ether	0	0	0
126-99-8	Chloroprene	0	177,746	177,746
1897-45-6	Chlorothalonil	755	204,127	204,882
7440-47-3	Chromium	201,337	9,387,794	9,589,131
7440-48-4	Cobalt	7,917	265,020	272,937
7440-50-8	Copper	154,763	13,032,534	13,187,297
8001-58-9	Creosote	18,929	4,637,301	4,656,230
120-71-8	p-Cresidine	18,750	0	18,750
1319-77-3	Cresol (mixed isomers)	57,073	649,835	706,908
108-39-4	m-Cresol	7,439	14,721	22,160
95-48-7	o-Cresol	53,066	66,247	119,313
106-44-5	p-Cresol	879,959	80,741	960,700
98-82-8	Cumene	254,062	416,412	670,474
80-15-9	Cumene hydroperoxide	3,755	190,086	193,841
135-20-6	Cupferron	530	0	530
110-82-7	Cyclohexane	33,146	1,330,726	1,363,872
94-75-7	2,4-D (acetic acid)	5,581	59,214	64,795
1163-19-5	Decabromodiphenyl oxide	37,100	811,316	848,416
615-05-4	2,4-Diaminoanisole	0	0	0
39156-41-7	2,4-Diaminoanisole sulfate	250	0	250
101-80-4	4,4'-Diaminodiphenyl ether	250	5,857	6,107
25376-45-8	Diaminotoluene (mixed isomers)	80,350	1,167,925	1,248,275
95-80-7	2,4-Diaminotoluene	1,501	0	1,501
132-64-9	Dibenzofuran	40,052	85,225	125,277
106-93-4	1,2-Dibromoethane	255	86,864	87,119
84-74-2	Dibutyl phthalate	19,356	145,990	165,346
25321-22-6	Dichlorobenzene (mixed isomers)	26,769	212,700	239,469
95-50-1	1,2-Dichlorobenzene	76,763	2,847,638	2,924,401
541-73-1	1,3-Dichlorobenzene	30	1,464	1,494
106-46-7	1,4-Dichlorobenzene	12,921	180,756	193,677
91-94-1	3,3'-Dichlorobenzidine	505	16,751	17,256
75-27-4	Dichlorobromomethane	0	0	0
107-06-2	1,2-Dichloroethane	81,514	3,568,409	3,649,923
540-59-0	1,2-Dichloroethylene	0	4,001	4,001
75-09-2	Dichloromethane	1,215,304	8,551,622	9,766,926
120-83-2	2,4-Dichlorophenol	0	60,800	60,800
78-87-5	1,2-Dichloropropane	8,596	6,014	14,610
78-88-6	2,3-Dichloropropene	0	164,340	164,340
542-75-6	1,3-Dichloropropylene	0	1,268	1,268
62-73-7	Dichlorvos	5	3,991	3,996
115-32-2	Dicofol	0	286	286
111-42-2	Diethanolamine	3,460,521	609,815	4,070,336
117-81-7	Di-(2-ethylhexyl) phthalate	93,536	1,477,020	1,570,556
84-66-2	Diethyl phthalate	436,182	85,521	521,703
64-67-5	Diethyl sulfate	1,170	2,826	3,996
119-90-4	3,3'-Dimethoxybenzidine	37	0	37
119-93-7	3,3'-Dimethylbenzidine	5	0	5
57-14-7	1,1-Dimethyl hydrazine	0	8,546	8,546
105-67-9	2,4-Dimethylphenol	4,030	14,642	18,672
131-11-3	Dimethyl phthalate	88,719	57,146	145,865
77-78-1	Dimethyl sulfate	30	33	63
99-65-0	m-Dinitrobenzene	0	0	0
528-29-0	o-Dinitrobenzene	0	0	0
100-25-4	p-Dinitrobenzene	0	0	0
534-52-1	4,6-Dinitro-o-cresol	44,756	204,573	249,329
51-28-5	2,4-Dinitrophenol	261	3,923	4,184
121-14-2	2,4-Dinitrotoluene	12	120,820	120,832

Table 11. Releases and Transfers of All TRI Chemicals, 1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
606-20-2	2,6-Dinitrotoluene	1,486	16,251	416	19,000	0	37,153
25321-14-6	Dinitrotoluene (mixed isomers)	3,839	320	7,112	0	363	11,634
117-84-0	n-Dioctyl phthalate	17,054	12,803	1,842	5	261	31,965
123-91-1	1,4-Dioxane	294,564	303,764	203,967	0	12,545	814,840
106-89-8	Epichlorohydrin	255,755	171,606	10,639	79,220	7,648	524,868
110-80-5	2-Ethoxyethanol	334,199	623,936	42,015	0	0	1,000,150
140-88-5	Ethyl acrylate	116,891	87,333	1,161	10	498	205,893
100-41-4	Ethylbenzene	2,723,279	5,894,359	12,634	213,625	62,626	8,906,523
541-41-3	Ethyl chloroformate	1,302	520	0	0	0	1,822
74-85-1	Ethylene	15,736,049	22,807,267	11,488	27,500	11,005	38,593,309
107-21-1	Ethylene glycol	3,911,506	5,477,345	2,695,768	187,660	1,187,284	13,459,563
75-21-8	Ethylene oxide	785,088	1,662,406	8,911	49,280	24,042	2,529,727
96-45-7	Ethylene thiourea	5	30	0	0	0	35
2164-17-2	Fluometuron	26	19	0	0	0	45
50-00-0	Formaldehyde	2,723,926	10,042,072	759,567	8,184,829	188,613	21,899,007
76-13-1	Freon 113	30,389,887	14,970,022	12,148	1,815	35,457	45,409,329
76-44-8	Heptachlor	3,797	0	1	0	0	3,798
118-74-1	Hexachlorobenzene	1,258	210	124	220	0	1,812
87-68-3	Hexachloro-1,3-butadiene	3,364	1,542	715	330	0	5,951
77-47-4	Hexachlorocyclopentadiene	83,812	773	10	5	0	84,600
67-72-1	Hexachloroethane	1,885	6,156	1	1,500	334	9,876
302-01-2	Hydrazine	23,085	4,793	1,414	423	5	29,720
10034-93-2	Hydrazine sulfate	5	252	0	138,941	0	139,198
7647-01-0	Hydrochloric acid	5,436,543	68,010,383	2,769,970	154,098,891	514,830	230,830,617
74-90-8	Hydrogen cyanide	55,825	614,750	3,824	1,597,552	48	2,271,999
7664-39-3	Hydrogen fluoride	3,250,767	5,295,297	11,675	20	8,304	8,566,063
123-31-9	Hydroquinone	6,166	5,221	4,525	284,020	295	300,227
78-84-2	Isobutyraldehyde	149,031	341,247	80	864	1	491,223
67-63-0	Isopropyl alcohol (manufacturing)	1,069,174	2,110,323	11,131	15	32,955	3,223,598
80-05-7	4,4'-Isopropylidenediphenol	92,454	90,445	2,412	23,000	555,917	764,228
120-58-1	Isosafrole	5	0	0	0	0	5
7439-92-1	Lead	495,989	364,584	24,659	45	5,338,494	6,223,771
58-89-9	Lindane	1,011	538	250	0	5	1,804
108-31-6	Maleic anhydride	90,604	402,465	1,373	10	120,816	615,268
12427-38-2	Maneb	270	521	5	0	0	796
7439-96-5	Manganese	653,739	945,099	139,681	800	10,840,007	12,579,326
7439-97-6	Mercury	14,020	8,384	751	0	4,184	27,339
67-56-1	Methanol	38,013,004	145,090,113	18,171,884	25,370,822	5,505,842	232,151,665
72-43-5	Methoxychlor	756	846	505	0	255	2,362
109-86-4	2-Methoxyethanol	1,273,514	1,198,567	40,340	4,540	3,233	2,520,194
96-33-3	Methyl acrylate	79,059	170,167	470	99	0	249,795
1634-04-4	Methyl tert-butyl ether	667,560	2,117,064	42,667	112,400	1,501	2,941,192
101-14-4	4,4'-Methylenebis(2-chloro aniline)	1,510	1,255	0	0	0	2,765
101-68-8	Methylenebis(phenylisocyanate)	397,015	279,377	80	30	226,703	903,205
74-95-3	Methylene bromide	51,164	13,630	0	0	0	64,794
101-77-9	4,4'-Methylenedianiline	14,250	5,273	1,201	57,250	6	77,980
78-93-3	Methyl ethyl ketone	37,588,656	83,738,400	65,213	117,204	81,940	121,591,413
60-34-4	Methyl hydrazine	1	0	0	0	0	1
74-88-4	Methyl iodide	29,443	373	1	5,085	0	34,902
108-10-1	Methyl isobutyl ketone	9,300,401	18,010,971	53,798	52,221	28,103	27,445,494
624-83-9	Methyl isocyanate	12,983	1,390	0	0	500	14,873
80-62-6	Methyl methacrylate	558,481	1,557,797	6,981	210,015	593	2,333,867
90-94-8	Michler's ketone	0	0	0	0	0	0
1313-27-5	Molybdenum trioxide	21,841	41,921	102,840	170,650	49,120	386,372
91-20-3	Naphthalene	1,988,558	1,717,563	36,080	28,152	142,130	3,912,483
134-32-7	alpha-Naphthylamine	250	250	0	0	0	500
7440-02-0	Nickel	286,156	368,303	56,813	9,111	2,989,862	3,710,245
7697-37-2	Nitric acid	746,283	3,395,206	159,099	31,912,662	394,758	36,608,008
139-13-9	Nitrilotriacetic acid	25	1,000	7,700	0	0	8,725
99-59-2	5-Nitro-o-anisidine	5	5	0	0	0	10
98-95-3	Nitrobenzene	51,251	15,009	1,419	608,000	755	676,434
55-63-0	Nitroglycerin	1,053	29,550	11,580	0	17,150	59,333

CAS Number	Chemical	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
606-20-2	2,6-Dinitrotoluene	0	30,230	30,230
25321-14-6	Dinitrotoluene (mixed isomers)	690,000	16,084	706,084
117-84-0	n-Dioctyl phthalate	6,188	194,367	200,555
123-91-1	1,4-Dioxane	210,938	101,048	311,986
106-89-8	Epichlorohydrin	57,931	669,716	727,647
110-80-5	2-Ethoxyethanol	48,641	198,211	246,852
140-88-5	Ethyl acrylate	12,973	100,283	113,256
100-41-4	Ethylbenzene	121,296	2,218,947	2,340,243
541-41-3	Ethyl chloroformate	0	0	0
74-85-1	Ethylene	11	194,412	194,423
107-21-1	Ethylene glycol	15,206,867	10,683,493	25,890,360
75-21-8	Ethylene oxide	266,464	2,729	269,193
96-45-7	Ethylene thiourea	255	16,609	16,864
2164-17-2	Fluometuron	81,085	3,393	84,478
50-00-0	Formaldehyde	6,270,359	1,882,415	8,152,774
76-13-1	Freon 113	91,720	2,545,723	2,637,443
76-44-8	Heptachlor	58	85,306	85,364
118-74-1	Hexachlorobenzene	23	53,010	53,033
87-68-3	Hexachloro-1,3-butadiene	958	84,345	85,303
77-47-4	Hexachlorocyclopentadiene	904	44,109	45,013
67-72-1	Hexachloroethane	0	128,241	128,241
302-01-2	Hydrazine	11,367	25,474	36,841
10034-93-2	Hydrazine sulfate	250	250	500
7647-01-0	Hydrochloric acid	24,272,295	43,692,876	67,965,171
74-90-8	Hydrogen cyanide	290	4,127	4,417
7664-39-3	Hydrogen fluoride	70,951	3,778,591	3,849,542
123-31-9	Hydroquinone	275,740	141,089	416,829
78-84-2	Isobutyraldehyde	35,728	41,987	77,715
67-63-0	Isopropyl alcohol (manufacturing)	98,154	972,856	1,071,010
80-05-7	4,4'-Isopropylidenediphenol	42,334	477,272	519,606
120-58-1	Isosafrole	250	0	250
7439-92-1	Lead	33,203	9,447,358	9,480,561
58-89-9	Lindane	5	3,052	3,057
108-31-6	Maleic anhydride	643,342	737,942	1,381,284
12427-38-2	Maneb	0	5,850	5,850
7439-96-5	Manganese	62,133	11,505,663	11,567,796
7439-97-6	Mercury	42	168,079	168,121
67-56-1	Methanol	125,203,885	43,353,675	168,557,560
72-43-5	Methoxychlor	0	1,487	1,487
109-86-4	2-Methoxyethanol	530,365	897,943	1,428,308
96-33-3	Methyl acrylate	9,377	743,707	753,084
1634-04-4	Methyl tert-butyl ether	123,291	55,580	178,871
101-14-4	4,4'-Methylenebis(2-chloro aniline)	0	2,105	2,105
101-68-8	Methylenebis(phenylisocyanate)	5,171	1,763,860	1,769,031
74-95-3	Methylene bromide	8,579	49,085	57,664
101-77-9	4,4'-Methylenedianiline	2,434	106,306	108,740
78-93-3	Methyl ethyl ketone	787,817	18,640,870	19,428,687
60-34-4	Methyl hydrazine	0	0	0
74-88-4	Methyl iodide	0	228	228
108-10-1	Methyl isobutyl ketone	1,258,909	4,486,484	5,745,393
624-83-9	Methyl isocyanate	0	0	0
80-62-6	Methyl methacrylate	145,841	1,129,562	1,275,403
90-94-8	Michler's ketone	0	27,591	27,591
1313-27-5	Molybdenum trioxide	31,834	578,464	610,298
91-20-3	Naphthalene	167,442	1,809,080	1,976,522
134-32-7	alpha-Naphthylamine	0	534	534
7440-02-0	Nickel	119,989	5,110,006	5,229,995
7697-37-2	Nitric acid	13,218,392	20,954,662	34,173,054
139-13-9	Nitrilotriacetic acid	3,300	0	3,300
99-59-2	5-Nitro-o-anisidine	5	0	5
98-95-3	Nitrobenzene	1,372	108,352	109,724
55-63-0	Nitroglycerin	84	32,936	33,020

Table 11. Releases and Transfers of All TRI Chemicals, 1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
88-75-5	2-Nitrophenol	0	4	29	0	0	33
100-02-7	4-Nitrophenol	7,570	83	31	1,200	0	8,884
79-46-9	2-Nitropropane	62,836	21,422	1,100	87,000	0	172,358
156-10-5	p-Nitrosodiphenylamine	24	0	0	0	0	24
121-69-7	N,N-Dimethylaniline	17,705	33,010	16,030	0	0	66,745
86-30-6	N-Nitrosodiphenylamine	0	0	0	0	0	0
56-38-2	Parathion	296	317	10	0	10	633
87-86-5	Pentachlorophenol	15,507	7,699	2,577	0	1,941	27,724
79-21-0	Peracetic acid	2,066	3,766	113	0	1,826	7,771
108-95-2	Phenol	3,199,563	4,455,302	271,580	4,421,439	256,043	12,603,927
106-50-3	p-Phenylenediamine	768	0	0	0	0	768
90-43-7	2-Phenylphenol	8,925	985	135	10	530	10,585
75-44-5	Phosgene	2,423	2,430	15	10	20	4,898
7664-38-2	Phosphoric acid	402,491	1,200,153	74,733,560	1,500,404	57,480,518	135,317,126
7723-14-0	Phosphorus (yellow or white)	19,310	4,913	2,343	0	2,189,653	2,216,219
85-44-9	Phthalic anhydride	147,783	539,687	369	0	9,605	697,444
88-89-1	Picric acid	1	1	2	1,249,930	2	1,249,936
1336-36-3	Polychlorinated biphenyls (PCBs)	5	0	0	0	71,366	71,371
123-38-6	Propionaldehyde	340,631	648,355	491	34,394	0	1,023,871
114-26-1	Propoxur	260	10	5	0	0	275
115-07-1	Propylene	12,107,152	9,392,758	867	5	316	21,501,098
75-55-8	Propyleneimine	330	322	0	0	0	652
75-56-9	Propylene oxide	490,390	869,606	70,780	120,005	3,880	1,554,661
110-86-1	Pyridine	64,227	48,263	7,336	514,955	25	634,806
91-22-5	Quinoline	20,513	7,177	17	0	198	27,905
106-51-4	Quinone	711	891	5	0	0	1,607
82-68-8	Quintozene	255	16	0	0	0	271
81-07-2	Saccharin (manufacturing)	68	258	0	0	0	326
94-59-7	Safrole	5	0	0	0	0	5
7782-49-2	Selenium	1,260	799	452	0	171,283	173,794
7440-22-4	Silver	4,907	7,439	298	5	3,725	16,374
100-42-5	Styrene	13,472,563	18,204,101	37,371	29,045	166,746	31,909,826
96-09-3	Styrene oxide	1,535	888	0	0	0	2,423
7664-93-9	Sulfuric acid	1,596,048	21,963,187	25,855,900	112,116,692	1,863,934	163,395,761
79-34-5	1,1,2,2-Tetrachloroethane	38,323	6,273	3,529	80	495	48,700
127-18-4	Tetrachloroethylene	8,790,493	12,854,503	21,505	11,012	1,017	21,678,530
961-11-5	Tetrachlorvinphos	500	254	0	0	0	754
7440-28-0	Thallium	250	500	5	0	0	755
62-56-6	Thiourea	2,300	565	572	4,800	265	8,502
1314-20-1	Thorium dioxide	250	610	0	0	0	860
7550-45-0	Titanium tetrachloride	42,397	11,963	0	0	0	54,360
108-88-3	Toluene	77,249,500	156,576,022	198,260	1,400,654	367,537	235,791,973
584-84-9	Toluene-2,4-diisocyanate	18,803	38,510	0	0	5	57,318
91-08-7	Toluene-2,6-diisocyanate	6,009	19,437	5	0	5	25,456
26471-62-5	Toluenediisocyanate (mixed isomers)	17,534	33,098	25	5	275	50,937
95-53-4	o-Toluidine	5,367	2,075	252	250	8,486	16,430
8001-35-2	Toxaphene	0	0	0	0	0	0
52-68-6	Trichlorfon	250	254	6	0	0	510
120-82-1	1,2,4-Trichlorobenzene	106,656	270,210	7,417	3,479	725	388,487
71-55-6	1,1,1-Trichloroethane	82,110,866	79,288,714	16,313	1,581	62,868	161,480,342
79-00-5	1,1,2-Trichloroethane	106,907	491,797	1,351	1,091	265	601,411
79-01-6	Trichloroethylene	18,110,383	19,787,565	14,209	805	13,154	37,926,116
88-06-2	2,4,6-Trichlorophenol	0	78	79	0	0	157
1582-09-8	Trifluralin	12,992	2,616	12	0	5	15,625
95-63-6	1,2,4-Trimethylbenzene	1,988,290	2,430,019	5,617	28,582	12,182	4,464,690
51-79-6	Urethane	760	3,310	0	5	270	4,345
7440-62-2	Vanadium (fume or dust)	2,623	12,683	670	0	63,952	79,928
108-05-4	Vinyl acetate	1,204,493	4,352,266	5,558	1,360,901	14,151	6,937,369
593-60-2	Vinyl bromide	9,190	915	270	0	0	10,375
75-01-4	Vinyl chloride	313,835	821,974	7,291	593	2,521	1,146,214
75-35-4	Vinylidene chloride	69,562	234,040	251	155	226	304,234
1330-20-7	Xylene (mixed isomers)	36,744,901	103,231,897	42,377	105,420	444,675	140,569,270

CAS Number	Chemical	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
88-75-5	2-Nitrophenol	4,600	35,894	40,494
100-02-7	4-Nitrophenol	400,774	62,617	463,391
79-46-9	2-Nitropropane	0	6,100	6,100
156-10-5	p-Nitrosodiphenylamine	0	1,300	1,300
121-69-7	N,N-Dimethylaniline	198,535	108,870	307,405
86-30-6	N-Nitrosodiphenylamine	0	1,853,445	1,853,445
56-38-2	Parathion	0	26,566	26,566
87-86-5	Pentachlorophenol	4,349	75,159	79,508
79-21-0	Peracetic acid	2,000	1,821	3,821
108-95-2	Phenol	5,059,604	6,252,178	11,311,782
106-50-3	p-Phenylenediamine	23,509	41,586	65,095
90-43-7	2-Phenylphenol	5,447	1,000	6,447
75-44-5	Phosgene	0	1,713	1,713
7664-38-2	Phosphoric acid	7,837,294	5,093,703	12,930,997
7723-14-0	Phosphorus (yellow or white)	1,552	14,529	16,081
85-44-9	Phthalic anhydride	42,719	2,309,803	2,352,522
88-89-1	Picric acid	1	1,044	1,045
1336-36-3	Polychlorinated biphenyls (PCBs)	0	2,592,044	2,592,044
123-38-6	Propionaldehyde	69	1,457	1,526
114-26-1	Propoxur	260	796	1,056
115-07-1	Propylene	1,340	4,907,543	4,908,883
75-55-8	Propyleneimine	250	0	250
75-56-9	Propylene oxide	251,414	12,256	263,670
110-86-1	Pyridine	264,948	175,476	440,424
91-22-5	Quinoline	4,893	16,533	21,426
106-51-4	Quinone	0	0	0
82-68-8	Quintozene	5	1,087	1,092
81-07-2	Saccharin (manufacturing)	681	4,043	4,724
94-59-7	Safrole	12	0	12
7782-49-2	Selenium	520	22,896	23,416
7440-22-4	Silver	3,072	3,892	6,964
100-42-5	Styrene	254,879	11,452,834	11,707,713
96-09-3	Styrene oxide	0	0	0
7664-93-9	Sulfuric acid	30,460,264	73,210,682	103,670,946
79-34-5	1,1,2,2-Tetrachloroethane	124	150,527	150,651
127-18-4	Tetrachloroethylene	450,528	4,266,258	4,716,786
961-11-5	Tetrachlorvinphos	28	98,128	98,156
7440-28-0	Thallium	0	916	916
62-56-6	Thiourea	11,045	3,955	15,000
1314-20-1	Thorium dioxide	660	410,128	410,788
7550-45-0	Titanium tetrachloride	5	1,975,893	1,975,898
108-88-3	Toluene	1,695,836	38,374,945	40,070,781
584-84-9	Toluene-2,4-diisocyanate	0	90,952	90,952
91-08-7	Toluene-2,6-diisocyanate	2,005	18,516	20,521
26471-62-5	Toluenediisocyanate (mixed isomers)	16	149,552	149,568
95-53-4	o-Toluidine	28,312	12,391	40,703
8001-35-2	Toxaphene	0	2,200	2,200
52-68-6	Trichlorfon	125	1,007	1,132
120-82-1	1,2,4-Trichlorobenzene	229,363	683,172	912,535
71-55-6	1,1,1-Trichloroethane	169,965	12,027,414	12,197,379
79-00-5	1,1,2-Trichloroethane	855	2,019,761	2,020,616
79-01-6	Trichloroethylene	11,341	3,619,556	3,630,897
88-06-2	2,4,6-Trichlorophenol	0	0	0
1582-09-8	Trifluralin	93	82,201	82,294
95-63-6	1,2,4-Trimethylbenzene	110,578	558,802	669,380
51-79-6	Urethane	750	3,028	3,778
7440-62-2	Vanadium (fume or dust)	260	41,132	41,392
108-05-4	Vinyl acetate	221,679	2,064,420	2,286,099
593-60-2	Vinyl bromide	0	0	0
75-01-4	Vinyl chloride	1,897	130,873	132,770
75-35-4	Vinylidene chloride	986	133,043	134,029
1330-20-7	Xylene (mixed isomers)	1,878,512	21,386,050	23,264,562

Table 11. Releases and Transfers of All TRI Chemicals, 1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
108-38-3	m-Xylene	550,000	652,284	1,086	0	1,130	1,204,500
95-47-6	o-Xylene	1,357,221	547,350	2,541	0	1,842	1,908,954
106-42-3	p-Xylene	1,231,745	4,706,927	677	0	1,369	5,940,718
87-62-7	2,6-Xylidine	0	17	1,906	0	0	1,923
7440-66-6	Zinc (fume or dust)	814,527	1,311,315	40,645	285	11,297,832	13,464,604
12122-67-7	Zineb	10	250	0	0	0	260
	Antimony compounds	41,512	104,439	32,243	6,873	1,812,210	1,997,277
	Arsenic compounds	50,989	114,826	4,102	23,276	2,640,888	2,834,081
	Barium compounds	287,698	900,563	68,478	309	8,134,325	9,391,373
	Beryllium compounds	1	211	88	0	40,000	40,300
	Cadmium compounds	25,829	64,184	1,958	1,570	312,631	406,172
	Chlorophenols	3,909	1,022	551	174,100	2	179,584
	Chromium compounds	340,703	428,867	405,831	83,141	18,174,599	19,433,141
	Cobalt compounds	9,884	41,880	90,865	19,313	195,173	357,115
	Copper compounds	2,073,030	1,835,911	72,010	188,646	55,687,136	59,856,733
	Cyanide compounds	181,888	956,214	122,414	3,383,660	19,672	4,663,848
	Glycol ethers	9,807,356	37,173,693	309,664	17,042	274,865	47,582,620
	Lead compounds	409,609	1,214,865	106,609	1,619	14,725,761	16,458,463
	Manganese compounds	1,353,442	899,260	722,676	2,852	83,444,913	86,423,143
	Mercury compounds	783	375	58	21	15	1,252
	Nickel compounds	163,735	101,831	87,629	259,827	3,051,580	3,664,602
	Selenium compounds	5,287	25,325	1,145	5,000	148,861	185,618
	Silver compounds	7,577	3,632	1,792	265	21,411	34,677
	Thallium compounds	5	250	0	0	255	510
	Zinc compounds	1,868,145	2,861,422	1,087,346	308,476	109,649,130	115,774,519
	Mixtures and other trade names	254,875	1,156,522	61,824	1,350,015	22,285	2,845,521
	Trade secret chemicals	0	0	530	0	0	530
	Total	681,485,117	1,522,025,638	197,372,969	725,234,160	441,320,232	3,567,438,116

CAS Number	Chemical	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
108-38-3	m-Xylene	1,013	174,020	175,033
95-47-6	o-Xylene	55,154	453,667	508,821
106-42-3	p-Xylene	256	55,446	55,702
87-62-7	2,6-Xylidine	0	0	0
7440-66-6	Zinc (fume or dust)	45,062	10,276,204	10,321,266
12122-67-7	Zineb	0	750	750
	Antimony compounds	37,138	2,669,933	2,707,071
	Arsenic compounds	1,961	16,747,829	16,749,790
	Barium compounds	3,009,027	18,171,224	21,180,251
	Beryllium compounds	1	1,121	1,122
	Cadmium compounds	8,952	1,031,163	1,040,115
	Chlorophenols	1,128	806,406	807,534
	Chromium compounds	936,199	15,670,892	16,607,091
	Cobalt compounds	16,400	423,058	439,458
	Copper compounds	201,914	45,070,491	45,272,405
	Cyanide compounds	116,782	1,584,946	1,701,728
	Glycol ethers	9,909,482	7,276,880	17,186,362
	Lead compounds	157,540	43,967,983	44,125,523
	Manganese compounds	6,550,657	29,873,260	36,423,917
	Mercury compounds	274	36,256	36,530
	Nickel compounds	197,060	6,419,072	6,616,132
	Selenium compounds	478	59,210	59,688
	Silver compounds	3,711	79,418	83,129
	Thallium compounds	5	0	5
	Zinc compounds	1,150,786	81,709,236	82,860,022
	Mixtures and other trade names	195,506	1,777,681	1,973,187
	Trade secret chemicals	0	9,500	9,500
	Total	448,098,320	815,444,385	1,263,542,705

Table 12. Releases of All TRI Chemicals, 1990 (Ordered by Total Release).

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
7664-41-7	Ammonia	52,121,470	156,494,590	44,437,803	259,071,166	13,793,828	525,918,857
108-88-3	Toluene	77,249,500	156,576,022	198,260	1,400,654	367,537	235,791,973
67-56-1	Methanol	38,013,004	145,090,113	18,171,884	25,370,822	5,505,842	232,151,665
7647-01-0	Hydrochloric acid	5,436,543	68,010,383	2,769,970	154,098,891	514,830	230,830,617
67-64-1	Acetone	89,412,951	90,877,529	1,280,863	4,662,386	235,174	186,468,903
7664-93-9	Sulfuric acid	1,596,048	21,963,187	25,855,900	112,116,692	1,863,934	163,395,761
71-55-6	1,1,1-Trichloroethane	82,110,866	79,288,714	16,313	1,581	62,868	161,480,342
1330-20-7	Xylene (mixed isomers)	36,744,901	103,231,897	42,377	105,420	444,675	140,569,270
7664-38-2	Phosphoric acid	402,491	1,200,153	74,733,560	1,500,404	57,480,518	135,317,126
78-93-3	Methyl ethyl ketone	37,588,656	83,738,400	65,213	117,204	81,940	121,591,413
	Zinc compounds	1,868,145	2,861,422	1,087,346	308,476	109,649,130	115,774,519
7782-50-5	Chlorine	2,292,442	102,625,448	1,280,604	73,919	308,254	106,580,667
75-15-0	Carbon disulfide	3,291,871	94,930,808	40,565	3,900	500	98,267,644
75-09-2	Dichloromethane	35,692,060	56,805,056	192,739	850,018	11,809	93,551,682
	Manganese compounds	1,353,442	899,260	722,676	2,852	83,444,913	86,423,143
	Copper compounds	2,073,030	1,835,911	72,010	188,646	55,687,136	59,856,733
6484-52-2	Ammonium nitrate (solution)	381,380	2,325,754	7,629,700	38,912,210	4,168,380	53,417,424
	Glycol ethers	9,807,356	37,173,693	309,664	17,042	274,865	47,582,620
76-13-1	Freon 113	30,389,887	14,970,022	12,148	1,815	35,457	45,409,329
74-85-1	Ethylene	15,736,049	22,807,267	11,488	27,500	11,005	38,593,309
79-01-6	Trichloroethylene	18,110,383	19,787,565	14,209	805	13,154	37,926,116
71-36-3	n-Butyl alcohol	6,725,819	25,919,186	323,555	3,529,441	112,062	36,610,063
7697-37-2	Nitric acid	746,283	3,395,206	159,099	31,912,662	394,758	36,608,008
100-42-5	Styrene	13,472,563	18,204,101	37,371	29,045	166,746	31,909,826
108-10-1	Methyl isobutyl ketone	9,300,401	18,010,971	53,798	52,221	28,103	27,445,494
71-43-2	Benzene	13,511,366	10,895,483	24,943	654,068	724,429	25,810,289
67-66-3	Chloroform	8,255,323	13,507,138	1,001,446	89,560	57,897	22,911,364
79-10-7	Acrylic acid	228,357	198,582	44,133	21,525,000	94,333	22,090,405
50-00-0	Formaldehyde	2,723,926	10,042,072	759,567	8,184,829	188,613	21,899,007
127-18-4	Tetrachloroethylene	8,790,493	12,854,503	21,505	11,012	1,017	21,678,530
115-07-1	Propylene	12,107,152	9,392,758	867	5	316	21,501,098
75-05-8	Acetonitrile	805,851	857,666	10,726	19,445,260	248	21,119,751
	Chromium compounds	340,703	428,867	405,831	83,141	18,174,599	19,433,141
463-58-1	Carbonyl sulfide	12,249	18,622,615	0	0	0	18,634,864
110-82-7	Cyclohexane	6,108,055	11,107,792	25,979	327,259	34,701	17,603,786
7783-20-2	Ammonium sulfate (solution)	18,850	355,717	9,171,794	5,221,981	2,531,338	17,299,680
	Lead compounds	409,609	1,214,865	106,609	1,619	14,725,761	16,458,463
7440-66-6	Zinc (fume or dust)	814,527	1,311,315	40,645	285	11,297,832	13,464,604
107-21-1	Ethylene glycol	3,911,506	5,477,345	2,695,768	187,660	1,187,284	13,459,563
7440-50-8	Copper	431,567	829,627	56,009	22,351	11,419,098	12,758,652
108-95-2	Phenol	3,199,563	4,455,302	271,580	4,421,439	256,043	12,603,927
7439-96-5	Manganese	653,739	945,099	139,681	800	10,840,007	12,579,326
	Barium compounds	287,698	900,563	68,478	309	8,134,325	9,391,373
75-07-0	Acetaldehyde	2,504,978	4,375,685	78,345	1,963,498	29,665	8,952,171
100-41-4	Ethylbenzene	2,723,279	5,894,359	12,634	213,625	62,626	8,906,523
7664-39-3	Hydrogen fluoride	3,250,767	5,295,297	11,675	20	8,304	8,566,063
74-87-3	Chloromethane	1,994,876	5,649,012	144,433	199,605	92,260	8,080,186
107-13-1	Acrylonitrile	641,310	2,506,739	3,877	4,925,276	268	8,077,470
108-05-4	Vinyl acetate	1,204,493	4,352,266	5,558	1,360,901	14,151	6,937,369
107-06-2	1,2-Dichloroethane	1,166,038	4,429,935	48,763	826,672	7,351	6,478,759
7439-92-1	Lead	495,989	364,584	24,659	45	5,338,494	6,223,771
106-42-3	p-Xylene	1,231,745	4,706,927	677	0	1,369	5,940,718
10049-04-4	Chlorine dioxide	261,702	5,149,849	785	15	20	5,412,371
106-99-0	1,3-Butadiene	3,089,320	1,948,311	111,234	1,610	6,448	5,156,923
	Cyanide compounds	181,888	956,214	122,414	3,383,660	19,672	4,663,848
95-63-6	1,2,4-Trimethylbenzene	1,988,290	2,430,019	5,617	28,582	12,182	4,464,690
79-06-1	Acrylamide	42,632	7,336	3,814	4,214,315	565	4,268,662
108-90-7	Chlorobenzene	1,845,230	2,201,569	72,893	49,406	4,267	4,173,365
98-82-8	Cumene	1,400,080	2,703,033	1,876	13,402	19,671	4,138,062
75-00-3	Chloroethane	1,798,493	2,143,585	35,997	110	93	3,978,278
91-20-3	Naphthalene	1,988,558	1,717,563	36,080	28,152	142,130	3,912,483

Table 12. Releases of All TRI Chemicals, 1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
7440-02-0	Nickel	286,156	368,303	56,813	9,111	2,989,862	3,710,245
	Nickel compounds	163,735	101,831	87,629	259,827	3,051,580	3,664,602
7429-90-5	Aluminum (fume or dust)	631,284	1,491,561	56,805	10	1,328,181	3,507,841
7440-47-3	Chromium	324,729	413,023	39,746	82	2,725,304	3,502,884
67-63-0	Isopropyl alcohol (manufacturing)	1,069,174	2,110,323	11,131	15	32,955	3,223,598
62-53-3	Aniline	210,969	263,870	36,008	2,435,752	3,099	2,949,698
1634-04-4	Methyl tert-butyl ether	667,560	2,117,064	42,667	112,400	1,501	2,941,192
75-65-0	tert-Butyl alcohol	1,240,753	326,265	271,260	995,382	24,962	2,858,622
	Mixtures and other trade names	254,875	1,156,522	61,824	1,350,015	22,285	2,845,521
	Arsenic compounds	50,989	114,826	4,102	23,276	2,640,888	2,834,081
75-21-8	Ethylene oxide	785,088	1,662,406	8,911	49,280	24,042	2,529,727
109-86-4	2-Methoxyethanol	1,273,514	1,198,567	40,340	4,540	3,233	2,520,194
1319-77-3	Cresol (mixed isomers)	378,803	353,801	2,336	1,634,529	3,855	2,373,324
80-62-6	Methyl methacrylate	558,481	1,557,797	6,981	210,015	593	2,333,867
74-90-8	Hydrogen cyanide	55,825	614,750	3,824	1,597,552	48	2,271,999
74-83-9	Bromomethane	431,397	1,774,422	0	28,000	0	2,233,819
7723-14-0	Phosphorus (yellow or white)	19,310	4,913	2,343	0	2,189,653	2,216,219
8001-58-9	Creosote	578,173	1,439,036	3,105	5	15,582	2,035,901
	Antimony compounds	41,512	104,439	32,243	6,873	1,812,210	1,997,277
95-47-6	o-Xylene	1,357,221	547,350	2,541	0	1,842	1,908,954
56-23-5	Carbon tetrachloride	403,326	1,267,766	4,644	31,557	1,005	1,708,298
75-56-9	Propylene oxide	490,390	869,606	70,780	120,005	3,880	1,554,661
1344-28-1	Aluminum oxide	158,803	597,264	9,086	20	772,934	1,538,107
117-81-7	Di-(2-ethylhexyl) phthalate	147,831	1,196,864	2,378	260	19,531	1,366,864
88-89-1	Picric acid	1	1	2	1,249,930	2	1,249,936
92-52-4	Biphenyl	752,690	368,315	21,409	63,219	35,577	1,241,210
108-38-3	m-Xylene	550,000	652,284	1,086	0	1,130	1,204,500
75-01-4	Vinyl chloride	313,835	821,974	7,291	593	2,521	1,146,214
123-38-6	Propionaldehyde	340,631	648,355	491	34,394	0	1,023,871
111-42-2	Diethanolamine	287,126	96,538	360,137	157,015	120,866	1,021,682
110-80-5	2-Ethoxyethanol	334,199	623,936	42,015	0	0	1,000,150
101-68-8	Methylenebis(phenylisocyanate)	397,015	279,377	80	30	226,703	903,205
78-92-2	sec-Butyl alcohol	205,755	475,424	4,315	171,484	51	857,029
106-46-7	1,4-Dichlorobenzene	96,238	721,895	3,912	255	38	822,338
123-91-1	1,4-Dioxane	294,564	303,764	203,967	0	12,545	814,840
80-05-7	4,4'-Isopropylidenediphenol	92,454	90,445	2,412	23,000	555,917	764,228
85-44-9	Phthalic anhydride	147,783	539,687	369	0	9,605	697,444
98-95-3	Nitrobenzene	51,251	15,009	1,419	608,000	755	676,434
110-86-1	Pyridine	64,227	48,263	7,336	514,955	25	634,806
78-87-5	1,2-Dichloropropane	171,862	458,651	4,253	0	0	634,766
108-31-6	Maleic anhydride	90,604	402,465	1,373	10	120,816	615,268
79-00-5	1,1,2-Trichloroethane	106,907	491,797	1,351	1,091	265	601,411
123-72-8	Butyraldehyde	214,984	310,692	3,423	1,937	371	531,407
106-89-8	Epichlorohydrin	255,755	171,606	10,639	79,220	7,648	524,868
7440-39-3	Barium	46,054	32,157	54,201	15	359,704	492,131
78-84-2	Isobutyraldehyde	149,031	341,247	80	864	1	491,223
	Cadmium compounds	25,829	64,184	1,958	1,570	312,631	406,172
120-82-1	1,2,4-Trichlorobenzene	106,656	270,210	7,417	3,479	725	388,487
1313-27-5	Molybdenum trioxide	21,841	41,921	102,840	170,650	49,120	386,372
95-50-1	1,2-Dichlorobenzene	155,845	168,103	12,390	15,313	32,588	384,239
	Cobalt compounds	9,884	41,880	90,865	19,313	195,173	357,115
120-80-9	Catechol	2,517	25,220	224,903	0	89,076	341,716
131-11-3	Dimethyl phthalate	76,787	256,768	1,528	750	433	336,266
141-32-2	Butyl acrylate	134,707	166,796	28,231	0	68	329,802
1332-21-4	Asbestos (friable)	6,870	10,458	515	5	302,282	320,130
75-35-4	Vinylidene chloride	69,562	234,040	251	155	226	304,234
123-31-9	Hydroquinone	6,166	5,221	4,525	284,020	295	300,227
96-33-3	Methyl acrylate	79,059	170,167	470	99	0	249,795
106-44-5	p-Cresol	8,262	230,742	1,955	1,997	2,873	245,829
7440-36-0	Antimony	6,974	45,384	4,714	165	182,272	239,509
85-68-7	Butyl benzyl phthalate	42,753	184,940	925	260	9,774	238,652

Table 12. Releases of All TRI Chemicals, 1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
51-28-5	2,4-Dinitrophenol	17,111	7,586	89,074	111,500	3,307	228,578
84-74-2	Dibutyl phthalate	60,436	47,841	558	110,000	167	219,002
107-05-1	Allyl chloride	169,368	36,656	135	1,200	0	207,359
140-88-5	Ethyl acrylate	116,891	87,333	1,161	10	498	205,893
	Selenium compounds	5,287	25,325	1,145	5,000	148,861	185,618
	Chlorophenols	3,909	1,022	551	174,100	2	179,584
126-99-8	Chloroprene	55,032	120,102	750	0	750	176,634
7782-49-2	Selenium	1,260	799	452	0	171,283	173,794
79-46-9	2-Nitropropane	62,836	21,422	1,100	87,000	0	172,358
80-15-9	Cumene hydroperoxide	97,285	13,386	427	45,518	6,670	163,286
10034-93-2	Hydrazine sulfate	5	252	0	138,941	0	139,198
121-14-2	2,4-Dinitrotoluene	6,312	51,271	3,735	74,000	2,153	137,471
78-88-6	2,3-Dichloropropene	89,740	870	590	37,170	0	128,370
107-02-8	Acrolein	5,816	16,213	5	103,059	5	125,098
540-59-0	1,2-Dichloroethylene	81,311	43,188	54	360	118	125,031
75-25-2	Bromoform	48,205	0	0	0	72,000	120,205
103-23-1	Bis(2-ethylhexyl) adipate	51,004	55,124	6,919	0	4,074	117,121
25376-45-8	Diaminotoluene (mixed isomers)	19,595	6,119	955	89,000	265	115,934
7440-43-9	Cadmium	5,115	11,922	1,106	10	91,792	109,945
84-66-2	Diethyl phthalate	12,824	83,573	2,697	0	37	99,131
98-88-4	Benzoyl chloride	17,667	5,657	0	67,501	260	91,085
25321-22-6	Dichlorobenzene (mixed isomers)	29,606	59,918	1	11	22	89,558
1163-19-5	Decabromodiphenyl oxide	15,613	48,687	2,587	48	20,698	87,633
77-47-4	Hexachlorocyclopentadiene	83,812	773	10	5	0	84,600
106-88-7	1,2-Butylene oxide	54,696	24,769	4,625	0	5	84,095
7440-48-4	Cobalt	15,766	20,558	8,853	0	34,758	79,935
7440-62-2	Vanadium (fume or dust)	2,623	12,683	670	0	63,952	79,928
101-77-9	4,4'-Methylenedianiline	14,250	5,273	1,201	57,250	6	77,980
120-12-7	Anthracene	27,065	38,373	1,359	0	4,806	71,603
1336-36-3	Polychlorinated biphenyls (PCBs)	5	0	0	0	71,366	71,371
121-69-7	N,N-Dimethylaniline	17,705	33,010	16,030	0	0	66,745
74-95-3	Methylene bromide	51,164	13,630	0	0	0	64,794
105-67-9	2,4-Dimethylphenol	2,123	5,203	13	56,900	302	64,541
542-75-6	1,3-Dichloropropylene	46,570	12,903	310	0	0	59,783
55-63-0	Nitroglycerin	1,053	29,550	11,580	0	17,150	59,333
106-93-4	1,2-Dibromoethane	22,533	35,537	0	495	125	58,690
7440-38-2	Arsenic	1,964	3,872	1,640	5	50,530	58,011
584-84-9	Toluene-2,4-diisocyanate	18,803	38,510	0	0	5	57,318
7550-45-0	Titanium tetrachloride	42,397	11,963	0	0	0	54,360
156-62-7	Calcium cyanamide	12,000	620	0	0	40,000	52,620
26471-62-5	Toluenediisocyanate (mixed isomers)	17,534	33,098	25	5	275	50,937
79-34-5	1,1,2,2-Tetrachloroethane	38,323	6,273	3,529	80	495	48,700
	Beryllium compounds	1	211	88	0	40,000	40,300
95-48-7	o-Cresol	20,824	18,322	36	0	255	39,437
606-20-2	2,6-Dinitrotoluene	1,486	16,251	416	19,000	0	37,153
74-88-4	Methyl iodide	29,443	373	1	5,085	0	34,902
	Silver compounds	7,577	3,632	1,792	265	21,411	34,677
100-44-7	Benzyl chloride	26,024	7,521	265	315	270	34,395
117-84-0	n-Dioctyl phthalate	17,054	12,803	1,842	5	261	31,965
132-64-9	Dibenzofuran	21,207	9,018	532	0	897	31,654
94-36-0	Benzoyl peroxide	12,927	1,708	5	5	16,025	30,670
302-01-2	Hydrazine	23,085	4,793	1,414	423	5	29,720
91-22-5	Quinoline	20,513	7,177	17	0	198	27,905
87-86-5	Pentachlorophenol	15,507	7,699	2,577	0	1,941	27,724
7439-97-6	Mercury	14,020	8,384	751	0	4,184	27,339
79-11-8	Chloroacetic acid	20,650	4,754	1,691	0	0	27,095
133-06-2	Captan	1,783	17,469	505	5,500	505	25,762
91-08-7	Toluene-2,6-diisocyanate	6,009	19,437	5	0	5	25,456
107-18-6	Allyl alcohol	13,388	7,478	2,205	0	0	23,071
120-83-2	2,4-Dichlorophenol	255	565	95	20,400	0	21,315
94-75-7	2,4-D (acetic acid)	3,780	3,962	259	2,100	10,662	20,763

Table 12. Releases of All TRI Chemicals, 1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
108-60-1	Bis(2-chloro-1-methylethyl)ether	3,800	2,430	12,000	0	0	18,230
95-53-4	o-Toluidine	5,367	2,075	252	250	8,486	16,430
7440-22-4	Silver	4,907	7,439	298	5	3,725	16,374
1582-09-8	Trifluralin	12,992	2,616	12	0	5	15,625
63-25-2	Carbaryl	2,299	6,871	505	0	5,555	15,230
624-83-9	Methyl isocyanate	12,983	1,390	0	0	500	14,873
1897-45-6	Chlorothalonil	2,786	9,668	9	0	0	12,463
25321-14-6	Dinitrotoluene (mixed isomers)	3,839	320	7,112	0	363	11,634
90-43-7	2-Phenylphenol	8,925	985	135	10	530	10,585
593-60-2	Vinyl bromide	9,190	915	270	0	0	10,375
77-78-1	Dimethyl sulfate	9,303	436	375	0	0	10,114
67-72-1	Hexachloroethane	1,885	6,156	1	1,500	334	9,876
541-73-1	1,3-Dichlorobenzene	3,104	5,578	785	0	0	9,467
100-02-7	4-Nitrophenol	7,570	83	31	1,200	0	8,884
139-13-9	Nitrilotriacetic acid	25	1,000	7,700	0	0	8,725
62-56-6	Thiourea	2,300	565	572	4,800	265	8,502
98-07-7	Benzoic trichloride	8,310	25	0	0	0	8,335
99-65-0	m-Dinitrobenzene	505	7,361	0	0	358	8,224
7440-41-7	Beryllium	9	1,361	42	0	6,517	7,929
79-21-0	Peracetic acid	2,066	3,766	113	0	1,826	7,771
108-39-4	m-Cresol	4,152	3,415	0	0	0	7,567
87-68-3	Hexachloro-1,3-butadiene	3,364	1,542	715	330	0	5,951
64-67-5	Diethyl sulfate	5,058	435	10	5	280	5,788
75-44-5	Phosgene	2,423	2,430	15	10	20	4,898
57-74-9	Chlordane	4,244	178	1	0	0	4,423
51-79-6	Urethane	760	3,310	0	5	270	4,345
95-80-7	2,4-Diaminotoluene	3,801	127	250	0	0	4,178
111-44-4	Bis(2-chloroethyl) ether	3,205	573	83	0	0	3,861
76-44-8	Heptachlor	3,797	0	1	0	0	3,798
120-71-8	p-Cresidine	2,607	83	0	0	250	2,940
101-14-4	4,4'-Methylenebis(2-chloro aniline)	1,510	1,255	0	0	0	2,765
96-09-3	Styrene oxide	1,535	888	0	0	0	2,423
72-43-5	Methoxychlor	756	846	505	0	255	2,362
90-04-0	o-Anisidine	500	1,341	141	0	250	2,232
87-62-7	2,6-Xylidine	0	17	1,906	0	0	1,923
541-41-3	Ethyl chloroformate	1,302	520	0	0	0	1,822
118-74-1	Hexachlorobenzene	1,258	210	124	220	0	1,812
58-89-9	Lindane	1,011	538	250	0	5	1,804
98-87-3	Benzal chloride	1,744	11	0	0	0	1,755
106-51-4	Quinone	711	891	5	0	0	1,607
101-80-4	4,4'-Diaminodiphenyl ether	5	900	413	0	0	1,318
62-73-7	Dichlorvos	800	510	0	0	0	1,310
	Mercury compounds	783	375	58	21	15	1,252
2832-40-8	C.I. Disperse Yellow 3	364	0	26	0	843	1,233
528-29-0	o-Dinitrobenzene	51	1,040	0	0	49	1,140
1314-20-1	Thorium dioxide	250	610	0	0	0	860
100-25-4	p-Dinitrobenzene	50	759	0	0	14	823
12427-38-2	Maneb	270	521	5	0	0	796
106-50-3	p-Phenylenediamine	768	0	0	0	0	768
7440-28-0	Thallium	250	500	5	0	0	755
961-11-5	Tetrachlorvinphos	500	254	0	0	0	754
57-14-7	1,1-Dimethyl hydrazine	104	364	250	0	0	718
75-55-8	Propyleneimine	330	322	0	0	0	652
56-38-2	Parathion	296	317	10	0	10	633
75-27-4	Dichlorobromomethane	632	0	0	0	0	632
	Trade secret chemicals	0	0	530	0	0	530
135-20-6	Cupferron	5	480	34	0	0	519
52-68-6	Trichlorfon	250	254	6	0	0	510
	Thallium compounds	5	250	0	0	255	510
134-32-7	alpha-Naphthylamine	250	250	0	0	0	500
81-07-2	Saccharin (manufacturing)	68	258	0	0	0	326

Table 12. Releases of All TRI Chemicals, 1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
114-26-1	Propoxur	260	10	5	0	0	275
115-32-2	Dicofol	13	255	5	0	0	273
82-68-8	Quintozene	255	16	0	0	0	271
569-64-2	C.I. Basic Green 4	9	7	250	0	0	266
12122-67-7	Zineb	10	250	0	0	0	260
534-52-1	4,6-Dinitro-o-cresol	8	39	131	0	0	178
88-06-2	2,4,6-Trichlorophenol	0	78	79	0	0	157
107-30-2	Chloromethyl methyl ether	33	91	0	0	0	124
2164-17-2	Fluometuron	26	19	0	0	0	45
60-35-5	Acetamide	12	23	5	0	0	40
96-45-7	Ethylene thiourea	5	30	0	0	0	35
88-75-5	2-Nitrophenol	0	4	29	0	0	33
91-94-1	3,3'-Dichlorobenzidine	10	15	1	0	0	26
615-05-4	2,4-Diaminoanisole	21	5	0	0	0	26
156-10-5	p-Nitrosodiphenylamine	24	0	0	0	0	24
104-94-9	p-Anisidine	5	10	5	0	0	20
99-59-2	5-Nitro-o-anisidine	5	5	0	0	0	10
133-90-4	Chloramben	5	5	0	0	0	10
119-90-4	3,3'-Dimethoxybenzidine	3	1	4	0	0	8
120-58-1	Isosafrole	5	0	0	0	0	5
542-88-1	Bis(chloromethyl) ether	2	3	0	0	0	5
97-56-3	C.I. Solvent Yellow 3	0	0	5	0	0	5
94-59-7	Safrole	5	0	0	0	0	5
81-88-9	C.I. Food Red 15	0	2	0	0	0	2
60-34-4	Methyl hydrazine	1	0	0	0	0	1
90-94-8	Michler's ketone	0	0	0	0	0	0
119-93-7	3,3'-Dimethylbenzidine	0	0	0	0	0	0
8001-35-2	Toxaphene	0	0	0	0	0	0
39156-41-7	2,4-Diaminoanisole sulfate	0	0	0	0	0	0
86-30-6	N-Nitrosodiphenylamine	0	0	0	0	0	0
989-38-8	C.I. Basic Red 1	0	0	0	0	0	0
	Total	681,485,117	1,522,025,638	197,372,969	725,234,160	441,320,232	3,567,438,116

Table 13. Releases of TRI Metal Compounds, 1990.

Metal Compound	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Antimony compounds	41,512	104,439	32,243	6,873	1,812,210	1,997,277
Arsenic compounds	50,989	114,826	4,102	23,276	2,640,888	2,834,081
Barium compounds	287,698	900,563	68,478	309	8,134,325	9,391,373
Beryllium compounds	1	211	88	0	40,000	40,300
Cadmium compounds	25,829	64,184	1,958	1,570	312,631	406,172
Chromium compounds	340,703	428,867	405,831	83,141	18,174,599	19,433,141
Cobalt compounds	9,884	41,880	90,865	19,313	195,173	357,115
Copper compounds	2,073,030	1,835,911	72,010	188,646	55,687,136	59,856,733
Lead compounds	409,609	1,214,865	106,609	1,619	14,725,761	16,458,463
Manganese compounds	1,353,442	899,260	722,676	2,852	83,444,913	86,423,143
Mercury compounds	783	375	58	21	15	1,252
Nickel compounds	163,735	101,831	87,629	259,827	3,051,580	3,664,602
Selenium compounds	5,287	25,325	1,145	5,000	148,861	185,618
Silver compounds	7,577	3,632	1,792	265	21,411	34,677
Thallium compounds	5	250	0	0	255	510
Zinc compounds	1,868,145	2,861,422	1,087,346	308,476	109,649,130	115,774,519
Total	6,638,229	8,597,841	2,682,830	901,188	298,038,888	316,858,976

Table 14. Transfers of TRI Metal Compounds, 1990.

Metal Compound	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
Antimony compounds	37,138	2,669,933	2,707,071
Arsenic compounds	1,961	16,747,829	16,749,790
Barium compounds	3,009,027	18,171,224	21,180,251
Beryllium compounds	1	1,121	1,122
Cadmium compounds	8,952	1,031,163	1,040,115
Chromium compounds	936,199	15,670,892	16,607,091
Cobalt compounds	16,400	423,058	439,458
Copper compounds	201,914	45,070,491	45,272,405
Lead compounds	157,540	43,967,983	44,125,523
Manganese compounds	6,550,657	29,873,260	36,423,917
Mercury compounds	274	36,256	36,530
Nickel compounds	197,060	6,419,072	6,616,132
Selenium compounds	478	59,210	59,688
Silver compounds	3,711	79,418	83,129
Thallium compounds	5	0	5
Zinc compounds	1,150,786	81,709,236	82,860,022
Total	12,272,103	261,930,146	274,202,249

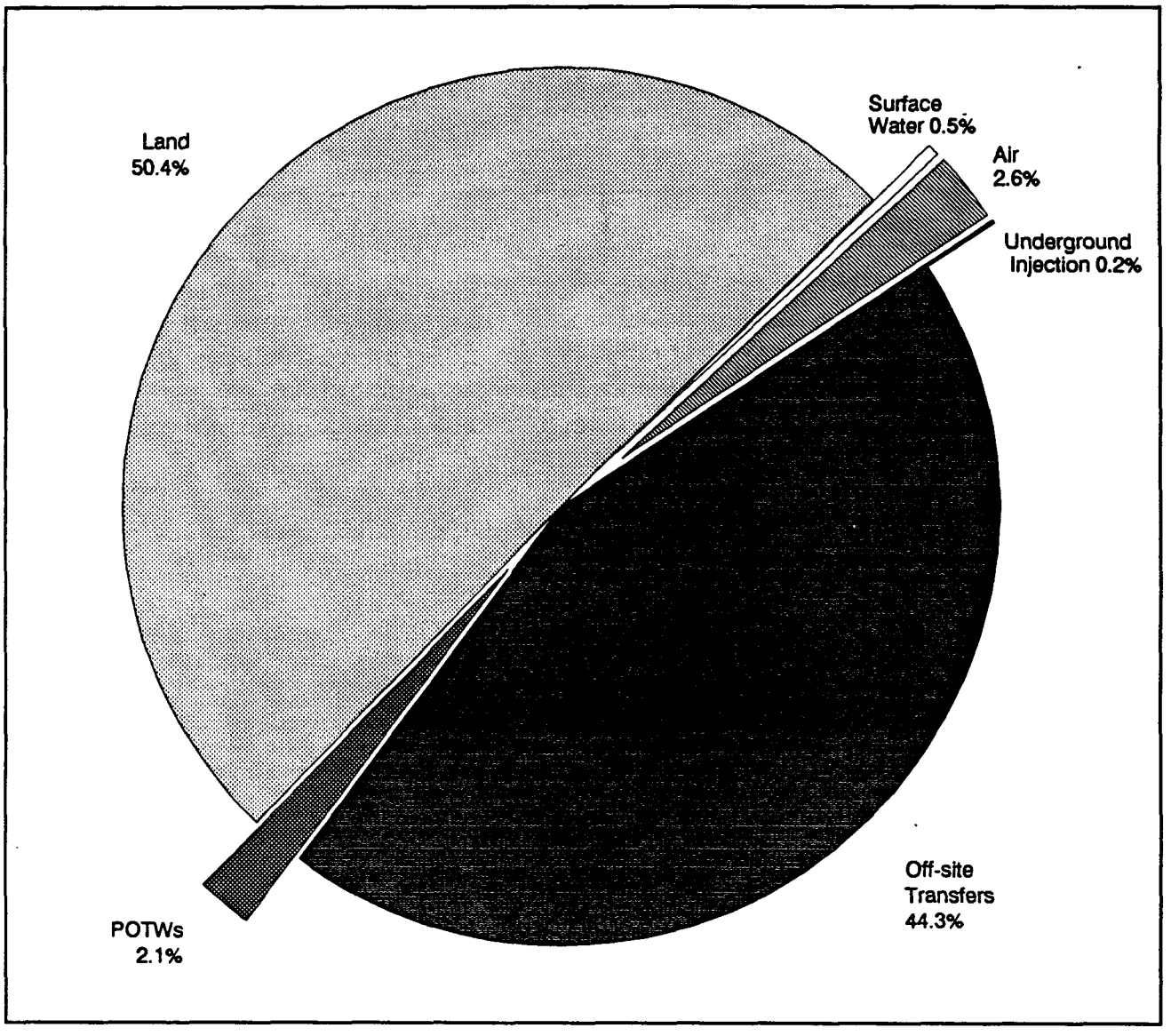


Figure 2. Releases and Transfers of TRI Metal Compounds, 1990.

CLARIFICATION OF THE BASIS FOR CARCINOGEN LISTINGS ON THE EPCRA SECTION 313 LIST OF TOXIC CHEMICALS

The EPCRA section 313 reporting rule contains a "*de minimis*" concentration in mixture limitation.* When the rule was developed EPA adopted the *de minimis* percentages from the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standards (29 CFR 1910.1200), because much of the information the industry would have relating to mixtures would most likely be from the material safety data sheet (MSDS) on that mixture. The OSHA *de minimis* limitation is 0.1 percent if the chemical is a carcinogen 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

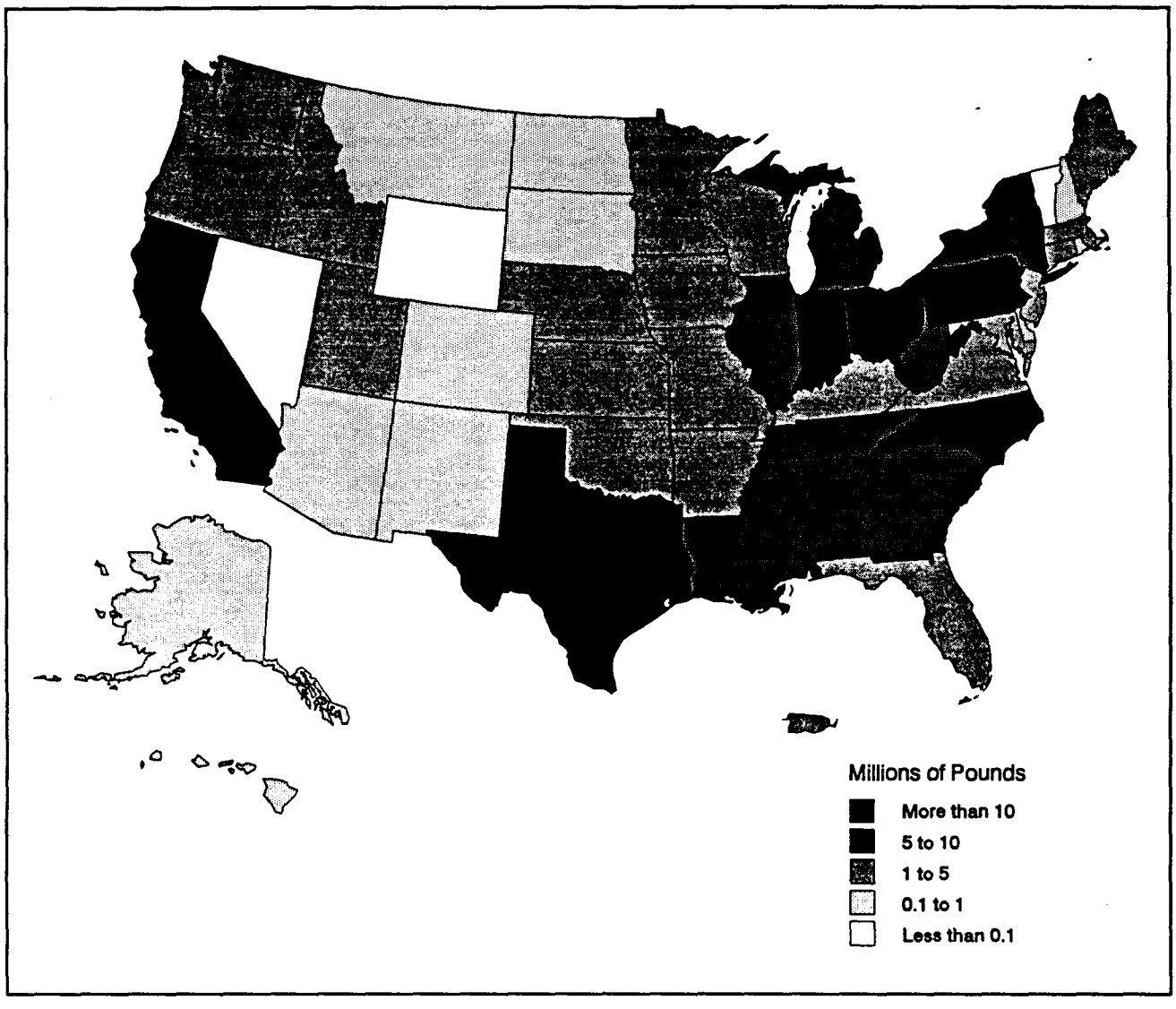
(3) 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

The *de minimis* limitation is 1.0 percent for chemicals that do not meet the above OSHA criteria.

The carcinogen designations in the list of chemicals relate to any chemical that the Agency determined met the above OSHA criteria for the 0.1 percent *de minimis* limitation.

The following Tables consist of chemicals on the EPCRA section 313 list that meet this definition of a carcinogen or suspect carcinogen.

* A facility subject to the reporting requirements of EPCRA section 313 need not consider a listed toxic chemical if it is present in a mixture at a concentration below a specified de minimis level.



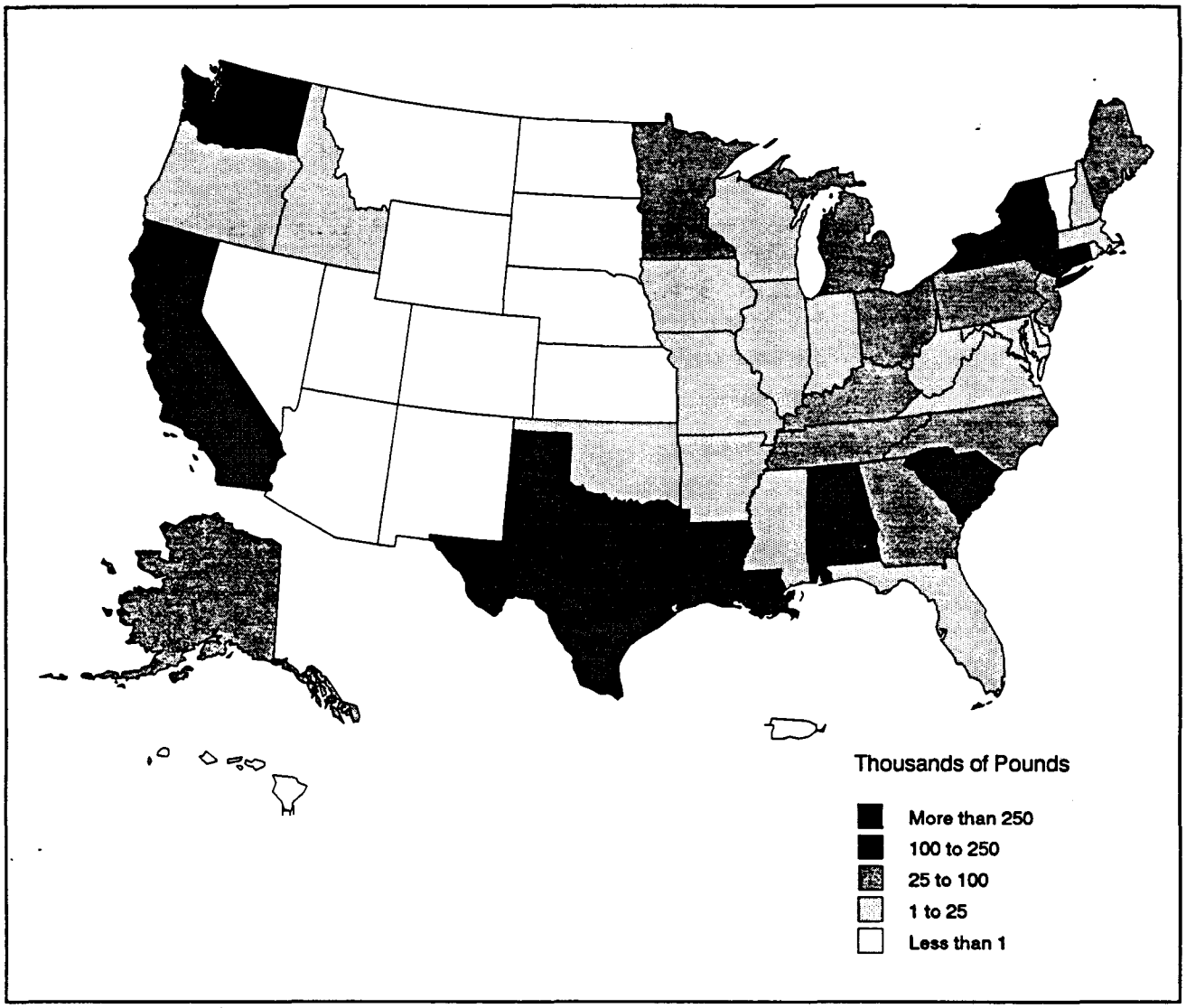
Map 3. TRI Releases of Carcinogens to Air, 1990.

Table 15. TRI Releases of Carcinogens to Air, 1990.

CAS Number	Chemical	Air Emissions Pounds
60-35-5	Acetamide	35
79-06-1	Acrylamide	49,968
107-13-1	Acrylonitrile	3,148,049
90-04-0	o-Anisidine	1,841
7440-38-2	Arsenic	5,836
1332-21-4	Asbestos (friable)	17,328
71-43-2	Benzene	24,406,849
98-07-7	Benzoic trichloride	8,335
7440-41-7	Beryllium	1,370
542-88-1	Bis(chloromethyl) ether	5
103-23-1	Bis(2-ethylhexyl) adipate	106,128
106-99-0	1,3-Butadiene	5,037,631
989-38-8	C.I. Basic Red 1	0
81-88-9	C.I. Food Red 15	2
97-56-3	C.I. Solvent Yellow 3	0
7440-43-9	Cadmium	17,037
56-23-5	Carbon tetrachloride	1,671,092
67-66-3	Chloroform	21,762,461
107-30-2	Chloromethyl methyl ether	124
7440-47-3	Chromium	737,752
8001-58-9	Creosote	2,017,209
120-71-8	p-Cresidine	2,690
135-20-6	Cupferron	485
615-05-4	2,4-Diaminoanisole	26
39156-41-7	2,4-Diaminoanisole sulfate	0
101-80-4	4,4'-Diaminodiphenyl ether	905
25376-45-8	Diaminotoluene (mixed isomers)	25,714
95-80-7	2,4-Diaminotoluene	3,928
106-93-4	1,2-Dibromoethane	58,070
25321-22-6	Dichlorobenzene (mixed isomers)	89,524
106-46-7	1,4-Dichlorobenzene	818,133
91-94-1	3,3'-Dichlorobenzidine	25
107-06-2	1,2-Dichloroethane	5,595,973
75-09-2	Dichloromethane	92,497,116
542-75-6	1,3-Dichloropropylene	59,473
117-81-7	Di-(2-ethylhexyl) phthalate	1,344,695
64-67-5	Diethyl sulfate	5,493
119-90-4	3,3'-Dimethoxybenzidine	4
119-93-7	3,3'-Dimethylbenzidine	0
57-14-7	1,1-Dimethyl hydrazine	468
77-78-1	Dimethyl sulfate	9,739
123-91-1	1,4-Dioxane	598,328

Table 15. TRI Releases of Carcinogens to Air, 1990, Continued.

CAS Number	Chemical	Air Emissions Pounds
106-89-8	Epichlorohydrin	427,361
140-88-5	Ethyl acrylate	204,224
75-21-8	Ethylene oxide	2,447,494
96-45-7	Ethylene thiourea	35
50-00-0	Formaldehyde	12,765,998
118-74-1	Hexachlorobenzene	1,468
302-01-2	Hydrazine	27,878
10034-93-2	Hydrazine sulfate	257
7439-92-1	Lead	860,573
58-89-9	Lindane	1,549
101-14-4	4,4'-Methylenebis(2-chloro aniline)	2,765
101-77-9	4,4'-Methylenedianiline	19,523
74-88-4	Methyl iodide	29,816
90-94-8	Michler's ketone	0
134-32-7	alpha-Naphthylamine	500
7440-02-0	Nickel	654,459
139-13-9	Nitrilotriacetic acid	1,025
99-59-2	5-Nitro-o-anisidine	10
79-46-9	2-Nitropropane	84,258
156-10-5	p-Nitrosodiphenylamine	24
1336-36-3	Polychlorinated biphenyls (PCBs)	5
75-55-8	Propyleneimine	652
75-56-9	Propylene oxide	1,359,996
81-07-2	Saccharin (manufacturing)	326
94-59-7	Safrole	5
100-42-5	Styrene	31,676,664
96-09-3	Styrene oxide	2,423
79-34-5	1,1,2,2-Tetrachloroethane	44,596
127-18-4	Tetrachloroethylene	21,644,996
62-56-6	Thiourea	2,865
584-84-9	Toluene-2,4-diisocyanate	57,313
91-08-7	Toluene-2,6-diisocyanate	25,446
26471-62-5	Toluenediisocyanate (mixed isomers)	50,632
95-53-4	o-Toluidine	7,442
8001-35-2	Toxaphene	0
88-06-2	2,4,6-Trichlorophenol	78
51-79-6	Urethane	4,070
593-60-2	Vinyl bromide	10,105
75-01-4	Vinyl chloride	1,135,809
	Total	233,652,481



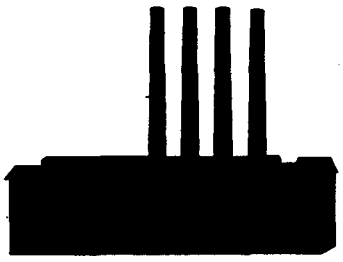
Map 4. TRI Releases of Carcinogens to Water, 1990.

Table 16. TRI Releases of Carcinogens to Water, 1990.

CAS Number	Chemical	Surface Water Discharges Pounds
60-35-5	Acetamide	5
79-06-1	Acrylamide	3,814
107-13-1	Acrylonitrile	3,877
90-04-0	o-Anisidine	141
7440-38-2	Arsenic	1,640
1332-21-4	Asbestos (friable)	515
71-43-2	Benzene	24,943
98-07-7	Benzoic trichloride	0
7440-41-7	Beryllium	42
542-88-1	Bis(chloromethyl) ether	0
103-23-1	Bis(2-ethylhexyl) adipate	6,919
106-99-0	1,3-Butadiene	111,234
989-38-8	C.I. Basic Red 1	0
81-88-9	C.I. Food Red 15	0
97-56-3	C.I. Solvent Yellow 3	5
7440-43-9	Cadmium	1,106
56-23-5	Carbon tetrachloride	4,644
67-66-3	Chloroform	1,001,446
107-30-2	Chloromethyl methyl ether	0
7440-47-3	Chromium	39,746
8001-58-9	Creosote	3,105
120-71-8	p-Cresidine	0
135-20-6	Cupferron	34
615-05-4	2,4-Diaminoanisole	0
39156-41-7	2,4-Diaminoanisole sulfate	0
101-80-4	4,4'-Diaminodiphenyl ether	413
25376-45-8	Diaminotoluene (mixed isomers)	955
95-80-7	2,4-Diaminotoluene	250
106-93-4	1,2-Dibromoethane	0
25321-22-6	Dichlorobenzene (mixed isomers)	1
106-46-7	1,4-Dichlorobenzene	3,912
91-94-1	3,3'-Dichlorobenzidine	1
107-06-2	1,2-Dichloroethane	48,763
75-09-2	Dichloromethane	192,739
542-75-6	1,3-Dichloropropylene	310
117-81-7	Di-(2-ethylhexyl) phthalate	2,378
64-67-5	Diethyl sulfate	10
119-90-4	3,3'-Dimethoxybenzidine	4
119-93-7	3,3'-Dimethylbenzidine	0
57-14-7	1,1-Dimethyl hydrazine	250
77-78-1	Dimethyl sulfate	375
123-91-1	1,4-Dioxane	203,967

Table 16. TRI Releases of Carcinogens to Water, 1990, Continued.

CAS Number	Chemical	Surface Water Discharges Pounds
106-89-8	Epichlorohydrin	10,639
140-88-5	Ethyl acrylate	1,161
75-21-8	Ethylene oxide	8,911
96-45-7	Ethylene thiourea	0
50-00-0	Formaldehyde	759,567
118-74-1	Hexachlorobenzene	124
302-01-2	Hydrazine	1,414
10034-93-2	Hydrazine sulfate	0
7439-92-1	Lead	24,659
58-89-9	Lindane	250
101-14-4	4,4'-Methylenebis(2-chloro aniline)	0
101-77-9	4,4'-Methylenedianiline	1,201
74-88-4	Methyl iodide	1
90-94-8	Michler's ketone	0
134-32-7	alpha-Naphthylamine	0
7440-02-0	Nickel	56,813
139-13-9	Nitrilotriacetic acid	7,700
99-59-2	5-Nitro-o-anisidine	0
79-46-9	2-Nitropropane	1,100
156-10-5	p-Nitrosodiphenylamine	0
1336-36-3	Polychlorinated biphenyls (PCBs)	0
75-55-8	Propyleneimine	0
75-56-9	Propylene oxide	70,780
81-07-2	Saccharin (manufacturing)	0
94-59-7	Safrole	0
100-42-5	Styrene	37,371
96-09-3	Styrene oxide	0
79-34-5	1,1,2,2-Tetrachloroethane	3,529
127-18-4	Tetrachloroethylene	21,505
62-56-6	Thiourea	572
584-84-9	Toluene-2,4-diisocyanate	0
91-08-7	Toluene-2,6-diisocyanate	5
26471-62-5	Toluenediisocyanate (mixed isomers)	25
95-53-4	o-Toluidine	252
8001-35-2	Toxaphene	0
88-06-2	2,4,6-Trichlorophenol	79
51-79-6	Urethane	0
593-60-2	Vinyl bromide	270
75-01-4	Vinyl chloride	7,291
	Total	2,672,763



THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

1990 Releases and Transfers by Industry

Table 17. TRI Releases by Industry, 1990.

SIC Code	Industry	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
20	Food	15,270,902	11,615,081	5,404,441	36,308	8,688,949	41,015,681
21	Tobacco	192,198	2,283,058	22,892	0	1,500	2,499,648
22	Textiles	8,592,716	25,374,488	555,741	35	36,801	34,559,781
23	Apparel	371,787	1,226,416	47,992	0	770	1,648,965
24	Lumber	6,509,489	31,139,885	208,965	75	126,614	37,985,028
25	Furniture	7,889,948	52,160,915	3,990	65	76,326	60,131,244
26	Paper	38,961,947	204,974,144	37,675,563	65	7,367,967	288,979,686
27	Printing	26,421,599	25,613,711	1,002	35	4,674	52,041,021
28	Chemicals	203,473,274	491,884,902	133,478,748	658,662,114	98,518,029	1,586,017,067
29	Petroleum	43,638,419	27,660,341	4,986,669	37,850,987	3,113,982	117,250,398
30	Plastics	64,146,237	128,394,477	462,536	15,093	200,197	193,218,540
31	Leather	3,561,829	8,283,907	388,408	0	20,603	12,254,747
32	Stone/Clay	6,691,485	15,177,291	175,467	7,555,070	2,283,349	31,882,662
33	Primary Metals	62,040,226	159,831,730	12,089,054	20,051,000	314,577,163	568,589,173
34	Fabr. Metals	49,622,001	80,015,224	412,146	850	1,013,898	131,064,119
35	Machinery	21,771,887	31,005,134	209,001	568	139,335	53,125,925
36	Electrical	26,909,671	54,957,463	415,525	18,728	2,735,798	85,037,185
37	Transportation	69,981,058	123,540,554	234,514	320	1,949,365	195,705,811
38	Measure./Photo.	12,746,607	20,033,623	58,233	20	5,321	32,843,804
39	Miscellaneous	7,299,310	17,591,354	17,048	90	40,294	24,948,096
	Non 20-39 SIC Code	5,392,527	9,259,940	525,034	1,042,737	419,297	16,639,535
	Total	681,485,117	1,522,025,638	197,372,969	725,234,160	441,320,232	3,567,438,116

Table 18. TRI Transfers by Industry, 1990.

SIC Code	Industry	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
20	Food	42,261,037	9,116,057	51,377,094
21	Tobacco	8,841	38,663	47,504
22	Textiles	7,983,530	3,119,800	11,103,330
23	Apparel	149,244	169,772	319,016
24	Lumber	102,684	7,325,962	7,428,646
25	Furniture	337,214	4,327,705	4,664,919
26	Paper	52,089,432	18,440,948	70,530,380
27	Printing	310,204	4,382,995	4,693,199
28	Chemicals	269,945,924	251,192,905	521,138,829
29	Petroleum	7,714,110	9,249,443	16,963,553
30	Plastics	8,860,515	22,455,085	31,315,600
31	Leather	9,621,274	2,552,329	12,173,603
32	Stone/Clay	1,767,608	12,000,611	13,768,219
33	Primary Metals	9,507,604	296,932,716	306,440,320
34	Fabr. Metals	8,160,378	67,192,583	75,352,961
35	Machinery	2,737,076	13,564,152	16,301,228
36	Electrical	12,499,490	35,119,294	47,618,784
37	Transportation	9,698,248	39,536,990	49,235,238
38	Measure./Photo.	1,817,682	9,785,498	11,603,180
39	Miscellaneous	638,858	6,485,714	7,124,572
	Non 20-39 SIC Code	1,887,367	2,455,163	4,342,530
	Total	448,098,320	815,444,385	1,263,542,705

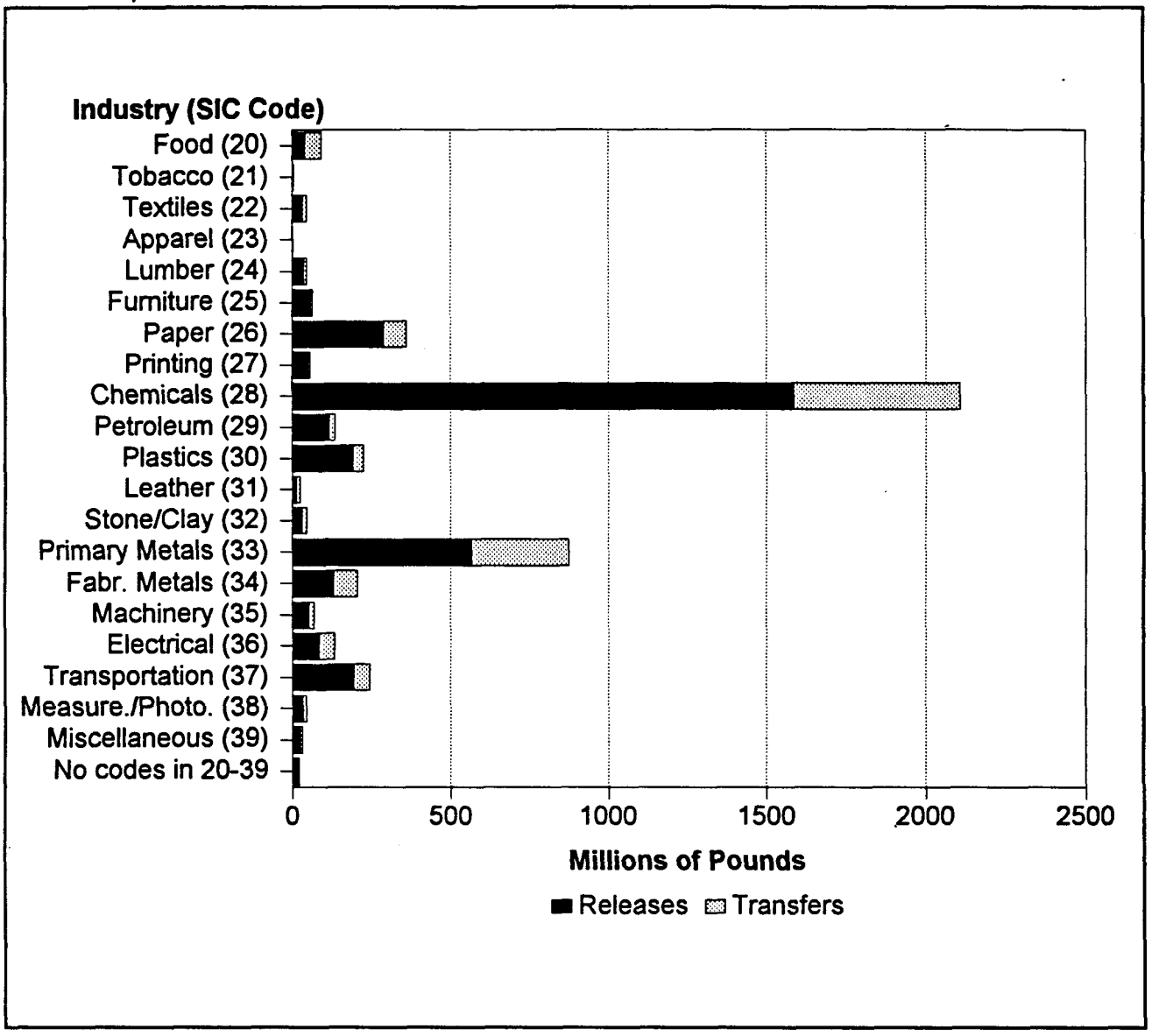


Figure 3. TRI Releases and Transfers by Industry, 1990.

1987-1990 RELEASES AND TRANSFERS

In order to make valid comparisons between reporting years, this section contains information on all chemicals listed on EPCRA section 313 except:

1) Those chemicals that were first reportable in the 1990 reporting year:

Allyl alcohol
Creosote
2,3-Dichloropropene
m-Dinitrobenzene
o-Dinitrobenzene
p-Dinitrobenzene
Dinitrotoluene (mixed isomers)
Isosafrole
Toluenediisocyanate (mixed isomers)
and
Aluminum oxide (fibrous forms)*

2) Those chemicals that have been deleted from EPCRA section 313:

Aluminum oxide (non-fibrous forms)
Color Index (C.I.) Acid Blue 9 disodium salt
C.I. Acid Blue 9 diammonium salt
C.I. Pigment Blue 15
C.I. Pigment Green 7
C.I. Pigment Green 36
Melamine
Sodium hydroxide (solution)
Sodium sulfate (solution)
Terephthalic acid
Titanium dioxide

* Non-fibrous forms of aluminum oxide were deleted from EPCRA section 313 beginning with the 1989 reporting year. TRI data indicate that facilities continued to report both the non-fibrous and fibrous forms of aluminum oxide for the 1989 reporting year, but reported only fibrous forms of aluminum oxide in the 1990 reporting year. Thus, aluminum oxide (fibrous forms) is treated as if it were a newly added chemical reportable beginning with the 1990 reporting year.

Table 19. TRI Releases and Transfers, 1987-1990.

	1987 Pounds	1988 Pounds	1989 Pounds	1990 Pounds
Releases	5.18 billion	4.81 billion	4.37 billion	3.56 billion
Air Emissions	2.71 billion	2.63 billion	2.55 billion	2.20 billion
Surface Water Discharges	412 million	311 million	193 million	197 million
Underground Injection	1.33 billion	1.34 billion	1.17 billion	725 million
Releases to Land	728 million	531 million	454 million	441 million
Transfers	1.85 billion	1.66 billion	1.49 billion	1.25 billion
Transfers to POTWs	610 million	574 million	557 million	447 million
Transfers to Other Off-site Locations	1.24 billion	1.08 billion	932 million	804 million

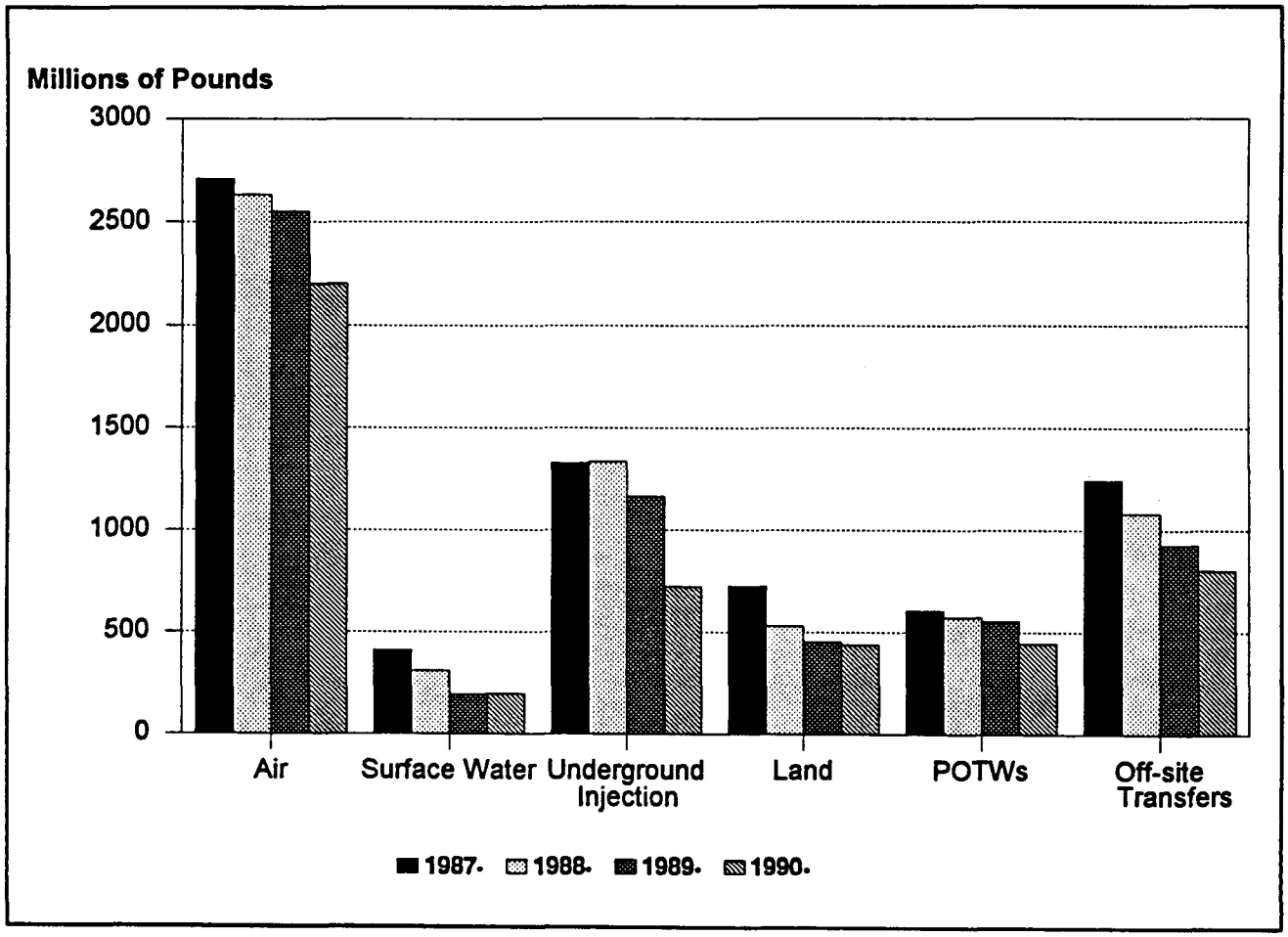


Figure 4. TRI Releases and Transfers, 1987-1990.

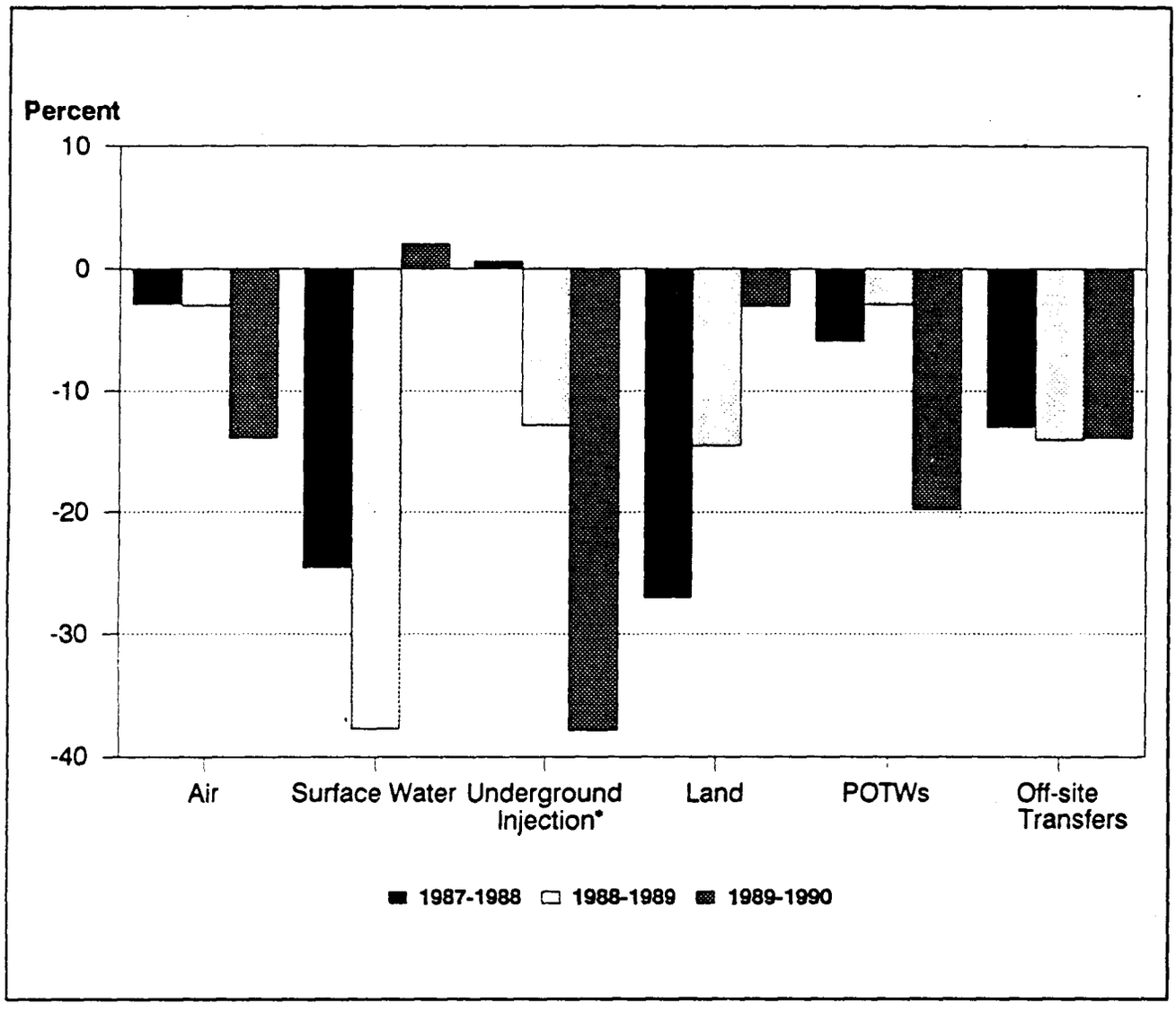
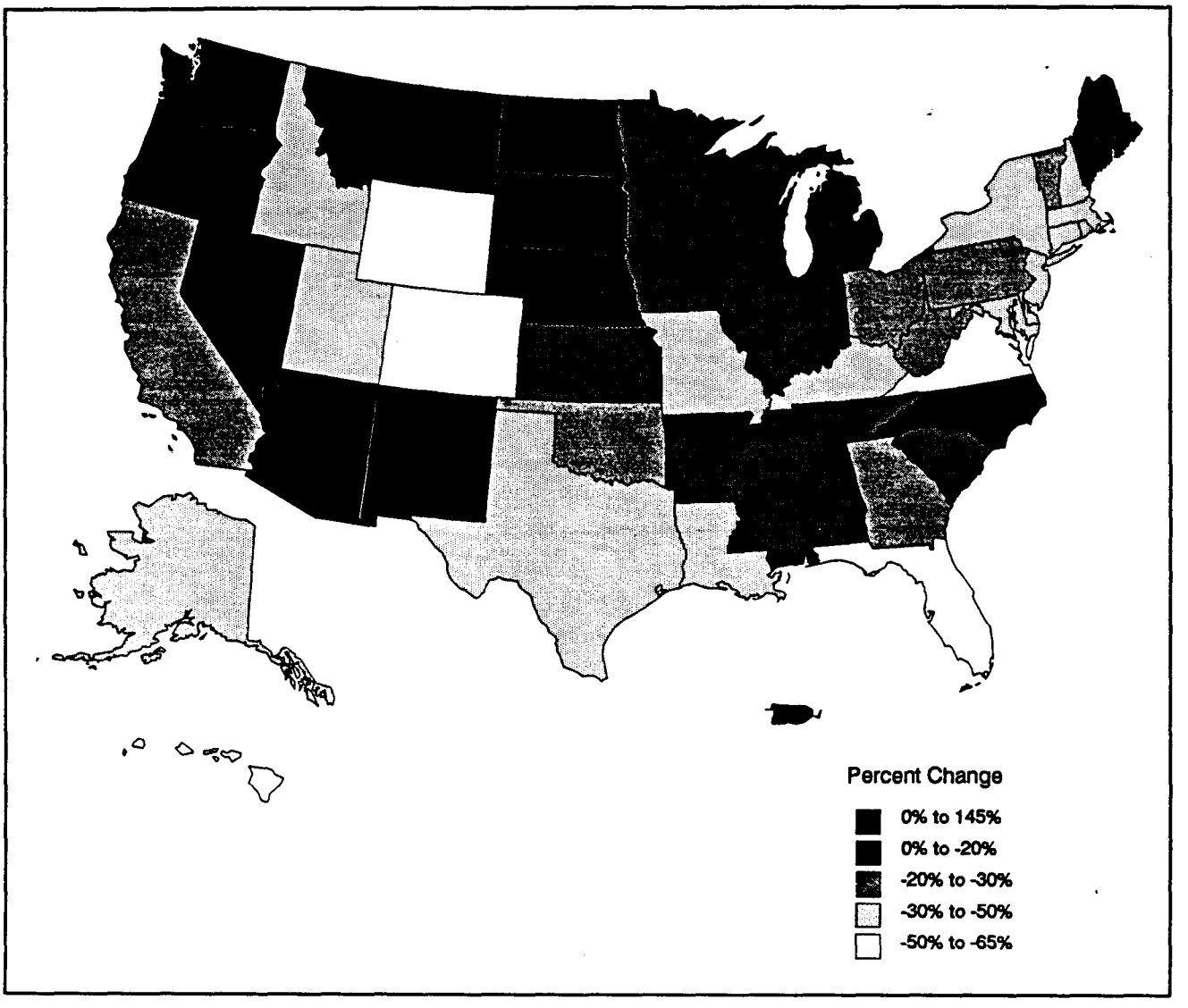


Figure 5. TRI Releases and Transfers, Percent Change, 1987-1990.

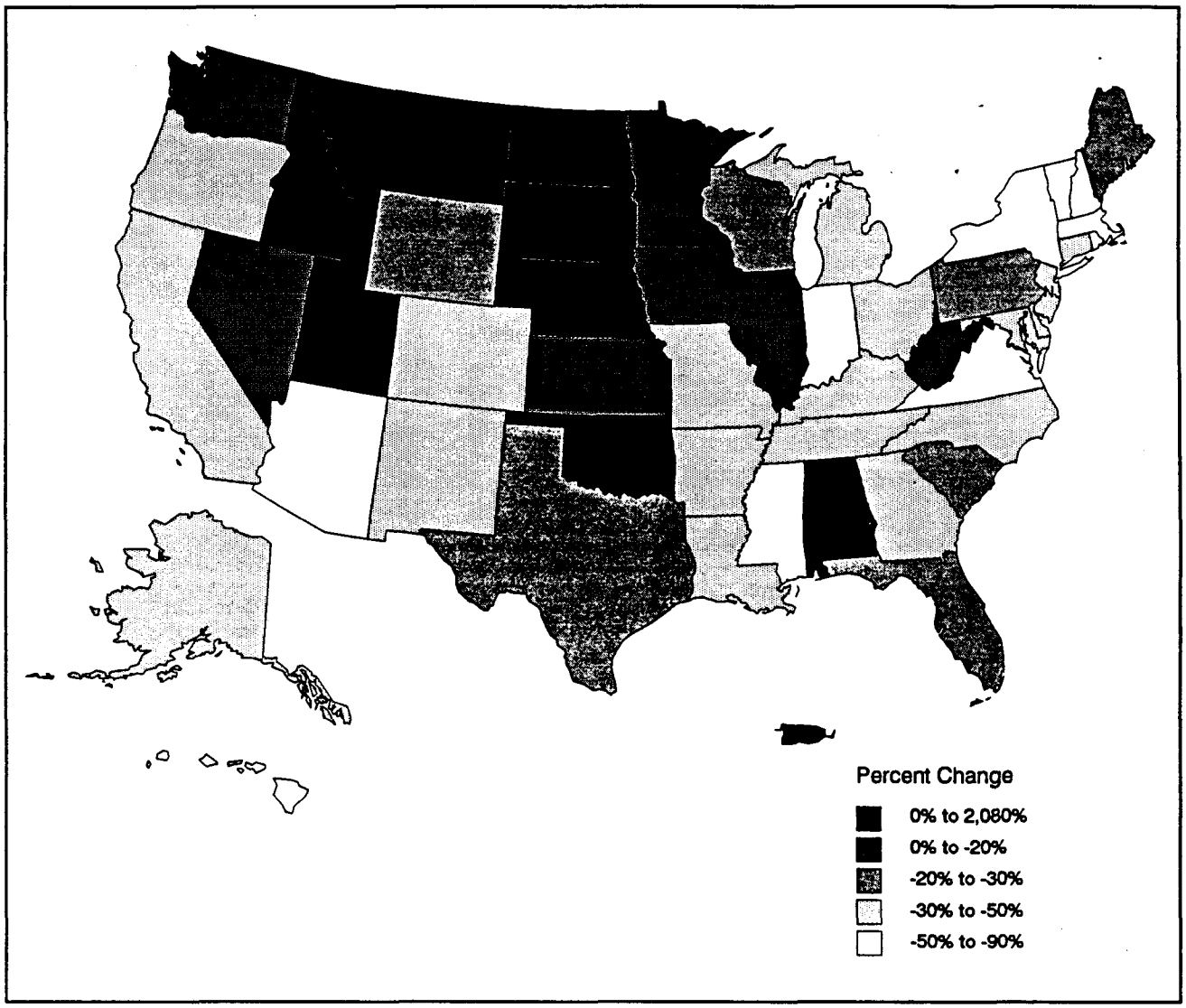
* Three quarters of the 1989-1990 decrease is due to a change in EPA's reporting guidance for one chemical and does not represent an actual decrease in the amount of the waste injected underground.

THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

1987 - 1990
Releases and Transfers
by State



Map 5. TRI Releases by State, Percent Change, 1987-1990.



Map 6. TRI Transfers by State, Percent Change, 1987-1990.

Table 20. TRI Releases and Transfers by State, 1987-1990 (Alphabetically Ordered).

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Alabama	90	16,938,476	83,080,198	2,797,180	6,317,242	3,172,501	112,305,597
	89	18,187,232	87,544,612	7,553,642	1,533,747	5,180,111	119,999,344
	88	20,181,480	85,651,284	7,067,592	1,734,717	4,615,038	119,250,111
	87	19,363,825	82,572,911	14,193,352	1,428,391	6,041,030	123,599,509
Alaska	90	396,347	14,577,730	5,569,839	20	29,076	20,573,012
	89	318,983	19,407,840	5,429,576	1,000	10,415	25,167,814
	88	343,987	21,405,709	4,271,465	1,018	1,720	26,023,899
	87	346,162	31,191,501	6,728,665	0	14,180	38,280,508
American Samoa	90	19,300	0	5	0	0	19,305
	89	27,750	0	0	0	0	27,750
	88	29,500	0	0	0	0	29,500
	87	27,750	0	0	0	0	27,750
Arizona	90	4,190,813	8,400,281	158	30	58,522,281	71,113,563
	89	4,636,733	8,180,986	2,260	10	32,321,688	45,141,677
	88	7,047,699	9,149,168	9,855	505	53,667,725	69,874,952
	87	7,109,260	10,486,309	2,755	0	48,176,251	65,774,575
Arkansas	90	9,214,371	21,982,028	2,606,835	20,554,004	3,459,469	57,816,707
	89	10,195,515	33,058,523	9,087,751	21,926,895	2,307,694	76,576,378
	88	11,276,828	37,192,840	7,448,237	8,121,284	1,938,400	65,977,589
	87	8,569,849	41,136,114	5,411,241	11,283,120	1,325,028	67,725,352
California	90	31,163,504	47,595,670	11,086,222	1,769,286	5,107,344	96,722,026
	89	33,706,390	52,729,111	14,996,314	1,728,366	6,477,415	109,637,596
	88	36,140,161	54,547,800	10,862,294	1,586,653	8,476,996	111,613,904
	87	37,726,075	50,350,095	23,513,427	1,537,882	12,235,167	125,362,646
Colorado	90	3,051,331	3,704,631	175,972	280	477,676	7,409,890
	89	4,987,985	6,128,422	124,133	1,250	897,140	12,138,930
	88	5,954,792	6,196,895	89,268	1,750	2,802,039	15,044,744
	87	5,436,129	4,957,803	234,137	1,250	5,244,863	15,874,182
Connecticut	90	8,168,945	8,993,393	4,012,122	0	165,742	21,340,202
	89	10,807,681	10,433,774	4,753,600	0	337,775	26,332,830
	88	13,356,878	12,062,055	6,080,370	250	1,687,141	33,186,694
	87	15,713,108	12,183,860	9,146,269	0	1,148,025	38,191,262
Delaware	90	1,762,968	4,254,882	431,506	0	130,349	6,579,705
	89	1,700,467	6,176,367	649,993	0	78,911	8,605,738
	88	1,743,901	5,840,194	574,601	0	130,117	8,288,813
	87	2,483,541	6,688,856	1,536,001	250	340,576	11,049,224
District of Columbia	89	0	0	250	0	0	250
	88	250	0	250	0	0	500
Florida	90	23,442,222	21,766,390	2,781,622	21,536,061	37,022,470	106,548,765
	89	31,423,570	27,855,258	6,603,383	28,338,638	39,824,533	134,045,382
	88	22,654,719	28,970,246	6,954,597	34,651,616	35,793,603	129,024,781
	87	21,889,544	29,532,712	19,352,222	22,572,495	180,906,966	274,253,939
Georgia	90	16,782,726	55,680,001	4,273,161	810	1,063,613	77,800,311
	89	18,580,046	58,113,553	5,778,321	0	2,787,834	85,259,754
	88	19,671,317	66,551,308	3,018,325	59,467	9,283,986	98,584,403
	87	20,469,862	72,976,970	9,345,213	19,500	8,366,678	111,178,223

State	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
Alabama	90	996,525	17,547,389	18,543,914
	89	1,345,741	18,885,661	20,231,402
	88	1,196,876	15,514,563	16,711,439
	87	1,222,542	16,201,791	17,424,333
Alaska	90	4	90	94
	89	750	5,750	6,500
	88	1,000	1,750	2,750
	87	0	139	139
American Samoa	90	0	0	0
	89	0	0	0
	88	0	0	0
	87	0	0	0
Arizona	90	1,336,730	1,178,004	2,514,734
	89	4,041,900	1,668,641	5,710,541
	88	4,535,974	1,803,358	6,339,332
	87	5,737,769	1,988,411	7,726,180
Arkansas	90	2,169,947	7,747,525	9,917,472
	89	1,021,680	11,089,189	12,110,869
	88	1,277,923	7,969,811	9,247,734
	87	1,364,798	14,617,198	15,981,996
California	90	31,944,813	25,235,912	57,180,725
	89	47,303,940	22,662,173	69,966,113
	88	49,972,373	42,650,901	92,623,274
	87	50,437,433	57,127,662	107,565,095
Colorado	90	677,926	3,143,077	3,821,003
	89	776,168	5,160,359	5,936,527
	88	759,635	5,549,921	6,309,556
	87	1,581,479	3,948,875	5,530,354
Connecticut	90	2,117,634	11,023,996	13,141,630
	89	2,276,090	14,988,202	17,264,292
	88	2,952,557	18,188,715	21,141,272
	87	2,788,595	21,376,773	24,165,368
Delaware	90	4,003,760	1,697,856	5,701,616
	89	3,278,847	2,698,570	5,977,417
	88	4,418,013	4,172,497	8,590,510
	87	4,266,637	4,647,963	8,914,600
District of Columbia	89	250	500	750
	88	250	250	500
Florida	90	17,292,580	7,065,022	24,357,602
	89	16,308,252	16,639,856	32,948,108
	88	16,659,386	13,309,165	29,968,551
	87	17,357,683	13,665,314	31,022,997
Georgia	90	7,874,116	14,816,871	22,690,987
	89	9,532,691	25,293,060	34,825,751
	88	8,320,359	29,011,571	37,331,930
	87	9,663,490	23,588,190	33,251,680

Table 20. TRI Releases and Transfers by State, 1987-1990 (Alphabetically Ordered), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Hawaii	90	550,617	138,744	15,990	111,500	34,009	850,860
	89	514,209	170,804	9,500	1,196,672	211,372	2,102,557
	88	535,305	338,840	10,000	1,051,509	205,745	2,141,399
	87	513,755	399,880	23,750	1,074,340	235,342	2,247,067
Idaho	90	1,940,866	3,743,919	474,398	0	5,434,670	11,593,853
	89	2,443,353	2,892,084	308,667	0	11,632,840	17,276,944
	88	2,546,912	2,907,771	296,220	0	11,850,374	17,601,277
	87	2,222,255	2,773,383	551,799	0	13,694,349	19,241,786
Illinois	90	32,158,605	55,691,026	6,257,325	9,449,680	15,328,703	118,885,339
	89	38,025,074	63,477,587	16,753,901	10,712,556	11,688,818	140,657,936
	88	43,218,329	64,723,607	14,169,602	7,340,184	11,536,842	140,988,564
	87	45,256,287	60,757,750	13,826,254	13,417,547	10,586,793	143,844,631
Indiana	90	40,586,114	67,518,225	2,848,513	9,192,193	48,574,082	168,719,127
	89	46,434,229	67,827,393	5,419,864	32,703,116	50,536,212	202,920,814
	88	43,212,501	67,847,067	4,920,076	34,820,400	63,076,375	213,876,419
	87	48,124,254	65,503,601	5,912,105	32,976,624	23,926,050	176,442,634
Iowa	90	6,969,967	31,121,959	2,313,802	20	283,079	40,688,827
	89	9,365,408	34,880,557	1,224,605	250	194,064	45,664,884
	88	10,230,787	33,725,024	1,386,542	5	637,285	45,979,643
	87	8,455,258	31,821,107	1,411,368	0	403,402	42,091,135
Kansas	90	8,666,536	20,151,245	1,044,876	58,706,062	1,323,496	89,892,215
	89	10,865,625	24,730,440	654,421	91,660,915	374,262	128,285,663
	88	10,668,550	23,605,633	853,474	90,767,460	487,074	126,382,191
	87	8,814,028	18,202,766	1,509,862	66,037,910	346,229	94,910,795
Kentucky	90	11,435,582	29,152,838	682,745	50	1,094,021	42,365,236
	89	13,014,551	31,795,855	773,051	39,000,000	635,729	85,219,186
	88	15,388,232	32,584,194	1,700,777	30,000,250	5,505,007	85,178,460
	87	17,548,696	29,685,358	1,520,087	25,000,250	3,655,745	77,410,136
Louisiana	90	23,381,438	82,546,323	101,000,892	218,554,054	1,519,373	427,002,080
	89	27,478,589	107,251,828	46,315,248	286,806,610	2,425,112	470,277,387
	88	24,595,949	108,105,712	159,390,181	423,589,470	2,276,609	717,957,921
	87	27,494,699	118,907,120	196,236,988	485,405,098	1,017,387	829,061,292
Maine	90	2,277,759	11,418,712	625,878	0	504,946	14,827,295
	89	3,028,678	12,208,511	366,329	0	444,789	16,048,307
	88	3,306,899	13,741,530	437,488	0	960,950	18,446,867
	87	4,003,445	12,168,239	940,946	0	320,332	17,432,962
Maryland	90	5,704,994	7,202,333	1,279,056	55	1,868,993	16,055,431
	89	5,715,225	12,493,401	2,448,229	0	1,946,141	22,602,996
	88	5,263,038	12,716,221	3,955,551	2	2,668,375	24,603,187
	87	5,681,987	13,100,292	10,226,440	750	2,112,312	31,121,781
Massachusetts	90	8,474,730	12,018,438	264,175	50	62,425	20,819,818
	89	9,497,964	15,397,292	837,455	0	80,176	25,812,887
	88	10,223,354	17,535,086	675,505	4,000	919,016	29,356,961
	87	10,577,154	21,450,597	540,598	250	786,577	33,355,176
Michigan	90	23,115,133	61,954,074	818,096	8,390,267	25,566,035	119,843,605
	89	23,272,014	82,265,884	739,332	6,328,650	23,507,685	136,113,565
	88	27,355,487	71,215,793	1,153,624	6,379,978	18,532,668	124,637,550
	87	27,785,987	90,598,052	1,189,808	6,054,430	2,519,878	128,148,155

State	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
Hawaii	90	388,060	8,459	396,519
	89	1,287,450	12,358	1,299,808
	88	835,250	13,682	848,932
	87	931,250	11,991	943,241
Idaho	90	2,864,047	209,897	3,073,944
	89	1,722,366	377,831	2,100,197
	88	484,374	122,215	606,589
	87	346,894	188,958	535,852
Illinois	90	62,675,945	49,597,299	112,273,244
	89	59,743,997	57,896,606	117,640,603
	88	60,060,473	54,726,807	114,787,280
	87	70,507,448	61,518,299	132,025,747
Indiana	90	7,101,813	34,806,170	41,907,983
	89	15,641,310	38,537,042	54,178,352
	88	14,022,356	52,908,496	66,930,852
	87	16,622,604	67,703,738	84,326,342
Iowa	90	7,225,667	4,084,301	11,309,968
	89	7,175,308	4,824,410	11,999,718
	88	6,568,213	7,842,617	14,410,830
	87	6,145,464	6,823,926	12,969,390
Kansas	90	2,703,128	8,354,721	11,057,849
	89	3,569,975	60,912,861	64,482,836
	88	3,381,348	55,255,696	58,637,044
	87	4,333,816	8,110,135	12,443,951
Kentucky	90	2,218,058	22,529,085	24,747,143
	89	2,096,844	25,088,937	27,185,781
	88	2,719,764	33,370,557	36,090,321
	87	2,860,982	43,418,859	46,279,841
Louisiana	90	49,556	15,223,014	15,272,570
	89	59,501	20,225,643	20,285,144
	88	3,538,703	21,908,647	25,447,350
	87	372,285	29,056,747	29,429,032
Maine	90	898,682	1,353,032	2,251,714
	89	1,255,304	1,479,325	2,734,629
	88	2,779,593	1,313,371	4,092,964
	87	1,154,797	1,783,911	2,938,708
Maryland	90	4,434,876	2,937,450	7,372,326
	89	3,266,491	3,952,588	7,219,079
	88	3,992,911	5,409,432	9,402,343
	87	6,508,659	6,206,498	12,715,157
Massachusetts	90	7,146,973	13,168,117	20,315,090
	89	11,447,188	18,535,536	29,982,724
	88	16,322,404	22,321,742	38,644,146
	87	12,831,580	28,976,014	41,807,594
Michigan	90	13,995,665	61,389,190	75,384,855
	89	15,341,077	84,841,981	100,183,058
	88	15,964,967	97,202,107	113,167,074
	87	15,296,730	125,456,079	140,752,809

Table 20. TRI Releases and Transfers by State, 1987-1990 (Alphabetically Ordered), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Minnesota	90	8,218,081	41,424,161	852,494	20	1,544,178	52,038,934
	89	8,162,543	54,476,835	1,415,110	0	1,316,033	65,370,521
	88	9,421,006	45,075,879	2,735,819	0	2,778,268	60,010,972
	87	8,248,869	41,273,662	2,773,601	0	754,649	53,050,781
Mississippi	90	14,371,140	41,090,028	2,252,717	40,396,040	5,240,518	103,350,443
	89	19,344,312	44,618,259	3,159,016	43,303,000	8,555,481	118,980,068
	88	17,441,185	47,394,721	2,340,357	46,806,568	9,001,500	122,984,331
	87	16,459,136	49,187,527	3,651,279	43,614,250	9,300,251	122,212,443
Missouri	90	11,391,386	32,823,390	1,518,912	30	22,706,607	68,440,325
	89	11,811,385	36,979,778	1,262,113	0	27,556,992	77,610,268
	88	11,162,947	38,889,058	1,941,032	500	39,485,389	91,478,926
	87	11,663,896	37,379,015	1,631,582	1,000,921	49,355,479	101,030,893
Montana	90	1,694,767	781,592	105,362	0	40,095,368	42,677,089
	89	1,838,492	666,933	105,825	0	36,448,109	39,059,359
	88	1,809,408	592,249	124,874	0	32,910,607	35,437,138
	87	1,932,894	817,562	136,622	0	31,414,887	34,301,965
Nebraska	90	4,613,943	12,145,352	562,466	10	60,890	17,382,661
	89	4,504,743	12,273,871	265,960	0	131,070	17,175,644
	88	4,699,455	14,090,368	309,718	0	56,737	19,156,278
	87	3,572,196	10,927,084	1,741,506	0	367,130	16,607,916
Nevada	90	384,560	337,720	251	0	2,547,192	3,269,723
	89	332,676	353,870	1,150	0	2,284,722	2,972,418
	88	358,484	345,192	250	0	1,841,221	2,545,147
	87	341,968	435,396	0	0	2,437,330	3,214,694
New Hampshire	90	2,257,225	5,680,887	254,243	35	106,210	8,298,600
	89	2,513,763	8,480,012	153,016	0	61,882	11,208,673
	88	3,399,426	8,702,678	522,963	0	429,118	13,054,185
	87	3,074,366	9,892,526	882,793	0	606,419	14,456,104
New Jersey	90	8,750,756	15,604,069	468,327	115	1,101,119	25,924,386
	89	10,296,299	20,642,435	858,700	0	3,107,282	34,904,716
	88	13,478,062	25,169,156	1,437,700	2,500	2,871,740	42,959,158
	87	17,017,941	27,175,559	1,741,080	530	1,943,341	47,878,451
New Mexico	90	550,618	1,914,502	14	20	30,183,583	32,648,737
	89	933,707	1,888,845	5	5	31,011,089	33,833,651
	88	748,852	1,384,496	505	5	28,830,402	30,964,260
	87	1,181,129	2,715,805	4,321	5	17,219,785	21,121,045
New York	90	21,707,136	35,325,636	1,613,734	145	1,740,192	60,386,843
	89	32,519,321	53,352,708	1,769,979	250	2,193,359	89,835,617
	88	37,206,793	59,147,963	2,075,041	251	3,154,050	101,584,098
	87	40,125,089	61,585,089	2,836,139	250	5,618,134	110,164,701
North Carolina	90	24,616,539	64,907,094	1,383,927	85	33,021,637	123,929,282
	89	26,744,498	69,185,309	905,491	0	25,783,320	122,618,618
	88	27,293,278	70,742,428	694,739	0	16,856,513	115,586,958
	87	31,782,077	69,885,987	1,554,400	0	15,435,141	118,657,605
North Dakota	90	480,221	1,526,131	334	0	101,401	2,108,087
	89	687,371	941,571	1,704	0	164,012	1,794,658
	88	410,796	860,291	1,800	0	35,312	1,308,199
	87	272,865	503,159	3,600	0	94,500	874,124

State	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
Minnesota	90	6,863,748	4,347,235	11,210,983
	89	4,937,328	13,815,762	18,753,090
	88	6,058,210	6,152,487	12,210,697
	87	6,618,941	7,300,829	13,919,770
Mississippi	90	1,262,582	3,729,707	4,992,289
	89	1,314,027	4,909,699	6,223,726
	88	1,509,156	7,978,524	9,487,680
	87	5,934,287	46,145,690	52,079,977
Missouri	90	30,354,919	9,798,466	40,153,385
	89	76,652,380	11,457,957	88,110,337
	88	67,044,181	14,515,389	81,559,570
	87	62,358,940	17,445,209	79,804,149
Montana	90	30,042	343,162	373,204
	89	29,646	18,456	48,102
	88	1,312	50,510	51,822
	87	1,087	167,082	168,169
Nebraska	90	1,189,130	7,239,710	8,428,840
	89	1,000,108	4,803,700	5,803,808
	88	901,304	4,297,902	5,199,206
	87	708,592	2,457,281	3,165,873
Nevada	90	15,277	141,481	156,758
	89	14,880	311,379	326,259
	88	20,555	639,896	660,451
	87	31,906	153,893	185,799
New Hampshire	90	450,275	1,262,993	1,713,268
	89	734,485	2,580,903	3,315,388
	88	523,545	2,179,177	2,702,722
	87	887,807	4,045,984	4,933,791
New Jersey	90	56,374,524	31,024,563	87,399,087
	89	61,511,622	30,202,823	91,714,445
	88	55,316,004	69,529,341	124,845,345
	87	51,557,123	75,446,328	127,003,451
New Mexico	90	69,430	271,391	340,821
	89	119,352	220,449	339,801
	88	35,871	262,045	297,916
	87	33,798	622,070	655,868
New York	90	12,797,067	23,623,752	36,420,819
	89	16,393,856	26,946,414	43,340,270
	88	24,208,805	48,930,444	73,139,249
	87	24,333,818	62,491,325	86,825,143
North Carolina	90	5,710,056	8,487,643	14,197,699
	89	5,536,114	13,554,400	19,090,514
	88	6,751,608	18,407,842	25,159,450
	87	6,163,613	20,087,527	26,251,140
North Dakota	90	222,855	75,165	298,020
	89	67,154	79,232	146,386
	88	52,832	157,491	210,323
	87	92,226	147,733	239,959

Table 20. TRI Releases and Transfers by State, 1987-1990 (Alphabetically Ordered), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Ohio	90	36,574,190	76,980,497	5,974,425	25,426,150	23,213,043	168,168,305
	89	44,776,575	96,002,872	6,211,790	61,324,955	30,934,051	239,250,243
	88	42,490,371	97,007,304	5,796,576	56,920,298	32,360,141	234,574,690
	87	48,561,425	92,528,349	8,033,466	64,927,903	29,276,927	243,328,070
Oklahoma	90	6,043,906	22,024,929	539,528	4,171,697	330,716	33,110,776
	89	7,497,457	22,090,242	388,269	6,141,510	933,614	37,051,092
	88	8,976,480	26,663,118	367,955	6,354,214	1,793,664	44,155,431
	87	9,760,331	26,502,174	424,809	6,975,441	1,057,334	44,720,089
Oregon	90	4,834,118	13,479,347	561,556	25	3,716,595	22,591,641
	89	5,734,808	14,019,343	382,402	0	2,420,301	22,556,854
	88	6,633,904	14,317,264	349,446	1	1,360,882	22,661,497
	87	8,386,287	12,329,339	405,970	0	1,432,822	22,554,418
Pennsylvania	90	29,896,601	42,663,593	1,584,412	115	15,116,671	89,261,392
	89	33,495,399	48,005,498	2,135,205	519	19,263,180	102,899,801
	88	39,322,639	52,380,526	4,303,308	750	16,882,039	112,889,262
	87	35,436,224	58,200,864	5,978,170	16,250	13,017,871	112,649,379
Puerto Rico	90	7,294,409	8,056,424	118,849	738	25,457	15,495,877
	89	7,483,157	6,153,865	22,435	250	44,960	13,704,667
	88	10,543,673	6,703,784	128,610	0	110,825	17,486,892
	87	7,564,496	5,457,661	298,152	988	72,100	13,393,397
Rhode Island	90	2,945,546	2,252,827	61,683	0	1,272	5,261,328
	89	3,583,690	2,713,362	543,278	0	0	6,840,330
	88	4,066,248	3,695,659	586,245	0	115,048	8,463,200
	87	4,257,771	3,662,112	57,491	0	67,321	8,044,695
South Carolina	90	18,772,150	45,986,431	972,068	62	1,491,972	67,222,683
	89	21,183,436	50,968,114	1,200,817	0	1,383,184	74,735,551
	88	18,921,432	47,892,827	1,394,749	5	1,299,422	69,508,435
	87	19,115,826	49,232,072	1,763,116	755	1,497,960	71,609,729
South Dakota	90	467,252	2,417,303	44,867	0	1	2,929,423
	89	466,920	2,745,664	55,115	0	26	3,267,725
	88	688,579	1,811,288	2,400	0	1	2,502,268
	87	627,324	1,869,609	3,698	0	9	2,500,640
Tennessee	90	50,974,679	88,431,903	4,874,245	54,068,496	9,129,838	207,479,161
	89	55,030,760	100,196,438	5,964,022	54,996,665	10,705,428	226,893,313
	88	52,117,293	88,720,984	6,317,455	49,906,115	13,587,070	210,648,917
	87	53,912,007	83,739,431	13,556,002	69,037,423	18,008,981	238,253,844
Texas	90	75,384,106	87,608,222	4,421,813	239,732,317	11,309,407	418,455,865
	89	87,909,628	98,469,483	6,028,005	464,685,251	22,118,287	679,210,654
	88	87,438,948	106,836,823	5,438,621	509,924,768	44,117,568	753,756,728
	87	126,171,119	100,178,577	5,474,537	445,307,971	23,646,422	700,778,626
Utah	90	11,686,355	100,749,509	278,735	45	12,716,701	125,431,345
	89	5,190,341	125,094,831	255,590	0	15,866,398	146,407,160
	88	4,792,425	116,817,216	370,721	0	13,821,107	135,801,469
	87	3,726,092	80,941,498	134,504	3	162,968,038	247,770,135
Vermont	90	250,480	630,922	91,158	5	44,038	1,016,603
	89	320,176	834,737	136,463	0	40,203	1,331,579
	88	414,975	1,104,318	113,058	0	24,341	1,656,692
	87	334,267	902,636	102,199	0	55,908	1,395,010

State	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
Ohio	90	24,721,112	77,418,029	102,139,141
	89	30,228,634	104,259,415	134,488,049
	88	25,296,713	109,472,259	134,768,972
	87	30,437,065	136,832,426	167,269,491
Oklahoma	90	141,870	13,965,984	14,107,854
	89	388,705	11,095,031	11,483,736
	88	521,595	11,848,660	12,370,255
	87	600,704	11,962,217	12,562,921
Oregon	90	7,548,585	2,392,785	9,941,370
	89	7,437,233	3,089,781	10,527,014
	88	7,068,036	5,556,661	12,624,697
	87	8,679,082	6,201,415	14,880,497
Pennsylvania	90	17,103,506	72,106,078	89,209,584
	89	16,121,421	68,807,404	84,928,825
	88	15,243,528	88,755,139	103,998,667
	87	13,798,380	105,532,703	119,331,083
Puerto Rico	90	8,205,082	4,610,687	12,815,769
	89	6,532,852	7,040,552	13,573,404
	88	8,025,455	5,124,780	13,150,235
	87	5,696,673	4,868,229	10,564,902
Rhode Island	90	1,222,579	1,822,315	3,044,894
	89	1,420,088	2,870,475	4,290,563
	88	1,938,667	4,569,114	6,507,781
	87	2,353,884	4,652,845	7,006,729
South Carolina	90	3,044,057	10,103,786	13,147,843
	89	3,402,857	13,917,073	17,319,930
	88	2,662,216	12,702,678	15,364,894
	87	2,589,923	15,527,026	18,116,949
South Dakota	90	211,803	402,146	613,949
	89	101,905	594,962	696,867
	88	156,884	399,484	556,368
	87	147,151	445,610	592,761
Tennessee	90	16,476,858	15,714,615	32,191,473
	89	21,216,697	21,359,279	42,575,976
	88	24,854,166	18,769,210	43,623,376
	87	33,845,262	17,939,566	51,784,828
Texas	90	37,581,958	78,076,312	115,658,270
	89	36,738,555	87,057,601	123,796,156
	88	40,451,612	86,594,928	127,046,540
	87	55,885,139	100,842,965	156,728,104
Utah	90	895,732	88,099,619	88,995,351
	89	758,611	2,021,570	2,780,181
	88	915,043	2,109,873	3,024,916
	87	480,244	3,605,837	4,086,081
Vermont	90	43,208	202,167	245,375
	89	77,588	551,184	628,772
	88	72,761	644,961	717,722
	87	124,424	673,406	797,830

Table 20. TRI Releases and Transfers by State, 1987-1990 (Alphabetically Ordered), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Virgin Islands	90	831,913	380,552	195,751	0	75,224	1,483,440
	89	502,680	656,722	1,190	0	113,643	1,274,235
	88	748,330	742,462	2,500	0	140,342	1,633,634
	87	1,125,850	906,953	3,250	0	87,005	2,123,058
Virginia	90	21,250,281	54,243,356	2,154,571	859	1,911,738	79,560,805
	89	29,732,463	62,169,549	10,591,722	0	2,209,322	104,703,056
	88	23,078,015	100,562,860	19,964,567	1,373	6,282,455	149,889,270
	87	30,495,539	120,975,253	21,160,000	250	6,667,036	179,298,078
Washington	90	11,661,701	16,485,847	12,514,187	35	646,708	41,308,478
	89	12,546,662	15,873,272	15,574,367	0	421,163	44,415,464
	88	11,093,279	18,388,530	13,519,530	0	914,274	43,915,613
	87	9,534,667	19,159,923	9,257,903	250	1,344,293	39,297,036
West Virginia	90	11,523,378	16,702,640	2,008,829	5	7,879,311	38,114,163
	89	12,499,415	21,418,896	2,912,276	0	10,183,750	47,014,337
	88	15,008,702	21,755,357	3,903,006	0	896,028	41,563,093
	87	15,972,607	25,152,442	3,043,282	319,219	8,436,389	52,923,939
Wisconsin	90	9,967,557	31,107,421	460,923	20	3,402,954	44,938,875
	89	11,165,460	30,325,008	267,989	250	5,042,167	46,800,874
	88	12,617,302	33,309,944	493,393	250	7,025,321	53,446,210
	87	11,055,860	38,646,820	1,480,157	1,500	1,839,396	53,023,733
Wyoming	90	834,691	3,483,087	120,097	6,818,227	325,763	11,581,865
	89	747,972	2,911,530	82,173	14,125,832	192,699	18,060,206
	88	1,144,667	1,746,397	42,050	27,113,559	15,274,367	45,321,040
	87	2,098,993	408,331	91,487	30,651,671	410,165	33,660,647
Total	90	680,623,029	1,519,938,412	197,350,846	725,196,960	440,530,657	3,563,639,904
	89	783,783,380	1,769,529,934	193,481,002	1,166,517,162	454,386,443	4,367,697,921
	88	802,473,809	1,829,465,117	310,604,882	1,337,141,675	531,308,837	4,810,994,320
	87	869,422,021	1,840,017,691	411,578,403	1,328,665,667	727,836,183	5,177,519,965

State	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Location Pounds	Total Transfers Pounds
Virgin Islands	90	0	13,200	13,200
	89	0	0	0
	88	0	0	0
	87	0	0	0
Virginia	90	17,104,855	8,882,181	25,987,036
	89	34,748,787	10,849,306	45,598,093
	88	37,717,724	13,406,877	51,124,601
	87	45,126,852	16,974,284	62,101,136
Washington	90	1,296,780	3,670,516	4,967,296
	89	796,179	4,906,780	5,702,959
	88	978,070	7,491,409	8,469,479
	87	926,935	4,974,033	5,900,968
West Virginia	90	3,055,855	11,913,528	14,969,383
	89	3,423,488	11,614,435	15,037,923
	88	3,536,365	22,424,128	25,960,493
	87	3,183,859	12,515,283	15,699,142
Wisconsin	90	13,138,216	20,768,871	33,907,087
	89	16,983,632	37,662,867	54,646,499
	88	21,320,736	30,236,729	51,557,465
	87	15,247,777	28,080,230	43,328,007
Wyoming	90	250	26,222	26,472
	89	250	17,418	17,668
	88	10,350	128,583	138,933
	87	0	36,483	36,483
Total	90	447,248,716	803,650,786	1,250,899,502
	89	557,181,554	932,393,386	1,489,574,940
	88	573,958,006	1,083,904,392	1,657,862,398
	87	610,178,427	1,244,592,980	1,854,771,407

Table 21. TRI Releases by State, 1987-1990 (Ordered by Total Release).

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Louisiana	90	23,381,438	82,546,323	101,000,892	218,554,054	1,519,373	427,002,080
	89	27,478,589	107,251,828	46,315,248	286,806,610	2,425,112	470,277,387
	88	24,595,949	108,105,712	159,390,181	423,589,470	2,276,609	717,957,921
	87	27,494,699	118,907,120	196,236,988	485,405,098	1,017,387	829,061,292
Texas	90	75,384,106	87,608,222	4,421,813	239,732,317	11,309,407	418,455,865
	89	87,909,628	98,469,483	6,028,005	464,685,251	22,118,287	679,210,654
	88	87,438,948	106,836,823	5,438,621	509,924,768	44,117,568	753,756,728
	87	126,171,119	100,178,577	5,474,537	445,307,971	23,646,422	700,778,626
Tennessee	90	50,974,679	88,431,903	4,874,245	54,068,496	9,129,838	207,479,161
	89	55,030,760	100,196,438	5,964,022	54,996,665	10,705,428	226,893,313
	88	52,117,293	88,720,984	6,317,455	49,906,115	13,587,070	210,648,917
	87	53,912,007	83,739,431	13,556,002	69,037,423	18,008,981	238,253,844
Indiana	90	40,586,114	67,518,225	2,848,513	9,192,193	48,574,082	168,719,127
	89	46,434,229	67,827,393	5,419,864	32,703,116	50,536,212	202,920,814
	88	43,212,501	67,847,067	4,920,076	34,820,400	63,076,375	213,876,419
	87	48,124,254	65,503,601	5,912,105	32,976,624	23,926,050	176,442,634
Ohio	90	36,574,190	76,980,497	5,974,425	25,426,150	23,213,043	168,168,305
	89	44,776,575	96,002,872	6,211,790	61,324,955	30,934,051	239,250,243
	88	42,490,371	97,007,304	5,796,576	56,920,298	32,360,141	234,574,690
	87	48,561,425	92,528,349	8,033,466	64,927,903	29,276,927	243,328,070
Utah	90	11,686,355	100,749,509	278,735	45	12,716,701	125,431,345
	89	5,190,341	125,094,831	255,590	0	15,866,398	146,407,160
	88	4,792,425	116,817,216	370,721	0	13,821,107	135,801,469
	87	3,726,092	80,941,498	134,504	3	162,968,038	247,770,135
North Carolina	90	24,616,539	64,907,094	1,383,927	85	33,021,637	123,929,282
	89	26,744,498	69,185,309	905,491	0	25,783,320	122,618,618
	88	27,293,278	70,742,428	694,739	0	16,856,513	115,586,958
	87	31,782,077	69,885,987	1,554,400	0	15,435,141	118,657,605
Michigan	90	23,115,133	61,954,074	818,096	8,390,267	25,566,035	119,843,605
	89	23,272,014	82,265,884	739,332	6,328,650	23,507,685	136,113,565
	88	27,355,487	71,215,793	1,153,624	6,379,978	18,532,668	124,637,550
	87	27,785,987	90,598,052	1,189,808	6,054,430	2,519,878	128,148,155
Illinois	90	32,158,605	55,691,026	6,257,325	9,449,680	15,328,703	118,885,339
	89	38,025,074	63,477,587	16,753,901	10,712,556	11,688,818	140,657,936
	88	43,218,329	64,723,607	14,169,602	7,340,184	11,536,842	140,988,564
	87	45,256,287	60,757,750	13,826,254	13,417,547	10,586,793	143,844,631
Alabama	90	16,938,476	83,080,198	2,797,180	6,317,242	3,172,501	112,305,597
	89	18,187,232	87,544,612	7,553,642	1,533,747	5,180,111	119,999,344
	88	20,181,480	85,651,284	7,067,592	1,734,717	4,615,038	119,250,111
	87	19,363,825	82,572,911	14,193,352	1,428,391	6,041,030	123,599,509
Florida	90	23,442,222	21,766,390	2,781,622	21,536,061	37,022,470	106,548,765
	89	31,423,570	27,855,258	6,603,383	28,338,638	39,824,533	134,045,382
	88	22,654,719	28,970,246	6,954,597	34,651,616	35,793,603	129,024,781
	87	21,889,544	29,532,712	19,352,222	22,572,495	180,906,966	274,253,939
Mississippi	90	14,371,140	41,090,028	2,252,717	40,396,040	5,240,518	103,350,443
	89	19,344,312	44,618,259	3,159,016	43,303,000	8,555,481	118,980,068
	88	17,441,185	47,394,721	2,340,357	46,806,568	9,001,500	122,984,331
	87	16,459,136	49,187,527	3,651,279	43,614,250	9,300,251	122,212,443

Table 21. TRI Releases by State, 1987-1990 (Ordered by Total Release), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
California	90	31,163,504	47,595,670	11,086,222	1,769,286	5,107,344	96,722,026
	89	33,706,390	52,729,111	14,996,314	1,728,366	6,477,415	109,637,596
	88	36,140,161	54,547,800	10,862,294	1,586,653	8,476,996	111,613,904
	87	37,726,075	50,350,095	23,513,427	1,537,882	12,235,167	125,362,646
Kansas	90	8,666,536	20,151,245	1,044,876	58,706,062	1,323,496	89,892,215
	89	10,865,625	24,730,440	654,421	91,660,915	374,262	128,285,663
	88	10,668,550	23,605,633	853,474	90,767,460	487,074	126,382,191
	87	8,814,028	18,202,766	1,509,862	66,037,910	346,229	94,910,795
Pennsylvania	90	29,896,601	42,663,593	1,584,412	115	15,116,671	89,261,392
	89	33,495,399	48,005,498	2,135,205	519	19,263,180	102,899,801
	88	39,322,639	52,380,526	4,303,308	750	16,882,039	112,889,262
	87	35,436,224	58,200,864	5,978,170	16,250	13,017,871	112,649,379
Virginia	90	21,250,281	54,243,356	2,154,571	859	1,911,738	79,560,805
	89	29,732,463	62,169,549	10,591,722	0	2,209,322	104,703,056
	88	23,078,015	100,562,860	19,964,567	1,373	6,282,455	149,889,270
	87	30,495,539	120,975,253	21,160,000	250	6,667,036	179,298,078
Georgia	90	16,782,726	55,680,001	4,273,161	810	1,063,613	77,800,311
	89	18,580,046	58,113,553	5,778,321	0	2,787,834	85,259,754
	88	19,671,317	66,551,308	3,018,325	59,467	9,283,986	98,584,403
	87	20,469,862	72,976,970	9,345,213	19,500	8,366,678	111,178,223
Arizona	90	4,190,813	8,400,281	158	30	58,522,281	71,113,563
	89	4,636,733	8,180,986	2,260	10	32,321,688	45,141,677
	88	7,047,699	9,149,168	9,855	505	53,667,725	69,874,952
	87	7,109,260	10,486,309	2,755	0	48,176,251	65,774,575
Missouri	90	11,391,386	32,823,390	1,518,912	30	22,706,607	68,440,325
	89	11,811,385	36,979,778	1,262,113	0	27,556,992	77,610,268
	88	11,162,947	38,889,058	1,941,032	500	39,485,389	91,478,926
	87	11,663,896	37,379,015	1,631,582	1,000,921	49,355,479	101,030,893
South Carolina	90	18,772,150	45,986,431	972,068	62	1,491,972	67,222,683
	89	21,183,436	50,968,114	1,200,817	0	1,383,184	74,735,551
	88	18,921,432	47,892,827	1,394,749	5	1,299,422	69,508,435
	87	19,115,826	49,232,072	1,763,116	755	1,497,960	71,609,729
New York	90	21,707,136	35,325,636	1,613,734	145	1,740,192	60,386,843
	89	32,519,321	53,352,708	1,769,979	250	2,193,359	89,835,617
	88	37,206,793	59,147,963	2,075,041	251	3,154,050	101,584,098
	87	40,125,089	61,585,089	2,836,139	250	5,618,134	110,164,701
Arkansas	90	9,214,371	21,982,028	2,606,835	20,554,004	3,459,469	57,816,707
	89	10,195,515	33,058,523	9,087,751	21,926,895	2,307,694	76,576,378
	88	11,276,828	37,192,840	7,448,237	8,121,284	1,938,400	65,977,589
	87	8,569,849	41,136,114	5,411,241	11,283,120	1,325,028	67,725,352
Minnesota	90	8,218,081	41,424,161	852,494	20	1,544,178	52,038,934
	89	8,162,543	54,476,835	1,415,110	0	1,316,033	65,370,521
	88	9,421,006	45,075,879	2,735,819	0	2,778,268	60,010,972
	87	8,248,869	41,273,662	2,773,601	0	754,649	53,050,781
Wisconsin	90	9,967,557	31,107,421	460,923	20	3,402,954	44,938,875
	89	11,165,460	30,325,008	267,989	250	5,042,167	46,800,874
	88	12,617,302	33,309,944	493,393	250	7,025,321	53,446,210
	87	11,055,860	38,646,820	1,480,157	1,500	1,839,396	53,023,733

Table 21. TRI Releases by State, 1987-1990 (Ordered by Total Release), Continued.

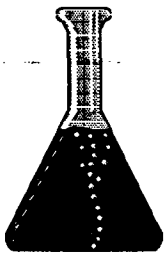
State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Montana	90	1,694,767	781,592	105,362	0	40,095,368	42,677,089
	89	1,838,492	666,933	105,825	0	36,448,109	39,059,359
	88	1,809,408	592,249	124,874	0	32,910,607	35,437,138
	87	1,932,894	817,562	136,622	0	31,414,887	34,301,965
Kentucky	90	11,435,582	29,152,838	682,745	50	1,094,021	42,365,236
	89	13,014,551	31,795,855	773,051	39,000,000	635,729	85,219,186
	88	15,388,232	32,584,194	1,700,777	30,000,250	5,505,007	85,178,460
	87	17,548,696	29,685,358	1,520,087	25,000,250	3,655,745	77,410,136
Washington	90	11,661,701	16,485,847	12,514,187	35	646,708	41,308,478
	89	12,546,662	15,873,272	15,574,367	0	421,163	44,415,464
	88	11,093,279	18,388,530	13,519,530	0	914,274	43,915,613
	87	9,534,667	19,159,923	9,257,903	250	1,344,293	39,297,036
Iowa	90	6,969,967	31,121,959	2,313,802	20	283,079	40,688,827
	89	9,365,408	34,880,557	1,224,605	250	194,064	45,664,884
	88	10,230,787	33,725,024	1,386,542	5	637,285	45,979,643
	87	8,455,258	31,821,107	1,411,368	0	403,402	42,091,135
West Virginia	90	11,523,378	16,702,640	2,008,829	5	7,879,311	38,114,163
	89	12,499,415	21,418,896	2,912,276	0	10,183,750	47,014,337
	88	15,008,702	21,755,357	3,903,006	0	896,028	41,563,093
	87	15,972,607	25,152,442	3,043,282	319,219	8,436,389	52,923,939
Oklahoma	90	6,043,906	22,024,929	539,528	4,171,697	330,716	33,110,776
	89	7,497,457	22,090,242	388,269	6,141,510	933,614	37,051,092
	88	8,976,480	26,663,118	367,955	6,354,214	1,793,664	44,155,431
	87	9,760,331	26,502,174	424,809	6,975,441	1,057,334	44,720,089
New Mexico	90	550,618	1,914,502	14	20	30,183,583	32,648,737
	89	933,707	1,888,845	5	5	31,011,089	33,833,651
	88	748,852	1,384,496	505	5	28,830,402	30,964,260
	87	1,181,129	2,715,805	4,321	5	17,219,785	21,121,045
New Jersey	90	8,750,756	15,604,069	468,327	115	1,101,119	25,924,386
	89	10,296,299	20,642,435	858,700	0	3,107,282	34,904,716
	88	13,478,062	25,169,156	1,437,700	2,500	2,871,740	42,959,158
	87	17,017,941	27,175,559	1,741,080	530	1,943,341	47,878,451
Oregon	90	4,834,118	13,479,347	561,556	25	3,716,595	22,591,641
	89	5,734,808	14,019,343	382,402	0	2,420,301	22,556,854
	88	6,633,904	14,317,264	349,446	1	1,360,882	22,661,497
	87	8,386,287	12,329,339	405,970	0	1,432,822	22,554,418
Connecticut	90	8,168,945	8,993,393	4,012,122	0	165,742	21,340,202
	89	10,807,681	10,433,774	4,753,600	0	337,775	26,332,830
	88	13,356,878	12,062,055	6,080,370	250	1,687,141	33,186,694
	87	15,713,108	12,183,860	9,146,269	0	1,148,025	38,191,262
Massachusetts	90	8,474,730	12,018,438	264,175	50	62,425	20,819,818
	89	9,497,964	15,397,292	837,455	0	80,176	25,812,887
	88	10,223,354	17,535,086	675,505	4,000	919,016	29,356,961
	87	10,577,154	21,450,597	540,598	250	786,577	33,355,176
Alaska	90	396,347	14,577,730	5,569,839	20	29,076	20,573,012
	89	318,983	19,407,840	5,429,576	1,000	10,415	25,167,814
	88	343,987	21,405,709	4,271,465	1,018	1,720	26,023,899
	87	346,162	31,191,501	6,728,665	0	14,180	38,280,508

Table 21. TRI Releases by State, 1987-1990 (Ordered by Total Release), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
Nebraska	90	4,613,943	12,145,352	562,466	10	60,890	17,382,661
	89	4,504,743	12,273,871	265,960	0	131,070	17,175,644
	88	4,699,455	14,090,368	309,718	0	56,737	19,156,278
	87	3,572,196	10,927,084	1,741,506	0	367,130	16,607,916
Maryland	90	5,704,994	7,202,333	1,279,056	55	1,868,993	16,055,431
	89	5,715,225	12,493,401	2,448,229	0	1,946,141	22,602,996
	88	5,263,038	12,716,221	3,955,551	2	2,668,375	24,603,187
	87	5,681,987	13,100,292	10,226,440	750	2,112,312	31,121,781
Puerto Rico	90	7,294,409	8,056,424	118,849	738	25,457	15,495,877
	89	7,483,157	6,153,865	22,435	250	44,960	13,704,667
	88	10,543,673	6,703,784	128,610	0	110,825	17,486,892
	87	7,564,496	5,457,661	298,152	988	72,100	13,393,397
Maine	90	2,277,759	11,418,712	625,878	0	504,946	14,827,295
	89	3,028,678	12,208,511	366,329	0	444,789	16,048,307
	88	3,306,899	13,741,530	437,488	0	960,950	18,446,867
	87	4,003,445	12,168,239	940,946	0	320,332	17,432,962
Idaho	90	1,940,866	3,743,919	474,398	0	5,434,670	11,593,853
	89	2,443,353	2,892,084	308,667	0	11,632,840	17,276,944
	88	2,546,912	2,907,771	296,220	0	11,850,374	17,601,277
	87	2,222,255	2,773,383	551,799	0	13,694,349	19,241,786
Wyoming	90	834,691	3,483,087	120,097	6,818,227	325,763	11,581,865
	89	747,972	2,911,530	82,173	14,125,832	192,699	18,060,206
	88	1,144,667	1,746,397	42,050	27,113,559	15,274,367	45,321,040
	87	2,098,993	408,331	91,487	30,651,671	410,165	33,660,647
New Hampshire	90	2,257,225	5,680,887	254,243	35	106,210	8,298,600
	89	2,513,763	8,480,012	153,016	0	61,882	11,208,673
	88	3,399,426	8,702,678	522,963	0	429,118	13,054,185
	87	3,074,366	9,892,526	882,793	0	606,419	14,456,104
Colorado	90	3,051,331	3,704,631	175,972	280	477,676	7,409,890
	89	4,987,985	6,128,422	124,133	1,250	897,140	12,138,930
	88	5,954,792	6,196,895	89,268	1,750	2,802,039	15,044,744
	87	5,436,129	4,957,803	234,137	1,250	5,244,863	15,874,182
Delaware	90	1,762,968	4,254,882	431,506	0	130,349	6,579,705
	89	1,700,467	6,176,367	649,993	0	78,911	8,605,738
	88	1,743,901	5,840,194	574,601	0	130,117	8,288,813
	87	2,483,541	6,688,856	1,536,001	250	340,576	11,049,224
Rhode Island	90	2,945,546	2,252,827	61,683	0	1,272	5,261,328
	89	3,583,690	2,713,362	543,278	0	0	6,840,330
	88	4,066,248	3,695,659	586,245	0	115,048	8,463,200
	87	4,257,771	3,662,112	57,491	0	67,321	8,044,695
Nevada	90	384,560	337,720	251	0	2,547,192	3,269,723
	89	332,676	353,870	1,150	0	2,284,722	2,972,418
	88	358,484	345,192	250	0	1,841,221	2,545,147
	87	341,968	435,396	0	0	2,437,330	3,214,694
South Dakota	90	467,252	2,417,303	44,867	0	1	2,929,423
	89	466,920	2,745,664	55,115	0	26	3,267,725
	88	688,579	1,811,288	2,400	0	1	2,502,268
	87	627,324	1,869,609	3,698	0	9	2,500,640

Table 21. TRI Releases by State, 1987-1990 (Ordered by Total Release), Continued.

State	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
North Dakota	90	480,221	1,526,131	334	0	101,401	2,108,087
	89	687,371	941,571	1,704	0	164,012	1,794,658
	88	410,796	860,291	1,800	0	35,312	1,308,199
	87	272,865	503,159	3,600	0	94,500	874,124
Virgin Islands	90	831,913	380,552	195,751	0	75,224	1,483,440
	89	502,680	656,722	1,190	0	113,643	1,274,235
	88	748,330	742,462	2,500	0	140,342	1,633,634
	87	1,125,850	906,953	3,250	0	87,005	2,123,058
Vermont	90	250,480	630,922	91,158	5	44,038	1,016,603
	89	320,176	834,737	136,463	0	40,203	1,331,579
	88	414,975	1,104,318	113,058	0	24,341	1,656,692
	87	334,267	902,636	102,199	0	55,908	1,395,010
Hawaii	90	550,617	138,744	15,990	111,500	34,009	850,860
	89	514,209	170,804	9,500	1,196,672	211,372	2,102,557
	88	535,305	338,840	10,000	1,051,509	205,745	2,141,399
	87	513,755	399,880	23,750	1,074,340	235,342	2,247,067
American Samoa	90	19,300	0	5	0	0	19,305
	89	27,750	0	0	0	0	27,750
	88	29,500	0	0	0	0	29,500
	87	27,750	0	0	0	0	27,750
District of Columbia	89	0	0	250	0	0	250
	88	250	0	250	0	0	500
Total	90	680,623,029	1,519,938,412	197,350,846	725,196,960	440,530,657	3,563,639,904
	89	783,783,380	1,769,529,934	193,481,002	1,166,517,162	454,386,443	4,367,697,921
	88	802,473,809	1,829,465,117	310,604,882	1,337,141,675	531,308,837	4,810,994,320
	87	869,422,021	1,840,017,691	411,578,403	1,328,665,667	727,836,183	5,177,519,965



THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

1987 - 1990
Releases and Transfers
by Chemical

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically).

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
75-07-0	Acetaldehyde	90	2,504,978	4,375,685	78,345	1,963,498	29,665	8,952,171
		89	2,501,704	5,274,489	66,722	2,050,529	30,764	9,924,208
		88	2,530,954	4,057,310	79,786	2,219,105	194,951	9,082,106
		87	2,322,964	4,306,922	152,766	1,568,090	27,001	8,377,743
60-35-5	Acetamide	90	12	23	5	0	0	40
		89	0	0	250	0	0	250
		88	0	0	0	0	0	0
		87	982	760	0	0	0	1,742
67-64-1	Acetone	90	89,412,951	90,877,529	1,280,863	4,662,386	235,174	186,468,903
		89	108,223,564	106,954,187	1,023,408	4,589,483	264,143	221,054,785
		88	94,659,481	109,415,060	1,134,378	3,117,541	423,341	208,749,801
		87	96,985,636	109,975,743	2,044,351	2,449,563	311,147	211,766,440
75-05-8	Acetonitrile	90	805,851	857,666	10,726	19,445,260	248	21,119,751
		89	650,480	814,110	91,876	18,113,780	1,250	19,671,496
		88	1,277,000	784,891	42,223	16,739,010	1,790	18,844,914
		87	999,626	766,640	70,486	15,937,922	1,330	17,776,004
107-02-8	Acrolein	90	5,816	16,213	5	103,059	5	125,098
		89	7,332	12,743	0	67,637	80	87,792
		88	17,352	16,300	0	68,950	500	103,102
		87	16,737	31,973	562	106,650	250	156,172
79-06-1	Acrylamide	90	42,632	7,336	3,814	4,214,315	565	4,268,662
		89	18,685	6,811	7,372	4,430,980	992	4,464,840
		88	17,298	8,721	3,124	2,198,000	756	2,227,899
		87	26,781	8,913	4,750	2,268,000	914	2,309,358
79-10-7	Acrylic acid	90	228,357	198,582	44,133	21,525,000	94,333	22,090,405
		89	165,305	192,370	10,451	18,728,000	2,009	19,098,135
		88	584,799	214,518	16,396	22,262,010	15,950	23,093,673
		87	625,286	206,563	16,126	27,264,250	6,153	28,118,378
107-13-1	Acrylonitrile	90	641,310	2,506,739	3,877	4,925,276	268	8,077,470
		89	839,799	3,650,668	4,492	8,090,548	4,712	12,590,219
		88	995,764	3,201,123	5,874	4,562,713	2,150	8,767,624
		87	1,245,461	4,167,905	7,579	4,237,970	14,948	9,673,863
107-05-1	Allyl chloride	90	169,368	36,656	135	1,200	0	207,359
		89	98,802	76,801	364	1,250	250	177,467
		88	93,911	55,558	430	250	200	150,349
		87	107,327	70,449	49,556	250	0	227,582
7429-90-5	Aluminum (fume or dust)	90	631,284	1,491,561	56,805	10	1,328,181	3,507,841
		89	1,067,736	1,888,061	78,857	250	3,544,118	6,579,022
		88	1,219,403	2,221,389	91,518	250	3,177,625	6,710,185
		87	1,402,047	3,989,636	119,323	3	2,829,753	8,340,762
60-09-3	4-Aminoazobenzene	89	0	0	0	353	0	353
		88	0	0	0	537	0	537
		87	0	0	0	693	0	693
92-67-1	4-Aminobiphenyl	89	0	1	0	9	0	10
		88	0	10	0	4	0	14
		87	0	1	0	6	0	7
7664-41-7	Ammonia	90	52,121,470	156,494,590	44,437,803	259,071,166	13,793,828	525,918,857
		89	60,796,650	194,686,552	24,546,136	73,286,998	7,940,619	361,256,955
		88	53,870,645	199,050,519	24,494,626	51,293,540	8,945,960	337,655,290
		87	58,299,650	231,681,178	31,815,234	49,791,440	5,788,934	377,376,436

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
75-07-0	Acetaldehyde	90	167,425	35,421	202,846
		89	388,700	205,136	593,836
		88	207,038	187,923	394,961
		87	190,583	40,582	231,165
60-35-5	Acetamide	90	0	0	0
		89	0	0	0
		88	0	250	250
		87	0	7,800	7,800
67-64-1	Acetone	90	12,237,581	22,278,953	34,516,534
		89	13,676,761	37,478,671	51,155,432
		88	14,219,915	35,661,911	49,881,826
		87	14,273,707	42,467,442	56,741,149
75-05-8	Acetonitrile	90	731,313	1,720,806	2,452,119
		89	950,278	4,860,649	5,810,927
		88	600,450	4,402,814	5,003,264
		87	379,549	4,641,233	5,020,782
107-02-8	Acrolein	90	5	108	113
		89	250	51	301
		88	250	250	500
		87	250	0	250
79-06-1	Acrylamide	90	37,100	67,283	104,383
		89	33,136	137,799	170,935
		88	13,540	112,040	125,580
		87	10,052	35,450	45,502
79-10-7	Acrylic acid	90	128,172	270,672	398,844
		89	31,441	214,619	246,060
		88	23,264	242,924	266,188
		87	23,487	443,762	467,249
107-13-1	Acrylonitrile	90	342,102	862,115	1,204,217
		89	787,803	1,331,242	2,119,045
		88	955,741	1,099,741	2,055,482
		87	691,212	793,292	1,484,504
107-05-1	Allyl chloride	90	6,459	234,000	240,459
		89	11,144	168,476	179,620
		88	14,900	209,075	223,975
		87	290	58,154	58,444
7429-90-5	Aluminum (fume or dust)	90	28,781	14,799,371	14,828,152
		89	20,990	16,854,208	16,875,198
		88	19,324	22,513,306	22,532,630
		87	69,999	22,336,603	22,406,602
60-09-3	4-Aminoazobenzene	89	0	0	0
		88	0	0	0
		87	0	0	0
92-67-1	4-Aminobiphenyl	89	0	0	0
		88	0	0	0
		87	0	0	0
7664-41-7	Ammonia	90	80,031,200	10,460,953	90,492,153
		89	30,197,962	6,876,992	37,074,954
		88	24,263,451	6,436,568	30,700,019
		87	28,468,615	5,703,820	34,172,435

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
6484-52-2	Ammonium nitrate (solution)	90	381,380	2,325,754	7,629,700	38,912,210	4,168,380	53,417,424
		89	900,274	2,562,293	8,853,607	44,738,000	7,606,025	64,660,199
		88	418,788	2,527,619	8,436,348	67,941,000	16,021,854	95,345,609
		87	637,896	6,197,072	11,773,176	58,565,000	14,154,899	91,328,043
7783-20-2	Ammonium sulfate (solution)	90	18,850	355,717	9,171,794	5,221,981	2,531,338	17,299,680
		89	20,834	839,427	69,031,944	461,238,592	15,308,173	546,438,970
		88	280,637	440,189	71,838,665	520,144,631	13,422,824	606,126,946
		87	267,458	6,203,705	97,182,691	505,971,819	7,324,758	616,950,431
62-53-3	Aniline	90	210,969	263,870	36,008	2,435,752	3,099	2,949,698
		89	241,107	263,033	14,844	3,272,543	11,655	3,803,182
		88	323,900	402,573	16,105	3,582,975	12,822	4,338,375
		87	273,120	403,733	14,306	1,280,878	14,962	1,986,999
90-04-0	o-Anisidine	90	500	1,341	141	0	250	2,232
		89	750	1,298	4,949	0	2,570	9,567
		88	501	1,792	285	0	250	2,828
		87	500	3,103	607	0	250	4,460
104-94-9	p-Anisidine	90	5	10	5	0	0	20
		89	0	4	250	0	0	254
		88	0	10	250	0	250	510
		87	0	0	40	0	0	40
120-12-7	Anthracene	90	27,065	38,373	1,359	0	4,806	71,603
		89	41,501	53,449	2,316	0	17,342	114,608
		88	146,428	55,935	4,632	0	11,106	218,101
		87	61,874	90,139	5,133	0	15,695	172,841
7440-36-0	Antimony	90	6,974	45,384	4,714	165	182,272	239,509
		89	13,773	90,446	3,783	440	557,336	665,778
		88	10,699	58,507	11,178	2,100	903,916	986,400
		87	8,684	34,859	37,506	8,800	170,698	260,547
7440-38-2	Arsenic	90	1,964	3,872	1,640	5	50,530	58,011
		89	5,257	53,143	1,754	0	147,616	207,770
		88	2,858	5,579	1,282	0	181,267	190,986
		87	4,240	23,453	2,662	0	70,861	101,216
1332-21-4	Asbestos (friable)	90	6,870	10,458	515	5	302,282	320,130
		89	11,044	27,391	800	0	1,073,901	1,113,136
		88	11,538	36,077	10,449	0	9,621,129	9,679,193
		87	11,828	39,883	20,129	252,000	3,677,287	4,001,127
7440-39-3	Barium	90	46,054	32,157	54,201	15	359,704	492,131
		89	185,399	94,077	26,048	0	2,762,045	3,067,569
		88	174,151	91,660	18,650	0	6,721,686	7,006,147
		87	11,193	103,806	8,981	0	7,032,735	7,156,715
98-87-3	Benzal chloride	90	1,744	11	0	0	0	1,755
		89	5,450	6	0	0	0	5,456
		88	5,252	6	0	0	0	5,258
		87	4,383	251	0	0	0	4,634
55-21-0	Benzamide	89	250	250	250	250	0	1,000
		88	250	250	250	250	0	1,000
71-43-2	Benzene	90	13,511,366	10,895,483	24,943	654,068	724,429	25,810,289
		89	14,970,154	12,072,926	169,947	799,132	122,444	28,134,603
		88	20,005,703	10,782,244	47,763	825,035	136,691	31,797,436
		87	21,298,018	10,592,102	289,916	801,733	129,782	33,111,551

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
6484-52-2	Ammonium nitrate (solution)	90	7,726,117	1,584,180	9,310,297
		89	7,178,242	1,597,638	8,775,880
		88	7,597,472	2,211,539	9,809,011
		87	9,813,639	12,080,269	21,893,908
7783-20-2	Ammonium sulfate (solution)	90	63,040,033	4,109,890	67,149,923
		89	201,662,992	3,400,733	205,063,725
		88	188,000,129	4,667,266	192,667,395
		87	190,943,849	14,848,508	205,792,357
62-53-3	Aniline	90	1,706,763	692,692	2,399,455
		89	1,811,082	1,385,917	3,196,999
		88	2,106,510	830,567	2,937,077
		87	1,831,103	2,070,816	3,901,919
90-04-0	o-Anisidine	90	5,610	99	5,709
		89	3,038	1,250	4,288
		88	768	3	771
		87	4,832	1	4,833
104-94-9	p-Anisidine	90	5	0	5
		89	0	0	0
		88	0	0	0
		87	0	0	0
120-12-7	Anthracene	90	18,427	855,083	873,510
		89	20,111	255,087	275,198
		88	20,419	279,187	299,606
		87	19,424	380,155	399,579
7440-36-0	Antimony	90	10,577	300,432	311,009
		89	36,027	389,995	426,022
		88	40,842	552,108	592,950
		87	44,113	434,704	478,817
7440-38-2	Arsenic	90	1,029	371,405	372,434
		89	2,051	237,341	239,392
		88	1,928	64,219	66,147
		87	3,380	1,456,842	1,460,222
1332-21-4	Asbestos (friable)	90	4,652	8,001,964	8,006,616
		89	41,252	6,465,575	6,506,827
		88	68,148	13,524,427	13,592,575
		87	340,747	12,183,156	12,523,903
7440-39-3	Barium	90	13,078	498,370	511,448
		89	26,301	1,355,449	1,381,750
		88	205,209	1,764,799	1,970,008
		87	378,308	3,550,549	3,928,857
98-87-3	Benzal chloride	90	5	37,000	37,005
		89	0	280,000	280,000
		88	0	103,186	103,186
		87	0	682,706	682,706
55-21-0	Benzamide	89	0	750	750
		88	0	750	750
71-43-2	Benzene	90	630,669	2,228,781	2,859,450
		89	1,178,362	1,881,680	3,060,042
		88	1,146,116	2,350,382	3,496,498
		87	782,392	2,515,590	3,297,982

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
98-07-7	Benzoic trichloride	90	8,310	25	0	0	0	8,335
		89	24,833	442	0	0	0	25,275
		88	24,542	421	0	0	0	24,963
		87	23,028	982	0	0	0	24,010
98-88-4	Benzoyl chloride	90	17,667	5,657	0	67,501	260	91,085
		89	31,488	5,725	0	168,200	550	205,963
		88	28,295	4,719	0	130,000	250	163,264
		87	32,156	5,201	0	130,000	0	167,357
94-36-0	Benzoyl peroxide	90	12,927	1,708	5	5	16,025	30,670
		89	3,277	1,797	1,000	0	19,500	25,574
		88	4,063	2,231	0	5,350	36,050	47,694
		87	2,022	3,470	950	19,250	16,000	41,692
100-44-7	Benzyl chloride	90	26,024	7,521	265	315	270	34,395
		89	18,527	8,591	251	400	500	28,269
		88	30,689	12,640	640	0	500	44,469
		87	29,795	19,037	870	1,600	250	51,552
7440-41-7	Beryllium	90	9	1,361	42	0	6,517	7,929
		89	503	1,892	372	0	31,522	34,289
		88	1,300	2,463	324	0	37,000	41,087
		87	1,250	1,251	1,004	0	27,620	31,125
92-52-4	Biphenyl	90	752,690	368,315	21,409	63,219	35,577	1,241,210
		89	762,112	327,217	42,685	72,993	44,115	1,249,122
		88	631,580	578,841	68,993	82,760	222,297	1,584,471
		87	709,788	876,245	101,770	69,760	51,749	1,809,312
111-44-4	Bis(2-chloroethyl) ether	90	3,205	573	83	0	0	3,861
		89	3,637	1,251	1,552	0	0	6,440
		88	4,322	600	1,351	0	0	6,273
		87	5,797	830	160	0	2	6,789
542-88-1	Bis(chloromethyl) ether	90	2	3	0	0	0	5
		89	1	2	0	0	0	3
		88	1	0	0	0	0	1
		87	1	0	0	0	0	1
108-60-1	Bis(2-chloro-1-methyl-ethyl)ether	90	3,800	2,430	12,000	0	0	18,230
		89	751	2,608	12,000	0	0	15,359
		88	340	800	30,000	0	0	31,140
		87	44	680	30,000	0	0	30,724
103-23-1	Bis(2-ethylhexyl) adipate	90	51,004	55,124	6,919	0	4,074	117,121
		89	25,936	39,471	2,453	0	46,659	114,519
		88	20,386	54,056	10,440	0	1,200	86,082
		87	41,279	70,674	5,054	0	500	117,507
75-25-2	Bromoform	90	48,205	0	0	0	72,000	120,205
		89	0	0	0	0	0	0
		88	0	0	8,600	0	0	8,600
74-83-9	Bromomethane	90	431,397	1,774,422	0	28,000	0	2,233,819
		89	323,915	2,271,511	0	66,525	0	2,661,951
		88	513,494	1,428,718	0	1,546	0	1,943,758
		87	355,415	1,836,340	0	2,200	0	2,193,955
106-99-0	1,3-Butadiene	90	3,089,320	1,948,311	111,234	1,610	6,448	5,156,923
		89	3,507,540	2,241,136	143,434	1,500	14,823	5,908,433
		88	3,877,127	2,884,401	412,504	1,500	7,817	7,183,349
		87	5,864,878	3,754,439	432,668	0	4,496	10,056,481

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
98-07-7	Benzoic trichloride	90	5	90	95
		89	0	4,117	4,117
		88	0	22,572	22,572
		87	0	79,014	79,014
98-88-4	Benzoyl chloride	90	1,353	640,743	642,096
		89	200	434,542	434,742
		88	180	360,969	361,149
		87	2,300	356,289	358,589
94-36-0	Benzoyl peroxide	90	48,028	16,527	64,555
		89	73,463	151,766	225,229
		88	69,946	62,554	132,500
		87	53,280	52,827	106,107
100-44-7	Benzyl chloride	90	45,550	280,212	325,762
		89	52,101	19,527	71,628
		88	41,553	98,847	140,400
		87	42,861	161,390	204,251
7440-41-7	Beryllium	90	0	1,371	1,371
		89	0	1,209	1,209
		88	4	3,158	3,162
		87	0	4,350	4,350
92-52-4	Biphenyl	90	1,085,193	397,567	1,482,760
		89	890,452	366,251	1,256,703
		88	1,446,610	478,363	1,924,973
		87	1,280,894	572,273	1,853,167
111-44-4	Bis(2-chloroethyl) ether	90	31,791	20,697	52,488
		89	24,829	22,024	46,853
		88	9,621	27,265	36,886
		87	10,167	33,866	44,033
542-88-1	Bis(chloromethyl) ether	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
108-60-1	Bis(2-chloro-1-methyl-ethyl)ether	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
103-23-1	Bis(2-ethylhexyl) adipate	90	23,637	180,182	203,819
		89	50,638	264,807	315,445
		88	43,319	206,206	249,525
		87	35,876	230,221	266,097
75-25-2	Bromoform	90	0	0	0
		89	0	0	0
		88	0	0	0
74-83-9	Bromomethane	90	552,160	2,821	554,981
		89	0	0	0
		88	0	0	0
		87	0	3,080	3,080
106-99-0	1,3-Butadiene	90	14,383	150,145	164,528
		89	29,072	409,847	438,919
		88	44,874	366,184	411,058
		87	56,365	214,052	270,417

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
141-32-2	Butyl acrylate	90	134,707	166,796	28,231	0	68	329,802
		89	121,039	191,037	6,400	2	462	318,940
		88	165,058	246,710	3,528	10	602	415,908
		87	339,734	350,206	2,397	0	18,733	711,070
71-36-3	n-Butyl alcohol	90	6,725,819	25,919,186	323,555	3,529,441	112,062	36,610,063
		89	7,847,073	28,817,359	943,547	1,414,104	109,200	39,131,283
		88	8,476,114	29,207,185	127,610	3,006,660	175,791	40,993,360
		87	8,290,509	25,529,675	211,200	2,310,984	493,225	36,835,593
78-92-2	sec-Butyl alcohol	90	205,755	475,424	4,315	171,484	51	857,029
		89	358,390	622,727	6,411	0	307	987,835
		88	393,046	695,007	122,291	0	2,600	1,212,944
		87	367,224	549,705	70,054	47,000	1,000	1,034,983
75-65-0	tert-Butyl alcohol	90	1,240,753	326,265	271,260	995,382	24,962	2,858,622
		89	1,029,250	431,451	221,906	724,537	23,110	2,430,254
		88	1,207,260	368,197	14,989	674,798	818	2,266,062
		87	1,138,573	329,987	104,306	363,379	57,025	1,993,270
85-68-7	Butyl benzyl phthalate	90	42,753	184,940	925	260	9,774	238,652
		89	54,204	219,718	1,028	250	8,324	283,524
		88	45,407	245,841	802	480	16,682	309,212
		87	45,378	230,398	1,200	0	8,640	285,616
106-88-7	1,2-Butylene oxide	90	54,696	24,769	4,625	0	5	84,095
		89	68,234	51,445	4,139	0	0	123,818
		88	34,973	64,958	3,500	0	250	103,681
		87	41,024	29,426	750	0	0	71,200
123-72-8	Butyraldehyde	90	214,984	310,692	3,423	1,937	371	531,407
		89	348,448	1,191,898	4,297	7,562	278	1,552,483
		88	698,722	1,558,388	3,812	1,997	31	2,262,950
		87	1,200,992	1,226,707	17,453	2,600	252	2,448,004
569-64-2	C.I. Basic Green 4	90	9	7	250	0	0	266
		89	500	250	250	0	250	1,250
		88	500	250	0	0	0	750
		87	1	1	0	0	0	2
989-38-8	C.I. Basic Red 1	90	0	0	0	0	0	0
		89	250	0	0	0	0	250
1937-37-7	C.I. Direct Black 38	89	250	250	0	0	0	500
2832-40-8	C.I. Disperse Yellow 3	90	364	0	26	0	843	1,233
		89	359	0	24	0	846	1,229
		88	398	0	302	0	0	700
		87	0	0	263	0	676	939
81-88-9	C.I. Food Red 15	90	0	2	0	0	0	2
		89	250	0	0	0	0	250
		88	250	0	0	0	0	250
3118-97-6	C.I. Solvent Orange 7	89	0	0	0	0	0	0
97-56-3	C.I. Solvent Yellow 3	90	0	0	5	0	0	5
		89	0	0	0	0	0	0
		88	250	0	0	0	0	250
842-07-9	C.I. Solvent Yellow 14	89	250	250	0	0	0	500
		88	0	0	0	0	0	0
		87	4	0	0	0	0	4

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
141-32-2	Butyl acrylate	90	127,398	122,589	249,987
		89	20,536	664,022	684,558
		88	34,615	604,456	639,071
		87	108,711	1,607,326	1,716,037
71-36-3	n-Butyl alcohol	90	4,237,281	5,875,063	10,112,344
		89	5,692,244	5,229,602	10,921,846
		88	4,525,113	8,243,089	12,768,202
		87	2,507,028	9,069,697	11,576,725
78-92-2	sec-Butyl alcohol	90	9,991	73,105	83,096
		89	14,563	129,700	144,263
		88	41,108	227,062	268,170
		87	51,341	542,657	593,998
75-65-0	tert-Butyl alcohol	90	1,792,590	472,254	2,264,844
		89	1,521,031	488,133	2,009,164
		88	1,539,726	495,275	2,035,001
		87	1,271,116	408,871	1,679,987
85-68-7	Butyl benzyl phthalate	90	85,732	874,735	960,467
		89	56,782	912,833	969,615
		88	44,235	1,065,246	1,109,481
		87	85,191	1,622,799	1,707,990
106-88-7	1,2-Butylene oxide	90	250	8,185	8,435
		89	250	585	835
		88	0	1,148	1,148
		87	2,153	1,537	3,690
123-72-8	Butyraldehyde	90	350,893	4,082	354,975
		89	392,052	220,498	612,550
		88	371,633	123,938	495,571
		87	408,711	22,581	431,292
569-64-2	C.I. Basic Green 4	90	1,006	500	1,506
		89	1,492	1	1,493
		88	1,320	250	1,570
		87	1,584	250	1,834
989-38-8	C.I. Basic Red 1	90	0	0	0
		89	0	0	0
1937-37-7	C.I. Direct Black 38	89	0	250	250
2832-40-8	C.I. Disperse Yellow 3	90	250	219	469
		89	250	63	313
		88	0	899	899
		87	0	194	194
81-88-9	C.I. Food Red 15	90	270	0	270
		89	0	0	0
		88	0	0	0
3118-97-6	C.I. Solvent Orange 7	89	0	0	0
97-56-3	C.I. Solvent Yellow 3	90	5	0	5
		89	0	0	0
		88	0	0	0
842-07-9	C.I. Solvent Yellow 14	89	750	250	1,000
		88	0	0	0
		87	0	4,402	4,402

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
7440-43-9	Cadmium	90	5,115	11,922	1,106	10	91,792	109,945
		89	12,336	22,931	2,746	0	103,163	141,176
		88	9,300	12,625	2,598	0	94,602	119,125
		87	6,427	8,442	7,840	4,220	89,101	116,030
156-62-7	Calcium cyanamide	90	12,000	620	0	0	40,000	52,620
		89	12,000	620	0	0	3,600	16,220
		88	12,000	600	0	0	66,000	78,600
		87	12,000	750	0	0	250	13,000
133-06-2	Captan	90	1,783	17,469	505	5,500	505	25,762
		89	3,762	21,460	500	5,000	500	31,222
		88	4,066	10,803	750	5,100	1,000	21,719
		87	9,019	18,346	0	6,100	500	33,965
63-25-2	Carbaryl	90	2,299	6,871	505	0	5,555	15,230
		89	3,303	6,778	750	0	33,952	44,783
		88	2,515	5,408	877	0	500	9,300
		87	1,683	5,261	124	0	3,750	10,818
75-15-0	Carbon disulfide	90	3,291,871	94,930,808	40,565	3,900	500	98,267,644
		89	3,193,614	98,503,528	33,091	16,600	503	101,747,336
		88	3,096,255	120,797,449	39,487	13,400	43,436	123,990,027
		87	3,337,186	132,538,470	23,040	89,500	3,480	135,991,676
56-23-5	Carbon tetrachloride	90	403,326	1,267,766	4,644	31,557	1,005	1,708,298
		89	994,133	2,449,115	16,396	122,043	1,616	3,583,303
		88	1,085,036	2,682,385	16,447	98,054	14,759	3,896,681
		87	1,112,049	3,379,560	11,283	211,000	3,134	4,717,026
463-58-1	Carbonyl sulfide	90	12,249	18,622,615	0	0	0	18,634,864
		89	9,023	18,453,663	772	0	0	18,463,458
		88	7,643	20,175,429	750	0	0	20,183,822
		87	5,861	22,481,144	750	0	0	22,487,755
120-80-9	Catechol	90	2,517	25,220	224,903	0	89,076	341,716
		89	2,748	1,214	313,163	0	84,718	401,843
		88	2,388	1,201	398,760	0	84,223	486,572
		87	875	616	67,750	0	2,459	71,700
133-90-4	Chloramben	90	5	5	0	0	0	10
		89	0	0	0	0	0	0
		88	250	1,168	250	0	0	1,668
		87	250	250	0	0	0	500
57-74-9	Chlordane	90	4,244	178	1	0	0	4,423
		89	3,617	136	4	0	0	3,757
		88	572	3	4	4,262	0	4,841
		87	6,901	257	4	19,825	0	26,987
7782-50-5	Chlorine	90	2,292,442	102,625,448	1,280,604	73,919	308,254	106,580,667
		89	2,240,178	130,433,145	2,403,657	469,857	291,386	135,838,223
		88	4,652,027	129,105,473	6,666,150	107,624	428,097	140,959,371
		87	6,303,187	100,909,969	8,003,043	83,939	1,179,942	116,480,080
10049-04-4	Chlorine dioxide	90	261,702	5,149,849	785	15	20	5,412,371
		89	124,294	6,908,597	1,250	0	0	7,034,141
		88	2,311,796	12,125,441	2,350	0	41,000	14,480,587
		87	1,829,508	11,169,031	7,965	0	110,325	13,116,829
79-11-8	Chloroacetic acid	90	20,650	4,754	1,691	0	0	27,095
		89	20,616	4,229	1,524	10	0	26,379
		88	21,410	4,909	600	10	0	26,929
		87	24,229	4,383	29,956	280	0	58,848

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
7440-43-9	Cadmium	90	4,482	250,068	254,550
		89	8,489	279,024	287,513
		88	8,144	219,670	227,814
		87	19,750	137,861	157,611
156-62-7	Calcium cyanamide	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
133-06-2	Captan	90	255	25,730	25,985
		89	350	16,695	17,045
		88	250	13,695	13,945
		87	250	363,229	363,479
63-25-2	Carbaryl	90	0	7,092	7,092
		89	14	14,610	14,624
		88	171	33,780	33,951
		87	124	364,237	364,361
75-15-0	Carbon disulfide	90	121,882	244,231	366,113
		89	132,535	173,493	306,028
		88	159,369	212,788	372,157
		87	180,511	251,400	431,911
56-23-5	Carbon tetrachloride	90	42,049	1,079,478	1,121,527
		89	3,841	1,716,644	1,720,485
		88	5,014	1,349,761	1,354,775
		87	16,551	1,898,593	1,915,144
463-58-1	Carbonyl sulfide	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
120-80-9	Catechol	90	336,096	246,537	582,633
		89	270,614	238,233	508,847
		88	245,399	137,088	382,487
		87	1,248,959	10,794	1,259,753
133-90-4	Chloramben	90	0	15,591	15,591
		89	0	0	0
		88	0	1,159	1,159
		87	0	4,009	4,009
57-74-9	Chlordane	90	99	523	622
		89	37	3,099	3,136
		88	23	80,809	80,832
		87	4,035	223,695	227,730
7782-50-5	Chlorine	90	1,286,370	675,588	1,961,958
		89	2,814,308	3,147,885	5,962,193
		88	3,145,120	3,999,038	7,144,158
		87	3,257,502	1,925,504	5,183,006
10049-04-4	Chlorine dioxide	90	1,841	5	1,846
		89	2,250	750	3,000
		88	2,400	41,750	44,150
		87	1,250	23,922	25,172
79-11-8	Chloroacetic acid	90	1,785	6,768	8,553
		89	9,717	4,096	13,813
		88	10,727	9,156	19,883
		87	1,380	4,010	5,390

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
532-27-4	4-Chloroacetophenone	87	0	250	1,656	0	0	1,906
108-90-7	Chlorobenzene	90	1,845,230	2,201,569	72,893	49,406	4,267	4,173,365
		89	1,523,160	2,527,989	62,551	82,969	6,609	4,203,278
		88	2,033,840	2,535,673	98,354	84,457	4,127	4,756,451
		87	2,638,810	2,534,971	62,744	56,503	18,878	5,311,906
510-15-6	Chlorobenzilate	87	259	10	0	0	0	269
75-00-3	Chloroethane	90	1,798,493	2,143,585	35,997	110	93	3,978,278
		89	2,097,353	2,690,818	71,749	150	0	4,860,070
		88	2,056,879	2,562,563	27,448	1,510	0	4,648,400
		87	2,203,819	2,196,690	1,954	1,510	2	4,403,975
67-66-3	Chloroform	90	8,255,323	13,507,138	1,001,446	89,560	57,897	22,911,364
		89	8,791,898	17,089,184	1,208,450	114,338	70,145	27,274,015
		88	7,157,076	16,714,428	1,120,702	36,002	68,498	25,096,706
		87	7,562,868	17,690,549	1,216,418	161,000	39,220	26,670,055
74-87-3	Chloromethane	90	1,994,876	5,649,012	144,433	199,605	92,260	8,080,186
		89	2,940,259	7,193,174	108,399	180,250	0	10,422,082
		88	2,998,328	8,292,087	115,985	165,250	0	11,571,650
		87	5,217,111	8,913,602	109,958	132,050	3,100	14,375,821
107-30-2	Chloromethyl methyl ether	90	33	91	0	0	0	124
		89	33	97	0	0	0	130
		88	32	90	0	0	0	122
		87	289	62	0	0	0	351
126-99-8	Chloroprene	90	55,032	120,102	750	0	750	176,634
		89	211,663	794,678	9	158,183	0	1,164,533
		88	234,478	984,448	287	68,792	0	1,288,005
		87	214,546	849,482	277	48,200	0	1,112,505
1897-45-6	Chlorothalonil	90	2,786	9,668	9	0	0	12,463
		89	19,715	9,782	252	0	1	29,750
		88	19,455	9,021	250	0	0	28,726
		87	1,954	19,127	240	0	0	21,321
7440-47-3	Chromium	90	324,729	413,023	39,746	82	2,725,304	3,502,884
		89	869,390	273,761	67,798	693	3,341,836	4,553,478
		88	346,937	201,744	73,948	2,249	9,295,829	9,920,707
		87	168,550	246,310	268,672	3,094	2,944,022	3,630,648
7440-48-4	Cobalt	90	15,766	20,558	8,853	0	34,758	79,935
		89	29,639	18,363	14,415	0	237,431	299,848
		88	16,493	17,522	16,213	0	212,954	263,182
		87	20,279	11,536	14,259	0	18,890	64,964
7440-50-8	Copper	90	431,567	829,627	56,009	22,351	11,419,098	12,758,652
		89	1,049,397	1,214,730	101,105	31,889	10,045,367	12,442,488
		88	428,342	1,299,956	116,984	15,651	10,515,935	12,376,868
		87	433,918	2,214,584	216,854	453,140	138,346,027	141,664,523
120-71-8	p-Cresidine	90	2,607	83	0	0	250	2,940
		89	977	1,233	250	0	250	2,710
		88	5,400	1,680	250	0	750	8,080
		87	1,232	1,296	250	0	1,678	4,456
1319-77-3	Cresol (mixed isomers)	90	378,803	353,801	2,336	1,634,529	3,855	2,373,324
		89	419,031	478,713	7,627	2,069,891	2,437	2,977,699
		88	395,167	374,117	6,516	1,804,060	4,772	2,584,632
		87	329,471	468,071	11,475	2,418,718	845,704	4,073,439

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
532-27-4	4-Chloroacetophenone	87	0	250	250
108-90-7	Chlorobenzene	90	148,728	3,747,266	3,895,994
		89	312,398	4,074,606	4,387,004
		88	578,774	5,043,055	5,621,829
		87	559,923	5,290,627	5,850,550
510-15-6	Chlorobenzilate	87	0	0	0
75-00-3	Chloroethane	90	10	436,391	436,401
		89	250	395,063	395,313
		88	0	460,559	460,559
		87	0	332,943	332,943
67-66-3	Chloroform	90	799,120	1,153,889	1,953,009
		89	1,067,436	876,933	1,944,369
		88	1,226,573	1,469,422	2,695,995
		87	895,936	2,611,979	3,507,915
74-87-3	Chloromethane	90	47,201	130,668	177,869
		89	159,077	137,268	296,345
		88	54,223	104,432	158,655
		87	71,559	111,394	182,953
107-30-2	Chloromethyl methyl ether	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
126-99-8	Chloroprene	90	0	177,746	177,746
		89	41,000	33,677	74,677
		88	62,000	20,528	82,528
		87	36,250	811,590	847,840
1897-45-6	Chlorothalonil	90	755	204,127	204,882
		89	1,004	316,841	317,845
		88	541	399,934	400,475
		87	705	851,005	851,710
7440-47-3	Chromium	90	201,337	9,387,794	9,589,131
		89	318,422	9,170,557	9,488,979
		88	415,721	11,451,444	11,867,165
		87	1,356,120	20,992,668	22,348,788
7440-48-4	Cobalt	90	7,917	265,020	272,937
		89	12,103	269,589	281,692
		88	8,840	211,166	220,006
		87	9,906	252,385	262,291
7440-50-8	Copper	90	154,763	13,032,534	13,187,297
		89	195,922	14,527,415	14,723,337
		88	310,232	18,827,742	19,137,974
		87	577,923	29,246,508	29,824,431
120-71-8	p-Cresidine	90	18,750	0	18,750
		89	25,750	10,300	36,050
		88	37,750	4,700	42,450
		87	234,032	3,200	237,232
1319-77-3	Cresol (mixed isomers)	90	57,073	649,835	706,908
		89	78,305	728,393	806,698
		88	358,242	1,559,595	1,917,837
		87	56,210	2,703,567	2,759,777

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
108-39-4	m-Cresol	90	4,152	3,415	0	0	0	7,567
		89	4,825	7,776	45	0	0	12,646
		88	6,110	12,822	283	0	455	19,670
		87	7,930	12,520	0	0	250	20,700
95-48-7	o-Cresol	90	20,824	18,322	36	0	255	39,437
		89	38,014	21,652	311	2	3,345	63,324
		88	45,562	44,235	448	1	1,667	91,913
		87	46,435	10,947	721	0	3,200	61,303
106-44-5	p-Cresol	90	8,262	230,742	1,955	1,997	2,873	245,829
		89	8,969	246,515	3,421	1,800	10,000	270,705
		88	6,286	634,417	1,143	152,000	62,291	856,137
		87	9,187	77,397	1,000	96,000	16,912	200,496
98-82-8	Cumene	90	1,400,080	2,703,033	1,876	13,402	19,671	4,138,062
		89	1,400,439	3,146,852	10,088	27,620	3,784	4,588,783
		88	1,987,520	2,896,449	3,201	30,165	8,591	4,925,926
		87	1,458,287	1,938,670	3,007	1,000	8,107	3,409,071
80-15-9	Cumene hydroperoxide	90	97,285	13,386	427	45,518	6,670	163,286
		89	101,457	14,164	3,411	134,316	250	253,598
		88	178,787	13,736	1,784	371,000	250	565,557
		87	211,408	9,539	1,256	63,000	270	285,473
135-20-6	Cupferron	90	5	480	34	0	0	519
		89	0	1,500	34	0	0	1,534
		88	140	780	0	0	0	920
		87	140	690	678	0	0	1,508
110-82-7	Cyclohexane	90	6,108,055	11,107,792	25,979	327,259	34,701	17,603,786
		89	6,128,059	12,044,329	20,222	355,243	48,559	18,596,412
		88	5,071,563	8,739,013	20,664	334,471	40,290	14,206,001
		87	4,960,271	7,289,298	33,739	336,222	41,118	12,660,648
94-75-7	2,4-D	90	3,780	3,962	259	2,100	10,662	20,763
		89	3,755	3,451	1,422	2,660	0	11,288
		88	3,289	3,731	549	3,789	38,000	49,358
		87	2,884	2,482	506	0	36,079	41,951
1163-19-5	Decabromodiphenyl oxide	90	15,613	48,687	2,587	48	20,698	87,633
		89	19,241	30,716	3,450	52	9,394	62,853
		88	7,500	22,104	500	292	21,450	51,846
		87	4,962	150,129	326	250	16,250	171,917
615-05-4	2,4-Diaminoanisole	90	21	5	0	0	0	26
		89	250	0	0	0	0	250
		88	0	0	0	0	0	0
		87	0	0	0	0	0	0
39156-41-7	2,4-Diaminoanisole sulfate	90	0	0	0	0	0	0
		89	0	0	0	0	0	0
		88	0	0	0	0	0	0
		87	250	250	250	0	0	750
101-80-4	4,4'-Diaminodiphenyl ether	90	5	900	413	0	0	1,318
		89	250	380	595	0	0	1,225
		88	0	216	585	0	0	801
		87	250	310	583	0	0	1,143
25376-45-8	Diaminotoluene (mixed isomers)	90	19,595	6,119	955	89,000	265	115,934
		89	15,707	4,016	2,068	95,000	480	117,271
		88	15,204	5,917	3,288	174,000	295	198,704
		87	39,120	10,039	1,843	28,000	500	79,502

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
108-39-4	m-Cresol	90	7,439	14,721	22,160
		89	15,588	55,715	71,303
		88	7,415	139,240	146,655
		87	7,091	33,508	40,599
95-48-7	o-Cresol	90	53,066	66,247	119,313
		89	123,923	73,192	197,115
		88	40,703	90,523	131,226
		87	15,118	116,939	132,057
106-44-5	p-Cresol	90	879,959	80,741	960,700
		89	1,507,037	745,156	2,252,193
		88	744,568	27,270	771,838
		87	339,052	33,711	372,763
98-82-8	Cumene	90	254,062	416,412	670,474
		89	185,473	197,808	383,281
		88	203,279	207,207	410,486
		87	84,930	287,785	372,715
80-15-9	Cumene hydroperoxide	90	3,755	190,086	193,841
		89	3,051	343,913	346,964
		88	5,250	25,516	30,766
		87	3,400	52,640	56,040
135-20-6	Cupferron	90	530	0	530
		89	1,600	0	1,600
		88	780	4,275	5,055
		87	695	600	1,295
110-82-7	Cyclohexane	90	33,146	1,330,726	1,363,872
		89	30,129	2,367,600	2,397,729
		88	141,667	2,946,911	3,088,578
		87	12,628	1,391,612	1,404,240
94-75-7	2,4-D	90	5,581	59,214	64,795
		89	10,015	352,644	362,659
		88	27,952	91,757	119,709
		87	561	58,320	58,881
1163-19-5	Decabromodiphenyl oxide	90	37,100	811,316	848,416
		89	48,868	831,251	880,119
		88	19,090	626,825	645,915
		87	23,952	383,501	407,453
615-05-4	2,4-Diaminoanisole	90	0	0	0
		89	250	0	250
		88	250	0	250
		87	230	0	230
39156-41-7	2,4-Diaminoanisole sulfate	90	250	0	250
		89	250	0	250
		88	250	0	250
		87	250	250	500
101-80-4	4,4'-Diaminodiphenyl ether	90	250	5,857	6,107
		89	250	4,754	5,004
		88	179	142	321
		87	210	0	210
25376-45-8	Diaminotoluene (mixed isomers)	90	80,350	1,167,925	1,248,275
		89	7,523	1,106,968	1,114,491
		88	2,951	745,955	748,906
		87	150,000	1,497,475	1,647,475

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
95-80-7	2,4-Diaminotoluene	90	3,801	127	250	0	0	4,178
		89	4,050	376	250	0	0	4,676
		88	2,900	88	250	0	0	3,238
		87	2,600	817	250	0	0	3,667
132-64-9	Dibenzofuran	90	21,207	9,018	532	0	897	31,654
		89	31,588	32,922	447	0	8,536	73,493
		88	46,648	24,406	1,510	0	9,929	82,493
		87	47,822	29,441	11,891	0	13,547	102,701
106-93-4	1,2-Dibromoethane	90	22,533	35,537	0	495	125	58,690
		89	22,880	36,287	250	4,914	322	64,653
		88	34,119	29,208	1,011	6,882	259	71,479
		87	117,560	32,294	1,034	44	1,702	152,634
84-74-2	Dibutyl phthalate	90	60,436	47,841	558	110,000	167	219,002
		89	116,976	117,404	2,400	310,000	13,022	559,802
		88	169,228	24,245	14,337	350,000	6,393	564,203
		87	233,501	115,700	26,178	270,000	566	645,945
25321-22-6	Dichlorobenzene (mixed isomers)	90	29,606	59,918	1	11	22	89,558
		89	11,564	126,348	185	0	0	138,097
		88	20,169	143,515	40	0	0	163,724
		87	11,997	59,712	1,068	250	78,610	151,637
95-50-1	1,2-Dichlorobenzene	90	155,845	168,103	12,390	15,313	32,588	384,239
		89	208,999	168,729	16,146	18,680	75,863	488,417
		88	206,070	248,381	11,624	20,115	13,354	499,544
		87	239,357	388,568	27,230	18,000	15,289	688,444
541-73-1	1,3-Dichlorobenzene	90	3,104	5,578	785	0	0	9,467
		89	3,554	7,844	22	0	0	11,420
		88	5,782	9,500	1,281	0	0	16,563
		87	36,169	14,848	1,526	0	26	52,569
106-46-7	1,4-Dichlorobenzene	90	96,238	721,895	3,912	255	38	822,338
		89	115,581	1,476,648	6,621	250	250	1,599,350
		88	103,870	1,787,549	6,153	4,000	1,300	1,902,872
		87	336,908	907,925	11,557	19,000	740	1,276,130
91-94-1	3,3'-Dichlorobenzidine	90	10	15	1	0	0	26
		89	250	4	241	0	0	495
		88	250	5	752	0	0	1,007
		87	503	504	2,052	0	0	3,059
75-27-4	Dichlorobromomethane	90	632	0	0	0	0	632
		87	0	250	0	0	0	250
107-06-2	1,2-Dichloroethane	90	1,166,038	4,429,935	48,763	826,672	7,351	6,478,759
		89	1,358,861	3,023,205	227,614	1,046,661	714	5,657,055
		88	1,567,075	2,957,854	40,517	1,452,084	2,166	6,019,696
		87	2,571,167	3,810,919	75,486	1,162,844	3,173	7,623,589
540-59-0	1,2-Dichloroethylene	90	81,311	43,188	54	360	118	125,031
		89	109,604	76,388	728	55	0	186,775
		88	18,052	88,766	95	0	1	106,914
		87	43,415	88,977	357	346	1	133,096
75-09-2	Dichloromethane	90	35,692,060	56,805,056	192,739	850,018	11,809	93,551,682
		89	43,614,629	81,956,162	229,620	1,937,469	25,943	127,763,823
		88	47,314,151	78,681,392	350,270	1,478,833	157,960	127,982,606
		87	50,164,415	85,679,964	384,223	874,671	104,371	137,207,644

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
95-80-7	2,4-Diaminotoluene	90	1,501	0	1,501
		89	1,250	0	1,250
		88	1,200	0	1,200
		87	0	0	0
132-64-9	Dibenzofuran	90	40,052	85,225	125,277
		89	47,572	170,179	217,751
		88	47,726	234,034	281,760
		87	45,940	205,593	251,533
106-93-4	1,2-Dibromoethane	90	255	86,864	87,119
		89	310	122,348	122,658
		88	253	33,861	34,114
		87	503	50,226	50,729
84-74-2	Dibutyl phthalate	90	19,356	145,990	165,346
		89	25,994	279,059	305,053
		88	36,773	270,275	307,048
		87	33,114	214,828	247,942
25321-22-6	Dichlorobenzene (mixed isomers)	90	26,769	212,700	239,469
		89	44,813	500,636	545,449
		88	182,663	124,378	307,041
		87	137,957	181,161	319,118
95-50-1	1,2-Dichlorobenzene	90	76,763	2,847,638	2,924,401
		89	208,084	2,519,915	2,727,999
		88	64,118	2,040,355	2,104,473
		87	19,183	1,811,214	1,830,397
541-73-1	1,3-Dichlorobenzene	90	30	1,464	1,494
		89	40	260	300
		88	40	540	580
		87	28,250	75,850	104,100
106-46-7	1,4-Dichlorobenzene	90	12,921	180,756	193,677
		89	33,941	104,091	138,032
		88	37,997	138,882	176,879
		87	87,305	126,308	213,613
91-94-1	3,3'-Dichlorobenzidine	90	505	16,751	17,256
		89	342	22,195	22,537
		88	617	224,205	224,822
		87	1,087	6,309	7,396
75-27-4	Dichlorobromomethane	90	0	0	0
		87	0	22,873	22,873
107-06-2	1,2-Dichloroethane	90	81,514	3,568,409	3,649,923
		89	1,399,826	2,623,097	4,022,923
		88	1,476,992	2,013,386	3,490,378
		87	1,391,536	4,408,848	5,800,384
540-59-0	1,2-Dichloroethylene	90	0	4,001	4,001
		89	0	22,210	22,210
		88	0	213,360	213,360
		87	0	58,780	58,780
75-09-2	Dichloromethane	90	1,215,304	8,551,622	9,766,926
		89	1,482,167	12,893,795	14,375,962
		88	2,936,101	22,773,265	25,709,366
		87	1,822,475	24,980,035	26,802,510

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
120-83-2	2,4-Dichlorophenol	90	255	565	95	20,400	0	21,315
		89	554	999	78	6,589	0	8,220
		88	535	868	107	17,700	2	19,212
		87	500	1,821	250	4,580	12,000	19,151
78-87-5	1,2-Dichloropropane	90	171,862	458,651	4,253	0	0	634,766
		89	304,066	1,054,964	14,977	0	5	1,374,012
		88	293,698	1,072,146	23,785	0	3,400	1,393,029
		87	182,780	834,840	34,615	5,000	540	1,057,775
542-75-6	1,3-Dichloropropylene	90	46,570	12,903	310	0	0	59,783
		89	35,469	15,448	340	0	0	51,257
		88	39,790	14,800	250	0	0	54,840
		87	12,020	22,050	560	0	490	35,120
62-73-7	Dichlorvos	90	800	510	0	0	0	1,310
		89	1,111	214	0	0	0	1,325
		88	1,050	0	0	0	0	1,050
		87	1,001	490	0	0	0	1,491
115-32-2	Dicofol	90	13	255	5	0	0	273
		89	829	500	250	0	0	1,579
		88	593	750	0	0	0	1,343
		87	0	0	0	0	0	0
111-42-2	Diethanolamine	90	287,126	96,538	360,137	157,015	120,866	1,021,682
		89	365,331	120,226	591,555	162,459	130,724	1,370,295
		88	437,390	199,792	438,702	238,317	142,187	1,456,388
		87	365,872	124,468	371,975	3,194,000	101,763	4,158,078
117-81-7	Di-(2-ethylhexyl) phthalate	90	147,831	1,196,864	2,378	260	19,531	1,366,864
		89	290,492	788,470	2,983	600	25,937	1,108,482
		88	175,892	953,294	3,276	3,091	20,748	1,156,301
		87	692,361	964,089	3,845	500	34,794	1,695,589
84-66-2	Diethyl phthalate	90	12,824	83,573	2,697	0	37	99,131
		89	10,742	81,868	9,163	0	250	102,023
		88	15,339	82,368	11,272	0	0	108,979
		87	26,817	165,138	1,220	0	0	193,175
64-67-5	Diethyl sulfate	90	5,058	435	10	5	280	5,788
		89	7,345	1,372	0	0	250	8,967
		88	8,436	2,191	0	0	250	10,877
		87	7,824	3,005	250	0	500	11,579
119-90-4	3,3'-Dimethoxybenzidine	90	3	1	4	0	0	8
		89	250	250	3	0	0	503
119-93-7	3,3'-Dimethylbenzidine	90	0	0	0	0	0	0
		89	0	0	0	0	0	0
57-14-7	1,1-Dimethyl hydrazine	90	104	364	250	0	0	718
		89	467	337	250	0	0	1,054
		88	2,206	2,117	10	0	0	4,333
		87	270	750	0	0	0	1,020
105-67-9	2,4-Dimethylphenol	90	2,123	5,203	13	56,900	302	64,541
		89	756	924	218	55,869	54	57,821
		88	1,071	9,717	481	24,703	620	36,592
		87	887	545	563	44,658	641	47,294
131-11-3	Dimethyl phthalate	90	76,787	256,768	1,528	750	433	336,266
		89	101,739	261,691	1,260	500	415	365,605
		88	113,841	420,965	4,335	390	504	540,035
		87	2,276,124	71,331	5,001	380	1,001	2,353,837

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
120-83-2	2,4-Dichlorophenol	90	0	60,800	60,800
		89	0	117,721	117,721
		88	6	12,909	12,915
		87	0	78,722	78,722
78-87-5	1,2-Dichloropropane	90	8,596	6,014	14,610
		89	10,802	6,744	17,546
		88	136,775	4,913	141,688
		87	91,510	74,647	166,157
542-75-6	1,3-Dichloropropylene	90	0	1,268	1,268
		89	0	4,604	4,604
		88	0	2,738	2,738
		87	0	0	0
62-73-7	Dichlorvos	90	5	3,991	3,996
		89	1	4,441	4,442
		88	0	1,516	1,516
		87	1	8,814	8,815
115-32-2	Dicofol	90	0	286	286
		89	0	14,045	14,045
		88	0	25,166	25,166
		87	0	1,840	1,840
111-42-2	Diethanolamine	90	3,460,521	609,815	4,070,336
		89	1,516,194	1,290,264	2,806,458
		88	1,913,089	1,339,142	3,252,231
		87	824,097	4,264,671	5,088,768
117-81-7	Di-(2-ethylhexyl) phthalate	90	93,536	1,477,020	1,570,556
		89	197,358	2,276,967	2,474,325
		88	168,891	2,235,346	2,404,237
		87	159,075	2,291,202	2,450,277
84-66-2	Diethyl phthalate	90	436,182	85,521	521,703
		89	276,553	102,354	378,907
		88	37,600	105,924	143,524
		87	69,133	193,151	262,284
64-67-5	Diethyl sulfate	90	1,170	2,826	3,996
		89	1,500	0	1,500
		88	890	0	890
		87	950	2,000	2,950
119-90-4	3,3'-Dimethoxybenzidine	90	37	0	37
		89	259	0	259
119-93-7	3,3'-Dimethylbenzidine	90	5	0	5
		89	0	0	0
57-14-7	1,1-Dimethyl hydrazine	90	0	8,546	8,546
		89	0	8,997	8,997
		88	0	8,855	8,855
		87	0	5,306	5,306
105-67-9	2,4-Dimethylphenol	90	4,030	14,642	18,672
		89	5,190	10,780	15,970
		88	7,964	3,000	10,964
		87	3,089	973	4,062
131-11-3	Dimethyl phthalate	90	88,719	57,146	145,865
		89	339,024	114,413	453,437
		88	508,821	135,710	644,531
		87	383,008	171,441	554,449

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
77-78-1	Dimethyl sulfate	90	9,303	436	375	0	0	10,114
		89	14,434	1,905	500	0	50	16,889
		88	9,171	1,625	610	0	50	11,456
		87	7,981	2,855	6,680	0	0	17,516
534-52-1	4,6-Dinitro-o-cresol	90	8	39	131	0	0	178
		89	258	13	25	0	1	297
		88	259	15	266	0	2	542
		87	278	788	1,202	0	0	2,268
51-28-5	2,4-Dinitrophenol	90	17,111	7,586	89,074	111,500	3,307	228,578
		89	10,568	3,084	160,672	301,070	3,242	478,636
		88	12,386	8,439	98,692	86,200	257	205,974
		87	23,036	9,564	86,950	100,100	750	220,400
121-14-2	2,4-Dinitrotoluene	90	6,312	51,271	3,735	74,000	2,153	137,471
		89	9,500	77,793	12,657	69,000	341	169,291
		88	15,533	77,724	12,055	106,400	14,961	226,673
		87	17,591	81,907	11,270	203,000	261	314,029
606-20-2	2,6-Dinitrotoluene	90	1,486	16,251	416	19,000	0	37,153
		89	2,268	81,646	1,083	18,000	0	102,997
		88	6,074	81,523	957	27,000	0	115,554
		87	4,146	82,760	602	50,700	250	138,458
117-84-0	n-Dioctyl phthalate	90	17,054	12,803	1,842	5	261	31,965
		89	20,659	503,685	1,185	0	1,748	527,277
		88	26,097	43,935	1,513	0	1,000	72,545
		87	7,043	25,662	4,370	0	1,890	38,965
123-91-1	1,4-Dioxane	90	294,564	303,764	203,967	0	12,545	814,840
		89	409,848	411,172	273,522	0	33,723	1,128,265
		88	349,870	251,374	203,320	0	11,702	816,266
		87	210,973	164,469	163,873	0	22,501	561,816
106-89-8	Epichlorohydrin	90	255,755	171,606	10,639	79,220	7,648	524,868
		89	284,394	188,154	4,245	197,200	2,511	676,504
		88	265,003	200,265	4,467	68,300	2,524	540,559
		87	282,068	184,854	9,911	73,000	2,480	552,313
110-80-5	2-Ethoxyethanol	90	334,199	623,936	42,015	0	0	1,000,150
		89	283,046	1,371,989	96,042	0	78	1,751,155
		88	246,736	2,077,617	120,154	0	52	2,444,559
		87	705,652	2,067,468	133,783	0	54,101	2,961,004
140-88-5	Ethyl acrylate	90	116,891	87,333	1,161	10	498	205,893
		89	103,084	92,601	1,188	0	3,281	200,154
		88	132,827	118,996	1,211	0	265	253,299
		87	123,445	139,230	856	0	23,007	286,538
100-41-4	Ethylbenzene	90	2,723,279	5,894,359	12,634	213,625	62,626	8,906,523
		89	3,006,806	6,139,997	16,923	60,475	91,932	9,316,133
		88	2,912,970	4,193,531	16,932	72,914	201,868	7,398,215
		87	3,169,453	3,541,383	21,355	71,030	56,582	6,859,803
541-41-3	Ethyl chloroformate	90	1,302	520	0	0	0	1,822
		89	7,950	692	0	0	0	8,642
		88	11,880	2,023	0	0	0	13,903
		87	9,882	1,848	0	0	0	11,730
74-85-1	Ethylene	90	15,736,049	22,807,267	11,488	27,500	11,005	38,593,309
		89	18,250,561	26,395,893	14,902	18,618	16,200	44,696,174
		88	17,662,098	25,779,862	15,214	17,203	13,250	43,487,627
		87	38,307,392	22,639,730	12,686	0	7,436	60,967,244

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
77-78-1	Dimethyl sulfate	90	30	33	63
		89	1,250	0	1,250
		88	1,000	0	1,000
		87	500	250	750
534-52-1	4,6-Dinitro-o-cresol	90	44,756	204,573	249,329
		89	61,206	87,809	149,015
		88	19	306,096	306,115
		87	286	70,430	70,716
51-28-5	2,4-Dinitrophenol	90	261	3,923	4,184
		89	0	2,385	2,385
		88	1,000	677,650	678,650
		87	261	648,541	648,802
121-14-2	2,4-Dinitrotoluene	90	12	120,820	120,832
		89	600,000	243,455	843,455
		88	700,000	126,336	826,336
		87	770,000	3,952,902	4,722,902
606-20-2	2,6-Dinitrotoluene	90	0	30,230	30,230
		89	140,000	70,630	210,630
		88	170,000	31,585	201,585
		87	200,000	1,137,081	1,337,081
117-84-0	n-Dioctyl phthalate	90	6,188	194,367	200,555
		89	12,560	176,124	188,684
		88	6,777	214,422	221,199
		87	304	155,258	155,562
123-91-1	1,4-Dioxane	90	210,938	101,048	311,986
		89	281,002	219,998	501,000
		88	203,103	211,281	414,384
		87	104,612	650,306	754,918
106-89-8	Epichlorohydrin	90	57,931	669,716	727,647
		89	30,742	784,801	815,543
		88	73,385	690,564	763,949
		87	80,403	316,332	396,735
110-80-5	2-Ethoxyethanol	90	48,641	198,211	246,852
		89	162,581	315,711	478,292
		88	196,287	440,162	636,449
		87	137,278	648,786	786,064
140-88-5	Ethyl acrylate	90	12,973	100,283	113,256
		89	9,219	121,040	130,259
		88	27,656	108,663	136,319
		87	34,738	121,492	156,230
100-41-4	Ethylbenzene	90	121,296	2,218,947	2,340,243
		89	547,930	4,016,804	4,564,734
		88	507,375	3,433,911	3,941,286
		87	445,296	4,175,344	4,620,640
541-41-3	Ethyl chloroformate	90	0	0	0
		89	0	0	0
		88	0	69,600	69,600
		87	0	0	0
74-85-1	Ethylene	90	11	194,412	194,423
		89	200	371,105	371,305
		88	250	41,319	41,569
		87	250	58,936	59,186

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
107-21-1	Ethylene glycol	90	3,911,506	5,477,345	2,695,768	187,660	1,187,284	13,459,563
		89	4,438,738	8,788,911	3,773,670	8,583,941	1,143,340	26,728,600
		88	4,274,896	9,296,776	3,747,151	7,651,339	897,807	25,867,969
		87	5,242,561	10,225,513	4,382,123	4,843,362	726,452	25,420,011
151-56-4	Ethyleneimine (Aziridine)	88	250	250	0	0	0	500
		87	0	0	0	0	0	0
75-21-8	Ethylene oxide	90	785,088	1,662,406	8,911	49,280	24,042	2,529,727
		89	851,394	2,431,150	5,327	16,219	37,962	3,342,052
		88	869,532	3,900,464	44,851	11,125	54,700	4,880,672
		87	1,335,882	4,009,932	43,201	1,205,323	1,450	6,595,788
96-45-7	Ethylene thiourea	90	5	30	0	0	0	35
		89	1	763	0	0	0	764
		88	0	500	0	0	0	500
		87	0	0	0	0	0	0
2164-17-2	Fluometuron	90	26	19	0	0	0	45
		89	273	267	0	0	0	540
		88	250	250	0	0	0	500
		87	1,861	250	0	0	0	2,111
50-00-0	Formaldehyde	90	2,723,926	10,042,072	759,567	8,184,829	188,613	21,899,007
		89	2,741,458	10,349,687	838,705	8,347,005	242,245	22,519,100
		88	3,178,406	8,860,993	1,010,336	9,608,524	497,153	23,155,412
		87	5,081,975	8,477,818	1,611,090	6,409,400	336,664	21,916,947
76-13-1	Freon 113	90	30,389,887	14,970,022	12,148	1,815	35,457	45,409,329
		89	42,097,852	22,215,504	14,588	2,057	25,185	64,355,186
		88	45,961,054	23,025,382	32,644	5,965	27,799	69,052,844
		87	38,178,520	19,163,454	26,587	617	21,996	57,391,174
76-44-8	Heptachlor	90	3,797	0	1	0	0	3,798
		89	3,403	8	2	0	0	3,413
		88	49,052	3	2	0	0	49,057
		87	8,174	4	2	0	0	8,180
118-74-1	Hexachlorobenzene	90	1,258	210	124	220	0	1,812
		89	3,647	944	338	710	0	5,639
		88	4,497	497	4	410	0	5,408
		87	3,150	189	6	522	0	3,867
87-68-3	Hexachloro-1,3-butadiene	90	3,364	1,542	715	330	0	5,951
		89	2,928	709	622	330	1	4,590
		88	2,043	513	153	220	0	2,929
		87	3,230	350	189	70	1	3,840
77-47-4	Hexachlorocyclo-pentadiene	90	83,812	773	10	5	0	84,600
		89	88,061	1,185	6	250	0	89,502
		88	14,303	415	6	2,131	0	16,855
		87	55,115	664	32	9,913	0	65,724
67-72-1	Hexachloroethane	90	1,885	6,156	1	1,500	334	9,876
		89	3,141	19,339	421	770	1	23,672
		88	2,949	16,238	11	520	1	19,719
		87	3,602	2,054	8	197	501	6,362
302-01-2	Hydrazine	90	23,085	4,793	1,414	423	5	29,720
		89	20,627	11,042	2,291	0	71	34,031
		88	21,341	7,663	2,149	0	29	31,182
		87	22,411	6,630	31,559	0	3,108	63,708

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
107-21-1	Ethylene glycol	90	15,206,867	10,683,493	25,890,360
		89	17,438,202	15,733,833	33,172,035
		88	17,397,942	18,074,521	35,472,463
		87	17,440,323	8,638,760	26,079,083
151-56-4	Ethyleneimine (Aziridine)	88	0	0	0
		87	250	250	500
75-21-8	Ethylene oxide	90	266,464	2,729	269,193
		89	351,993	26,622	378,615
		88	363,065	21,913	384,978
		87	446,038	90,151	536,189
96-45-7	Ethylene thiourea	90	255	16,609	16,864
		89	261	22,451	22,712
		88	500	2,500	3,000
		87	8	5,206	5,214
2164-17-2	Fluometuron	90	81,085	3,393	84,478
		89	126,214	15,569	141,783
		88	2,300	22,800	25,100
		87	1,138	14,438	15,576
50-00-0	Formaldehyde	90	6,270,359	1,882,415	8,152,774
		89	6,243,737	2,110,542	8,354,279
		88	4,398,037	2,728,106	7,126,143
		87	3,336,699	2,753,760	6,090,459
76-13-1	Freon 113	90	91,720	2,545,723	2,637,443
		89	61,098	4,490,196	4,551,294
		88	104,693	6,225,674	6,330,367
		87	104,851	9,216,761	9,321,612
76-44-8	Heptachlor	90	58	85,306	85,364
		89	51	73,292	73,343
		88	37	51,935	51,972
		87	57	118,550	118,607
118-74-1	Hexachlorobenzene	90	23	53,010	53,033
		89	30	1,453,803	1,453,833
		88	160	965,099	965,259
		87	109	656,847	656,956
87-68-3	Hexachloro-1,3-butadiene	90	958	84,345	85,303
		89	100	4,213,617	4,213,717
		88	300	3,532,641	3,532,941
		87	125	1,984,287	1,984,412
77-47-4	Hexachlorocyclo-pentadiene	90	904	44,109	45,013
		89	1,096	17,468	18,564
		88	852	619,315	620,167
		87	777	506,666	507,443
67-72-1	Hexachloroethane	90	0	128,241	128,241
		89	250	486,536	486,786
		88	260	649,856	650,116
		87	0	831,291	831,291
302-01-2	Hydrazine	90	11,367	25,474	36,841
		89	3,354	68,818	72,172
		88	1,468	43,123	44,591
		87	815	160,663	161,478

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
10034-93-2	Hydrazine sulfate	90	5	252	0	138,941	0	139,198
		89	0	1	0	76,957	0	76,958
		88	290	882	0	355,000	0	356,172
		87	0	0	0	139,000	0	139,000
7647-01-0	Hydrochloric acid	90	5,436,543	68,010,383	2,769,970	154,098,891	514,830	230,830,617
		89	5,289,931	68,137,940	3,052,332	273,272,293	4,940,143	354,692,639
		88	6,124,740	64,085,137	3,947,399	396,089,339	4,893,005	475,139,620
		87	5,715,530	67,451,701	8,789,999	414,811,594	7,925,501	504,694,325
74-90-8	Hydrogen cyanide	90	55,825	614,750	3,824	1,597,552	48	2,271,999
		89	117,267	702,120	5,610	3,534,070	328	4,359,395
		88	131,604	1,266,723	2,300	1,737,850	1,761	3,140,238
		87	136,845	505,495	1,825	1,056,180	1,002	1,701,347
7664-39-3	Hydrogen fluoride	90	3,250,767	5,295,297	11,675	20	8,304	8,566,063
		89	3,426,624	6,662,510	35,918	450,000	10,943	10,585,995
		88	3,627,585	8,490,012	189,928	560,250	13,002	12,880,777
		87	3,234,598	8,710,377	116,483	583,000	580,316	13,224,774
123-31-9	Hydroquinone	90	6,166	5,221	4,525	284,020	295	300,227
		89	6,774	6,286	4,884	353,022	504	371,470
		88	3,601	6,733	7,211	375,400	530	393,475
		87	24,578	6,640	8,113	402,050	1,854	443,235
78-84-2	Isobutyraldehyde	90	149,031	341,247	80	864	1	491,223
		89	143,714	416,035	751	1,042	1	561,543
		88	265,382	543,878	773	60	1	810,094
		87	730,795	590,772	1,036	0	3	1,322,606
67-63-0	Isopropyl alcohol (manufacturing)	90	1,069,174	2,110,323	11,131	15	32,955	3,223,598
		89	2,127,925	3,450,813	11,008	18,441	1,657	5,609,844
		88	801,006	1,135,511	1,840	0	14	1,938,371
		87	680,071	1,323,532	2,939	0	250	2,006,792
80-05-7	4,4'-Isopropylidene-diphenol	90	92,454	90,445	2,412	23,000	555,917	764,228
		89	114,926	112,329	2,629	0	779,533	1,009,417
		88	119,620	105,276	121,172	0	424,117	770,185
		87	90,372	202,988	13,315	250	651,554	958,479
7439-92-1	Lead	90	495,989	364,584	24,659	45	5,338,494	6,223,771
		89	313,635	551,023	33,314	0	6,320,848	7,218,820
		88	505,746	664,335	60,630	5	7,066,450	8,297,166
		87	513,588	960,000	66,667	287,872	20,085,585	21,913,712
58-89-9	Lindane	90	1,011	538	250	0	5	1,804
		89	751	36	0	0	250	1,037
		88	251	7	0	0	0	258
		87	500	311	250	0	250	1,311
108-31-6	Maleic anhydride	90	90,604	402,465	1,373	10	120,816	615,268
		89	93,864	357,200	2,824	0	750	454,638
		88	103,830	551,123	12,580	240,000	0	907,533
		87	146,785	772,288	15,354	250	5,453	940,130
12427-38-2	Maneb	90	270	521	5	0	0	796
		89	1,000	781	0	0	0	1,781
		88	1,000	1,265	250	0	0	2,515
		87	826	35,104	0	0	0	35,930
7439-96-5	Manganese	90	653,739	945,099	139,681	800	10,840,007	12,579,326
		89	2,362,726	685,787	148,561	556	7,982,937	11,180,567
		88	1,037,937	759,100	319,194	250	20,462,398	22,578,879
		87	409,636	496,513	489,802	571	13,502,468	14,898,990

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
10034-93-2	Hydrazine sulfate	90	250	250	500
		89	0	250	250
		88	0	0	0
		87	0	0	0
7647-01-0	Hydrochloric acid	90	24,272,295	43,692,876	67,965,171
		89	28,394,330	100,242,911	128,637,241
		88	35,666,684	125,170,979	160,837,663
		87	44,622,056	61,769,250	106,391,306
74-90-8	Hydrogen cyanide	90	290	4,127	4,417
		89	294	24,282	24,576
		88	337	22,451	22,788
		87	14,023	11,797	25,820
7664-39-3	Hydrogen fluoride	90	70,951	3,778,591	3,849,542
		89	222,554	4,674,804	4,897,358
		88	698,389	6,866,717	7,565,106
		87	970,011	6,844,177	7,814,188
123-31-9	Hydroquinone	90	275,740	141,089	416,829
		89	593,606	170,387	763,993
		88	510,560	309,941	820,501
		87	937,824	334,184	1,272,008
78-84-2	Isobutyraldehyde	90	35,728	41,987	77,715
		89	36,055	37,130	73,185
		88	713	30,260	30,973
		87	28,050	22,744	50,794
67-63-0	Isopropyl alcohol (manufacturing)	90	98,154	972,856	1,071,010
		89	681,647	1,465,322	2,146,969
		88	154,651	848,997	1,003,648
		87	88,479	438,340	526,819
80-05-7	4,4'-Isopropylidene-diphenol	90	42,334	477,272	519,606
		89	35,368	492,569	527,937
		88	31,135	1,434,162	1,465,297
		87	24,136	580,034	604,170
7439-92-1	Lead	90	33,203	9,447,358	9,480,561
		89	50,289	14,469,987	14,520,276
		88	121,114	13,433,862	13,554,976
		87	464,981	26,124,980	26,589,961
58-89-9	Lindane	90	5	3,052	3,057
		89	250	1,053	1,303
		88	0	186	186
		87	250	7,400	7,650
108-31-6	Maleic anhydride	90	643,342	737,942	1,381,284
		89	578,073	882,229	1,460,302
		88	556,373	912,454	1,468,827
		87	254,392	1,157,914	1,412,306
12427-38-2	Maneb	90	0	5,850	5,850
		89	250	16,489	16,739
		88	1,470	7,362	8,832
		87	15,440	5,822	21,262
7439-96-5	Manganese	90	62,133	11,505,663	11,567,796
		89	83,354	20,258,851	20,342,205
		88	131,139	20,148,223	20,279,362
		87	130,935	22,611,240	22,742,175

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
7439-97-6	Mercury	90	14,020	8,384	751	0	4,184	27,339
		89	15,813	9,272	1,555	0	4,942	31,582
		88	16,036	7,359	1,397	0	13,279	38,071
		87	17,172	6,237	2,111	0	28,267	53,787
67-56-1	Methanol	90	38,013,004	145,090,113	18,171,884	25,370,822	5,505,842	232,151,665
		89	43,531,598	166,452,790	21,276,746	24,065,690	7,770,516	263,097,340
		88	47,482,374	179,568,500	16,639,876	24,155,436	12,738,305	280,584,491
		87	49,273,630	167,863,421	27,018,005	21,576,371	16,514,275	282,245,702
72-43-5	Methoxychlor	90	756	846	505	0	255	2,362
		89	250	286	250	0	250	1,036
		88	47,971	224,910	252	0	258	273,391
		87	2	250	2	0	250	504
109-86-4	2-Methoxyethanol	90	1,273,514	1,198,567	40,340	4,540	3,233	2,520,194
		89	988,306	1,702,058	46,428	4,000	112	2,740,904
		88	1,148,320	4,746,721	40,520	750	7	5,936,318
		87	1,951,949	6,349,838	26,831	12,000	252	8,340,870
96-33-3	Methyl acrylate	90	79,059	170,167	470	99	0	249,795
		89	78,336	117,485	1,172	200	250	197,443
		88	319,897	109,438	1,358	200	30,260	461,153
		87	328,229	107,260	1,800	0	277	437,566
1634-04-4	Methyl tert-butyl ether	90	667,560	2,117,064	42,667	112,400	1,501	2,941,192
		89	502,133	2,519,677	37,439	19,300	1,290	3,079,839
		88	881,429	2,130,625	21,999	14,400	370	3,048,823
		87	1,208,649	1,117,925	93,342	6,900	2,410	2,429,226
101-14-4	4,4'-Methylenebis (2-chloro aniline)	90	1,510	1,255	0	0	0	2,765
		89	750	761	0	0	0	1,511
		88	500	250	0	0	0	750
		87	300	0	0	0	0	300
101-61-1	4,4'-Methylenebis(N,N-dimethyl)benzenamine	88	250	0	0	0	7,000	7,250
		87	0	18,173	0	0	0	18,173
101-68-8	Methylenebis (phenylisocyanate)	90	397,015	279,377	80	30	226,703	903,205
		89	262,673	117,540	506	0	149,001	529,720
		88	157,178	91,142	1,022	0	87,415	336,757
		87	750,246	84,524	770	0	86,975	922,515
74-95-3	Methylene bromide	90	51,164	13,630	0	0	0	64,794
		89	31,584	4,780	0	0	0	36,364
		88	34,468	23,255	0	0	0	57,723
		87	17,138	21,817	250	0	0	39,205
101-77-9	4,4'-Methylenedianiline	90	14,250	5,273	1,201	57,250	6	77,980
		89	33,140	14,620	1,305	96,000	0	145,065
		88	36,804	93,347	2,599	460,250	1,140	594,140
		87	85,512	16,299	2,692	456,000	2	560,505
78-93-3	Methyl ethyl ketone	90	37,588,656	83,738,400	65,213	117,204	81,940	121,591,413
		89	37,122,828	97,675,961	67,797	200,698	163,627	135,230,911
		88	36,209,534	99,824,477	77,304	253,762	162,163	136,527,240
		87	40,724,290	117,195,265	76,189	75,250	59,765	158,130,759
60-34-4	Methyl hydrazine	90	1	0	0	0	0	1
		89	0	73	0	0	0	73
		88	2,774	153	1	0	0	2,928
		87	1,410	273	0	0	0	1,683

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
7439-97-6	Mercury	90	42	168,079	168,121
		89	774	125,779	126,553
		88	1,613	257,378	258,991
		87	1,035	236,571	237,606
67-56-1	Methanol	90	125,203,885	43,353,675	168,557,560
		89	110,722,062	57,546,090	168,268,152
		88	113,890,852	61,806,477	175,697,329
		87	117,548,514	71,492,403	189,040,917
72-43-5	Methoxychlor	90	0	1,487	1,487
		89	0	440	440
		88	0	24,759	24,759
		87	0	0	0
109-86-4	2-Methoxyethanol	90	530,365	897,943	1,428,308
		89	480,845	1,286,586	1,767,431
		88	622,103	878,532	1,500,635
		87	669,343	1,346,019	2,015,362
96-33-3	Methyl acrylate	90	9,377	743,707	753,084
		89	13,131	80,591	93,722
		88	14,886	18,784	33,670
		87	15,288	131,392	146,680
1634-04-4	Methyl tert-butyl ether	90	123,291	55,580	178,871
		89	78,535	104,933	183,468
		88	7,713	98,427	106,140
		87	57,740	14,498	72,238
101-14-4	4,4'-Methylenebis (2-chloro aniline)	90	0	2,105	2,105
		89	0	4,541	4,541
		88	0	6,250	6,250
		87	0	250	250
101-61-1	4,4'-Methylenebis(N,N-dimethyl)benzenamine	88	0	1,150	1,150
		87	0	0	0
101-68-8	Methylenebis (phenylisocyanate)	90	5,171	1,763,860	1,769,031
		89	1,875	2,300,628	2,302,503
		88	1,250	2,789,963	2,791,213
		87	500	1,258,285	1,258,785
74-95-3	Methylene bromide	90	8,579	49,085	57,664
		89	5,440	51,082	56,522
		88	6,097	0	6,097
		87	5,248	188	5,436
101-77-9	4,4'-Methylenedianiline	90	2,434	106,306	108,740
		89	3,088	306,171	309,259
		88	7,399	280,887	288,286
		87	10,506	229,891	240,397
78-93-3	Methyl ethyl ketone	90	787,817	18,640,870	19,428,687
		89	789,574	29,551,913	30,341,487
		88	935,896	30,806,197	31,742,093
		87	724,166	48,338,190	49,062,356
60-34-4	Methyl hydrazine	90	0	0	0
		89	0	500	500
		88	0	2,700	2,700
		87	0	4,586	4,586

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
74-88-4	Methyl iodide	90	29,443	373	1	5,085	0	34,902
		89	17,178	8,294	1	5,085	0	30,558
		88	5,691	3,253	5	250	0	9,199
		87	250	250	0	55	0	555
108-10-1	Methyl isobutyl ketone	90	9,300,401	18,010,971	53,798	52,221	28,103	27,445,494
		89	10,646,739	21,257,723	449,410	81,850	20,891	32,456,613
		88	13,111,722	19,566,840	762,358	116,655	31,775	33,589,350
		87	11,377,563	19,252,957	1,117,203	60,450	86,303	31,894,476
624-83-9	Methyl isocyanate	90	12,983	1,390	0	0	500	14,873
		89	13,702	1,246	0	0	314	15,262
		88	9,589	586	0	0	64	10,239
		87	75,525	211,019	0	0	0	286,544
80-62-6	Methyl methacrylate	90	558,481	1,557,797	6,981	210,015	593	2,333,867
		89	1,294,059	1,855,000	28,802	197,013	4,801	3,379,675
		88	1,178,419	2,258,990	28,084	327,221	8,119	3,800,833
		87	1,334,146	2,303,287	25,396	227,550	10,009	3,900,388
90-94-8	Michler's ketone	90	0	0	0	0	0	0
		89	78	66	0	0	0	144
		88	450	650	0	0	0	1,100
		87	0	400	0	0	0	400
1313-27-5	Molybdenum trioxide	90	21,841	41,921	102,840	170,650	49,120	386,372
		89	34,336	66,333	124,535	173,270	108,264	506,738
		88	37,022	72,589	139,021	197,115	97,238	542,985
		87	44,714	65,702	65,845	1,500	66,384	244,145
91-20-3	Naphthalene	90	1,988,558	1,717,563	36,080	28,152	142,130	3,912,483
		89	1,847,930	1,615,270	146,615	39,552	116,473	3,765,840
		88	3,365,002	1,733,421	22,323	50,946	122,724	5,294,416
		87	2,552,097	2,086,796	128,325	34,773	142,497	4,944,488
134-32-7	alpha-Naphthylamine	90	250	250	0	0	0	500
		89	336	336	0	0	0	672
		88	336	254	101	0	0	691
		87	336	30,241	0	0	0	30,577
7440-02-0	Nickel	90	286,156	368,303	56,813	9,111	2,989,862	3,710,245
		89	793,623	339,494	86,211	18,946	1,293,440	2,531,714
		88	246,891	175,564	86,967	14,295	1,225,390	1,749,107
		87	128,202	295,058	128,988	22,913	745,103	1,320,264
7697-37-2	Nitric acid	90	746,283	3,395,206	159,099	31,912,662	394,758	36,608,008
		89	881,467	4,416,246	735,542	31,017,845	497,625	37,548,725
		88	1,126,230	7,456,699	1,432,540	25,485,680	1,330,695	36,831,844
		87	1,029,660	3,439,982	1,916,396	25,153,042	1,289,719	32,828,799
139-13-9	Nitrilotriacetic acid	90	25	1,000	7,700	0	0	8,725
		89	1,250	1,250	5,100	0	5,100	12,700
		88	1,000	1,500	5,100	0	5,100	12,700
		87	252	1,500	5,100	1,900,000	5,100	1,911,952
99-59-2	5-Nitro-o-anisidine	90	5	5	0	0	0	10
		89	250	250	0	0	0	500
		87	0	0	0	0	0	0
98-95-3	Nitrobenzene	90	51,251	15,009	1,419	608,000	755	676,434
		89	22,394	16,397	1,287	554,025	2,814	596,917
		88	22,614	17,759	5,907	819,024	2,875	868,179
		87	44,807	71,086	17,076	561,000	250	694,219
51-75-2	Nitrogen mustard	87	0	0	0	0	0	0

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
74-88-4	Methyl iodide	90	0	228	228
		89	250	251	501
		88	0	250	250
		87	0	500	500
108-10-1	Methyl isobutyl ketone	90	1,258,909	4,486,484	5,745,393
		89	1,286,918	6,521,112	7,808,030
		88	1,509,782	11,251,283	12,761,065
		87	1,320,743	12,678,987	13,999,730
624-83-9	Methyl isocyanate	90	0	0	0
		89	0	23,000	23,000
		88	0	8,714	8,714
		87	0	10,850	10,850
80-62-6	Methyl methacrylate	90	145,841	1,129,562	1,275,403
		89	137,680	3,880,334	4,018,014
		88	191,578	3,099,118	3,290,696
		87	229,945	4,560,550	4,790,495
90-94-8	Michler's ketone	90	0	27,591	27,591
		89	0	26,703	26,703
		88	0	33,519	33,519
		87	0	30,339	30,339
1313-27-5	Molybdenum trioxide	90	31,834	578,464	610,298
		89	22,024	885,998	908,022
		88	34,044	600,960	635,004
		87	33,147	574,717	607,864
91-20-3	Naphthalene	90	167,442	1,809,080	1,976,522
		89	964,706	1,634,134	2,598,840
		88	801,809	1,958,531	2,760,340
		87	185,504	10,849,121	11,034,625
134-32-7	alpha-Naphthylamine	90	0	534	534
		89	0	0	0
		88	0	0	0
		87	0	1,250	1,250
7440-02-0	Nickel	90	119,989	5,110,006	5,229,995
		89	215,342	7,446,984	7,662,326
		88	250,906	7,244,836	7,495,742
		87	228,626	15,413,870	15,642,496
7697-37-2	Nitric acid	90	13,218,392	20,954,662	34,173,054
		89	13,755,868	23,557,409	37,313,277
		88	23,317,077	26,321,897	49,638,974
		87	28,751,033	25,872,575	54,623,608
139-13-9	Nitrilotriacetic acid	90	3,300	0	3,300
		89	2,750	34,105	36,855
		88	274,359	191,003	465,362
		87	36,682	170,443	207,125
99-59-2	5-Nitro-o-anisidine	90	5	0	5
		89	250	0	250
		87	400	0	400
98-95-3	Nitrobenzene	90	1,372	108,352	109,724
		89	4,750	108,436	113,186
		88	5,671	1,371,395	1,377,066
		87	8,850	684,006	692,856
51-75-2	Nitrogen mustard	87	0	0	0

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
55-63-0	Nitroglycerin	90	1,053	29,550	11,580	0	17,150	59,333
		89	8,638	27,169	9,198	0	21,500	66,505
		88	1,530	50,103	2,746	0	11,640	66,019
		87	5,059	44,187	16,553	0	19,175	84,974
88-75-5	2-Nitrophenol	90	0	4	29	0	0	33
		89	4,186	219	6	0	0	4,411
		88	32,152	1,537	1	0	2	33,692
		87	31,418	1,731	250	0	0	33,399
100-02-7	4-Nitrophenol	90	7,570	83	31	1,200	0	8,884
		89	7,614	140	0	1,800	0	9,554
		88	7,642	213	0	6,300	7	14,162
		87	2,951	2,501	0	6,800	250	12,502
79-46-9	2-Nitropropane	90	62,836	21,422	1,100	87,000	0	172,358
		89	168,947	63,735	2,700	474,000	0	709,382
		88	208,303	181,082	4,300	257,000	0	650,685
		87	187,644	278,608	4,100	167,501	0	637,853
156-10-5	p-Nitrosodiphenylamine	90	24	0	0	0	0	24
		89	24	0	0	2,500	0	2,524
		88	15	0	0	2,000	0	2,015
		87	250	0	0	2,000	0	2,250
121-69-7	N,N-Dimethylaniline	90	17,705	33,010	16,030	0	0	66,745
		89	6,957	84,802	14,437	0	0	106,196
		88	18,448	80,457	19,967	0	250	119,122
		87	80,693	49,136	17,613	0	250	147,692
62-75-9	N-Nitrosodimethylamine	89	0	0	0	0	0	0
		88	0	0	0	0	0	0
86-30-6	N-Nitrosodiphenylamine	90	0	0	0	0	0	0
		89	0	0	9	40,000	9	40,018
		88	0	0	27	34,000	0	34,027
		87	0	0	0	34,000	0	34,000
621-64-7	N-Nitrosodi-n-propylamine	87	0	2,700	0	0	0	2,700
56-38-2	Parathion	90	296	317	10	0	10	633
		89	1,006	589	250	0	250	2,095
		88	2,258	1,007	750	0	250	4,265
		87	1,098	1,260	250	0	250	2,858
87-86-5	Pentachlorophenol	90	15,507	7,699	2,577	0	1,941	27,724
		89	6,066	5,057	2,559	0	6,906	20,588
		88	8,133	5,896	2,465	20,000	3,717	40,211
		87	9,992	6,777	3,153	8,520	65,176	93,618
79-21-0	Peracetic acid	90	2,066	3,766	113	0	1,826	7,771
		89	1,013	8,471	40	0	0	9,524
		88	766	4,687	55	0	0	5,508
		87	1,012	7,488	1,378	0	0	9,878
108-95-2	Phenol	90	3,199,563	4,455,302	271,580	4,421,439	256,043	12,603,927
		89	3,452,305	5,607,939	267,978	4,282,511	371,858	13,982,591
		88	4,487,690	5,896,624	260,197	4,664,246	1,882,284	17,191,041
		87	3,210,218	5,074,036	400,665	8,160,996	1,161,278	18,007,193
106-50-3	p-Phenylenediamine	90	768	0	0	0	0	768
		89	3,808	275	0	3,100	0	7,183
		88	2,210	111,680	826	4,716	0	119,432
		87	1,238	116,124	3,269	148,287	2,500	271,418

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
55-63-0	Nitroglycerin	90	84	32,936	33,020
		89	211	24,501	24,712
		88	53	3,583	3,636
		87	0	9,000	9,000
88-75-5	2-Nitrophenol	90	4,600	35,894	40,494
		89	14,638	24,819	39,457
		88	149,000	14,700	163,700
		87	127,684	25,553	153,237
100-02-7	4-Nitrophenol	90	400,774	62,617	463,391
		89	630,059	36	630,095
		88	560,428	70	560,498
		87	183,450	175,250	358,700
79-46-9	2-Nitropropane	90	0	6,100	6,100
		89	1,753	581	2,334
		88	3,000	13,695	16,695
		87	3,000	33,054	36,054
156-10-5	p-Nitrosodiphenylamine	90	0	1,300	1,300
		89	0	180	180
		88	0	180	180
		87	0	250	250
121-69-7	N,N-Dimethylaniline	90	198,535	108,870	307,405
		89	237,226	442,117	679,343
		88	287,483	466,169	753,652
		87	220,376	322,086	542,462
62-75-9	N-Nitrosodimethylamine	89	0	0	0
		88	0	0	0
86-30-6	N-Nitrosodiphenylamine	90	0	1,853,445	1,853,445
		89	0	520,190	520,190
		88	0	300	300
		87	0	0	0
621-64-7	N-Nitrosodi-n-propylamine	87	0	0	0
56-38-2	Parathion	90	0	26,566	26,566
		89	0	4,450	4,450
		88	0	5,280	5,280
		87	0	348,618	348,618
87-86-5	Pentachlorophenol	90	4,349	75,159	79,508
		89	8,013	87,417	95,430
		88	4,728	545,673	550,401
		87	25,760	118,190	143,950
79-21-0	Peracetic acid	90	2,000	1,821	3,821
		89	0	0	0
		88	0	0	0
		87	0	250	250
108-95-2	Phenol	90	5,059,604	6,252,178	11,311,782
		89	5,233,223	4,484,926	9,718,149
		88	5,927,801	6,380,848	12,308,649
		87	5,786,269	7,606,761	13,393,030
106-50-3	p-Phenylenediamine	90	23,509	41,586	65,095
		89	1,178	40,550	41,728
		88	6,277	117,923	124,200
		87	166,225	54,100	220,325

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
90-43-7	2-Phenylphenol	90	8,925	985	135	10	530	10,585
		89	7,225	827	134	0	500	8,686
		88	9,010	1,620	480	0	0	11,110
		87	1,506	1,520	254	0	250	3,530
75-44-5	Phosgene	90	2,423	2,430	15	10	20	4,898
		89	4,728	3,535	250	250	0	8,763
		88	3,839	17,764	500	250	0	22,353
		87	8,439	75,201	250	250	0	84,140
7664-38-2	Phosphoric acid	90	402,491	1,200,153	74,733,560	1,500,404	57,480,518	135,317,126
		89	573,845	1,360,416	26,961,174	93,016	49,841,884	78,830,335
		88	718,237	1,234,692	122,650,414	54,961	51,829,452	176,487,756
		87	416,818	1,234,201	139,542,327	58,504	185,098,116	326,349,966
7723-14-0	Phosphorus (yellow or white)	90	19,310	4,913	2,343	0	2,189,653	2,216,219
		89	10,685	5,489	3,033	0	3,291,402	3,310,609
		88	7,594	11,559	11,572	0	3,893,674	3,924,399
		87	16,489	9,863	18,090	0	4,042,960	4,087,402
85-44-9	Phthalic anhydride	90	147,783	539,687	369	0	9,605	697,444
		89	117,544	532,607	2,120	0	3,080	655,351
		88	126,326	395,573	1,040	0	1,015	523,954
		87	159,965	437,683	1,803	0	1,557	601,008
88-89-1	Picric acid	90	1	1	2	1,249,930	2	1,249,936
		89	251	1	250	1,265,460	250	1,266,212
		88	251	1	251	1,362,180	250	1,362,933
		87	500	250	500	0	500	1,750
1336-36-3	Polychlorinated biphenyls (PCBs)	90	5	0	0	0	71,366	71,371
		89	0	0	264	0	998	1,262
		88	0	0	10	0	3,452	3,462
		87	750	1	510	250	250	1,761
1120-71-4	Propane sultone	88	0	0	0	0	0	0
		87	0	0	0	0	0	0
123-38-6	Propionaldehyde	90	340,631	648,355	491	34,394	0	1,023,871
		89	331,352	746,117	411	4,518	0	1,082,398
		88	402,253	894,586	1,156	930	0	1,298,925
		87	358,374	752,817	423	3,400	10	1,115,024
114-26-1	Propoxur	90	260	10	5	0	0	275
		89	250	254	0	0	0	504
		88	250	0	0	0	0	250
		87	2	0	0	0	0	2
115-07-1	Propylene	90	12,107,152	9,392,758	867	5	316	21,501,098
		89	14,077,301	11,323,557	953	0	250	25,402,061
		88	14,036,760	10,717,298	10,003	0	0	24,764,061
		87	27,183,019	12,708,281	1,186	0	2,697	39,895,183
75-55-8	Propyleneimine	90	330	322	0	0	0	652
		89	287	253	0	0	0	540
		88	250	250	0	0	0	500
		87	250	250	0	0	0	500
75-56-9	Propylene oxide	90	490,390	869,606	70,780	120,005	3,880	1,554,661
		89	415,005	1,638,507	83,521	270,000	4,727	2,411,760
		88	539,841	2,710,436	112,503	1,113,780	11,630	4,488,190
		87	598,532	3,009,972	68,629	120,000	337,156	4,134,289

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
90-43-7	2-Phenylphenol	90	5,447	1,000	6,447
		89	6,416	1,250	7,666
		88	6,400	250	6,650
		87	17,582	250	17,832
75-44-5	Phosgene	90	0	1,713	1,713
		89	0	1,236	1,236
		88	0	1,520	1,520
		87	0	2,000	2,000
7664-38-2	Phosphoric acid	90	7,837,294	5,093,703	12,930,997
		89	11,618,696	8,105,499	19,724,195
		88	14,080,457	8,529,569	22,610,026
		87	12,590,108	10,260,936	22,851,044
7723-14-0	Phosphorus (yellow or white)	90	1,552	14,529	16,081
		89	4,495	85,591	90,086
		88	646	219,756	220,402
		87	95,623	220,527	316,150
85-44-9	Phthalic anhydride	90	42,719	2,309,803	2,352,522
		89	243,292	3,546,530	3,789,822
		88	53,441	5,980,559	6,034,000
		87	46,192	5,057,692	5,103,884
88-89-1	Picric acid	90	1	1,044	1,045
		89	0	25	25
		88	0	14,000	14,000
		87	0	635,893	635,893
1336-36-3	Polychlorinated biphenyls (PCBs)	90	0	2,592,044	2,592,044
		89	1	4,263,516	4,263,517
		88	250	5,580,054	5,580,304
		87	250	4,284,307	4,284,557
1120-71-4	Propane sultone	88	0	0	0
		87	0	0	0
123-38-6	Propionaldehyde	90	69	1,457	1,526
		89	26,553	0	26,553
		88	761	1,600	2,361
		87	0	1,139	1,139
114-26-1	Propoxur	90	260	796	1,056
		89	753	2,267	3,020
		88	0	250	250
		87	0	750	750
115-07-1	Propylene	90	1,340	4,907,543	4,908,883
		89	6,103	7,070,660	7,076,763
		88	500	1,524,389	1,524,889
		87	13,550	6,957	20,507
75-55-8	Propyleneimine	90	250	0	250
		89	250	0	250
		88	250	0	250
		87	250	0	250
75-56-9	Propylene oxide	90	251,414	12,256	263,670
		89	329,915	9,724	339,639
		88	386,355	17,752	404,107
		87	362,926	26,436	389,362

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
110-86-1	Pyridine	90	64,227	48,263	7,336	514,955	25	634,806
		89	75,476	67,527	2,365	660,281	251	805,900
		88	155,281	73,168	2,158	537,775	1,125	769,507
		87	255,595	42,843	4,630	303,650	28,656	635,374
91-22-5	Quinoline	90	20,513	7,177	17	0	198	27,905
		89	27,365	36,859	5	0	3,093	67,322
		88	31,633	17,717	502	0	896	50,748
		87	10,933	16,472	507	0	351	28,263
106-51-4	Quinone	90	711	891	5	0	0	1,607
		89	860	900	12	0	0	1,772
		88	4,600	6,700	140	0	0	11,440
		87	490	563	110	0	0	1,163
82-68-8	Quintozene	90	255	16	0	0	0	271
		89	1,250	790	0	0	250	2,290
		88	750	314	0	0	0	1,064
		87	0	254	0	0	0	254
81-07-2	Saccharin (manufacturing)	90	68	258	0	0	0	326
		89	315	760	0	0	0	1,075
		88	250	500	0	0	0	750
		87	250	500	0	0	0	750
94-59-7	Safrole	90	5	0	0	0	0	5
		89	0	0	0	0	0	0
		88	250	250	0	0	0	500
		87	250	250	0	0	0	500
7782-49-2	Selenium	90	1,260	799	452	0	171,283	173,794
		89	2,508	11,442	750	0	236,714	251,414
		88	2,251	14,031	1,168	0	127,508	144,958
		87	3,000	1,527	850	0	6,677	12,054
7440-22-4	Silver	90	4,907	7,439	298	5	3,725	16,374
		89	7,624	7,658	1,419	71	10,200	26,972
		88	11,482	36,517	1,654	0	39,510	89,163
		87	3,310	9,459	1,326	500	1,922	16,517
100-42-5	Styrene	90	13,472,563	18,204,101	37,371	29,045	166,746	31,909,826
		89	15,487,607	18,758,105	51,082	0	196,550	34,493,344
		88	12,540,368	20,358,707	59,069	165	242,941	33,201,250
		87	12,233,340	20,146,188	107,858	250	337,023	32,824,659
96-09-3	Styrene oxide	90	1,535	888	0	0	0	2,423
		89	511	1,514	0	0	0	2,025
		88	511	1,803	0	0	0	2,314
		87	254	769	779	0	0	1,802
7664-93-9	Sulfuric acid	90	1,596,048	21,963,187	25,855,900	112,116,692	1,863,934	163,395,761
		89	2,422,316	22,339,195	19,800,811	149,583,139	6,998,100	201,143,561
		88	2,253,921	14,779,318	36,633,317	138,707,333	4,598,560	196,972,449
		87	2,300,891	13,375,909	52,452,868	135,688,601	11,180,079	214,998,348
79-34-5	1,1,2,2-Tetrachloroethane	90	38,323	6,273	3,529	80	495	48,700
		89	26,059	9,342	5,429	283	18	41,131
		88	25,904	17,951	814	0	29	44,698
		87	38,338	87,951	8,051	0	10	134,350
127-18-4	Tetrachloroethylene	90	8,790,493	12,854,503	21,505	11,012	1,017	21,678,530
		89	11,956,884	15,281,344	54,940	50,005	10,791	27,353,964
		88	16,189,631	19,424,871	33,784	72,250	106,394	35,826,930
		87	15,594,818	17,613,040	162,021	354,000	5,220	33,729,099

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
110-86-1	Pyridine	90	264,948	175,476	440,424
		89	354,602	259,117	613,719
		88	275,083	97,428	372,511
		87	209,880	354,556	564,436
91-22-5	Quinoline	90	4,893	16,533	21,426
		89	6,575	22,336	28,911
		88	6,406	11,187	17,593
		87	5,694	12,453	18,147
106-51-4	Quinone	90	0	0	0
		89	250	120	370
		88	250	280	530
		87	250	239	489
82-68-8	Quintozene	90	5	1,087	1,092
		89	250	1,883	2,133
		88	250	12,625	12,875
		87	0	14,549	14,549
81-07-2	Saccharin (manufacturing)	90	681	4,043	4,724
		89	500	4,340	4,840
		88	7,900	750	8,650
		87	8,450	750	9,200
94-59-7	Safrole	90	12	0	12
		89	13	0	13
		88	250	0	250
		87	250	0	250
7782-49-2	Selenium	90	520	22,896	23,416
		89	762	15,240	16,002
		88	1,250	6,262	7,512
		87	750	5,764	6,514
7440-22-4	Silver	90	3,072	3,892	6,964
		89	4,243	53,573	57,816
		88	3,624	27,138	30,762
		87	2,497	41,646	44,143
100-42-5	Styrene	90	254,879	11,452,834	11,707,713
		89	422,227	7,713,205	8,135,432
		88	471,291	9,063,115	9,534,406
		87	482,896	9,439,090	9,921,986
96-09-3	Styrene oxide	90	0	0	0
		89	250	0	250
		88	250	750	1,000
		87	0	0	0
7664-93-9	Sulfuric acid	90	30,460,264	73,210,682	103,670,946
		89	42,958,987	77,029,921	119,988,908
		88	54,592,348	111,537,817	166,130,165
		87	75,865,322	170,375,259	246,240,581
79-34-5	1,1,2,2-Tetra-chloroethane	90	124	150,527	150,651
		89	663	201,051	201,714
		88	400	157,832	158,232
		87	0	678,269	678,269
127-18-4	Tetrachloroethylene	90	450,528	4,266,258	4,716,786
		89	467,501	4,230,162	4,697,663
		88	586,994	5,338,846	5,925,840
		87	468,519	9,380,569	9,849,088

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
961-11-5	Tetrachlorvinphos	90	500	254	0	0	0	754
		89	250	250	0	0	0	500
		88	250	1	0	0	0	251
		87	3,440	6,975	0	0	0	10,415
7440-28-0	Thallium	90	250	500	5	0	0	755
		89	500	500	0	0	500	1,500
		87	250	54,161	1,850	0	0	56,261
62-55-5	Thioacetamide	88	250	250	0	0	0	500
62-56-6	Thiourea	90	2,300	565	572	4,800	265	8,502
		89	2,253	1,500	971	5,900	752	11,376
		88	2,254	500	16,951	5,940	750	26,395
		87	770	5,250	16,090	5,400	16,500	44,010
1314-20-1	Thorium dioxide	90	250	610	0	0	0	860
		89	250	610	0	0	0	860
		88	230	1,600	0	0	0	1,830
		87	230	1,350	0	0	0	1,580
7550-45-0	Titanium tetrachloride	90	42,397	11,963	0	0	0	54,360
		89	44,785	12,502	0	0	0	57,287
		88	38,614	40,054	0	0	1,400	80,068
		87	132,157	37,008	25	0	750	169,940
108-88-3	Toluene	90	77,249,500	156,576,022	198,260	1,400,654	367,537	235,791,973
		89	89,880,203	175,656,689	179,797	621,498	420,227	266,758,414
		88	99,715,353	188,385,617	210,825	1,480,666	739,028	290,531,489
		87	111,339,110	179,880,351	348,945	1,516,944	1,577,422	294,662,772
584-84-9	Toluene-2,4-diiso-cyanate	90	18,803	38,510	0	0	5	57,318
		89	45,140	46,587	0	0	3,570	95,297
		88	47,185	183,399	0	0	1,040	231,624
		87	104,740	685,507	250	0	1,000	791,497
91-08-7	Toluene-2,6-diiso-cyanate	90	6,009	19,437	5	0	5	25,456
		89	24,914	27,193	0	0	12,180	64,287
		88	153,753	339,434	0	0	760	493,947
		87	21,672	361,904	950	250	1,000	385,776
95-53-4	o-Toluidine	90	5,367	2,075	252	250	8,486	16,430
		89	22,222	3,627	1,252	250	3,563	30,914
		88	19,196	27,726	1,902	250	5,024	54,098
		87	17,703	36,551	823	250	525	55,852
8001-35-2	Toxaphene	90	0	0	0	0	0	0
52-68-6	Trichlorfon	90	250	254	6	0	0	510
		89	500	347	1	0	0	848
		88	250	3	0	0	0	253
		87	9,950	3	0	0	0	9,953
120-82-1	1,2,4-Trichlorobenzene	90	106,656	270,210	7,417	3,479	725	388,487
		89	245,265	908,298	4,729	12,223	259	1,170,774
		88	438,321	1,094,970	31,628	7,408	3,073	1,575,400
		87	1,186,286	202,696	110,748	2,600	10,034	1,512,364
71-55-6	1,1,1-Trichloroethane	90	82,110,866	79,288,714	16,313	1,581	62,868	161,480,342
		89	90,464,382	82,980,697	27,549	2,318	70,630	173,545,576
		88	89,747,555	84,919,189	95,619	1,000	187,786	174,951,149
		87	90,156,849	74,618,640	39,061	28,325	198,941	165,041,816

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
961-11-5	Tetrachlorvinphos	90	28	98,128	98,156
		89	0	13,189	13,189
		88	2	49,480	49,482
		87	0	6,219	6,219
7440-28-0	Thallium	90	0	916	916
		89	250	250	500
		87	0	39,892	39,892
62-55-5	Thioacetamide	88	0	250	250
62-56-6	Thiourea	90	11,045	3,955	15,000
		89	9,263	7,586	16,849
		88	26,634	4,814	31,448
		87	19,144	6,392	25,536
1314-20-1	Thorium dioxide	90	660	410,128	410,788
		89	1,277	447,030	448,307
		88	500	778,376	778,876
		87	250	780,000	780,250
7550-45-0	Titanium tetrachloride	90	5	1,975,893	1,975,898
		89	0	2,354,006	2,354,006
		88	0	1,667,045	1,667,045
		87	0	1,603,456	1,603,456
108-88-3	Toluene	90	1,695,836	38,374,945	40,070,781
		89	3,004,829	63,841,940	66,846,769
		88	3,558,829	64,654,221	68,213,050
		87	3,565,798	81,412,531	84,978,329
584-84-9	Toluene-2,4-diiso-cyanate	90	0	90,952	90,952
		89	501	271,171	271,672
		88	500	229,580	230,080
		87	1,001	830,247	831,248
91-08-7	Toluene-2,6-diiso-cyanate	90	2,005	18,516	20,521
		89	250	105,690	105,940
		88	250	64,475	64,725
		87	251	101,524	101,775
95-53-4	o-Toluidine	90	28,312	12,391	40,703
		89	24,900	20,016	44,916
		88	15,172	32,170	47,342
		87	13,000	75,617	88,617
8001-35-2	Toxaphene	90	0	2,200	2,200
52-68-6	Trichlorfon	90	125	1,007	1,132
		89	86	1,713	1,799
		88	215	1,566	1,781
		87	510	1,235	1,745
120-82-1	1,2,4-Trichlorobenzene	90	229,363	683,172	912,535
		89	248,011	1,121,514	1,369,525
		88	262,676	1,155,055	1,417,731
		87	192,403	1,686,643	1,879,046
71-55-6	1,1,1-Trichloroethane	90	169,965	12,027,414	12,197,379
		89	311,232	16,453,826	16,765,058
		88	304,348	19,688,012	19,992,360
		87	420,534	30,179,866	30,600,400

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
79-00-5	1,1,2-Trichloroethane	90	106,907	491,797	1,351	1,091	265	601,411
		89	144,906	642,642	8,985	2,090	130	798,753
		88	618,608	1,122,734	5,303	0	89	1,746,734
		87	614,852	1,526,119	12,019	0	9	2,152,999
79-01-6	Trichloroethylene	90	18,110,383	19,787,565	14,209	805	13,154	37,926,116
		89	21,970,954	28,023,501	16,065	390	8,690	50,019,600
		88	25,268,692	29,354,681	14,050	390	21,440	54,659,253
		87	25,142,995	28,837,001	31,551	18,720	73,283	54,103,550
95-95-4	2,4,5-Trichlorophenol	89	250	0	0	0	0	250
		88	1	90	0	0	0	91
88-06-2	2,4,6-Trichlorophenol	90	0	78	79	0	0	157
		89	2	114	3,515	0	250	3,881
		88	0	250	50	12,000	0	12,300
		87	0	0	250	15,500	0	15,750
1582-09-8	Trifluralin	90	12,992	2,616	12	0	5	15,625
		89	2,079	1,853	322	0	970	5,224
		88	2,020	1,257	601	0	0	3,878
		87	1,592	1,250	257	71	250	3,420
95-63-6	1,2,4-Trimethylbenzene	90	1,988,290	2,430,019	5,617	28,582	12,182	4,464,690
		89	2,248,773	2,648,094	10,608	7,651	38,486	4,953,612
		88	1,881,498	2,295,712	10,843	7,964	60,833	4,256,850
		87	1,986,694	2,443,790	29,614	253	16,343	4,476,694
51-79-6	Urethane	90	760	3,310	0	5	270	4,345
		89	0	3,450	0	0	0	3,450
		88	140,500	4,873	0	0	0	145,373
		87	299,750	497,250	935	0	12,000	809,935
7440-62-2	Vanadium (fume or dust)	90	2,623	12,683	670	0	63,952	79,928
		89	3,377	5,970	1,004	0	10,702	21,053
		88	3,135	14,529	4,954	0	87,546	110,164
		87	3,453	17,206	1,092	0	56,794	78,545
108-05-4	Vinyl acetate	90	1,204,493	4,352,266	5,558	1,360,901	14,151	6,937,369
		89	1,535,420	4,280,855	5,449	1,296,265	22,599	7,140,588
		88	1,470,427	4,452,738	10,021	2,109,859	18,889	8,061,934
		87	2,020,401	4,848,655	9,933	2,109,378	33,023	9,021,390
593-60-2	Vinyl bromide	90	9,190	915	270	0	0	10,375
		89	150	620	270	0	0	1,040
		88	4,000	950	400	0	0	5,350
		87	26,500	27,200	0	0	0	53,700
75-01-4	Vinyl chloride	90	313,835	821,974	7,291	593	2,521	1,146,214
		89	399,883	869,149	2,969	391	3,899	1,276,291
		88	421,880	1,014,547	2,051	53	4,409	1,442,940
		87	716,373	1,078,099	3,578	700	2,833	1,801,583
75-35-4	Vinylidene chloride	90	69,562	234,040	251	155	226	304,234
		89	81,686	138,946	2,691	720	540	224,583
		88	104,552	191,801	3,462	170	429	300,414
		87	219,839	247,072	1,417	10,200	7	478,535
1330-20-7	Xylene (mixed isomers)	90	36,744,901	103,231,897	42,377	105,420	444,675	140,569,270
		89	34,879,505	117,487,289	185,752	70,161	470,214	153,092,921
		88	32,706,832	118,818,020	205,042	122,728	560,889	152,413,511
		87	36,616,152	114,388,671	308,760	686,392	516,335	152,516,310

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
79-00-5	1,1,2-Trichloroethane	90	855	2,019,761	2,020,616
		89	780	494,719	495,499
		88	750	259,842	260,592
		87	1,245	1,805,822	1,807,067
79-01-6	Trichloroethylene	90	11,341	3,619,556	3,630,897
		89	31,509	4,914,891	4,946,400
		88	79,652	6,531,916	6,611,568
		87	130,836	10,426,948	10,557,784
95-95-4	2,4,5-Trichlorophenol	89	0	250	250
		88	0	20	20
88-06-2	2,4,6-Trichlorophenol	90	0	0	0
		89	0	0	0
		88	0	10	10
		87	0	0	0
1582-09-8	Trifluralin	90	93	82,201	82,294
		89	79	71,092	71,171
		88	371	190,546	190,917
		87	502	135,436	135,938
95-63-6	1,2,4-Trimethylbenzene	90	110,578	558,802	669,380
		89	700,930	607,484	1,308,414
		88	496,894	564,839	1,061,733
		87	19,152	607,815	626,967
51-79-6	Urethane	90	750	3,028	3,778
		89	758	10,350	11,108
		88	1,010	4,908	5,918
		87	1,255	53,897	55,152
7440-62-2	Vanadium (fume or dust)	90	260	41,132	41,392
		89	751	38,924	39,675
		88	0	94,824	94,824
		87	0	147,397	147,397
108-05-4	Vinyl acetate	90	221,679	2,064,420	2,286,099
		89	178,538	249,172	427,710
		88	2,319,733	402,185	2,721,918
		87	147,219	396,952	544,171
593-60-2	Vinyl bromide	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
75-01-4	Vinyl chloride	90	1,897	130,873	132,770
		89	7,925	105,396	113,321
		88	17,104	675,787	692,891
		87	38,973	801,165	840,138
75-35-4	Vinylidene chloride	90	986	133,043	134,029
		89	1,172	169,048	170,220
		88	3,303	405,239	408,542
		87	3,023	399,420	402,443
1330-20-7	Xylene (mixed isomers)	90	1,878,512	21,386,050	23,264,562
		89	3,826,213	33,637,714	37,463,927
		88	4,159,567	37,141,417	41,300,984
		87	4,308,885	57,776,038	62,084,923

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
108-38-3	m-Xylene	90	550,000	652,284	1,086	0	1,130	1,204,500
		89	648,726	577,535	2,933	0	5,930	1,235,124
		88	1,271,413	1,044,625	3,066	0	18,045	2,337,149
		87	1,348,111	1,666,508	3,656	0	300,814	3,319,089
95-47-6	o-Xylene	90	1,357,221	547,350	2,541	0	1,842	1,908,954
		89	1,193,719	630,337	3,295	0	3,640	1,830,991
		88	1,549,756	664,673	3,446	250	22,470	2,240,595
		87	2,059,550	1,620,676	14,551	0	318,184	4,012,961
106-42-3	p-Xylene	90	1,231,745	4,706,927	677	0	1,369	5,940,718
		89	1,157,452	4,780,290	2,225	0	2,450	5,942,417
		88	1,792,845	4,460,155	3,840	0	49,231	6,306,071
		87	1,849,414	5,653,522	4,110	0	598,881	8,105,927
87-62-7	2,6-Xylidine	90	0	17	1,906	0	0	1,923
		89	0	44	1,906	0	0	1,950
		88	0	337	1,537	0	0	1,874
		87	7,200	250	0	0	0	7,450
7440-66-6	Zinc (fume or dust)	90	814,527	1,311,315	40,645	285	11,297,832	13,464,604
		89	2,014,184	1,542,616	134,700	2,720	20,523,162	24,217,382
		88	1,909,110	1,487,448	849,294	140,010	27,082,135	31,467,997
		87	1,562,418	3,026,275	457,163	189,574	47,082,116	52,317,546
12122-67-7	Zineb	90	10	250	0	0	0	260
		89	250	250	0	0	0	500
		88	250	1,000	0	0	0	1,250
		87	0	750	0	0	0	750
	Antimony compounds	90	41,512	104,439	32,243	6,873	1,812,210	1,997,277
		89	74,068	94,725	45,474	3,900	1,155,089	1,373,256
		88	58,943	107,937	31,678	9,200	2,011,718	2,219,476
		87	33,233	78,432	24,875	9,150	2,204,683	2,350,373
	Arsenic compounds	90	50,989	114,826	4,102	23,276	2,640,888	2,834,081
		89	34,277	141,307	14,222	33,860	4,005,209	4,228,875
		88	43,461	223,791	6,243	27,400	4,946,434	5,247,329
		87	36,937	248,034	10,469,119	1,454,635	12,615,715	24,824,440
	Barium compounds	90	287,698	900,563	68,478	309	8,134,325	9,391,373
		89	229,834	507,152	81,172	850	5,267,394	6,086,402
		88	153,979	843,339	95,576	2,773	5,521,677	6,617,344
		87	180,367	963,103	252,382	2,947	9,574,468	10,973,267
	Beryllium compounds	90	1	211	88	0	40,000	40,300
		89	501	461	25	0	36,000	36,987
		88	1	861	17	0	12,000	12,879
		87	2	502	10	0	0	514
	Cadmium compounds	90	25,829	64,184	1,958	1,570	312,631	406,172
		89	29,212	55,792	1,984	886	247,340	335,214
		88	23,327	77,160	1,817	2,409	295,127	399,840
		87	23,470	147,198	4,457	0	380,851	555,976
	Chlorophenols	90	3,909	1,022	551	174,100	2	179,584
		89	3,655	909	294	137,624	0	142,482
		88	2,404	419	272	71,554	0	74,649
		87	700	486	17,317	10,082	0	28,585
	Chromium compounds	90	340,703	428,867	405,831	83,141	18,174,599	19,433,141
		89	838,878	571,780	486,674	59,110	31,048,231	33,004,673
		88	283,408	510,504	320,921	52,653	30,910,176	32,077,662
		87	363,822	436,744	377,928	60,908	19,677,333	20,916,735

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
108-38-3	m-Xylene	90	1,013	174,020	175,033
		89	2,054	324,982	327,036
		88	19,708	1,440,222	1,459,930
		87	2,009	333,077	335,086
95-47-6	o-Xylene	90	55,154	453,667	508,821
		89	132,763	335,099	467,862
		88	44,025	942,759	986,784
		87	30,468	294,608	325,076
106-42-3	p-Xylene	90	256	55,446	55,702
		89	500	105,052	105,552
		88	754	1,348,678	1,349,432
		87	2,258	195,677	197,935
87-62-7	2,6-Xylidine	90	0	0	0
		89	0	0	0
		88	0	0	0
		87	0	0	0
7440-66-6	Zinc (fume or dust)	90	45,062	10,276,204	10,321,266
		89	131,829	35,155,794	35,287,623
		88	837,178	36,257,204	37,094,382
		87	785,112	47,639,857	48,424,969
12122-67-7	Zineb	90	0	750	750
		89	0	500	500
		88	0	2,850	2,850
		87	64,796	352,400	417,196
	Antimony compounds	90	37,138	2,669,933	2,707,071
		89	57,703	2,267,511	2,325,214
		88	66,734	2,305,508	2,372,242
		87	60,635	1,257,189	1,317,824
	Arsenic compounds	90	1,961	16,747,829	16,749,790
		89	1,200	2,807,514	2,808,714
		88	3,126	1,423,750	1,426,876
		87	5,271	1,989,293	1,994,564
	Barium compounds	90	3,009,027	18,171,224	21,180,251
		89	1,211,246	15,299,111	16,510,357
		88	822,020	15,953,080	16,775,100
		87	663,542	12,251,148	12,914,690
	Beryllium compounds	90	1	1,121	1,122
		89	1	5,254	5,255
		88	3	8,541	8,544
		87	3	7,305	7,308
	Cadmium compounds	90	8,952	1,031,163	1,040,115
		89	11,074	435,112	446,186
		88	13,718	1,069,263	1,082,981
		87	13,960	707,534	721,494
	Chlorophenols	90	1,128	806,406	807,534
		89	2,350	1,610,640	1,612,990
		88	3,400	1,970,912	1,974,312
		87	6,650	1,450,767	1,457,417
	Chromium compounds	90	936,199	15,670,892	16,607,091
		89	993,246	18,663,899	19,657,145
		88	1,695,860	14,375,255	16,071,115
		87	1,132,848	12,419,881	13,552,729

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
	Cobalt compounds	90	9,884	41,880	90,865	19,313	195,173	357,115
		89	14,323	64,848	70,468	15,562	92,902	258,103
		88	11,330	45,326	63,662	18,500	37,794	176,612
		87	14,037	36,459	41,466	500	100,014	192,476
	Copper compounds	90	2,073,030	1,835,911	72,010	188,646	55,687,136	59,856,733
		89	2,177,691	1,645,102	141,003	167,941	40,783,416	44,915,153
		88	3,064,680	1,300,266	186,314	165,957	42,546,400	47,263,617
		87	2,534,229	842,840	179,899	125,496	30,295,839	33,978,303
	Cyanide compounds	90	181,888	956,214	122,414	3,383,660	19,672	4,663,848
		89	220,727	607,499	152,545	4,475,872	44,352	5,500,995
		88	525,371	389,473	194,651	3,707,326	107,208	4,924,029
		87	236,872	1,185,436	145,085	4,071,252	9,813	5,648,458
	Glycol ethers	90	9,807,356	37,173,693	309,664	17,042	274,865	47,582,620
		89	10,601,719	37,888,257	156,250	364,850	142,481	49,153,557
		88	10,339,345	38,247,977	239,216	362,198	105,181	49,293,917
		87	8,662,641	34,204,622	170,582	210,580	28,664	43,277,089
	Lead compounds	90	409,609	1,214,865	106,609	1,619	14,725,761	16,458,463
		89	477,527	1,107,279	115,667	1,424	14,228,388	15,930,285
		88	346,358	1,173,380	180,663	2,755	20,331,296	22,034,452
		87	318,145	845,102	119,822	1,401	11,174,163	12,458,633
	Manganese compounds	90	1,353,442	899,260	722,676	2,852	83,444,913	86,423,143
		89	903,063	939,065	907,946	1,005,518	85,680,115	89,435,707
		88	562,417	1,112,021	761,906	6,816,070	84,197,074	93,449,488
		87	462,214	1,523,779	1,596,868	8,501,550	32,970,007	45,054,418
	Mercury compounds	90	783	375	58	21	15	1,252
		89	2,049	1,960	13	36	260	4,318
		88	1,001	1,365	259	27	500	3,152
		87	751	1,585	502	16	251	3,105
	Nickel compounds	90	163,735	101,831	87,629	259,827	3,051,580	3,664,602
		89	144,453	128,323	117,945	269,266	3,119,510	3,779,497
		88	148,307	108,369	130,885	224,968	2,415,916	3,028,445
		87	191,770	115,088	96,635	276,516	4,814,632	5,494,641
	Polybrominated biphenyls	88	250	0	0	0	0	250
	Selenium compounds	90	5,287	25,325	1,145	5,000	148,861	185,618
		89	5,755	14,966	1,511	4,500	1,560	28,292
		88	2,251	12,255	250	3,400	46,000	64,156
		87	751	4,402	0	4,400	680	10,233
	Silver compounds	90	7,577	3,632	1,792	265	21,411	34,677
		89	6,825	14,388	12,096	250	19,990	53,549
		88	5,991	9,665	8,934	250	11,550	36,390
		87	2,205	9,303	7,866	250	11,700	31,324
	Thallium compounds	90	5	250	0	0	255	510
		89	2	254	0	0	250	506
		88	1	252	750	0	250	1,253
		87	0	250	0	0	0	250
	Zinc compounds	90	1,868,145	2,861,422	1,087,346	308,476	109,649,130	115,774,519
		89	1,950,951	2,865,722	879,981	148,493	99,673,185	105,518,332
		88	3,241,407	3,988,184	1,058,134	104,016	114,009,101	122,400,842
		87	1,289,022	4,638,041	1,485,438	682,449	100,835,149	108,930,099

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
	Cobalt compounds	90	16,400	423,058	439,458
		89	24,570	437,672	462,242
		88	28,364	330,626	358,990
		87	27,387	425,495	452,882
	Copper compounds	90	201,914	45,070,491	45,272,405
		89	369,473	9,584,741	9,954,214
		88	429,666	14,368,147	14,797,813
		87	520,753	8,255,019	8,775,772
	Cyanide compounds	90	116,782	1,584,946	1,701,728
		89	147,907	2,403,139	2,551,046
		88	1,151,757	2,899,918	4,051,675
		87	1,244,035	2,028,620	3,272,655
	Glycol ethers	90	9,909,482	7,276,880	17,186,362
		89	8,975,723	8,925,997	17,901,720
		88	8,881,944	7,655,955	16,537,899
		87	6,411,759	11,156,395	17,568,154
	Lead compounds	90	157,540	43,967,983	44,125,523
		89	101,762	16,397,668	16,499,430
		88	89,421	16,992,633	17,082,054
		87	97,120	15,871,806	15,968,926
	Manganese compounds	90	6,550,657	29,873,260	36,423,917
		89	6,568,595	27,926,744	34,495,339
		88	1,842,909	23,978,690	25,821,599
		87	600,504	15,952,442	16,552,946
	Mercury compounds	90	274	36,256	36,530
		89	1,034	62,581	63,615
		88	528	17,846	18,374
		87	539	81,510	82,049
	Nickel compounds	90	197,060	6,419,072	6,616,132
		89	257,089	9,113,273	9,370,362
		88	649,424	5,868,276	6,517,700
		87	193,336	7,328,905	7,522,241
	Polybrominated biphenyls	88	0	0	0
	Selenium compounds	90	478	59,210	59,688
		89	1,618	40,567	42,185
		88	1,860	62,997	64,857
		87	1,120	31,541	32,661
	Silver compounds	90	3,711	79,418	83,129
		89	6,009	7,367	13,376
		88	8,328	14,960	23,288
		87	5,420	12,614	18,034
	Thallium compounds	90	5	0	5
		89	4	500	504
		88	6	1,250	1,256
		87	0	0	0
	Zinc compounds	90	1,150,786	81,709,236	82,860,022
		89	2,032,611	59,658,777	61,691,388
		88	1,515,749	83,083,592	84,599,341
		87	3,041,611	76,689,372	79,730,983

Table 22. Releases and Transfers of All TRI Chemicals, 1987-1990 (Ordered Alphabetically), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
	Mixtures and other trade name products	90	254,875	1,156,522	61,824	1,350,015	22,285	2,845,521
		89	713,630	5,141,760	2,053	750	178,230	6,036,423
		88	670,457	2,742,535	58,960	0	26,958	3,498,910
		87	740,234	2,952,847	24,301	16,000	625,933	4,359,315
	Trade secret chemicals	90	0	0	530	0	0	530
		89	52,000	165,000	3,850	0	0	220,850
		88	52,000	105,000	19,950	0	0	176,950
		87	73,000	280,000	8,050	0	0	361,050
	Total	90	680,623,029	1,519,938,412	197,350,846	725,196,960	440,530,657	3,563,639,904
		89	783,783,380	1,769,529,934	193,481,002	1,166,517,162	454,386,443	4,367,697,921
		88	802,473,809	1,829,465,117	310,604,882	1,337,141,675	531,308,837	4,810,994,320
		87	869,422,021	1,840,017,691	411,578,403	1,328,665,667	727,836,183	5,177,519,965

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
	Mixtures and other trade name products	90	195,506	1,777,681	1,973,187
		89	129,456	4,150,243	4,279,699
		88	186,188	11,613,059	11,799,247
		87	404,277	14,979,756	15,384,033
	Trade secret chemicals	90	0	9,500	9,500
		89	250	30,500	30,750
		88	0	20,650	20,650
		87	380,000	166,850	546,850
	Total	90	447,248,716	803,650,786	1,250,899,502
		89	557,181,554	932,393,386	1,489,574,940
		88	573,958,006	1,083,904,392	1,657,862,398
		87	610,178,427	1,244,592,980	1,854,771,407

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release).

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
7664-41-7	Ammonia	90	52,121,470	156,494,590	44,437,803	259,071,166	13,793,828	525,918,857
		89	60,796,650	194,686,552	24,546,136	73,286,998	7,940,619	361,256,955
		88	53,870,645	199,050,519	24,494,626	51,293,540	8,945,960	337,655,290
		87	58,299,650	231,681,178	31,815,234	49,791,440	5,788,934	377,376,436
108-88-3	Toluene	90	77,249,500	156,576,022	198,260	1,400,654	367,537	235,791,973
		89	89,880,203	175,656,689	179,797	621,498	420,227	266,758,414
		88	99,715,353	188,385,617	210,825	1,480,666	739,028	290,531,489
		87	111,339,110	179,880,351	348,945	1,516,944	1,577,422	294,662,772
67-56-1	Methanol	90	38,013,004	145,090,113	18,171,884	25,370,822	5,505,842	232,151,665
		89	43,531,598	166,452,790	21,276,746	24,065,690	7,770,516	263,097,340
		88	47,482,374	179,568,500	16,639,876	24,155,436	12,738,305	280,584,491
		87	49,273,630	167,863,421	27,018,005	21,576,371	16,514,275	282,245,702
7647-01-0	Hydrochloric acid	90	5,436,543	68,010,383	2,769,970	154,098,891	514,830	230,830,617
		89	5,289,931	68,137,940	3,052,332	273,272,293	4,940,143	354,692,639
		88	6,124,740	64,085,137	3,947,399	396,089,339	4,893,005	475,139,620
		87	5,715,530	67,451,701	8,789,999	414,811,594	7,925,501	504,694,325
67-64-1	Acetone	90	89,412,951	90,877,529	1,280,863	4,662,386	235,174	186,468,903
		89	108,223,564	106,954,187	1,023,408	4,589,483	264,143	221,054,785
		88	94,659,481	109,415,060	1,134,378	3,117,541	423,341	208,749,801
		87	96,985,636	109,975,743	2,044,351	2,449,563	311,147	211,766,440
7664-93-9	Sulfuric acid	90	1,596,048	21,963,187	25,855,900	112,116,692	1,863,934	163,395,761
		89	2,422,316	22,339,195	19,800,811	149,583,139	6,998,100	201,143,561
		88	2,253,921	14,779,318	36,633,317	138,707,333	4,598,560	196,972,449
		87	2,300,891	13,375,909	52,452,868	135,688,601	11,180,079	214,998,348
71-55-6	1,1,1-Trichloroethane	90	82,110,866	79,288,714	16,313	1,581	62,868	161,480,342
		89	90,464,382	82,980,697	27,549	2,318	70,630	173,545,576
		88	89,747,555	84,919,189	95,619	1,000	187,786	174,951,149
		87	90,156,849	74,618,640	39,061	28,325	198,941	165,041,816
1330-20-7	Xylene (mixed isomers)	90	36,744,901	103,231,897	42,377	105,420	444,675	140,569,270
		89	34,879,505	117,487,289	185,752	70,161	470,214	153,092,921
		88	32,706,832	118,818,020	205,042	122,728	560,889	152,413,511
		87	36,616,152	114,388,671	308,760	686,392	516,335	152,516,310
7664-38-2	Phosphoric acid	90	402,491	1,200,153	74,733,560	1,500,404	57,480,518	135,317,126
		89	573,845	1,360,416	26,961,174	93,016	49,841,884	78,830,335
		88	718,237	1,234,692	122,650,414	54,961	51,829,452	176,487,756
		87	416,818	1,234,201	139,542,327	58,504	185,098,116	326,349,966
78-93-3	Methyl ethyl ketone	90	37,588,656	83,738,400	65,213	117,204	81,940	121,591,413
		89	37,122,828	97,675,961	67,797	200,698	163,627	135,230,911
		88	36,209,534	99,824,477	77,304	253,762	162,163	136,527,240
		87	40,724,290	117,195,265	76,189	75,250	59,765	158,130,759
	Zinc compounds	90	1,868,145	2,861,422	1,087,346	308,476	109,649,130	115,774,519
		89	1,950,951	2,865,722	879,981	148,493	99,673,185	105,518,332
		88	3,241,407	3,988,184	1,058,134	104,016	114,009,101	122,400,842
		87	1,289,022	4,638,041	1,485,438	682,449	100,835,149	108,930,099
7782-50-5	Chlorine	90	2,292,442	102,625,448	1,280,604	73,919	308,254	106,580,667
		89	2,240,178	130,433,145	2,403,657	469,857	291,386	135,838,223
		88	4,652,027	129,105,473	6,666,150	107,624	428,097	140,959,371
		87	6,303,187	100,909,969	8,003,043	83,939	1,179,942	116,480,080
75-15-0	Carbon disulfide	90	3,291,871	94,930,808	40,565	3,900	500	98,267,644
		89	3,193,614	98,503,528	33,091	16,600	503	101,747,336
		88	3,096,255	120,797,449	39,487	13,400	43,436	123,990,027
		87	3,337,186	132,538,470	23,040	89,500	3,480	135,991,676

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
75-09-2	Dichloromethane	90	35,692,060	56,805,056	192,739	850,018	11,809	93,551,682
		89	43,614,629	81,956,162	229,620	1,937,469	25,943	127,763,823
		88	47,314,151	78,681,392	350,270	1,478,833	157,960	127,982,606
		87	50,164,415	85,679,964	384,223	874,671	104,371	137,207,644
	Manganese compounds	90	1,353,442	899,260	722,676	2,852	83,444,913	86,423,143
		89	903,063	939,065	907,946	1,005,518	85,680,115	89,435,707
		88	562,417	1,112,021	761,906	6,816,070	84,197,074	93,449,488
		87	462,214	1,523,779	1,596,868	8,501,550	32,970,007	45,054,418
	Copper compounds	90	2,073,030	1,835,911	72,010	188,646	55,687,136	59,856,733
		89	2,177,691	1,645,102	141,003	167,941	40,783,416	44,915,153
		88	3,064,680	1,300,266	186,314	165,957	42,546,400	47,263,617
		87	2,534,229	842,840	179,899	125,496	30,295,839	33,978,303
6484-52-2	Ammonium nitrate (solution)	90	381,380	2,325,754	7,629,700	38,912,210	4,168,380	53,417,424
		89	900,274	2,562,293	8,853,607	44,738,000	7,606,025	64,660,199
		88	418,788	2,527,619	8,436,348	67,941,000	16,021,854	95,345,609
		87	637,896	6,197,072	11,773,176	58,565,000	14,154,899	91,328,043
	Glycol ethers	90	9,807,356	37,173,693	309,664	17,042	274,865	47,582,620
		89	10,601,719	37,888,257	156,250	364,850	142,481	49,153,557
		88	10,339,345	38,247,977	239,216	362,198	105,181	49,293,917
		87	8,662,641	34,204,622	170,582	210,580	28,664	43,277,089
76-13-1	Freon 113	90	30,389,887	14,970,022	12,148	1,815	35,457	45,409,329
		89	42,097,852	22,215,504	14,588	2,057	25,185	64,355,186
		88	45,961,054	23,025,382	32,644	5,965	27,799	69,052,844
		87	38,178,520	19,163,454	26,587	617	21,996	57,391,174
74-85-1	Ethylene	90	15,736,049	22,807,267	11,488	27,500	11,005	38,593,309
		89	18,250,561	26,395,893	14,902	18,618	16,200	44,696,174
		88	17,662,098	25,779,862	15,214	17,203	13,250	43,487,627
		87	38,307,392	22,639,730	12,686	0	7,436	60,967,244
79-01-6	Trichloroethylene	90	18,110,383	19,787,565	14,209	805	13,154	37,926,116
		89	21,970,954	28,023,501	16,065	390	8,690	50,019,600
		88	25,268,692	29,354,681	14,050	390	21,440	54,659,253
		87	25,142,995	28,837,001	31,551	18,720	73,283	54,103,550
71-36-3	n-Butyl alcohol	90	6,725,819	25,919,186	323,555	3,529,441	112,062	36,610,063
		89	7,847,073	28,817,359	943,547	1,414,104	109,200	39,131,283
		88	8,476,114	29,207,185	127,610	3,006,660	175,791	40,993,360
		87	8,290,509	25,529,675	211,200	2,310,984	493,225	36,835,593
7697-37-2	Nitric acid	90	746,283	3,395,206	159,099	31,912,662	394,758	36,608,008
		89	881,467	4,416,246	735,542	31,017,845	497,625	37,548,725
		88	1,126,230	7,456,699	1,432,540	25,485,680	1,330,695	36,831,844
		87	1,029,660	3,439,982	1,916,396	25,153,042	1,289,719	32,828,799
100-42-5	Styrene	90	13,472,563	18,204,101	37,371	29,045	166,746	31,909,826
		89	15,487,607	18,758,105	51,082	0	196,550	34,493,344
		88	12,540,368	20,358,707	59,069	165	242,941	33,201,250
		87	12,233,340	20,146,188	107,858	250	337,023	32,824,659
108-10-1	Methyl isobutyl ketone	90	9,300,401	18,010,971	53,798	52,221	28,103	27,445,494
		89	10,646,739	21,257,723	449,410	81,850	20,891	32,456,613
		88	13,111,722	19,566,840	762,358	116,655	31,775	33,589,350
		87	11,377,563	19,252,957	1,117,203	60,450	86,303	31,894,476
71-43-2	Benzene	90	13,511,366	10,895,483	24,943	654,068	724,429	25,810,289
		89	14,970,154	12,072,926	169,947	799,132	122,444	28,134,603
		88	20,005,703	10,782,244	47,763	825,035	136,691	31,797,436
		87	21,298,018	10,592,102	289,916	801,733	129,782	33,111,551

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
67-66-3	Chloroform	90	8,255,323	13,507,138	1,001,446	89,560	57,897	22,911,364
		89	8,791,898	17,089,184	1,208,450	114,338	70,145	27,274,015
		88	7,157,076	16,714,428	1,120,702	36,002	68,498	25,096,706
		87	7,562,868	17,690,549	1,216,418	161,000	39,220	26,670,055
79-10-7	Acrylic acid	90	228,357	198,582	44,133	21,525,000	94,333	22,090,405
		89	165,305	192,370	10,451	18,728,000	2,009	19,098,135
		88	584,799	214,518	16,396	22,262,010	15,950	23,093,673
		87	625,286	206,563	16,126	27,264,250	6,153	28,118,378
50-00-0	Formaldehyde	90	2,723,926	10,042,072	759,567	8,184,829	188,613	21,899,007
		89	2,741,458	10,349,687	838,705	8,347,005	242,245	22,519,100
		88	3,178,406	8,860,993	1,010,336	9,608,524	497,153	23,155,412
		87	5,081,975	8,477,818	1,611,090	6,409,400	336,664	21,916,947
127-18-4	Tetrachloroethylene	90	8,790,493	12,854,503	21,505	11,012	1,017	21,678,530
		89	11,956,884	15,281,344	54,940	50,005	10,791	27,353,964
		88	16,189,631	19,424,871	33,784	72,250	106,394	35,826,930
		87	15,594,818	17,613,040	162,021	354,000	5,220	33,729,099
115-07-1	Propylene	90	12,107,152	9,392,758	867	5	316	21,501,098
		89	14,077,301	11,323,557	953	0	250	25,402,061
		88	14,036,760	10,717,298	10,003	0	0	24,764,061
		87	27,183,019	12,708,281	1,186	0	2,697	39,895,183
75-05-8	Acetonitrile	90	805,851	857,666	10,726	19,445,260	248	21,119,751
		89	650,480	814,110	91,876	18,113,780	1,250	19,671,496
		88	1,277,000	784,891	42,223	16,739,010	1,790	18,844,914
		87	999,626	766,640	70,486	15,937,922	1,330	17,776,004
	Chromium compounds	90	340,703	428,867	405,831	83,141	18,174,599	19,433,141
		89	838,878	571,780	486,674	59,110	31,048,231	33,004,673
		88	283,408	510,504	320,921	52,653	30,910,176	32,077,662
		87	363,822	436,744	377,928	60,908	19,677,333	20,916,735
463-58-1	Carbonyl sulfide	90	12,249	18,622,615	0	0	0	18,634,864
		89	9,023	18,453,663	772	0	0	18,463,458
		88	7,643	20,175,429	750	0	0	20,183,822
		87	5,861	22,481,144	750	0	0	22,487,755
110-82-7	Cyclohexane	90	6,108,055	11,107,792	25,979	327,259	34,701	17,603,786
		89	6,128,059	12,044,329	20,222	355,243	48,559	18,596,412
		88	5,071,563	8,739,013	20,664	334,471	40,290	14,206,001
		87	4,960,271	7,289,298	33,739	336,222	41,118	12,660,648
7783-20-2	Ammonium sulfate (solution)	90	18,850	355,717	9,171,794	5,221,981	2,531,338	17,299,680
		89	20,834	839,427	69,031,944	461,238,592	15,308,173	546,438,970
		88	280,637	440,189	71,838,665	520,144,631	13,422,824	606,126,946
		87	267,458	6,203,705	97,182,691	505,971,819	7,324,758	616,950,431
	Lead compounds	90	409,609	1,214,865	106,609	1,619	14,725,761	16,458,463
		89	477,527	1,107,279	115,667	1,424	14,228,388	15,930,285
		88	346,358	1,173,380	180,663	2,755	20,331,296	22,034,452
		87	318,145	845,102	119,822	1,401	11,174,163	12,458,633
7440-66-6	Zinc (fume or dust)	90	814,527	1,311,315	40,645	285	11,297,832	13,464,604
		89	2,014,184	1,542,616	134,700	2,720	20,523,162	24,217,382
		88	1,909,110	1,487,448	849,294	140,010	27,082,135	31,467,997
		87	1,562,418	3,026,275	457,163	189,574	47,082,116	52,317,546
107-21-1	Ethylene glycol	90	3,911,506	5,477,345	2,695,768	187,660	1,187,284	13,459,563
		89	4,438,738	8,788,911	3,773,670	8,583,941	1,143,340	26,728,600
		88	4,274,896	9,296,776	3,747,151	7,651,339	897,807	25,867,969
		87	5,242,561	10,225,513	4,382,123	4,843,362	726,452	25,420,011

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
7440-50-8	Copper	90	431,567	829,627	56,009	22,351	11,419,098	12,758,652
		89	1,049,397	1,214,730	101,105	31,889	10,045,367	12,442,488
		88	428,342	1,299,956	116,984	15,651	10,515,935	12,376,868
		87	433,918	2,214,584	216,854	453,140	138,346,027	141,664,523
108-95-2	Phenol	90	3,199,563	4,455,302	271,580	4,421,439	256,043	12,603,927
		89	3,452,305	5,607,939	267,978	4,282,511	371,858	13,982,591
		88	4,487,690	5,896,624	260,197	4,664,246	1,882,284	17,191,041
		87	3,210,218	5,074,036	400,665	8,160,996	1,161,278	18,007,193
7439-96-5	Manganese	90	653,739	945,099	139,681	800	10,840,007	12,579,326
		89	2,362,726	685,787	148,561	556	7,982,937	11,180,567
		88	1,037,937	759,100	319,194	250	20,462,398	22,578,879
		87	409,636	496,513	489,802	571	13,502,468	14,898,990
	Barium compounds	90	287,698	900,563	68,478	309	8,134,325	9,391,373
		89	229,834	507,152	81,172	850	5,267,394	6,086,402
		88	153,979	843,339	95,576	2,773	5,521,677	6,617,344
		87	180,367	963,103	252,382	2,947	9,574,468	10,973,267
75-07-0	Acetaldehyde	90	2,504,978	4,375,685	78,345	1,963,498	29,665	8,952,171
		89	2,501,704	5,274,489	66,722	2,050,529	30,764	9,924,208
		88	2,530,954	4,057,310	79,786	2,219,105	194,951	9,082,106
		87	2,322,964	4,306,922	152,766	1,568,090	27,001	8,377,743
100-41-4	Ethylbenzene	90	2,723,279	5,894,359	12,634	213,625	62,626	8,906,523
		89	3,006,806	6,139,997	16,923	60,475	91,932	9,316,133
		88	2,912,970	4,193,531	16,932	72,914	201,868	7,398,215
		87	3,169,453	3,541,383	21,355	71,030	56,582	6,859,803
7664-39-3	Hydrogen fluoride	90	3,250,767	5,295,297	11,675	20	8,304	8,566,063
		89	3,426,624	6,662,510	35,918	450,000	10,943	10,585,995
		88	3,627,585	8,490,012	189,928	560,250	13,002	12,880,777
		87	3,234,598	8,710,377	116,483	583,000	580,316	13,224,774
74-87-3	Chloromethane	90	1,994,876	5,649,012	144,433	199,605	92,260	8,080,186
		89	2,940,259	7,193,174	108,399	180,250	0	10,422,082
		88	2,998,328	8,292,087	115,985	165,250	0	11,571,650
		87	5,217,111	8,913,602	109,958	132,050	3,100	14,375,821
107-13-1	Acrylonitrile	90	641,310	2,506,739	3,877	4,925,276	268	8,077,470
		89	839,799	3,650,668	4,492	8,090,548	4,712	12,590,219
		88	995,764	3,201,123	5,874	4,562,713	2,150	8,767,624
		87	1,245,461	4,167,905	7,579	4,237,970	14,948	9,673,863
108-05-4	Vinyl acetate	90	1,204,493	4,352,266	5,558	1,360,901	14,151	6,937,369
		89	1,535,420	4,280,855	5,449	1,296,265	22,599	7,140,588
		88	1,470,427	4,452,738	10,021	2,109,859	18,889	8,061,934
		87	2,020,401	4,848,655	9,933	2,109,378	33,023	9,021,390
107-06-2	1,2-Dichloroethane	90	1,166,038	4,429,935	48,763	826,672	7,351	6,478,759
		89	1,358,861	3,023,205	227,614	1,046,661	714	5,657,055
		88	1,567,075	2,957,854	40,517	1,452,084	2,166	6,019,696
		87	2,571,167	3,810,919	75,486	1,162,844	3,173	7,623,589
7439-92-1	Lead	90	495,989	364,584	24,659	45	5,338,494	6,223,771
		89	313,635	551,023	33,314	0	6,320,848	7,218,820
		88	505,746	664,335	60,630	5	7,066,450	8,297,166
		87	513,588	960,000	66,667	287,872	20,085,585	21,913,712
106-42-3	p-Xylene	90	1,231,745	4,706,927	677	0	1,369	5,940,718
		89	1,157,452	4,780,290	2,225	0	2,450	5,942,417
		88	1,792,845	4,460,155	3,840	0	49,231	6,306,071
		87	1,849,414	5,653,522	4,110	0	598,881	8,105,927

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
10049-04-4	Chlorine dioxide	90	261,702	5,149,849	785	15	20	5,412,371
		89	124,294	6,908,597	1,250	0	0	7,034,141
		88	2,311,796	12,125,441	2,350	0	41,000	14,480,587
		87	1,829,508	11,169,031	7,965	0	110,325	13,116,829
106-99-0	1,3-Butadiene	90	3,089,320	1,948,311	111,234	1,610	6,448	5,156,923
		89	3,507,540	2,241,136	143,434	1,500	14,823	5,908,433
		88	3,877,127	2,884,401	412,504	1,500	7,817	7,183,349
		87	5,864,878	3,754,439	432,668	0	4,496	10,056,481
	Cyanide compounds	90	181,888	956,214	122,414	3,383,660	19,672	4,663,848
		89	220,727	607,499	152,545	4,475,872	44,352	5,500,995
		88	525,371	389,473	194,651	3,707,326	107,208	4,924,029
		87	236,872	1,185,436	145,085	4,071,252	9,813	5,648,458
95-63-6	1,2,4-Trimethylbenzene	90	1,988,290	2,430,019	5,617	28,582	12,182	4,464,690
		89	2,248,773	2,648,094	10,608	7,651	38,486	4,953,612
		88	1,881,498	2,295,712	10,843	7,964	60,833	4,256,850
		87	1,986,694	2,443,790	29,614	253	16,343	4,476,694
79-06-1	Acrylamide	90	42,632	7,336	3,814	4,214,315	565	4,268,662
		89	18,685	6,811	7,372	4,430,980	992	4,464,840
		88	17,298	8,721	3,124	2,198,000	756	2,227,899
		87	26,781	8,913	4,750	2,268,000	914	2,309,358
108-90-7	Chlorobenzene	90	1,845,230	2,201,569	72,893	49,406	4,267	4,173,365
		89	1,523,160	2,527,989	62,551	82,969	6,609	4,203,278
		88	2,033,840	2,535,673	98,354	84,457	4,127	4,756,451
		87	2,638,810	2,534,971	62,744	56,503	18,878	5,311,906
98-82-8	Cumene	90	1,400,080	2,703,033	1,876	13,402	19,671	4,138,062
		89	1,400,439	3,146,852	10,088	27,620	3,784	4,588,783
		88	1,987,520	2,896,449	3,201	30,165	8,591	4,925,926
		87	1,458,287	1,938,670	3,007	1,000	8,107	3,409,071
75-00-3	Chloroethane	90	1,798,493	2,143,585	35,997	110	93	3,978,278
		89	2,097,353	2,690,818	71,749	150	0	4,860,070
		88	2,056,879	2,562,563	27,448	1,510	0	4,648,400
		87	2,203,819	2,196,690	1,954	1,510	2	4,403,975
91-20-3	Naphthalene	90	1,988,558	1,717,563	36,080	28,152	142,130	3,912,483
		89	1,847,930	1,615,270	146,615	39,552	116,473	3,765,840
		88	3,365,002	1,733,421	22,323	50,946	122,724	5,294,416
		87	2,552,097	2,086,796	128,325	34,773	142,497	4,944,488
7440-02-0	Nickel	90	286,156	368,303	56,813	9,111	2,989,862	3,710,245
		89	793,623	339,494	86,211	18,946	1,293,440	2,531,714
		88	246,891	175,564	86,967	14,295	1,225,390	1,749,107
		87	128,202	295,058	128,988	22,913	745,103	1,320,264
	Nickel compounds	90	163,735	101,831	87,629	259,827	3,051,580	3,664,602
		89	144,453	128,323	117,945	269,266	3,119,510	3,779,497
		88	148,307	108,369	130,885	224,968	2,415,916	3,028,445
		87	191,770	115,088	96,635	276,516	4,814,632	5,494,641
7429-90-5	Aluminum (fume or dust)	90	631,284	1,491,561	56,805	10	1,328,181	3,507,841
		89	1,067,736	1,888,061	78,857	250	3,544,118	6,579,022
		88	1,219,403	2,221,389	91,518	250	3,177,625	6,710,185
		87	1,402,047	3,989,636	119,323	3	2,829,753	8,340,762
7440-47-3	Chromium	90	324,729	413,023	39,746	82	2,725,304	3,502,884
		89	869,390	273,761	67,798	693	3,341,836	4,553,478
		88	346,937	201,744	73,948	2,249	9,295,829	9,920,707
		87	168,550	246,310	268,672	3,094	2,944,022	3,630,648

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
67-63-0	Isopropyl alcohol (manufacturing)	90	1,069,174	2,110,323	11,131	15	32,955	3,223,598
		89	2,127,925	3,450,813	11,008	18,441	1,657	5,609,844
		88	801,006	1,135,511	1,840	0	14	1,938,371
		87	680,071	1,323,532	2,939	0	250	2,006,792
62-53-3	Aniline	90	210,969	263,870	36,008	2,435,752	3,099	2,949,698
		89	241,107	263,033	14,844	3,272,543	11,655	3,803,182
		88	323,900	402,573	16,105	3,582,975	12,822	4,338,375
		87	273,120	403,733	14,306	1,280,878	14,962	1,986,999
1634-04-4	Methyl tert-butyl ether	90	667,560	2,117,064	42,667	112,400	1,501	2,941,192
		89	502,133	2,519,677	37,439	19,300	1,290	3,079,839
		88	881,429	2,130,625	21,999	14,400	370	3,048,823
		87	1,208,649	1,117,925	93,342	6,900	2,410	2,429,226
75-65-0	tert-Butyl alcohol	90	1,240,753	326,265	271,260	995,382	24,962	2,858,622
		89	1,029,250	431,451	221,906	724,537	23,110	2,430,254
		88	1,207,260	368,197	14,989	674,798	818	2,266,062
		87	1,138,573	329,987	104,306	363,379	57,025	1,993,270
	Mixtures and other trade name products	90	254,875	1,156,522	61,824	1,350,015	22,285	2,845,521
		89	713,630	5,141,760	2,053	750	178,230	6,036,423
		88	670,457	2,742,535	58,960	0	26,958	3,498,910
		87	740,234	2,952,847	24,301	16,000	625,933	4,359,315
	Arsenic compounds	90	50,989	114,826	4,102	23,276	2,640,888	2,834,081
		89	34,277	141,307	14,222	33,860	4,005,209	4,228,875
		88	43,461	223,791	6,243	27,400	4,946,434	5,247,329
		87	36,937	248,034	10,469,119	1,454,635	12,615,715	24,824,440
75-21-8	Ethylene oxide	90	785,088	1,662,406	8,911	49,280	24,042	2,529,727
		89	851,394	2,431,150	5,327	16,219	37,962	3,342,052
		88	869,532	3,900,464	44,851	11,125	54,700	4,880,672
		87	1,335,882	4,009,932	43,201	1,205,323	1,450	6,595,788
109-86-4	2-Methoxyethanol	90	1,273,514	1,198,567	40,340	4,540	3,233	2,520,194
		89	988,306	1,702,058	46,428	4,000	112	2,740,904
		88	1,148,320	4,746,721	40,520	750	7	5,936,318
		87	1,951,949	6,349,838	26,831	12,000	252	8,340,870
1319-77-3	Cresol (mixed isomers)	90	378,803	353,801	2,336	1,634,529	3,855	2,373,324
		89	419,031	478,713	7,627	2,069,891	2,437	2,977,699
		88	395,167	374,117	6,516	1,804,060	4,772	2,584,632
		87	329,471	468,071	11,475	2,418,718	845,704	4,073,439
80-62-6	Methyl methacrylate	90	558,481	1,557,797	6,981	210,015	593	2,333,867
		89	1,294,059	1,855,000	28,802	197,013	4,801	3,379,675
		88	1,178,419	2,258,990	28,084	327,221	8,119	3,800,833
		87	1,334,146	2,303,287	25,396	227,550	10,009	3,900,388
74-90-8	Hydrogen cyanide	90	55,825	614,750	3,824	1,597,552	48	2,271,999
		89	117,267	702,120	5,610	3,534,070	328	4,359,395
		88	131,604	1,266,723	2,300	1,737,850	1,761	3,140,238
		87	136,845	505,495	1,825	1,056,180	1,002	1,701,347
74-83-9	Bromomethane	90	431,397	1,774,422	0	28,000	0	2,233,819
		89	323,915	2,271,511	0	66,525	0	2,661,951
		88	513,494	1,428,718	0	1,546	0	1,943,758
		87	355,415	1,836,340	0	2,200	0	2,193,955
7723-14-0	Phosphorus (yellow or white)	90	19,310	4,913	2,343	0	2,189,653	2,216,219
		89	10,685	5,489	3,033	0	3,291,402	3,310,609
		88	7,594	11,559	11,572	0	3,893,674	3,924,399
		87	16,489	9,863	18,090	0	4,042,960	4,087,402

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
	Antimony compounds	90	41,512	104,439	32,243	6,873	1,812,210	1,997,277
		89	74,068	94,725	45,474	3,900	1,155,089	1,373,256
		88	58,943	107,937	31,678	9,200	2,011,718	2,219,476
		87	33,233	78,432	24,875	9,150	2,204,683	2,350,373
95-47-6	o-Xylene	90	1,357,221	547,350	2,541	0	1,842	1,908,954
		89	1,193,719	630,337	3,295	0	3,640	1,830,991
		88	1,549,756	664,673	3,446	250	22,470	2,240,595
		87	2,059,550	1,620,676	14,551	0	318,184	4,012,961
56-23-5	Carbon tetrachloride	90	403,326	1,267,766	4,644	31,557	1,005	1,708,298
		89	994,133	2,449,115	16,396	122,043	1,616	3,583,303
		88	1,085,036	2,682,385	16,447	98,054	14,759	3,896,681
		87	1,112,049	3,379,560	11,283	211,000	3,134	4,717,026
75-56-9	Propylene oxide	90	490,390	869,606	70,780	120,005	3,880	1,554,661
		89	415,005	1,638,507	83,521	270,000	4,727	2,411,760
		88	539,841	2,710,436	112,503	1,113,780	11,630	4,488,190
		87	598,532	3,009,972	68,629	120,000	337,156	4,134,289
117-81-7	Di-(2-ethylhexyl) phthalate	90	147,831	1,196,864	2,378	260	19,531	1,366,864
		89	290,492	788,470	2,983	600	25,937	1,108,482
		88	175,892	953,294	3,276	3,091	20,748	1,156,301
		87	692,361	964,089	3,845	500	34,794	1,695,589
88-89-1	Picric acid	90	1	1	2	1,249,930	2	1,249,936
		89	251	1	250	1,265,460	250	1,266,212
		88	251	1	251	1,362,180	250	1,362,933
		87	500	250	500	0	500	1,750
92-52-4	Biphenyl	90	752,690	368,315	21,409	63,219	35,577	1,241,210
		89	762,112	327,217	42,685	72,993	44,115	1,249,122
		88	631,580	578,841	68,993	82,760	222,297	1,584,471
		87	709,788	876,245	101,770	69,760	51,749	1,809,312
108-38-3	m-Xylene	90	550,000	652,284	1,086	0	1,130	1,204,500
		89	648,726	577,535	2,933	0	5,930	1,235,124
		88	1,271,413	1,044,625	3,066	0	18,045	2,337,149
		87	1,348,111	1,666,508	3,656	0	300,814	3,319,089
75-01-4	Vinyl chloride	90	313,835	821,974	7,291	593	2,521	1,146,214
		89	399,883	869,149	2,969	391	3,899	1,276,291
		88	421,880	1,014,547	2,051	53	4,409	1,442,940
		87	716,373	1,078,099	3,578	700	2,833	1,801,583
123-38-6	Propionaldehyde	90	340,631	648,355	491	34,394	0	1,023,871
		89	331,352	746,117	411	4,518	0	1,082,398
		88	402,253	894,586	1,156	930	0	1,298,925
		87	358,374	752,817	423	3,400	10	1,115,024
111-42-2	Diethanolamine	90	287,126	96,538	360,137	157,015	120,866	1,021,682
		89	365,331	120,226	591,555	162,459	130,724	1,370,295
		88	437,390	199,792	438,702	238,317	142,187	1,456,388
		87	365,872	124,468	371,975	3,194,000	101,763	4,158,078
110-80-5	2-Ethoxyethanol	90	334,199	623,936	42,015	0	0	1,000,150
		89	283,046	1,371,989	96,042	0	78	1,751,155
		88	246,736	2,077,617	120,154	0	52	2,444,559
		87	705,652	2,067,468	133,783	0	54,101	2,961,004
101-68-8	Methylenebis (phenylisocyanate)	90	397,015	279,377	80	30	226,703	903,205
		89	262,673	117,540	506	0	149,001	529,720
		88	157,178	91,142	1,022	0	87,415	336,757
		87	750,246	84,524	770	0	86,975	922,515

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
78-92-2	sec-Butyl alcohol	90	205,755	475,424	4,315	171,484	51	857,029
		89	358,390	622,727	6,411	0	307	987,835
		88	393,046	695,007	122,291	0	2,600	1,212,944
		87	367,224	549,705	70,054	47,000	1,000	1,034,983
106-46-7	1,4-Dichlorobenzene	90	96,238	721,895	3,912	255	38	822,338
		89	115,581	1,476,648	6,621	250	250	1,599,350
		88	103,870	1,787,549	6,153	4,000	1,300	1,902,872
		87	336,908	907,925	11,557	19,000	740	1,276,130
123-91-1	1,4-Dioxane	90	294,564	303,764	203,967	0	12,545	814,840
		89	409,848	411,172	273,522	0	33,723	1,128,265
		88	349,870	251,374	203,320	0	11,702	816,266
		87	210,973	164,469	163,873	0	22,501	561,816
80-05-7	4,4'-Isopropylidene-diphenol	90	92,454	90,445	2,412	23,000	555,917	764,228
		89	114,926	112,329	2,629	0	779,533	1,009,417
		88	119,620	105,276	121,172	0	424,117	770,185
		87	90,372	202,988	13,315	250	651,554	958,479
85-44-9	Phthalic anhydride	90	147,783	539,687	369	0	9,605	697,444
		89	117,544	532,607	2,120	0	3,080	655,351
		88	126,326	395,573	1,040	0	1,015	523,954
		87	159,965	437,683	1,803	0	1,557	601,008
98-95-3	Nitrobenzene	90	51,251	15,009	1,419	608,000	755	676,434
		89	22,394	16,397	1,287	554,025	2,814	596,917
		88	22,614	17,759	5,907	819,024	2,875	868,179
		87	44,807	71,086	17,076	561,000	250	694,219
110-86-1	Pyridine	90	64,227	48,263	7,336	514,955	25	634,806
		89	75,476	67,527	2,365	660,281	251	805,900
		88	155,281	73,168	2,158	537,775	1,125	769,507
		87	255,595	42,843	4,630	303,650	28,656	635,374
78-87-5	1,2-Dichloropropane	90	171,862	458,651	4,253	0	0	634,766
		89	304,066	1,054,964	14,977	0	5	1,374,012
		88	293,698	1,072,146	23,785	0	3,400	1,393,029
		87	182,780	834,840	34,615	5,000	540	1,057,775
108-31-6	Maleic anhydride	90	90,604	402,465	1,373	10	120,816	615,268
		89	93,864	357,200	2,824	0	750	454,638
		88	103,830	551,123	12,580	240,000	0	907,533
		87	146,785	772,288	15,354	250	5,453	940,130
79-00-5	1,1,2-Trichloroethane	90	106,907	491,797	1,351	1,091	265	601,411
		89	144,906	642,642	8,985	2,090	130	798,753
		88	618,608	1,122,734	5,303	0	89	1,746,734
		87	614,852	1,526,119	12,019	0	9	2,152,999
123-72-8	Butyraldehyde	90	214,984	310,692	3,423	1,937	371	531,407
		89	348,448	1,191,898	4,297	7,562	278	1,552,483
		88	698,722	1,558,388	3,812	1,997	31	2,262,950
		87	1,200,992	1,226,707	17,453	2,600	252	2,448,004
106-89-8	Epichlorohydrin	90	255,755	171,606	10,639	79,220	7,648	524,868
		89	284,394	188,154	4,245	197,200	2,511	676,504
		88	265,003	200,265	4,467	68,300	2,524	540,559
		87	282,068	184,854	9,911	73,000	2,480	552,313
7440-39-3	Barium	90	46,054	32,157	54,201	15	359,704	492,131
		89	185,399	94,077	26,048	0	2,762,045	3,067,569
		88	174,151	91,660	18,650	0	6,721,686	7,006,147
		87	11,193	103,806	8,981	0	7,032,735	7,156,715

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
78-84-2	Isobutyraldehyde	90	149,031	341,247	80	864	1	491,223
		89	143,714	416,035	751	1,042	1	561,543
		88	265,382	543,878	773	60	1	810,094
		87	730,795	590,772	1,036	0	3	1,322,606
	Cadmium compounds	90	25,829	64,184	1,958	1,570	312,631	406,172
		89	29,212	55,792	1,984	886	247,340	335,214
		88	23,327	77,160	1,817	2,409	295,127	399,840
		87	23,470	147,198	4,457	0	380,851	555,976
120-82-1	1,2,4-Trichlorobenzene	90	106,656	270,210	7,417	3,479	725	388,487
		89	245,265	908,298	4,729	12,223	259	1,170,774
		88	438,321	1,094,970	31,628	7,408	3,073	1,575,400
		87	1,186,286	202,696	110,748	2,600	10,034	1,512,364
1313-27-5	Molybdenum trioxide	90	21,841	41,921	102,840	170,650	49,120	386,372
		89	34,336	66,333	124,535	173,270	108,264	506,738
		88	37,022	72,589	139,021	197,115	97,238	542,985
		87	44,714	65,702	65,845	1,500	66,384	244,145
95-50-1	1,2-Dichlorobenzene	90	155,845	168,103	12,390	15,313	32,588	384,239
		89	208,999	168,729	16,146	18,680	75,863	488,417
		88	206,070	248,381	11,624	20,115	13,354	499,544
		87	239,357	388,568	27,230	18,000	15,289	688,444
	Cobalt compounds	90	9,884	41,880	90,865	19,313	195,173	357,115
		89	14,323	64,848	70,468	15,562	92,902	258,103
		88	11,330	45,326	63,662	18,500	37,794	176,612
		87	14,037	36,459	41,466	500	100,014	192,476
120-80-9	Catechol	90	2,517	25,220	224,903	0	89,076	341,716
		89	2,748	1,214	313,163	0	84,718	401,843
		88	2,388	1,201	398,760	0	84,223	486,572
		87	875	616	67,750	0	2,459	71,700
131-11-3	Dimethyl phthalate	90	76,787	256,768	1,528	750	433	336,266
		89	101,739	261,691	1,260	500	415	365,605
		88	113,841	420,965	4,335	390	504	540,035
		87	2,276,124	71,331	5,001	380	1,001	2,353,837
141-32-2	Butyl acrylate	90	134,707	166,796	28,231	0	68	329,802
		89	121,039	191,037	6,400	2	462	318,940
		88	165,058	246,710	3,528	10	602	415,908
		87	339,734	350,206	2,397	0	18,733	711,070
1332-21-4	Asbestos (friable)	90	6,870	10,458	515	5	302,282	320,130
		89	11,044	27,391	800	0	1,073,901	1,113,136
		88	11,538	36,077	10,449	0	9,621,129	9,679,193
		87	11,828	39,883	20,129	252,000	3,677,287	4,001,127
75-35-4	Vinylidene chloride	90	69,562	234,040	251	155	226	304,234
		89	81,686	138,946	2,691	720	540	224,583
		88	104,552	191,801	3,462	170	429	300,414
		87	219,839	247,072	1,417	10,200	7	478,535
123-31-9	Hydroquinone	90	6,166	5,221	4,525	284,020	295	300,227
		89	6,774	6,286	4,884	353,022	504	371,470
		88	3,601	6,733	7,211	375,400	530	393,475
		87	24,578	6,640	8,113	402,050	1,854	443,235
96-33-3	Methyl acrylate	90	79,059	170,167	470	99	0	249,795
		89	78,336	117,485	1,172	200	250	197,443
		88	319,897	109,438	1,358	200	30,260	461,153
		87	328,229	107,260	1,800	0	277	437,566

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
106-44-5	p-Cresol	90	8,262	230,742	1,955	1,997	2,873	245,829
		89	8,969	246,515	3,421	1,800	10,000	270,705
		88	6,286	634,417	1,143	152,000	62,291	856,137
		87	9,187	77,397	1,000	96,000	16,912	200,496
7440-36-0	Antimony	90	6,974	45,384	4,714	165	182,272	239,509
		89	13,773	90,446	3,783	440	557,336	665,778
		88	10,699	58,507	11,178	2,100	903,916	986,400
		87	8,684	34,859	37,506	8,800	170,698	260,547
85-68-7	Butyl benzyl phthalate	90	42,753	184,940	925	260	9,774	238,652
		89	54,204	219,718	1,028	250	8,324	283,524
		88	45,407	245,841	802	480	16,682	309,212
		87	45,378	230,398	1,200	0	8,640	285,616
51-28-5	2,4-Dinitrophenol	90	17,111	7,586	89,074	111,500	3,307	228,578
		89	10,568	3,084	160,672	301,070	3,242	478,636
		88	12,386	8,439	98,692	86,200	257	205,974
		87	23,036	9,564	86,950	100,100	750	220,400
84-74-2	Dibutyl phthalate	90	60,436	47,841	558	110,000	167	219,002
		89	116,976	117,404	2,400	310,000	13,022	559,802
		88	169,228	24,245	14,337	350,000	6,393	564,203
		87	233,501	115,700	26,178	270,000	566	645,945
107-05-1	Allyl chloride	90	169,368	36,656	135	1,200	0	207,359
		89	98,802	76,801	364	1,250	250	177,467
		88	93,911	55,558	430	250	200	150,349
		87	107,327	70,449	49,556	250	0	227,582
140-88-5	Ethyl acrylate	90	116,891	87,333	1,161	10	498	205,893
		89	103,084	92,601	1,188	0	3,281	200,154
		88	132,827	118,996	1,211	0	265	253,299
		87	123,445	139,230	856	0	23,007	286,538
	Selenium compounds	90	5,287	25,325	1,145	5,000	148,861	185,618
		89	5,755	14,966	1,511	4,500	1,560	28,292
		88	2,251	12,255	250	3,400	46,000	64,156
		87	751	4,402	0	4,400	680	10,233
	Chlorophenols	90	3,909	1,022	551	174,100	2	179,584
		89	3,655	909	294	137,624	0	142,482
		88	2,404	419	272	71,554	0	74,649
		87	700	486	17,317	10,082	0	28,585
126-99-8	Chloroprene	90	55,032	120,102	750	0	750	176,634
		89	211,663	794,678	9	158,183	0	1,164,533
		88	234,478	984,448	287	68,792	0	1,288,005
		87	214,546	849,482	277	48,200	0	1,112,505
7782-49-2	Selenium	90	1,260	799	452	0	171,283	173,794
		89	2,508	11,442	750	0	236,714	251,414
		88	2,251	14,031	1,168	0	127,508	144,958
		87	3,000	1,527	850	0	6,677	12,054
79-46-9	2-Nitropropane	90	62,836	21,422	1,100	87,000	0	172,358
		89	168,947	63,735	2,700	474,000	0	709,382
		88	208,303	181,082	4,300	257,000	0	650,685
		87	187,644	278,608	4,100	167,501	0	637,853
80-15-9	Cumene hydroperoxide	90	97,285	13,386	427	45,518	6,670	163,286
		89	101,457	14,164	3,411	134,316	250	253,598
		88	178,787	13,736	1,784	371,000	250	565,557
		87	211,408	9,539	1,256	63,000	270	285,473

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
10034-93-2	Hydrazine sulfate	90	5	252	0	138,941	0	139,198
		89	0	1	0	76,957	0	76,958
		88	290	882	0	355,000	0	356,172
		87	0	0	0	139,000	0	139,000
121-14-2	2,4-Dinitrotoluene	90	6,312	51,271	3,735	74,000	2,153	137,471
		89	9,500	77,793	12,657	69,000	341	169,291
		88	15,533	77,724	12,055	106,400	14,961	226,673
		87	17,591	81,907	11,270	203,000	261	314,029
107-02-8	Acrolein	90	5,816	16,213	5	103,059	5	125,098
		89	7,332	12,743	0	67,637	80	87,792
		88	17,352	16,300	0	68,950	500	103,102
		87	16,737	31,973	562	106,650	250	156,172
540-59-0	1,2-Dichloroethylene	90	81,311	43,188	54	360	118	125,031
		89	109,604	76,388	728	55	0	186,775
		88	18,052	88,766	95	0	1	106,914
		87	43,415	88,977	357	346	1	133,096
75-25-2	Bromoform	90	48,205	0	0	0	72,000	120,205
		88	0	0	8,600	0	0	8,600
103-23-1	Bis(2-ethylhexyl) adipate	90	51,004	55,124	6,919	0	4,074	117,121
		89	25,936	39,471	2,453	0	46,659	114,519
		88	20,386	54,056	10,440	0	1,200	86,082
		87	41,279	70,674	5,054	0	500	117,507
25376-45-8	Diaminotoluene (mixed isomers)	90	19,595	6,119	955	89,000	265	115,934
		89	15,707	4,016	2,068	95,000	480	117,271
		88	15,204	5,917	3,288	174,000	295	198,704
		87	39,120	10,039	1,843	28,000	500	79,502
7440-43-9	Cadmium	90	5,115	11,922	1,106	10	91,792	109,945
		89	12,336	22,931	2,746	0	103,163	141,176
		88	9,300	12,625	2,598	0	94,602	119,125
		87	6,427	8,442	7,840	4,220	89,101	116,030
84-66-2	Diethyl phthalate	90	12,824	83,573	2,697	0	37	99,131
		89	10,742	81,868	9,163	0	250	102,023
		88	15,339	82,368	11,272	0	0	108,979
		87	26,817	165,138	1,220	0	0	193,175
98-88-4	Benzoyl chloride	90	17,667	5,657	0	67,501	260	91,085
		89	31,488	5,725	0	168,200	550	205,963
		88	28,295	4,719	0	130,000	250	163,264
		87	32,156	5,201	0	130,000	0	167,357
25321-22-6	Dichlorobenzene (mixed isomers)	90	29,606	59,918	1	11	22	89,558
		89	11,564	126,348	185	0	0	138,097
		88	20,169	143,515	40	0	0	163,724
		87	11,997	59,712	1,068	250	78,610	151,637
1163-19-5	Decabromodiphenyl oxide	90	15,613	48,687	2,587	48	20,698	87,633
		89	19,241	30,716	3,450	52	9,394	62,853
		88	7,500	22,104	500	292	21,450	51,846
		87	4,962	150,129	326	250	16,250	171,917
77-47-4	Hexachlorocyclo-pentadiene	90	83,812	773	10	5	0	84,600
		89	88,061	1,185	6	250	0	89,502
		88	14,303	415	6	2,131	0	16,855
		87	55,115	664	32	9,913	0	65,724

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
106-88-7	1,2-Butylene oxide	90	54,696	24,769	4,625	0	5	84,095
		89	68,234	51,445	4,139	0	0	123,818
		88	34,973	64,958	3,500	0	250	103,681
		87	41,024	29,426	750	0	0	71,200
7440-48-4	Cobalt	90	15,766	20,558	8,853	0	34,758	79,935
		89	29,639	18,363	14,415	0	237,431	299,848
		88	16,493	17,522	16,213	0	212,954	263,182
		87	20,279	11,536	14,259	0	18,890	64,964
7440-62-2	Vanadium (fume or dust)	90	2,623	12,683	670	0	63,952	79,928
		89	3,377	5,970	1,004	0	10,702	21,053
		88	3,135	14,529	4,954	0	87,546	110,164
		87	3,453	17,206	1,092	0	56,794	78,545
101-77-9	4,4'-Methylenedianiline	90	14,250	5,273	1,201	57,250	6	77,980
		89	33,140	14,620	1,305	96,000	0	145,065
		88	36,804	93,347	2,599	460,250	1,140	594,140
		87	85,512	16,299	2,692	456,000	2	560,505
120-12-7	Anthracene	90	27,065	38,373	1,359	0	4,806	71,603
		89	41,501	53,449	2,316	0	17,342	114,608
		88	146,428	55,935	4,632	0	11,106	218,101
		87	61,874	90,139	5,133	0	15,695	172,841
1336-36-3	Polychlorinated biphenyls (PCBs)	90	5	0	0	0	71,366	71,371
		89	0	0	264	0	998	1,262
		88	0	0	10	0	3,452	3,462
		87	750	1	510	250	250	1,761
121-69-7	N,N-Dimethylaniline	90	17,705	33,010	16,030	0	0	66,745
		89	6,957	84,802	14,437	0	0	106,196
		88	18,448	80,457	19,967	0	250	119,122
		87	80,693	49,136	17,613	0	250	147,692
74-95-3	Methylene bromide	90	51,164	13,630	0	0	0	64,794
		89	31,584	4,780	0	0	0	36,364
		88	34,468	23,255	0	0	0	57,723
		87	17,138	21,817	250	0	0	39,205
105-67-9	2,4-Dimethylphenol	90	2,123	5,203	13	56,900	302	64,541
		89	756	924	218	55,869	54	57,821
		88	1,071	9,717	481	24,703	620	36,592
		87	887	545	563	44,658	641	47,294
542-75-6	1,3-Dichloropropylene	90	46,570	12,903	310	0	0	59,783
		89	35,469	15,448	340	0	0	51,257
		88	39,790	14,800	250	0	0	54,840
		87	12,020	22,050	560	0	490	35,120
55-63-0	Nitroglycerin	90	1,053	29,550	11,580	0	17,150	59,333
		89	8,638	27,169	9,198	0	21,500	66,505
		88	1,530	50,103	2,746	0	11,640	66,019
		87	5,059	44,187	16,553	0	19,175	84,974
106-93-4	1,2-Dibromoethane	90	22,533	35,537	0	495	125	58,690
		89	22,880	36,287	250	4,914	322	64,653
		88	34,119	29,208	1,011	6,882	259	71,479
		87	117,560	32,294	1,034	44	1,702	152,634
7440-38-2	Arsenic	90	1,964	3,872	1,640	5	50,530	58,011
		89	5,257	53,143	1,754	0	147,616	207,770
		88	2,858	5,579	1,282	0	181,267	190,986
		87	4,240	23,453	2,662	0	70,861	101,216

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
584-84-9	Toluene-2,4-diiso-cyanate	90	18,803	38,510	0	0	5	57,318
		89	45,140	46,587	0	0	3,570	95,297
		88	47,185	183,399	0	0	1,040	231,624
		87	104,740	685,507	250	0	1,000	791,497
7550-45-0	Titanium tetrachloride	90	42,397	11,963	0	0	0	54,360
		89	44,785	12,502	0	0	0	57,287
		88	38,614	40,054	0	0	1,400	80,068
		87	132,157	37,008	25	0	750	169,940
156-62-7	Calcium cyanamide	90	12,000	620	0	0	40,000	52,620
		89	12,000	620	0	0	3,600	16,220
		88	12,000	600	0	0	66,000	78,600
		87	12,000	750	0	0	250	13,000
79-34-5	1,1,2,2-Tetra-chloroethane	90	38,323	6,273	3,529	80	495	48,700
		89	26,059	9,342	5,429	283	18	41,131
		88	25,904	17,951	814	0	29	44,698
		87	38,338	87,951	8,051	0	10	134,350
	Beryllium compounds	90	1	211	88	0	40,000	40,300
		89	501	461	25	0	36,000	36,987
		88	1	861	17	0	12,000	12,879
		87	2	502	10	0	0	514
95-48-7	o-Cresol	90	20,824	18,322	36	0	255	39,437
		89	38,014	21,652	311	2	3,345	63,324
		88	45,562	44,235	448	1	1,667	91,913
		87	46,435	10,947	721	0	3,200	61,303
606-20-2	2,6-Dinitrotoluene	90	1,486	16,251	416	19,000	0	37,153
		89	2,268	81,646	1,083	18,000	0	102,997
		88	6,074	81,523	957	27,000	0	115,554
		87	4,146	82,760	602	50,700	250	138,458
74-88-4	Methyl iodide	90	29,443	373	1	5,085	0	34,902
		89	17,178	8,294	1	5,085	0	30,558
		88	5,691	3,253	5	250	0	9,199
		87	250	250	0	55	0	555
	Silver compounds	90	7,577	3,632	1,792	265	21,411	34,677
		89	6,825	14,388	12,096	250	19,990	53,549
		88	5,991	9,665	8,934	250	11,550	36,390
		87	2,205	9,303	7,866	250	11,700	31,324
100-44-7	Benzyl chloride	90	26,024	7,521	265	315	270	34,395
		89	18,527	8,591	251	400	500	28,269
		88	30,689	12,640	640	0	500	44,469
		87	29,795	19,037	870	1,600	250	51,552
117-84-0	n-Dioctyl phthalate	90	17,054	12,803	1,842	5	261	31,965
		89	20,659	503,685	1,185	0	1,748	527,277
		88	26,097	43,935	1,513	0	1,000	72,545
		87	7,043	25,662	4,370	0	1,890	38,965
132-64-9	Dibenzofuran	90	21,207	9,018	532	0	897	31,654
		89	31,588	32,922	447	0	8,536	73,493
		88	46,648	24,406	1,510	0	9,929	82,493
		87	47,822	29,441	11,891	0	13,547	102,701
94-36-0	Benzoyl peroxide	90	12,927	1,708	5	5	16,025	30,670
		89	3,277	1,797	1,000	0	19,500	25,574
		88	4,063	2,231	0	5,350	36,050	47,694
		87	2,022	3,470	950	19,250	16,000	41,692

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
302-01-2	Hydrazine	90	23,085	4,793	1,414	423	5	29,720
		89	20,627	11,042	2,291	0	71	34,031
		88	21,341	7,663	2,149	0	29	31,182
		87	22,411	6,630	31,559	0	3,108	63,708
91-22-5	Quinoline	90	20,513	7,177	17	0	198	27,905
		89	27,365	36,859	5	0	3,093	67,322
		88	31,633	17,717	502	0	896	50,748
		87	10,933	16,472	507	0	351	28,263
87-86-5	Pentachlorophenol	90	15,507	7,699	2,577	0	1,941	27,724
		89	6,066	5,057	2,559	0	6,906	20,588
		88	8,133	5,896	2,465	20,000	3,717	40,211
		87	9,992	6,777	3,153	8,520	65,176	93,618
7439-97-6	Mercury	90	14,020	8,384	751	0	4,184	27,339
		89	15,813	9,272	1,555	0	4,942	31,582
		88	16,036	7,359	1,397	0	13,279	38,071
		87	17,172	6,237	2,111	0	28,267	53,787
79-11-8	Chloroacetic acid	90	20,650	4,754	1,691	0	0	27,095
		89	20,616	4,229	1,524	10	0	26,379
		88	21,410	4,909	600	10	0	26,929
		87	24,229	4,383	29,956	280	0	58,848
133-06-2	Captan	90	1,783	17,469	505	5,500	505	25,762
		89	3,762	21,460	500	5,000	500	31,222
		88	4,066	10,803	750	5,100	1,000	21,719
		87	9,019	18,346	0	6,100	500	33,965
91-08-7	Toluene-2,6-diiso-cyanate	90	6,009	19,437	5	0	5	25,456
		89	24,914	27,193	0	0	12,180	64,287
		88	153,753	339,434	0	0	760	493,947
		87	21,672	361,904	950	250	1,000	385,776
120-83-2	2,4-Dichlorophenol	90	255	565	95	20,400	0	21,315
		89	554	999	78	6,589	0	8,220
		88	535	868	107	17,700	2	19,212
		87	500	1,821	250	4,580	12,000	19,151
94-75-7	2,4-D (acetic acid)	90	3,780	3,962	259	2,100	10,662	20,763
		89	3,755	3,451	1,422	2,660	0	11,288
		88	3,289	3,731	549	3,789	38,000	49,358
		87	2,884	2,482	506	0	36,079	41,951
108-60-1	Bis(2-chloro-1-methyl-ethyl)ether	90	3,800	2,430	12,000	0	0	18,230
		89	751	2,608	12,000	0	0	15,359
		88	340	800	30,000	0	0	31,140
		87	44	680	30,000	0	0	30,724
95-53-4	o-Toluidine	90	5,367	2,075	252	250	8,486	16,430
		89	22,222	3,627	1,252	250	3,563	30,914
		88	19,196	27,726	1,902	250	5,024	54,098
		87	17,703	36,551	823	250	525	55,852
7440-22-4	Silver	90	4,907	7,439	298	5	3,725	16,374
		89	7,624	7,658	1,419	71	10,200	26,972
		88	11,482	36,517	1,654	0	39,510	89,163
		87	3,310	9,459	1,326	500	1,922	16,517
1582-09-8	Trifluralin	90	12,992	2,616	12	0	5	15,625
		89	2,079	1,853	322	0	970	5,224
		88	2,020	1,257	601	0	0	3,878
		87	1,592	1,250	257	71	250	3,420

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
63-25-2	Carbaryl	90	2,299	6,871	505	0	5,555	15,230
		89	3,303	6,778	750	0	33,952	44,783
		88	2,515	5,408	877	0	500	9,300
		87	1,683	5,261	124	0	3,750	10,818
624-83-9	Methyl isocyanate	90	12,983	1,390	0	0	500	14,873
		89	13,702	1,246	0	0	314	15,262
		88	9,589	586	0	0	64	10,239
		87	75,525	211,019	0	0	0	286,544
1897-45-6	Chlorothalonil	90	2,786	9,668	9	0	0	12,463
		89	19,715	9,782	252	0	1	29,750
		88	19,455	9,021	250	0	0	28,726
		87	1,954	19,127	240	0	0	21,321
90-43-7	2-Phenylphenol	90	8,925	985	135	10	530	10,585
		89	7,225	827	134	0	500	8,686
		88	9,010	1,620	480	0	0	11,110
		87	1,506	1,520	254	0	250	3,530
593-60-2	Vinyl bromide	90	9,190	915	270	0	0	10,375
		89	150	620	270	0	0	1,040
		88	4,000	950	400	0	0	5,350
		87	26,500	27,200	0	0	0	53,700
77-78-1	Dimethyl sulfate	90	9,303	436	375	0	0	10,114
		89	14,434	1,905	500	0	50	16,889
		88	9,171	1,625	610	0	50	11,456
		87	7,981	2,855	6,680	0	0	17,516
67-72-1	Hexachloroethane	90	1,885	6,156	1	1,500	334	9,876
		89	3,141	19,339	421	770	1	23,672
		88	2,949	16,238	11	520	1	19,719
		87	3,602	2,054	8	197	501	6,362
541-73-1	1,3-Dichlorobenzene	90	3,104	5,578	785	0	0	9,467
		89	3,554	7,844	22	0	0	11,420
		88	5,782	9,500	1,281	0	0	16,563
		87	36,169	14,848	1,526	0	26	52,569
100-02-7	4-Nitrophenol	90	7,570	83	31	1,200	0	8,884
		89	7,614	140	0	1,800	0	9,554
		88	7,642	213	0	6,300	7	14,162
		87	2,951	2,501	0	6,800	250	12,502
139-13-9	Nitrilotriacetic acid	90	25	1,000	7,700	0	0	8,725
		89	1,250	1,250	5,100	0	5,100	12,700
		88	1,000	1,500	5,100	0	5,100	12,700
		87	252	1,500	5,100	1,900,000	5,100	1,911,952
62-56-6	Thiourea	90	2,300	565	572	4,800	265	8,502
		89	2,253	1,500	971	5,900	752	11,376
		88	2,254	500	16,951	5,940	750	26,395
		87	770	5,250	16,090	5,400	16,500	44,010
98-07-7	Benzoic trichloride	90	8,310	25	0	0	0	8,335
		89	24,833	442	0	0	0	25,275
		88	24,542	421	0	0	0	24,963
		87	23,028	982	0	0	0	24,010
7440-41-7	Beryllium	90	9	1,361	42	0	6,517	7,929
		89	503	1,892	372	0	31,522	34,289
		88	1,300	2,463	324	0	37,000	41,087
		87	1,250	1,251	1,004	0	27,620	31,125

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
79-21-0	Peracetic acid	90	2,066	3,766	113	0	1,826	7,771
		89	1,013	8,471	40	0	0	9,524
		88	766	4,687	55	0	0	5,508
		87	1,012	7,488	1,378	0	0	9,878
108-39-4	m-Cresol	90	4,152	3,415	0	0	0	7,567
		89	4,825	7,776	45	0	0	12,646
		88	6,110	12,822	283	0	455	19,670
		87	7,930	12,520	0	0	250	20,700
87-68-3	Hexachloro-1,3-butadiene	90	3,364	1,542	715	330	0	5,951
		89	2,928	709	622	330	1	4,590
		88	2,043	513	153	220	0	2,929
		87	3,230	350	189	70	1	3,840
64-67-5	Diethyl sulfate	90	5,058	435	10	5	280	5,788
		89	7,345	1,372	0	0	250	8,967
		88	8,436	2,191	0	0	250	10,877
		87	7,824	3,005	250	0	500	11,579
75-44-5	Phosgene	90	2,423	2,430	15	10	20	4,898
		89	4,728	3,535	250	250	0	8,763
		88	3,839	17,764	500	250	0	22,353
		87	8,439	75,201	250	250	0	84,140
57-74-9	Chlordane	90	4,244	178	1	0	0	4,423
		89	3,617	136	4	0	0	3,757
		88	572	3	4	4,262	0	4,841
		87	6,901	257	4	19,825	0	26,987
51-79-6	Urethane	90	760	3,310	0	5	270	4,345
		89	0	3,450	0	0	0	3,450
		88	140,500	4,873	0	0	0	145,373
		87	299,750	497,250	935	0	12,000	809,935
95-80-7	2,4-Diaminotoluene	90	3,801	127	250	0	0	4,178
		89	4,050	376	250	0	0	4,676
		88	2,900	88	250	0	0	3,238
		87	2,600	817	250	0	0	3,667
111-44-4	Bis(2-chloroethyl) ether	90	3,205	573	83	0	0	3,861
		89	3,637	1,251	1,552	0	0	6,440
		88	4,322	600	1,351	0	0	6,273
		87	5,797	830	160	0	2	6,789
76-44-8	Heptachlor	90	3,797	0	1	0	0	3,798
		89	3,403	8	2	0	0	3,413
		88	49,052	3	2	0	0	49,057
		87	8,174	4	2	0	0	8,180
120-71-8	p-Cresidine	90	2,607	83	0	0	250	2,940
		89	977	1,233	250	0	250	2,710
		88	5,400	1,680	250	0	750	8,080
		87	1,232	1,296	250	0	1,678	4,456
101-14-4	4,4'-Methylenebis (2-chloro aniline)	90	1,510	1,255	0	0	0	2,765
		89	750	761	0	0	0	1,511
		88	500	250	0	0	0	750
		87	300	0	0	0	0	300
96-09-3	Styrene oxide	90	1,535	888	0	0	0	2,423
		89	511	1,514	0	0	0	2,025
		88	511	1,803	0	0	0	2,314
		87	254	769	779	0	0	1,802

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
72-43-5	Methoxychlor	90	756	846	505	0	255	2,362
		89	250	286	250	0	250	1,036
		88	47,971	224,910	252	0	258	273,391
		87	2	250	2	0	250	504
90-04-0	o-Anisidine	90	500	1,341	141	0	250	2,232
		89	750	1,298	4,949	0	2,570	9,567
		88	501	1,792	285	0	250	2,828
		87	500	3,103	607	0	250	4,460
87-62-7	2,6-Xylidine	90	0	17	1,906	0	0	1,923
		89	0	44	1,906	0	0	1,950
		88	0	337	1,537	0	0	1,874
		87	7,200	250	0	0	0	7,450
541-41-3	Ethyl chloroformate	90	1,302	520	0	0	0	1,822
		89	7,950	692	0	0	0	8,642
		88	11,880	2,023	0	0	0	13,903
		87	9,882	1,848	0	0	0	11,730
118-74-1	Hexachlorobenzene	90	1,258	210	124	220	0	1,812
		89	3,647	944	338	710	0	5,639
		88	4,497	497	4	410	0	5,408
		87	3,150	189	6	522	0	3,867
58-89-9	Lindane	90	1,011	538	250	0	5	1,804
		89	751	36	0	0	250	1,037
		88	251	7	0	0	0	258
		87	500	311	250	0	250	1,311
98-87-3	Benzal chloride	90	1,744	11	0	0	0	1,755
		89	5,450	6	0	0	0	5,456
		88	5,252	6	0	0	0	5,258
		87	4,383	251	0	0	0	4,634
106-51-4	Quinone	90	711	891	5	0	0	1,607
		89	860	900	12	0	0	1,772
		88	4,600	6,700	140	0	0	11,440
		87	490	563	110	0	0	1,163
101-80-4	4,4'-Diaminodiphenyl ether	90	5	900	413	0	0	1,318
		89	250	380	595	0	0	1,225
		88	0	216	585	0	0	801
		87	250	310	583	0	0	1,143
62-73-7	Dichlorvos	90	800	510	0	0	0	1,310
		89	1,111	214	0	0	0	1,325
		88	1,050	0	0	0	0	1,050
		87	1,001	490	0	0	0	1,491
	Mercury compounds	90	783	375	58	21	15	1,252
		89	2,049	1,960	13	36	260	4,318
		88	1,001	1,365	259	27	500	3,152
		87	751	1,585	502	16	251	3,105
2832-40-8	C.I. Disperse Yellow 3	90	364	0	26	0	843	1,233
		89	359	0	24	0	846	1,229
		88	398	0	302	0	0	700
		87	0	0	263	0	676	939
1314-20-1	Thorium dioxide	90	250	610	0	0	0	860
		89	250	610	0	0	0	860
		88	230	1,600	0	0	0	1,830
		87	230	1,350	0	0	0	1,580

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
12427-38-2	Maneb	90	270	521	5	0	0	796
		89	1,000	781	0	0	0	1,781
		88	1,000	1,265	250	0	0	2,515
		87	826	35,104	0	0	0	35,930
106-50-3	p-Phenylenediamine	90	768	0	0	0	0	768
		89	3,808	275	0	3,100	0	7,183
		88	2,210	111,680	826	4,716	0	119,432
		87	1,238	116,124	3,269	148,287	2,500	271,418
7440-28-0	Thallium	90	250	500	5	0	0	755
		89	500	500	0	0	500	1,500
		87	250	54,161	1,850	0	0	56,261
961-11-5	Tetrachlorvinphos	90	500	254	0	0	0	754
		89	250	250	0	0	0	500
		88	250	1	0	0	0	251
		87	3,440	6,975	0	0	0	10,415
57-14-7	1,1-Dimethyl hydrazine	90	104	364	250	0	0	718
		89	467	337	250	0	0	1,054
		88	2,206	2,117	10	0	0	4,333
		87	270	750	0	0	0	1,020
75-55-8	Propyleneimine	90	330	322	0	0	0	652
		89	287	253	0	0	0	540
		88	250	250	0	0	0	500
		87	250	250	0	0	0	500
56-38-2	Parathion	90	296	317	10	0	10	633
		89	1,006	589	250	0	250	2,095
		88	2,258	1,007	750	0	250	4,265
		87	1,098	1,260	250	0	250	2,858
75-27-4	Dichlorobromomethane	90	632	0	0	0	0	632
		87	0	250	0	0	0	250
	Trade secret chemicals	90	0	0	530	0	0	530
		89	52,000	165,000	3,850	0	0	220,850
		88	52,000	105,000	19,950	0	0	176,950
		87	73,000	280,000	8,050	0	0	361,050
135-20-6	Cupferron	90	5	480	34	0	0	519
		89	0	1,500	34	0	0	1,534
		88	140	780	0	0	0	920
		87	140	690	678	0	0	1,508
52-68-6	Trichlorfon	90	250	254	6	0	0	510
		89	500	347	1	0	0	848
		88	250	3	0	0	0	253
		87	9,950	3	0	0	0	9,953
	Thallium compounds	90	5	250	0	0	255	510
		89	2	254	0	0	250	506
		88	1	252	750	0	250	1,253
		87	0	250	0	0	0	250
134-32-7	alpha-Naphthylamine	90	250	250	0	0	0	500
		89	336	336	0	0	0	672
		88	336	254	101	0	0	691
		87	336	30,241	0	0	0	30,577
81-07-2	Saccharin (manufacturing)	90	68	258	0	0	0	326
		89	315	760	0	0	0	1,075
		88	250	500	0	0	0	750
		87	250	500	0	0	0	750

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
114-26-1	Propoxur	90	260	10	5	0	0	275
		89	250	254	0	0	0	504
		88	250	0	0	0	0	250
		87	2	0	0	0	0	2
115-32-2	Dicofol	90	13	255	5	0	0	273
		89	829	500	250	0	0	1,579
		88	593	750	0	0	0	1,343
82-68-8	Quintozene	90	255	16	0	0	0	271
		89	1,250	790	0	0	250	2,290
		88	750	314	0	0	0	1,064
		87	0	254	0	0	0	254
569-64-2	C.I. Basic Green 4	90	9	7	250	0	0	266
		89	500	250	250	0	250	1,250
		88	500	250	0	0	0	750
		87	1	1	0	0	0	2
12122-67-7	Zineb	90	10	250	0	0	0	260
		89	250	250	0	0	0	500
		88	250	1,000	0	0	0	1,250
		87	0	750	0	0	0	750
534-52-1	4,6-Dinitro-o-cresol	90	8	39	131	0	0	178
		89	258	13	25	0	1	297
		88	259	15	266	0	2	542
		87	278	788	1,202	0	0	2,268
88-06-2	2,4,6-Trichlorophenol	90	0	78	79	0	0	157
		89	2	114	3,515	0	250	3,881
		88	0	250	50	12,000	0	12,300
		87	0	0	250	15,500	0	15,750
107-30-2	Chloromethyl methyl ether	90	33	91	0	0	0	124
		89	33	97	0	0	0	130
		88	32	90	0	0	0	122
		87	289	62	0	0	0	351
2164-17-2	Fluometuron	90	26	19	0	0	0	45
		89	273	267	0	0	0	540
		88	250	250	0	0	0	500
		87	1,861	250	0	0	0	2,111
60-35-5	Acetamide	90	12	23	5	0	0	40
		89	0	0	250	0	0	250
		87	982	760	0	0	0	1,742
96-45-7	Ethylene thiourea	90	5	30	0	0	0	35
		89	1	763	0	0	0	764
		88	0	500	0	0	0	500
88-75-5	2-Nitrophenol	90	0	4	29	0	0	33
		89	4,186	219	6	0	0	4,411
		88	32,152	1,537	1	0	2	33,692
		87	31,418	1,731	250	0	0	33,399
615-05-4	2,4-Diaminoanisole	90	21	5	0	0	0	26
		89	250	0	0	0	0	250
91-94-1	3,3'-Dichlorobenzidine	90	10	15	1	0	0	26
		89	250	4	241	0	0	495
		88	250	5	752	0	0	1,007
		87	503	504	2,052	0	0	3,059

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
156-10-5	p-Nitrosodiphenylamine	90	24	0	0	0	0	24
		89	24	0	0	2,500	0	2,524
		88	15	0	0	2,000	0	2,015
		87	250	0	0	2,000	0	2,250
104-94-9	p-Anisidine	90	5	10	5	0	0	20
		89	0	4	250	0	0	254
		88	0	10	250	0	250	510
		87	0	0	40	0	0	40
133-90-4	Chloramben	90	5	5	0	0	0	10
		88	250	1,168	250	0	0	1,668
		87	250	250	0	0	0	500
99-59-2	5-Nitro-o-anisidine	90	5	5	0	0	0	10
		89	250	250	0	0	0	500
119-90-4	3,3'-Dimethoxybenzidine	90	3	1	4	0	0	8
		89	250	250	3	0	0	503
542-88-1	Bis(chloromethyl) ether	90	2	3	0	0	0	5
		89	1	2	0	0	0	3
		88	1	0	0	0	0	1
		87	1	0	0	0	0	1
97-56-3	C.I. Solvent Yellow 3	90	0	0	5	0	0	5
		88	250	0	0	0	0	250
94-59-7	Safrole	90	5	0	0	0	0	5
		88	250	250	0	0	0	500
		87	250	250	0	0	0	500
81-88-9	C.I. Food Red 15	90	0	2	0	0	0	2
		89	250	0	0	0	0	250
		88	250	0	0	0	0	250
60-34-4	Methyl hydrazine	90	1	0	0	0	0	1
		89	0	73	0	0	0	73
		88	2,774	153	1	0	0	2,928
		87	1,410	273	0	0	0	1,683
86-30-6	N-Nitrosodiphenylamine	89	0	0	9	40,000	9	40,018
		88	0	0	27	34,000	0	34,027
		87	0	0	0	34,000	0	34,000
55-21-0	Benzamide	89	250	250	250	250	0	1,000
		88	250	250	250	250	0	1,000
1937-37-7	C.I. Direct Black 38	89	250	250	0	0	0	500
842-07-9	C.I. Solvent Yellow 14	89	250	250	0	0	0	500
		87	4	0	0	0	0	4
60-09-3	4-Aminoazobenzene	89	0	0	0	353	0	353
		88	0	0	0	537	0	537
		87	0	0	0	693	0	693
989-38-8	C.I. Basic Red 1	89	250	0	0	0	0	250
95-95-4	2,4,5-Trichlorophenol	89	250	0	0	0	0	250
		88	1	90	0	0	0	91
90-94-8	Michler's ketone	89	78	66	0	0	0	144
		88	450	650	0	0	0	1,100
		87	0	400	0	0	0	400

Table 23. Releases of All TRI Chemicals, 1987-1990 (Ordered by Total Release), Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
92-67-1	4-Aminobiphenyl	89	0	1	0	9	0	10
		88	0	10	0	4	0	14
		87	0	1	0	6	0	7
101-61-1	4,4'-Methylenebis(N,N-dimethyl)benzenamine	88	250	0	0	0	7,000	7,250
		87	0	18,173	0	0	0	18,173
151-56-4	Ethyleneimine	88	250	250	0	0	0	500
62-55-5	Thioacetamide	88	250	250	0	0	0	500
	Polybrominated biphenyls	88	250	0	0	0	0	250
621-64-7	N-Nitrosodi-N-propylamine	87	0	2,700	0	0	0	2,700
532-27-4	2-Chloroacetophenone	87	0	250	1,656	0	0	1,906
39156-41-7	2,4-Diaminoanisole sulfate	87	250	250	250	0	0	750
510-15-6	Chlorobenzilate	87	259	10	0	0	0	269
	Total	90	680,623,029	1,519,938,412	197,350,846	725,196,960	440,530,657	3,563,639,904
		89	783,783,380	1,769,529,934	193,481,002	1,166,517,162	454,386,443	4,367,697,921
		88	802,473,809	1,829,465,117	310,604,882	1,337,141,675	531,308,837	4,810,994,320
		87	869,422,021	1,840,017,691	411,578,403	1,328,665,667	727,836,183	5,177,519,965

THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

1987 - 1990
Releases and Transfers
by Industry

Table 24. TRI Releases and Transfers by Industry, 1987-1990.

SIC Code	Industry	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
20	Food	90	15,270,897	11,614,936	5,404,441	36,308	8,688,949	41,015,531
		89	19,785,447	8,886,893	3,156,590	1,106,536	7,915,051	40,850,517
		88	15,424,184	7,047,453	3,821,489	1,073,219	5,353,356	32,719,701
		87	13,754,154	6,350,148	3,477,897	998,695	6,562,546	31,143,440
21	Tobacco	90	192,198	2,283,058	22,892	0	1,500	2,499,648
		89	69,002	1,656,796	45,092	0	1,511	1,772,401
		88	101,907	1,715,447	13,050	0	750	1,831,154
		87	3,625,022	3,126,200	41,550	0	459	6,793,231
22	Textiles	90	8,592,466	25,374,002	555,741	35	36,801	34,559,045
		89	11,615,693	29,376,402	999,825	0	46,988	42,038,908
		88	12,575,588	36,354,903	1,050,367	5	196,451	50,177,314
		87	12,687,672	42,623,444	7,647,832	0	320,007	63,278,955
23	Apparel	90	371,787	1,228,416	47,992	0	770	1,648,965
		89	469,029	6,349,150	500	0	500	6,819,179
		88	331,440	1,354,363	1,000	0	40,849	1,727,652
		87	1,584,547	1,166,452	42,810	0	0	2,793,809
24	Lumber	90	6,121,573	29,879,909	205,868	70	111,032	36,318,452
		89	6,032,764	33,046,303	234,870	0	112,510	39,426,447
		88	6,438,742	28,103,452	267,578	0	135,270	34,945,042
		87	7,147,641	23,360,569	170,596	0	138,157	30,816,963
25	Furniture	90	7,889,692	52,160,363	3,990	65	76,326	60,130,436
		89	9,987,101	54,077,025	1,780	0	20,285	64,086,191
		88	8,814,562	57,169,375	2,051	0	75,340	66,061,328
		87	8,568,224	50,224,098	42,694	0	36,853	58,871,869
26	Paper	90	38,961,697	204,974,144	37,675,563	65	7,367,967	288,979,436
		89	40,995,899	230,741,178	47,990,963	1	10,098,093	329,826,134
		88	45,134,743	227,847,287	40,310,934	0	11,144,410	324,437,374
		87	46,859,736	222,237,831	63,694,608	2,882,144	15,564,880	351,239,199
27	Printing	90	26,421,599	25,613,711	1,002	35	4,674	52,041,021
		89	32,211,348	26,604,360	4,725	0	3,784	58,824,217
		88	35,711,540	30,026,973	32,358	40,000	41,566	65,852,437
		87	40,054,373	23,578,009	3,776	0	253	63,636,411
28	Chemicals	90	203,166,707	491,718,249	133,468,578	658,662,114	98,516,727	1,585,532,375
		89	240,060,777	580,244,120	111,238,941	1,076,460,253	124,196,990	2,132,201,081
		88	234,888,673	624,038,118	231,737,294	1,250,545,824	138,042,004	2,479,251,913
		87	299,696,940	684,427,164	291,510,172	1,241,693,518	263,044,805	2,780,372,599
29	Petroleum	90	43,593,305	27,493,226	4,986,669	37,813,817	3,113,982	117,000,999
		89	41,508,009	33,436,566	5,516,035	37,582,710	4,057,275	122,100,595
		88	52,157,297	25,252,253	3,951,615	30,936,424	13,129,391	125,426,980
		87	59,980,383	28,346,858	5,649,134	29,072,005	10,031,505	133,079,885
30	Plastics	90	64,137,517	128,374,471	462,521	15,088	200,177	193,189,774
		89	56,830,530	144,713,022	701,967	8,250	252,076	202,505,845
		88	56,012,095	138,098,008	635,878	2,754	270,037	195,018,772
		87	50,537,844	131,778,518	406,346	49,800	392,954	183,165,462
31	Leather	90	3,561,829	8,283,907	388,408	0	20,603	12,254,747
		89	3,818,089	9,493,531	230,766	0	257,183	13,799,569
		88	3,963,820	10,919,790	682,870	0	353,215	15,919,695
		87	2,728,545	12,495,211	536,357	0	277,433	16,037,546

SIC Code	Industry	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
20	Food	90	42,261,037	9,110,963	51,372,000
		89	39,278,061	4,380,666	43,658,727
		88	38,421,628	4,749,748	43,171,376
		87	36,038,997	5,092,575	41,131,572
21	Tobacco	90	8,841	38,663	47,504
		89	16,558	42,047	58,605
		88	791,940	314,482	1,106,422
		87	990,240	431,744	1,421,984
22	Textiles	90	7,983,530	3,112,418	11,095,948
		89	11,175,321	4,822,053	15,997,374
		88	14,976,772	3,533,848	18,510,620
		87	14,008,137	6,870,950	20,879,087
23	Apparel	90	149,244	169,772	319,016
		89	441,203	444,770	885,973
		88	472,007	435,634	907,641
		87	121,551	320,321	441,872
24	Lumber	90	83,760	2,925,097	3,008,857
		89	112,615	3,473,447	3,586,062
		88	257,140	4,787,788	5,044,928
		87	186,666	4,285,179	4,471,845
25	Furniture	90	337,214	4,327,455	4,664,669
		89	528,557	4,811,379	5,339,936
		88	416,457	6,268,848	6,685,305
		87	547,401	8,408,020	8,955,421
26	Paper	90	52,087,332	18,384,948	70,472,280
		89	46,305,236	31,769,994	78,075,230
		88	47,108,971	34,235,230	81,344,201
		87	52,959,012	34,828,140	87,787,152
27	Printing	90	310,204	4,382,995	4,693,199
		89	827,104	7,726,585	8,553,689
		88	3,558,516	11,185,625	14,744,141
		87	2,719,691	9,348,217	12,067,908
28	Chemicals	90	269,136,824	250,374,290	519,511,114
		89	359,848,516	366,241,522	726,090,038
		88	347,203,225	424,209,582	771,412,807
		87	370,602,853	439,954,716	810,557,569
29	Petroleum	90	7,714,110	8,597,989	16,312,099
		89	10,053,735	8,185,165	18,238,900
		88	11,713,288	11,359,406	23,072,694
		87	8,307,164	70,133,114	78,440,278
30	Plastics	90	8,860,515	22,373,214	31,233,729
		89	12,254,282	29,612,472	41,866,754
		88	10,958,630	30,985,219	41,943,849
		87	8,490,172	35,922,148	44,412,320
31	Leather	90	9,621,274	2,552,329	12,173,603
		89	9,530,736	3,383,034	12,913,770
		88	10,028,875	2,827,706	12,856,581
		87	13,965,982	3,628,844	17,594,826

Table 24. TRI Releases and Transfers by Industry, 1987-1990, Continued.

SIC Code	Industry	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
32	Stone/Clay	90	6,622,336	15,169,436	171,436	7,555,070	2,283,330	31,801,608
		89	7,775,022	18,328,165	797,634	6,570,500	4,846,604	38,317,925
		88	8,810,978	20,159,048	1,225,740	6,580,250	7,236,502	44,012,518
		87	9,703,280	20,362,496	709,085	6,319,000	3,614,288	40,708,149
33	Primary Metals	90	62,017,818	159,378,014	12,084,504	20,050,980	314,031,791	567,563,107
		89	71,711,148	191,983,856	19,767,019	44,400,542	297,771,392	625,633,957
		88	74,744,620	178,621,708	20,826,737	47,447,936	343,432,662	665,073,663
		87	67,780,678	156,519,011	30,789,800	45,935,295	414,363,311	715,388,095
34	Fabr. Metals	90	49,604,986	80,014,959	411,891	850	998,598	131,031,284
		89	61,395,292	83,548,324	519,334	338,958	1,155,257	146,957,165
		88	59,417,073	84,439,741	1,759,373	386,130	4,304,553	150,306,870
		87	57,547,468	80,384,805	3,110,341	1,261,435	3,286,648	145,590,697
35	Machinery	90	21,771,382	31,003,898	208,996	568	108,295	53,093,139
		89	28,676,231	33,661,284	402,141	250	311,028	63,050,934
		88	28,805,302	41,585,043	406,134	0	231,895	71,028,374
		87	27,310,540	33,326,092	443,669	250	333,658	61,414,209
36	Electrical	90	26,907,499	54,956,458	415,525	18,728	2,735,798	85,034,008
		89	35,234,395	70,425,405	504,134	48,412	1,402,632	107,614,978
		88	38,727,625	89,309,777	776,522	43,720	1,473,402	130,331,046
		87	39,658,586	89,237,409	1,069,964	81,736	4,582,995	134,630,690
37	Transportation	90	69,980,055	123,532,594	234,514	320	1,768,425	195,515,908
		89	82,274,857	147,436,827	176,163	750	1,577,020	231,465,617
		88	87,492,039	152,822,857	469,308	81,850	2,519,083	243,385,137
		87	85,170,019	156,651,348	590,508	304,077	3,050,974	245,766,926
38	Measure./Photo.	90	12,746,357	20,033,623	58,233	20	5,321	32,843,554
		89	20,231,821	37,626,167	432,234	0	105,563	58,395,785
		88	16,695,595	41,849,443	691,160	250	494,543	59,730,991
		87	21,186,773	43,495,708	468,306	0	254,316	65,405,103
39	Miscellaneous	90	7,299,310	17,591,353	17,048	90	40,294	24,948,095
		89	7,967,732	19,781,301	35,828	0	95,783	27,880,644
		88	9,373,768	23,094,077	97,331	1	280,091	32,845,268
		87	8,322,281	20,611,925	211,686	250	253,473	29,399,615
Non 20-39 SIC Code		90	5,392,019	9,259,685	525,034	1,042,737	419,297	16,638,772
		89	5,133,194	8,113,259	724,461	0	158,918	14,129,832
		88	6,852,218	9,656,001	1,846,093	3,312	2,553,467	20,911,091
		87	5,517,315	9,714,395	961,272	67,462	1,726,668	17,987,112
Total		90	680,623,029	1,519,938,412	197,350,846	725,196,960	440,530,657	3,563,639,904
		89	783,783,380	1,769,529,934	193,481,002	1,166,517,162	454,386,443	4,367,697,921
		88	802,473,809	1,829,465,117	310,604,882	1,337,141,675	531,308,837	4,810,994,320
		87	869,422,021	1,840,017,691	411,578,403	1,328,665,667	727,836,183	5,177,519,965

SIC Code	Industry	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
32	Stone/Clay	90	1,766,073	11,916,423	13,682,496
		89	1,977,662	17,375,313	19,352,975
		88	2,086,745	21,789,159	23,875,904
		87	2,606,859	20,070,321	22,677,180
33	Primary Metals	90	9,506,849	292,618,698	302,125,547
		89	18,816,170	225,714,224	244,530,394
		88	23,771,320	270,051,243	293,822,563
		87	19,424,717	274,311,532	293,736,249
34	Fabr. Metals	90	8,144,323	66,712,400	74,856,723
		89	12,452,651	82,050,580	94,503,231
		88	22,722,241	85,767,946	108,490,187
		87	34,296,048	108,084,470	142,380,518
35	Machinery	90	2,735,946	13,012,380	15,748,326
		89	3,382,784	19,778,006	23,160,790
		88	3,305,891	22,096,524	25,402,415
		87	3,298,933	22,978,126	26,277,059
36	Electrical	90	12,499,485	34,982,522	47,482,007
		89	15,608,799	39,848,355	55,457,154
		88	19,677,110	47,788,429	67,465,539
		87	22,797,363	79,314,071	102,111,434
37	Transportation	90	9,698,248	39,351,555	49,049,803
		89	8,307,789	47,672,634	55,980,423
		88	8,511,784	65,072,524	73,584,308
		87	8,791,412	81,312,331	90,103,743
38	Measure./Photo.	90	1,817,682	9,785,498	11,603,180
		89	3,673,557	13,462,542	17,136,099
		88	5,151,013	21,197,460	26,348,473
		87	5,687,708	20,937,040	26,624,748
39	Miscellaneous	90	638,858	6,485,214	7,124,072
		89	735,967	14,297,800	15,033,767
		88	487,441	9,736,896	10,224,337
		87	1,253,466	11,165,078	12,418,544
Non 20-39 SIC Code		90	1,887,367	2,435,963	4,323,330
		89	1,854,251	7,300,798	9,155,049
		88	2,337,012	5,511,095	7,848,107
		87	3,084,055	7,196,043	10,280,098
Total		90	447,248,716	803,650,786	1,250,899,502
		89	557,181,554	932,393,386	1,489,574,940
		88	573,958,006	1,083,904,392	1,657,862,398
		87	610,178,427	1,244,592,980	1,854,771,407

THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

33/50 Program Chemicals

Table 25. Releases and Transfers of 33/50 Program Chemicals, 1988-1990.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
71-43-2	Benzene	90	13,511,366	10,895,483	24,943	654,068	724,429	25,810,289
		89	14,970,154	12,072,926	169,947	799,132	122,444	28,134,603
		88	20,005,703	10,782,244	47,763	825,035	136,691	31,797,436
56-23-5	Carbon tetrachloride	90	403,326	1,267,766	4,644	31,557	1,005	1,708,298
		89	994,133	2,449,115	16,396	122,043	1,616	3,583,303
		88	1,085,036	2,682,385	16,447	98,054	14,759	3,896,681
67-66-3	Chloroform	90	8,255,323	13,507,138	1,001,446	89,560	57,897	22,911,364
		89	8,791,898	17,089,184	1,208,450	114,338	70,145	27,274,015
		88	7,157,076	16,714,428	1,120,702	36,002	68,498	25,096,706
75-09-2	Dichloromethane	90	35,692,060	56,805,056	192,739	850,018	11,809	93,551,682
		89	43,614,629	81,956,162	229,620	1,937,469	25,943	127,763,823
		88	47,314,151	78,681,392	350,270	1,478,833	157,960	127,982,606
78-93-3	Methyl ethyl ketone	90	37,588,656	83,738,400	65,213	117,204	81,940	121,591,413
		89	37,122,828	97,675,961	67,797	200,698	163,627	135,230,911
		88	36,209,534	99,824,477	77,304	253,762	162,163	136,527,240
108-10-1	Methyl isobutyl ketone	90	9,300,401	18,010,971	53,798	52,221	28,103	27,445,494
		89	10,646,739	21,257,723	449,410	81,850	20,891	32,456,613
		88	13,111,722	19,566,840	762,358	116,655	31,775	33,589,350
127-18-4	Tetrachloroethylene	90	8,790,493	12,854,503	21,505	11,012	1,017	21,678,530
		89	11,956,884	15,281,344	54,940	50,005	10,791	27,353,964
		88	16,189,631	19,424,871	33,784	72,250	106,394	35,826,930
108-88-3	Toluene	90	77,249,500	156,576,022	198,260	1,400,654	367,537	235,791,973
		89	89,880,203	175,656,689	179,797	621,498	420,227	266,758,414
		88	99,715,353	188,385,617	210,825	1,480,666	739,028	290,531,489
71-55-6	1,1,1-Trichloroethane	90	82,110,866	79,288,714	16,313	1,581	62,868	161,480,342
		89	90,464,382	82,980,697	27,549	2,318	70,630	173,545,576
		88	89,747,555	84,919,189	95,619	1,000	187,786	174,951,149
79-01-6	Trichloroethylene	90	18,110,383	19,787,565	14,209	805	13,154	37,926,116
		89	21,970,954	28,023,501	16,065	390	8,690	50,019,600
		88	25,268,692	29,354,681	14,050	390	21,440	54,659,253
	Cadmium and cadmium compounds	90	30,944	76,106	3,064	1,580	404,423	516,117
		89	41,548	78,723	4,730	886	350,503	476,390
		88	32,627	89,785	4,415	2,409	389,729	518,965
	Chromium and chromium compounds	90	665,432	841,890	445,577	83,223	20,899,903	22,936,025
		89	1,708,268	845,541	554,472	59,803	34,390,067	37,558,151
		88	630,345	712,248	394,869	54,902	40,206,005	41,998,369
	Cyanide compounds	90	237,713	1,570,964	126,238	4,981,212	19,720	6,935,847
		89	337,994	1,309,619	158,155	8,009,942	44,680	9,860,390
		88	656,975	1,656,196	196,951	5,445,176	108,969	8,064,267
	Lead and lead compounds	90	905,598	1,579,449	131,268	1,664	20,064,255	22,682,234
		89	791,162	1,658,302	148,981	1,424	20,549,236	23,149,105
		88	852,104	1,837,715	241,293	2,760	27,397,746	30,331,618
	Mercury and mercury compounds	90	14,803	8,759	809	21	4,199	28,591
		89	17,862	11,232	1,568	36	5,202	35,900
		88	17,037	8,724	1,656	27	13,779	41,223

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
71-43-2	Benzene	90	630,669	2,228,781	2,859,450
		89	1,178,362	1,881,680	3,060,042
		88	1,146,116	2,350,382	3,496,498
56-23-5	Carbon tetrachloride	90	42,049	1,079,478	1,121,527
		89	3,841	1,716,644	1,720,485
		88	5,014	1,349,761	1,354,775
67-66-3	Chloroform	90	799,120	1,153,889	1,953,009
		89	1,067,436	876,933	1,944,369
		88	1,226,573	1,469,422	2,695,995
75-09-2	Dichloromethane	90	1,215,304	8,551,622	9,766,926
		89	1,482,167	12,893,795	14,375,962
		88	2,936,101	22,773,265	25,709,366
78-93-3	Methyl ethyl ketone	90	787,817	18,640,870	19,428,687
		89	789,574	29,551,913	30,341,487
		88	935,896	30,806,197	31,742,093
108-10-1	Methyl isobutyl ketone	90	1,258,909	4,486,484	5,745,393
		89	1,286,918	6,521,112	7,808,030
		88	1,509,782	11,251,283	12,761,065
127-18-4	Tetrachloroethylene	90	450,528	4,266,258	4,716,786
		89	467,501	4,230,162	4,697,663
		88	586,994	5,338,846	5,925,840
108-88-3	Toluene	90	1,695,836	38,374,945	40,070,781
		89	3,004,829	63,841,940	66,846,769
		88	3,558,829	64,654,221	68,213,050
71-55-6	1,1,1-Trichloroethane	90	169,965	12,027,414	12,197,379
		89	311,232	16,453,826	16,765,058
		88	304,348	19,688,012	19,992,360
79-01-6	Trichloroethylene	90	11,341	3,619,556	3,630,897
		89	31,509	4,914,891	4,946,400
		88	79,652	6,531,916	6,611,568
	Cadmium and cadmium compounds	90	13,434	1,281,231	1,294,665
		89	19,563	714,136	733,699
		88	21,862	1,288,933	1,310,795
	Chromium and chromium compounds	90	1,137,536	25,058,686	26,196,222
		89	1,311,668	27,834,456	29,146,124
		88	2,111,581	25,826,699	27,938,280
	Cyanide compounds	90	117,072	1,589,073	1,706,145
		89	148,201	2,427,421	2,575,622
		88	1,152,094	2,922,369	4,074,463
	Lead and lead compounds	90	190,743	53,415,341	53,606,084
		89	152,051	30,867,655	31,019,706
		88	210,535	30,426,495	30,637,030
	Mercury and mercury compounds	90	316	204,335	204,651
		89	1,808	188,360	190,168
		88	2,141	275,224	277,365

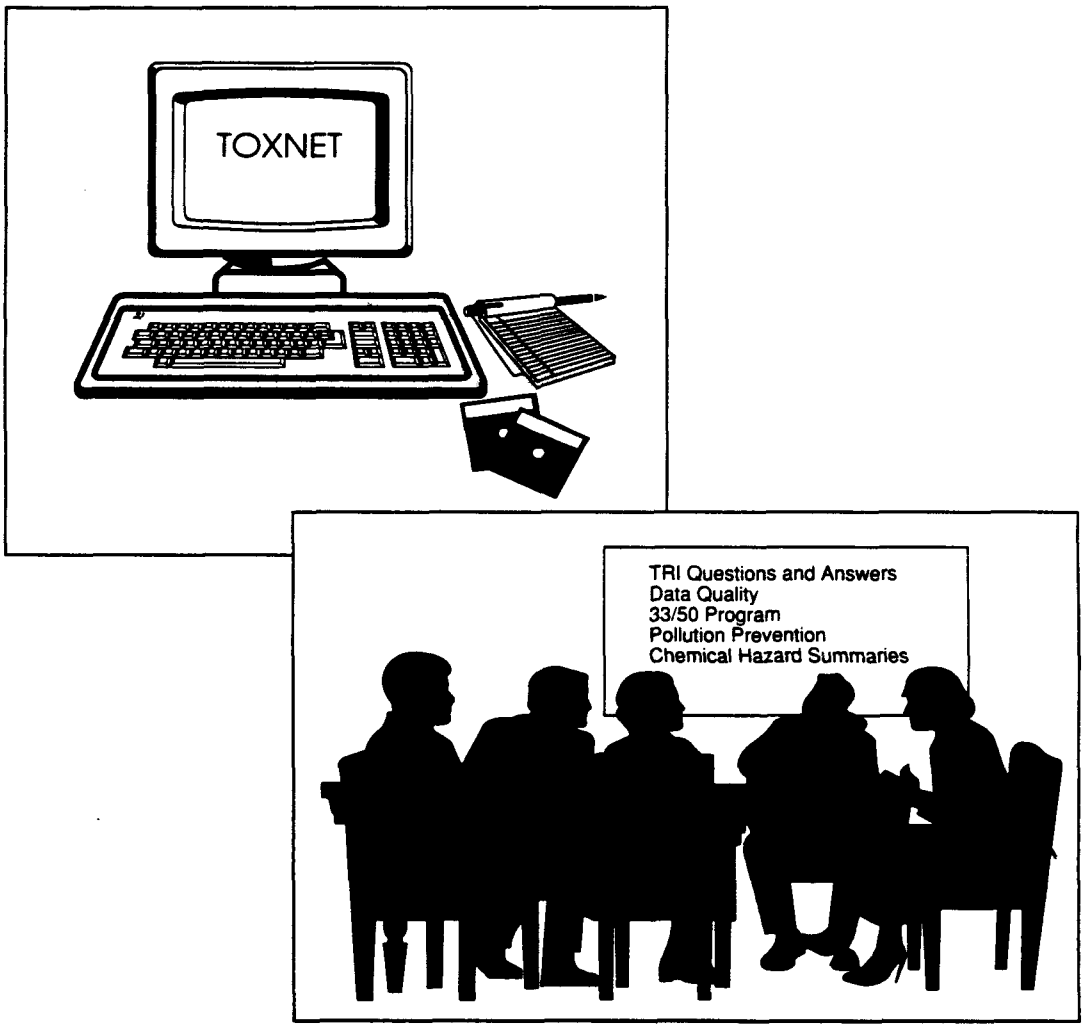
Table 25. Releases and Transfers of 33/50 Program Chemicals, 1988-1990, Continued.

CAS Number	Chemical	Year	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total Releases Pounds
	Nickel and nickel compounds	90	449,891	470,134	144,442	268,938	6,041,442	7,374,847
		89	938,076	467,817	204,156	288,212	4,412,950	6,311,211
		88	395,198	283,933	217,852	239,263	3,641,306	4,777,552
	Xylenes	90	39,883,867	109,138,458	46,681	105,420	449,016	149,623,442
		89	37,879,402	123,475,451	194,205	70,161	482,234	162,101,453
		88	37,320,846	124,987,473	215,394	122,978	650,635	163,297,326
	Total	90	333,200,622	566,417,378	2,491,149	8,650,738	49,232,717	959,992,604
		89	372,127,116	662,289,987	3,686,238	12,360,205	61,149,876	1,111,613,422
		88	395,709,585	679,912,198	4,001,552	10,230,162	74,034,663	1,163,888,160

CAS Number	Chemical	Year	Transfers to POTWs Pounds	Transfers to Other Off-site Locations Pounds	Total Transfers Pounds
	Nickel and nickel compounds	90	317,049	11,529,078	11,846,127
		89	472,431	16,560,257	17,032,688
		88	900,330	13,113,112	14,013,442
	Xylenes	90	1,934,935	22,069,183	24,004,118
		89	3,961,530	34,402,847	38,364,377
		88	4,224,054	40,873,076	45,097,130
	Total	90	10,772,623	209,576,224	220,348,847
		89	15,690,621	255,878,028	271,568,649
		88	20,911,902	280,939,213	301,851,115

THE 1990 TOXICS RELEASE INVENTORY PUBLIC DATA RELEASE

Appendices



QUESTIONS AND ANSWERS ABOUT THE 1990 TOXICS RELEASE INVENTORY (TRI) DATA

GENERAL AND CROSS-MEDIA QUESTIONS AND ANSWERS

Q Why were these data collected?

A The Toxics Release Inventory was mandated by the "Emergency Planning and Community Right-to-Know Act" (EPCRA) of 1986. The law is based on the premise that citizens have a right-to-know about chemicals in their communities. It has 2 main purposes: to encourage planning for response to chemical accidents; and to provide the public and the government information about possible chemical hazards in their communities. The law requires the establishment of State Emergency Response Commissions and Local Emergency Planning Committees to collect detailed information from local facilities.

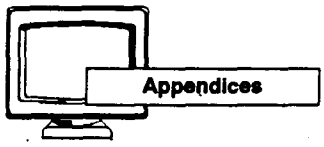
Section 313 of EPCRA requires certain manufacturers to report to the U.S. Environmental Protection Agency (EPA) and to States the amounts of over 300 toxic chemicals and 20 chemical categories that they release directly to air, water, or land, or inject underground, or that they transfer to off-site facilities. In addition, the law specifies that the EPA must compile these reports into an annual inventory of releases and transfers--the Toxics Release Inventory (TRI)--and make the inventory available to the public by computer telecommunication and other means on a cost reimbursable basis.

Q Who must report?

A Manufacturing facilities (those in Standard Industrial Classification codes 20-39) with ten or more employees are required to file toxic chemical release reports if they manufacture or process more than 25,000 pounds of any of the reportable chemicals or use more than 10,000 pounds of any of the reportable chemicals.

Q What is the compliance rate with this reporting requirement?

A EPA does not have any specific data on 1990 compliance with the law. However, a confidential survey of facilities conducted in the summer of 1989 estimated compliance for 1987 to be approximately 66%. That is, for every 100 facilities that should have filed a Form R, approximately 66 did file at least one report.



The survey estimated that there were approximately 148,000 facilities in SIC codes 20-39 with 10 or more employees in 1987. Of those facilities, an estimated 29,800 met the chemical thresholds and therefore were required to file at least one report in 1987. Of the 29,800 facilities that needed to report, only about 19,600 did file a report, leaving approximately 10,000 facilities out of compliance in 1987. This survey only identified facilities that failed to file any reports at all; additional facilities may have been out of compliance because they filed for some but not all chemicals they needed to file for, or because their estimates were inaccurate.

EPA has a very active and aggressive enforcement program which is further detailed in the section titled, "Compliance and Enforcement."

Q How was the list of chemicals subject to EPCRA section 313 reporting created?

A The list of chemicals subject to section 313 reporting was given to EPA from Congress. The lists were derived from separate lists from the states of New Jersey and Maryland. These State lists have served as a starting point. The criteria for chemicals on the Maryland and New Jersey lists differ from the criteria established under section 313. For instance, the Maryland list is a survey list and consists of chemicals which are noted for toxicity and/or high volume activities in that state. As a result of these differences in listing criteria, a number of chemicals have been added to the EPCRA section 313 list that were not on the original State lists. Also a number of chemicals have been deleted from the EPCRA section 313 list of toxic chemicals because EPA determined that they did not meet any of the criteria for listing.

Under EPCRA section 313 anyone may petition EPA to add a chemical(s) to, or delete a chemical(s) from the list of chemicals.

EPA has developed criteria and is currently refining the process for reviewing the section 313 list of chemicals. The result of this exercise will allow EPA to more effectively add chemicals to and delete chemicals from the list. This will result in reporting releases on chemicals which meet the intent of EPCRA section 313.

Q What are the criteria for listing a chemical under section 313 of EPCRA?

A For a chemical or chemical category to be kept on or added to the EPCRA section 313 list it must be known to cause or can reasonably be anticipated to cause one of the following:

- significant adverse acute human health effects at concentration levels that are reasonably likely to exist beyond facility boundaries as a result of continuous, or frequently recurring, releases.

- in humans - cancer or teratogenic effects, or serious or irreversible - reproductive dysfunction, neurological disorders, heritable genetic mutations, or other chronic health effects.

- because of its toxicity, its toxicity and persistence in the environment, or its toxicity and tendency to bioaccumulate in the environment, a significant adverse effect on the environment of sufficient seriousness to warrant release reporting under EPCRA section 313.

Q Have any chemicals been added to the EPCRA section 313 list?

A EPA added nine chemicals to the list which are subject to reporting for the 1990 reporting year. These chemicals were added to the list for cancer and chronic toxicity concerns. These chemicals are:

Allyl alcohol
Creosote
2,3-Dichloropropene
m-Dinitrobenzene
o-Dinitrobenzene
p-Dinitrobenzene
Dinitrotoluene (mixed isomers)
Isosafrole
Toluenediisocyanate (mixed isomers)

EPA has also added seven CFCs and halons to the list which will be subject to reporting for the 1991 reporting year. These chemicals were added because they are stratospheric ozone depleters. These chemicals are:

Bromotrifluoromethane (Halon 1301)
Trichlorofluoromethane (CFC-11)
Dichlorodifluoromethane (CFC-12)
Dichlorotetrafluoroethane (CFC-114)
(Mono)chloropentafluoroethane (CFC 115)
Dibromotetrafluoroethane (Halon 2402)
Bromochlorodifluoromethane (Halon 1211)

Q Have any chemicals been deleted from the EPCRA section 313 list?

A The following chemicals have been deleted from the EPCRA section 313 list of toxic substances: Titanium dioxide, Color Index (C.I.) Acid Blue 9 disodium salt, C.I. Acid Blue 9 diammonium salt, melamine, sodium hydroxide (solution), sodium sulfate (solution), terephthalic acid, C.I. Pigment Blue 15 (a copper compound), C.I. Pigment Green 7 (a copper compound), and C.I. Pigment Green 36 (a copper compound).

Q Is EPA planning to expand the number of chemicals covered by EPCRA section 313?

A EPA is reviewing information on various chemicals for addition to EPCRA section 313. EPA plans to initiate rulemaking to expand EPCRA section 313 by the end of 1992.

Concurrently, EPA is reviewing petitions to add a subset of the screened chemicals:

1) Hydrochlorofluorocarbons (HCFCs) (Deadline for response is May 31, 1992).

2) 82 chemicals listed under the Resource Conservation and Recovery Act (RCRA) (Deadline for response is August 31, 1992).

In addition, EPA is reviewing the following 16 Clean Air Act 'Air Toxics' chemicals for addition to EPCRA section 313.

Acetophenone
Caprolactam
DDE
Dimethylformamide
1,1-dichloroethane
Hexamethylene-1,6-diisocyanate
Hexane
Isophorone
Phosphine
2,3,7,8-Tetrachlorodibenzo-p-dioxin
Triethylamine
2,2,4-Trimethylpentane
Coke oven emissions
Fine mineral fibers
Polycyclic organic matter
Radionuclides

Q Does EPA plan to widen the coverage of reporting facilities under EPCRA section 313 in the future?

A EPA has begun evaluating other industrial sources for inclusion under EPCRA section 313. Operations being considered for addition include waste management firms, mining, public sewage treatment facilities, chemical warehouses, commercial launders, photo processing facilities, and other operations which may represent substantial sources of toxic chemical releases. EPA plans to initiate rulemaking to expand EPCRA section 313 by the end of 1992.

Q What is the status of EPCRA section 313 petitions to date?

A EPA has responded to and is currently working on many petitions to modify the EPCRA section 313 list of toxic substances. What follows is a summary of EPCRA section 313 petition decisions to date.

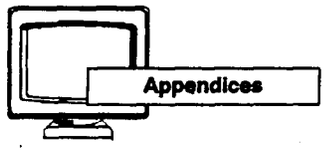
EPCRA Section 313 Petitions

Chemical	Action Requested	Status
Acetone	Delist	Pending
Aluminum oxide (non-fibrous)	Delist	Granted
Ammonium sulfate (solution)#	Delist	Proposed
Antimony tris(iso-octyl)-mercaptoacetate	Delist	Denied
Barium sulfate	Delist	Denied
Butyl benzyl phthalate	Delist	Proposed
Cadmium selenide	Delist	Denied
Cadmium sulfide	Delist	Denied
CFC@-11	List	Granted
CFC-114	List	Granted
CFC-115	List	Granted
CFC-12	List	Granted
Chromium (III) compounds	Delist	Denied
C.I.* Acid Blue 9 disodium and diammonium salts	Delist	Granted
C.I. Pigment Blue 15	Delist	Granted
C.I. Pigment Green 36	Delist	Granted
C.I. Pigment Green 7	Delist	Granted
Cobalt and compounds	Delist	Denied
Cyclohexane	Delist	Denied
Chromium antimony titanium buff rutile	Delist	Denied
Decabromodiphenyl ether	Delist	Denied
Di-n-Octyl phthalate	Delist	Pending
Diethyl phthalate	Delist	Withdrawn
Ethylene	Delist	Denied
Halon 1211	List	Granted
Halon 1301	List	Granted
Halon 2402	List	Granted
Hydrochlorofluorocarbons (HCFCs)	List	Pending
Hydrochloric acid	Modify	Pending
Inorganic Fluorides	List	Denied
Iron Chromite	Delist	Withdrawn
Manganese and compounds	Delist	Denied
Melamine	Delist	Granted
Methyl ethyl ketone	Delist	Withdrawn
Methyl isobutyl ketone	Delist	Withdrawn
Molybdenum trioxide	Delist	Withdrawn
Nickel and compounds	Delist	Denied
ortho-Phenylphenol	Delist	Denied
Phosphoric acid	Delist	Withdrawn
Phosphoric acid	Delist	Pending
Phthalic anhydride	Delist	Withdrawn
Propylene	Delist	Denied
Sodium hydroxide (solution)	Delist	Granted
Sodium sulfate (solution)	Delist	Granted
Sulfuric acid	Delist	Denied
Sulfuric acid	Modify	Proposed
Terephthalic acid	Delist	Granted
Titanium dioxide	Delist	Granted
Trifluralin	Delist	Withdrawn
Zinc borate hydrate	Delist	Denied
Zinc sulfide	Delist	Denied
82 RCRA Chemicals	List	Pending

The ammonium sulfate (solution) proposed deletion will not result in a loss of reporting, but rather in more focused reporting. The ammonium moiety will be reportable as (aqueous) ammonia, which is listed on EPCRA section 313.

@ CFC = Chlorofluorocarbon

* C.I. = Color Index



Q You did a National Report last year; will there be a report on this year's TRI data?

A Yes, but it will not be a TRI-specific document as it has been for the past 3 years. EPA will produce a report that will cover the issue of toxic releases by placing TRI within the context of chemicals in commerce. Tentatively titled "Pollution Prevention and Toxics - 1992", this new report will contain summary information on the TRI data. The report will also incorporate information on pollution prevention and the 33/50 Program. The report should be available this winter.

Q Can releases of these chemicals be controlled or prevented?

A Much can be done to prevent EPCRA section 313 chemicals from entering wastes and thus to reduce the amount ultimately released to the environment. One effect of the national availability of data on releases of toxic chemicals has been increased scrutiny by the facility, local community, state, and federal government with an eye to reducing releases. EPA will be tracking year-to-year trends in release and pollution prevention data. Beginning with the 1991 reporting year, pollution prevention reporting will be expanded and mandatory. All reporting facilities must provide EPA with information on what, if any, activities have been implemented to reduce releases of reported toxic chemicals. Currently over 700 parent companies have signed on to the 33/50 Program which is a voluntary program with a national goal of a 33% reduction in releases of 17 EPCRA section 313 chemicals in 1992 and a 50% reduction in 1995. A number of facilities have already either committed to plans to reduce releases of toxic chemicals over the next few years or have implemented changes which will reduce their releases in future years.

EPA's Office of Pollution Prevention and Toxics is leading an Agency-wide effort to promote reduction in the quantity of wastes generated not just by manufacturing industries, but by other sectors of the economy as well.

For more information on EPA's pollution prevention initiatives see the "Pollution Prevention" and "33/50 Industrial Toxics Project" sections in this document.

Q Ammonium sulfate (solution) was the number one released chemical (by volume) in 1989 but is ranked number 36 for 1990. What caused this difference?

A Facilities that manufacture, process or otherwise use ammonium sulfate (solution) were given the option of reporting their releases and transfers either as ammonium sulfate (solution) or as ammonia. EPA believes that reporting releases of aqueous solutions of ammonium salts, such as ammonium sulfate, as ammonia more properly represents the moiety of concern. Ammonium sulfate (solution) primarily affects water quality by the introduction of ammonia to a water body. EPA has low concern for sulfate as evidenced by its deletion of sodium sulfate (solution) from EPCRA section 313.

Q It has been said that making direct comparisons of the TRI releases and transfers across years is difficult to do. Why?

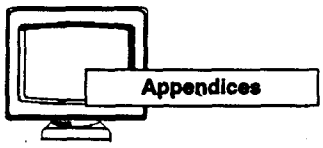
A There are many factors that may affect cross-year comparisons of releases and transfers at the state, local, chemical, or even facility specific level. For example, the list of chemicals subject to reporting has changed and thresholds for reporting for manufacturers and processors have been lowered from 75,000 pounds in 1987 to 50,000 pounds in 1988 to 25,000 pounds for 1989 and beyond. These changes alter the number of facilities which are required to report as well as the number of forms submitted under EPCRA section 313. In addition, many other facility-dependent factors make assessing releases and transfers across years difficult. Facilities may change their methods of making estimates of their releases and transfers of toxic chemicals (hopefully, towards more accurate estimates). Chemicals not subject to EPCRA section 313 reporting may be substituted for covered chemicals. The amount of a chemical manufactured, processed, or used at a facility may be drastically different from year to year. Facilities may change products or processes which may affect which chemicals and how much of these chemicals are manufactured, processed, or used. Production of a covered chemical may be up or down for a given year. These factors and more make yearly comparisons difficult. For more information on this subject, see "Toxics in the Community; National and Local Perspectives", USEPA (EPA 560/4-91-014), September 1991.

Q For the past two years, many reports of erroneous releases were made and many release figures have been modified. How accurate are the release data?

A Accuracy varies greatly. Some releases can be estimated fairly easily, just by knowing how much of the chemical was used during the reporting year or by weighing drums of solid/ liquid waste. Where monitoring of release streams or wastes has been done, release estimates may be within 20% of actual amount released, although infrequent, nonrepresentative sampling may lead to much less accuracy. Estimates of fugitive air emissions and complex waste waters for which monitoring data are not available may be off by one or even two orders of magnitude, particularly when the release is a small percentage of the chemical actually processed.

EPA has conducted site visits to determine how well facilities used data on hand to estimate 1987 and 1988 releases. These projects do not "confirm" estimates through monitoring, but they do determine how well facilities used available data and estimation techniques to calculate releases.

Overall, 1987 total annual releases appear to have been underestimated by 2%, representing the net effect of overestimates and underestimates. For non-zero release estimates, more than three-quarters were within a factor of 2 of EPA's best estimate. About 15% were in error by an order of magnitude or more.



The survey of the 1988 data focused on facilities in Standard Industrial Classification (SIC) codes 28 (chemical manufacturing), 29 (petroleum refining) and 34-38 (metal finishing and fabrication). The aggregate 1988 release estimates from the facilities in these industries were more accurate than their 1987 estimates, since their 1988 estimates were found to be approximately equal to the estimates calculated by the EPA contractor.

Q Why is there such variability in release and transfer quantities? Facilities in the same business reported different numbers; are these differences real?

A There are many reasons for variability. For example, facilities in the same business may use very different processes (e.g., 5 or 6 major pulping/papermaking processes exist in the U.S.) and may have very different capacities (50 to 1500 tons of paper per day). One facility may treat waste on site, while a similar facility may transfer the same waste off-site for treatment. Some facilities simply have more efficient production processes resulting in fewer releases and reduced waste. Even if two facilities generated the same quantity of waste, their reported releases and transfers could be quite different. For example, differences in type of pollution treatment controls and recycle practices utilized by facilities can lead to differences in reported releases and transfers.

A large difference may come from the ability of individual facilities to accurately estimate releases and transfers, which depends on the data and expertise available.

Q Isn't an off-site transfer just another form of release? How can I figure out what's happening to these wastes?

A Some general conclusions can be drawn from the off-site treatment codes. An off-site transfer is different from a direct release of the chemical to the environment from the reporting facility. The database will tell you how much of a chemical in a waste was sent to another "off-site" location for further management (e.g., treatment, storage, or disposal). The database does not tell you how much of the chemical may be released directly to the environment from any "off-site" location.

The database does tell you the general type of management activity that occurs to the chemical at the off-site location. For example, incineration (treatment code "M") can destroy 95 to 99% or more of an organic chemical, if properly operated. The remaining quantity may be emitted to air, although some incinerators will have controls to remove airborne organics.

Off-site transfers of metals and metal compounds are equivalent to release of the metal species because treatment will not result in the destruction of the metal species. For example, incineration does not destroy the EPCRA section 313 metals; release to air of the metal out of the stack may be reduced by particulate controls, with resulting fly-ash (and bottom-ash) generally released to land.

Publicly Owned Treatment Works (POTWs) treat wastewater by a variety of techniques and the fate of a particular chemical will vary. Generally, a combination of the following will occur:

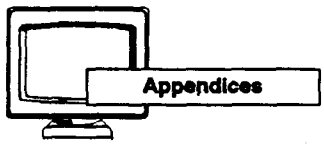
- The chemical will pass through the POTW and be discharged to a river; this is particularly the case for the listed inorganic salts.
- The chemical will be biodegraded. High volume pollutants such as methanol are readily biodegraded in secondary treatment.
- The chemical (for example, many of the listed metals) will be removed from the water by sorption to the sewage sludge or by filtration. These solids may be landfilled.
- Many municipal sewage sludges may be safely and beneficially used on land to condition soil or as a fertilizer source. EPA expects to issue standards for the use and disposal of municipal sewage sludge in late summer 1992.
- The chemical will evaporate to air during water treatment (particularly some of the lower molecular weight chlorinated organics).

Toxic discharges to POTWs are controlled by the National Pretreatment Program. The program prevents the discharge of pollutants to POTWs which will pass through to receiving waters or interfere with wastewater treatment or sludge disposal. In the pretreatment program, certain POTWs are required to adopt and carry out local pretreatment programs. Local programs, with State and EPA oversight, identify industrial discharges and chemicals of concern, impose appropriate limits, and monitor and enforce compliance.

Off-site landfills, of course, bury waste. Conditions at the landfills will vary. Landfills accepting hazardous waste are subject to manifesting and permitting regulations under the Resource Conservation and Recovery Act (RCRA).

Q How can I tell whether the reported releases are continuous or intermittent, due to accidents or infrequent occurrences?

A Release quantities are total annual aggregate amounts and the TRI database does not indicate whether peak releases and/or accidents occurred during the year. For a given facility, some release numbers may be for an essentially continuous release at a stable rate; others may include a large accidental or an atypical release due to start-up of a process.



Q What can I do to reduce TRI emissions in my community?

A A first step in encouraging emission reductions is developing a full picture of releases to your community from the reporting facilities. Be aware that emissions do not necessarily equate with health or environmental risk. Also do not assume that emissions reported under EPCRA section 313 are "unregulated." Quantities reported may be within current permit limits.

Contact the facility or facilities and ask them for more information on their TRI releases, pollution prevention and worker safety programs. Data on pollution prevention initiatives must be reported beginning with the 1991 calendar year, so Form R submissions can be used to see if facilities in your community are implementing source reduction programs and to determine what effect the programs are having. Establishing and continuing a positive dialogue with facilities on potential emissions reductions activities can promote risk reductions.

Discuss your concerns with local, state and EPA officials and encourage them to pursue pollution prevention initiatives with these facilities. These officials have more information that they can make available to you so you can develop a better understanding of environmental situation where you live. Organize a neighborhood citizen organization, contact existing public interest groups and work together as a coalition to seek pollution prevention and risk reduction.

These are just a few examples of some of the hundreds of ways the TRI could serve and has served as a pollution prevention and emission reduction tool. For more information on how TRI has been used, see the TRI Data Use section in this information package.

Exposure and Health Effects Questions

Q Where can I find out more about the toxic properties of the EPCRA section 313 chemicals and their potential to cause adverse human health and environmental effects?

A EPA has prepared fact sheets which will help the public understand the potential health and ecological effects of exposure to chemical releases identified in the Toxic Release Inventory. Fact Sheets for most of the EPCRA section 313 chemicals are available from EPA Regional Offices, State Emergency Response Commissions, and State Section 313 Contacts. You should be aware that determining the health and ecological effects of chemicals is a very complicated process. Most chemicals have not been tested for toxicity in a comprehensive manner. As further scientific information is acquired, additional information will be made available.

Q How much of these chemicals am I exposed to?

A Estimating exposure based on release quantities requires an analysis of chemical and site specific characteristics. There is no simple conversion of release quantity to concentration in the environment or dose received by individuals.

Natural environmental processes can: transform the chemical (e.g., sunlight decomposes some chemicals); transfer it from one medium to another (e.g., water to air); or concentrate it (e.g., bioaccumulation of the chemical in fish). Concentration in the environment can depend on the volume of water in the receiving stream into which the chemical is released; dispersion of air releases as a function of local meteorological conditions; the height from which the release occurs; integrity of landfill liners or other containment of disposed materials; and many other factors. Finally, your exposure to the chemicals will depend on factors such as distance from the release, source of, and treatment of your drinking water supply, etc.

Q What are my chances of getting sick when I have been exposed to chemicals?

A The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time someone is exposed and the amount of chemical they are exposed to, as well as the "inherent" toxicity of the chemical.

Q When are higher exposures more likely?

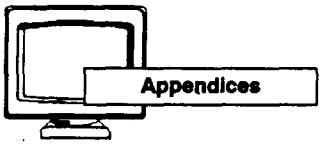
A Accidents can expose the facility's workers and surrounding community to the chemicals. Other conditions which increase risk of exposure include dust releasing operations (grinding, mixing, blasting, dumping, etc.), other physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.). During process start-up and shutdown operations there also is a greater likelihood of exposure. The closer one is to a release, the greater the risk of exposure.

Q Is the risk of getting sick higher for workers in the facilities than for community residents?

A Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of sensitive populations, such as children or people who are already ill, community exposures may cause health problems.

Q If I have acute (short-term) health effects, will these actually develop into chronic effects?

A Not always. Most chronic (long-term) effects result from repeated exposures to a chemical. Although many acute effects are reversible, some exposures may also cause chronic health effects.



Q Can I get long term effects without ever having short-term effects?

A Yes, because long-term effects can occur from repeated or continuous exposures to a chemical at levels not high enough to make you immediately sick.

Q Don't all chemicals cause cancer?

A No. Most chemicals tested by scientists are not cancer causing.

Q Should I be concerned if a chemical causes cancer in animals?

A Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q Should I be concerned if a chemical is a teratogen (a substance which causes fetal malformations) in animals?

A Yes. Although some chemicals may affect humans differently than they affect animals, damage to animals suggests that damage can occur in humans.

Q But don't they test animals using much higher levels of a chemical than people usually are exposed to?

A Yes. That is so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses especially over long periods of time.

Q Can men as well as women be affected by chemicals that cause reproductive system damage?

A Yes. Some chemicals reduce potency or fertility in either men or women. Some damage sperm and eggs, possibly leading to birth defects.

Q Aren't pregnant women at the greatest risk from reproductive hazards?

A Not necessarily. Pregnant women are at greatest risk from chemicals which harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of child-bearing age are at higher risk.

Q What is the risk to public health resulting from toxic emissions to the air?

A While the TRI data represent a useful means of identifying potential air toxics sources, these data are not sufficient to accurately determine the magnitude of the public health hazard posed by the emissions from a given facility. For example, TRI provides no information concerning the potential exposure to these emissions. These data are most

useful to point out the direction for further analyses of public health risk. In addition to identifying new regulatory projects, these data can be used to make priority decisions for the air toxics regulatory agenda.

Q Is there any difference between fugitive and stack air emissions when it comes to my health?

A Dispersion of the chemical and its concentration at various distances from the point of release are affected by whether, for example, the chemical is emitted from a tall stack at high temperatures or a pipe fitting near the ground at ambient temperature. Thus, your exposure could vary depending on the manner in which the release occurs. In general, a ground or near-ground release, such as through fugitive emissions, will more likely result in a higher exposure and, therefore, a greater possible health hazard for nearby residents than emissions from tall stacks.

Q Is my drinking water contaminated by this chemical?

A Again, this depends on the amount and concentration released, characteristics at the site, including the relationship of the release to the water supply, both surface and below ground, the distance to where the drinking water intake/well is located, and treatment, if any, the water receives before it is piped to your house.

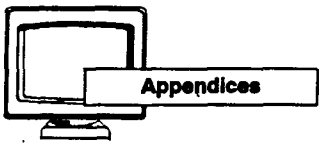
Q Are the plants with highest emissions always the most important in terms of public health?

A No. It is not possible to determine risks to public health strictly from knowing the amount of a chemical which is emitted by a facility over a year. An air emission total is an important first step in identifying a facility which may pose a public health hazard. Other factors that are necessary to the risk assessment process include specific information on: chemical potency and toxicity, local meteorological and topographical characteristics, where people live and work (potential population exposure), and when and how emissions occur. Because some chemicals are more toxic than others, knowing only the quantity of chemicals released to the environment is not sufficient to determine its importance with respect to risk.

Compliance and Enforcement Questions

Q How many inspections have EPA's Regional offices conducted in support of the Office of Compliance Monitoring's EPCRA section 313 program?

A Since Fiscal Year 1989 (October 1988), our field offices have conducted approximately 2,330 inspections of facilities subject to EPCRA section 313 reporting requirements.



Q What is the total amount of proposed penalties levied against EPCRA section 313 violators since Fiscal Year 1989?

A EPA has issued approximately 548 civil complaints (almost all of which are against non-reporters) since Fiscal Year 1989.

Q What is the total amount of proposed penalties levied against EPCRA section 313 violators since Fiscal Year 1989?

A EPA's Office of Compliance Monitoring has proposed penalties in excess of 16 million dollars in the EPCRA section 313 program.

Q What is EPA doing about Supplemental Environmental Projects (SEPs)?

A Supplemental Environmental Projects are projects facilities may undertake, as part of the settlement process, to protect or restore the environment through pollution prevention, waste minimization and/or decrease in the amount of natural resources used. Since Fiscal Year 1991 (when we began to track cases with SEPs), EPA has closed 77 civil complaint cases containing one or more SEPs.

Pollution Prevention Questions

Q Does the Pollution Prevention Act (PPA) of 1990 expand the EPCRA section 313 reporting requirements?

A The PPA requires that new data be reported under EPCRA section 313 beginning on January 1, 1991. The first reports containing the new data are due to the EPA and the states by July 1, 1992.

Q What new data are required under the PPA of 1990?

A The Act augments the information available to the public under EPCRA section 313. Starting on January 1 of 1991 facilities required to report under EPCRA section 313 must also report information on their pollution prevention and recycling activities on the EPCRA section 313 reporting form (Form R). Specifically all facilities covered under EPCRA section 313 must report the following information for each toxic chemical as specified in section 6607 of the PPA:

(1) The quantity of the chemical entering any waste stream (or otherwise released into the environment) prior to recycling, treatment, or disposal during the calendar year for which the report is filed and the percentage change from the previous year. The quantity reported shall not include any amount reported under paragraph (7). When actual measurements of the quantity of a toxic chemical entering the waste streams are not readily available, reasonable estimates should be made on best engineering judgement.

(2) The amount of the chemical from the facility which is recycled (at the facility or elsewhere) during such calendar year, the percentage change from the previous year, and the process of recycling used.

(3) The source reduction practices used with respect to that chemical during such year at the facility. Such practices shall be reported in accordance with the following categories unless EPA finds other categories to be more appropriate.

(A) Equipment, technology, process, or procedure modifications.
(B) Reformulation or redesign of products.
(C) Substitution of raw materials.
(D) Improvement in management, training, inventory control, materials handling, or other general operational phases of industrial facilities.

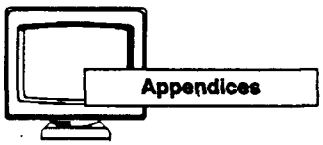
(4) The amount expected to be reported under paragraphs (1) and (2) for the two calendar years immediately following the calendar year for which the report is filed. Such amount shall be expressed as a percentage change from the amount reported in paragraphs (1) and (2).

(5) A ratio of production in the production (reporting) year to production in the previous year. The ratio should be calculated to most closely reflect all activities involving the toxic chemical. In specific industrial classifications subject to this section, where a feedstock or some variable other than production is the primary influence on waste characteristics or volumes, the report may provide an index based on that primary variable for each toxic chemical. The Administrator is encouraged to develop production indexes to accommodate individual industries for use on a voluntary basis.

(6) The techniques which were used to identify source reduction opportunities. Techniques listed should include, but are not limited to, employee recommendations, external and internal audits, participative team management, and material balance audits. Each type of source reduction listed under paragraph (3) should be associated with the techniques or multiples of techniques used to identify the source reduction technique.

(7) The amount of any toxic chemical released into the environment which resulted from a catastrophic event, remedial action, or other one-time event, and is not associated with production processes during the reporting year.

(8) The amount of the chemical from the facility which is treated (at the facility or elsewhere) during such calendar year and the percentage change from the previous year. For the first year of reporting under this subsection, comparison with the previous year is required only to the extent such information is available.



Q When will EPA publish the new Form R including the new PPA data elements?

A On September 25, 1991, EPA published a proposed rule in the *Federal Register* to implement the new reporting elements. The new elements and guidance for the 1991 reporting package are under negotiation with the Office of Management and Budget. Once a package has been cleared for the 1991 reporting year, EPA intends to distribute camera-ready copies of the final form and instructions as soon as possible, which will be followed by a direct distribution of the entire reporting package to all facilities that have reported in prior years.

Q What is the Office of Pollution Prevention and Toxics (OPPT) doing to reduce TRI releases?

A The Pollution Prevention Division (PPD) in OPPT is using TRI data to help target activities, chemicals, facilities, and industry categories that are of high concern. The Pollution Prevention Policy Council's new initiative, "Source Reduction Review Project", is one example where PPD used the TRI data as a screening tool to identify a group of industrial categories as long-term targets of opportunity. As a part of this project, PPD is working with program offices to incorporate prevention into their programs through regulation where feasible and through guidance and voluntary efforts. PPD is also working with industry (usually through trade associations) to raise awareness of the benefits of pollution prevention. PPD also conducts training programs which help orient government and industry toward pollution prevention and incorporate prevention into what they do. PPD has a state grants program to help states develop pollution prevention programs and has (with the Office of Research and Development) developed a clearinghouse which provides information on pollution prevention for industry, government and public interest groups to use in encouraging and implementing prevention.

Q The quantity of certain chemicals released (at a particular facility or nationwide) is decreasing. What does this mean?

A The TRI database does not include an explanation of the reason for changes in quantity. Any number of explanations are possible including shifting of chemicals off-site for energy recovery or recycling, decrease in economic activity or production levels, substitution of one chemical (that may or may not be in TRI) for another, changes in accounting or estimation techniques, and other reasons. A recently initiated study by PPD will in fact examine which of the above factors have contributed to changes in releases and transfers between 1989 and 1990. The results of this study will be used to further develop the methodology to assess changes over time using the source reduction and recycling data that will become available with the 1991 reporting year. These new data elements will help EPA better evaluate release trends and will also be critical in developing a comprehensive understanding of the effects of pollution prevention activities.

33/50 Program Questions

Q How is the 33/50 Program related to the TRI program?

A In February 1991, EPA Administrator, William K. Reilly, announced the establishment of the 33/50 Program. It is a voluntary TRI release reduction program that asks industries to work with EPA, the environmental community, and the States, to initiate or expand pollution prevention activities at individual facilities. EPA is seeking a 33% reduction in TRI releases for dioxin and 17 selected toxic chemicals and chemical categories by 1992 and a 50% or greater reduction by 1995. These reductions will be measured using the 1988 TRI data as a baseline and evaluated using the hierarchy of pollution prevention as a measure of success. EPA expects the public accountability fostered by TRI and the Pollution Prevention Act to continue to play a vital role in persuading companies to take voluntary actions to prevent pollution from toxic chemicals.

Besides dioxin, the 17 chemicals and chemical categories targeted for reductions are: benzene, methyl ethyl ketone, cadmium and compounds, methyl isobutyl ketone, carbon tetrachloride, nickel and compounds, chloroform, tetrachloroethylene, chromium and compounds, toluene, cyanide and compounds, 1,1,1-trichloroethane, dichloromethane, trichloroethylene, lead and compounds, xylene, and mercury and compounds.

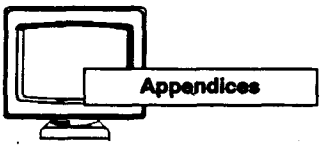
These chemicals were targeted for reductions because they pose a wide range of health and environmental risks including carcinogenicity, developmental effects, and the destruction of the ozone layer. These are also high-volume industrial chemicals released to the environment in substantial quantities.

Seventy-four percent the releases and transfers of the targeted chemicals are air emissions from fugitive or point sources. Many of these will eventually be controlled under the Clean Air Act. EPA's goal is to get these emissions (and other releases) reduced as early as possible, and through prevention techniques wherever practical.

Air Questions

Q How much of the 2.2 billion pounds of toxic compounds emitted to the air annually will be addressed by the air toxics section of the Clean Air Act Amendments?

A This legislation addresses nearly 1.6 billion pounds of the 2.2 billion pounds reported to the TRI for 1990. The remaining 600 million pounds are subject to control as volatile organic compounds under the ambient air standard for ozone or are subject to the particulate matter ambient air standard.



Q What legal tools are available to the Agency to reduce toxic air emissions?

A Title III of the amended Clean Air Act (CAA) is the primary regulatory tool by which EPA will control emissions of air toxics. Section 112(d) states that EPA shall promulgate regulations requiring the maximum degree of reduction in emissions that is achievable. After the application of the maximum achievable control technology (MACT) standards, section 112(f) states that EPA must promulgate additional standards within 8 years if they are required to further protect the public.

Also, EPA has authority to abate "imminent and substantial endangerment" to public health under several statutes. In particular, section 303 of the CAA and section 106 of Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA) provide that EPA can issue administrative orders or seek injunctive relief in court to address such hazards. Any plant-specific enforcement action would typically be preceded by a detailed site-specific analysis of emissions and risk. EPA would consider use of these authorities to reduce emissions from facilities that pose high risks due to toxic air pollutants.

Q When will the EPA promulgate regulations to reduce these emissions?

A In accordance with the new CAA, EPA published a draft list of the source categories to be regulated in June 1991. The final list is expected to be published about a month from now, and a draft schedule announcing when the various source categories will be regulated will follow about a month later. One of the first regulations to be promulgated will affect the synthetic organic chemical manufacturing industry. It is anticipated to have far reaching effects in that it will require reductions of up to 110 hazardous air pollutants. The requirement will result in substantial reductions in emissions from the affected facilities. In addition, a provision of the new CAA allows an incentive for sources that choose to reduce their emissions by 90% before the EPA proposes the new standards. If they enter into this "early reductions program", they can obtain extensions from the time required to comply with the new standards. The EPA is working closely with industry representatives to promote widespread participation in this program. The program encourages industry to come up with innovative, cost-effective control technologies and pollution prevention methods.

Q Why are some of the 189 hazardous air pollutants listed in the amendments to the Clean Air Act not included in the TRI?

A The following 16 chemicals are listed as hazardous air pollutants in the new CAA, but are not on the EPCRA section 313. EPA is reviewing the 16 chemicals for addition to EPCRA section 313.

Acetophenone
Caprolactam
Coke Oven Emissions

DDE
Dimethyl formamide
Ethylidene dichloride
Hexamethylene-1,6-diisocyanate
Hexane
Hydrogen sulfide
Isophorone
Mineral fibers
Phosphine
Polycyclic Organic matter
Radionuclides (including radon)
2,3,7,8-Tetrachlorodibenzo-p-dioxin
Trimethylamine
2,2,4-Trimethylpentane

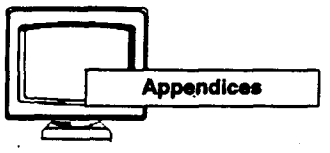
There are different reasons for why these chemicals are not found in the TRI data depending on the chemical. The EPCRA section 313 and CAA amendments lists were developed for different purposes, thus differences in these lists of chemicals are not unexpected. For example, polycyclic organic matter is a mixture of chemicals originating from the combustion of fossil fuel. This source category would not be subject to reporting under EPCRA section 313. Where appropriate, CAA chemicals may be added to the EPCRA section 313 reporting requirements after further review.

Q How will the TRI data be used in the future by the air office?

A The Office of Air and Radiation has used and plans to continue to use the TRI data for source identification and source category prioritization. The TRI data has been a valuable source of air emissions information and will continue to provide direction for further analyses of potential air toxics sources and associated public health risk. See the TRI Data Use section of this information package for more specific information on how the EPA program offices are using the TRI data.

Q What will EPA do about specific chemicals with respect to air toxics on the EPCRA section 313 list?

A Listed (below) are the 15 chemicals with the greatest total reported air emissions in TRI for 1990. Under Titles I, III, and VI in the amendments to the CAA of 1990 all 15 are subject to regulation. The new CAA requires EPA to focus on source categories which emit hazardous air pollutants rather than on specific pollutants. This approach will lead to the early regulation of source categories which emit multiple hazardous air pollutants. Therefore, significant reductions of all of the hazardous air pollutants emitted by an industrial plant will be achieved rather than reductions in just one specific pollutant. For example, with the exception of ammonia, chlorine, Freon 113, and hydrochloric acid, the air toxics will be regulated under one of the first emission standards to be promulgated under the new CAA. The Hazardous Organic National Emissions Standards for



Hazardous Air Pollutants will affect many sources of toxic emissions such as process vents, equipment leaks and storage tanks at chemical manufacturing plants, and will address the emissions of over 110 of the pollutants listed in section 112.

Chlorine and hydrochloric acid emissions will be regulated by MACT standards covering other source categories. Chlorine will also be subject to regulations under section 112(r) of Title III. Facilities producing, handling or storing extremely hazardous substances, including chlorine and ammonia, will be required to take precautions to protect against accidental releases of these toxic chemicals.

In addition to section 112 rules under Title III for emissions of air toxics, Section 604 of Title VI mandates a progressive production phase-out of chlorofluorocarbons and halons, applicable to Freon-113 and 1,1,1-trichloroethane (methyl chloroform) due to their ozone depleting potential.

Finally, many of these 15 chemicals are controlled to some extent by state and/or local governments as a result of emission reductions for volatile organic compounds (VOC's) and particulates under programs to meet ambient air quality standards.

Acetone
Ammonia
Carbon Disulfide
Chlorine
Dichloromethane
Ethylene
Freon-113
Glycol Ethers
Hydrochloric Acid
Methanol
Methyl Ethyl Ketone
Methylene Chloride
Toluene
1,1,1-Trichloroethane
Trichloroethylene
Xylene

WATER QUESTIONS

Q How do the 1990 TRI releases to water compare with the 1989 releases and what does it mean?

A Total release of the EPCRA section 313 chemicals to water in 1990 increased by approximately 2% compared to the 1989 releases. This could be attributed to a change in business activity (change in production) or more accurate discharge estimates by the reporting industries.

In the top 15 chemicals, which account for over 95% of the total releases, ammonium sulfate, ethylene glycol, chlorine, and magnesium compounds showed decreases of 87%, 29%, 47% and 20% respectively. [The decrease in ammonium sulfate releases to water is primarily the result of revised technical guidance on this chemical and does not represent an actual decrease.] Phosphoric acid, ammonia, sulfuric acid, acetone, and zinc compounds showed increases of 177%, 81%, 31%, 25%, and 23% respectively. [Ammonia increases are primarily due to revised technical guidance for ammonium sulfate/ ammonia.] Other chemicals showed a small gain or loss in releases.

Q How does EPA (or the States) regulate EPCRA section 313 chemicals discharged to water?

A Under section 301 of the Clean Water Act (CWA), the discharge of any pollutant by any person is unlawful unless it is in compliance with the provision of the Act. This provision is implemented by EPA and the States through the development of effluent guidelines, the adoption of water quality standards, and the issuance of a National Pollutant Discharge Elimination System (NPDES) permit. Pursuant to Congressional directive, these programs have focussed on a subset of toxic pollutants of greatest concern. There are 126 such toxic chemicals and they are known as "priority pollutants". This list includes 80 of the EPCRA section 313 chemicals. States are in the process of adopting water quality standards for these priority pollutants which could reasonably be expected to interfere with water quality. The States and EPA then use standards, together with best available treatment guidelines, to set enforceable permit limits on the amounts of these and other toxic pollutants that cities and industries are allowed to discharge to waters of the United States.

While many of the top 10 EPCRA section 313 chemicals being discharged to water are controlled, a number of the small-volume chemicals with high toxicity levels are not fully regulated. EPA will continue to work with the States to ensure that all appropriate standards and permits are adopted. EPA is also preparing to issue Federal water quality standards if States do not adopt standards as Congress has directed. In addition, States and EPA regulate the overall toxicity of effluents with permit limits that rely upon biological toxicity tests; these limits serve, in part, to control the discharge of those EPCRA section 313 listed toxic chemicals for which there are not State water quality standards.

Q What are the basic facts concerning the 12 chemicals accounting for 95% (by weight) of direct water discharges?

A The Toxic Release Inventory reports 230 chemicals discharged directly into the water environment. Over 95% (by weight) of these discharges consist of ten chemicals.

Four of these chemicals (phosphoric acid, sulfuric acid, nitric acid, and hydrochloric acid) affect water quality primarily by altering the pH of the water body, a chemical parameter EPA already regulates for industrial and municipal discharges to water.

Four of these chemicals (ammonium sulfate, ammonia, ammonium nitrate, and chlorine) primarily affect water quality by the introduction of ammonia or chlorine to the water body. EPA has issued water quality criteria for these chemicals. For several years, EPA has required States to pay special attention to them when developing water quality standards and regulatory control strategies. EPA also regulates the oxygen demand and the nutrient impact of all three ammonia chemicals.

For the two remaining chemicals, methanol and ethylene glycol:

Methanol is a semi-volatile chemical that biodegrades readily and is only toxic at moderately high levels.

Ethylene glycol is essentially antifreeze. Ethylene glycol is not a priority pollutant, and we do not have water quality criteria for this chemical. It is moderately toxic to aquatic organisms at high levels.

EPA will examine all of the information, including the remaining 218 chemicals (comprising less than 5% of the discharge by weight) to see if their toxicity or if the characteristics of the receiving waters require short-term or long-term attention. The environmental impact of these discharges is much more dependent on the toxicity of the chemicals and on the physical, chemical, and biological characteristics of the receiving waters than simply on the weight of these chemicals.

Q **EPA has completed its review of the State assessments under Section 304(1) of the CWA, which reported the names and locations of water bodies in the United States that are not in attainment with water quality standards. Separate lists have been prepared for waters impacted by any pollutants and for waters and point sources where water quality is entirely or substantially impacted due to priority pollutants from point sources.**

1. Was the TRI data used in these assessments?

A States may have used similar types of information in generating their lists, but the actual TRI data submitted to EPA was not been available to them at the time they did their assessments.

2. Was the TRI data used in EPA's review of the States' lists?

A Yes, to some degree. Under the Statutes, EPA had until June 4, 1990, to approve or disapprove the State lists. At a minimum, the list of facilities submitted by States and planned EPA-additions to these lists was reviewed against the list of facilities identified in the Toxics Release Inventory as discharging significant amounts of priority pollutants.

3. Will future State assessments of waters use TRI data?

A Yes. EPA will continue to review updates to State lists against the current TRI submittals and against subsequent TRI submittals.

4. What are the difficulties in resolving any differences between the lists submitted by the States and the TRI data?

A Each facility that reported under EPCRA section 313 that shows a significant release of toxics will need a separate review to determine if its receiving water should be included on future State lists of waters not meeting water quality standards. Although we expect the State lists to be generally consistent with the TRI data, in some cases, the TRI data include loadings from spills and other releases not regulated by permits. There are also some cases where States did not list waters on the Section 304(1) lists due to a lack of discharge or ambient data for some toxics. In such cases, EPA and the States will, over time, fill any data gaps by collecting (and/or having dischargers collect) additional effluent and ambient data. In some cases, this may also require permitting of previously unpermitted discharges.

Q **Which of the EPCRA section 313 chemicals are covered by water quality criteria? What are your plans to develop water quality criteria for chemicals that are on the EPCRA section 313 list, but for which criteria have not been developed? Also, are the EPCRA section 313 chemicals covered by the State water quality standards? If not, why not?**

A EPA has published water quality criteria for 80 of the EPCRA section 313 chemicals. We have a current capability to develop four to six water quality criteria a year. Obviously at this level of effort it would take us many years to complete criteria for all of the chemicals on the EPCRA section 313 list.

Because criteria and advisory development is a multi-year process, we are careful to set priorities before we begin work. First we collect a variety of toxicology and exposure information on chemicals we are considering for criteria or advisories. Then we rank the pollutants using a ranking methodology. Finally we meet with other affected offices to obtain their views before making a final selection of chemicals for criteria and advisory development. TRI data will play a major role in setting these priorities.

Once EPA issues a criteria document for a chemical, the next step is for states to adopt them as water quality standards under State law. Those standards are then used to derive enforceable NPDES permit limits for specific direct discharging facilities.

A number of the EPCRA section 313 chemicals are covered by State water quality standards. Recently, under the CWA our emphasis on adoption and revision of chemicals in State water quality standards has been on the subset of EPCRA section 313 chemicals

appearing on the CWA Section 307(a)(1) list. This is a list of 126 pollutants that Congress has identified for priority attention in EPA's water program. Our emphasis on this list for State Standards stems from the mandate in the 1987 CWA amendments that we ensure that these chemicals, in particular, are covered in State water quality standards.

We are, of course, very concerned with any pollution sources causing problems with human health or with aquatic life. We will review the TRI data, particularly in the context of our pollutant ranking described above and we do intend to move aggressively in the water quality standards area for unregulated pollutants.

Q **The Office of Prevention, Pesticides and Toxics has prepared information on the industrial categories that are responsible for the majority of the discharges of the EPCRA section 313 chemicals. What is the process for deciding whether to revise effluent guidelines or to develop new effluent guidelines to reflect the TRI information?**

A EPA is required to publish a biennial effluent guidelines plan under Section 304(m) of the CWA. The purpose of the plan is to identify those industrial categories for which effluent limitations and standards should be developed or revised. EPA's first plan was published in the Federal Register on January 2, 1990. The plan, which committed EPA to completing 8 effluent guideline regulations, is based on many sources of data and information about dischargers, including TRI. We expect to make greater use of the TRI data as further Section 304(m) plans are developed.

Q **How will the EPA use TRI to implement the Public Water Supply Supervision Program of the Safe Drinking Water Act?**

A The Office of Ground Water and Drinking Water will use the TRI data in a variety of ways to identify potential contaminants in specific geographic areas.

- In particular, these data could be source data for vulnerability assessments to determine frequency of monitoring by public water systems.
- The Office of Ground Water and Drinking Water could review chemicals reported in the TRI database for identifying candidates for future maximum contaminant level developments.
- The Office of Ground Water and Drinking Water will compare hazardous waste injection data with TRI data to identify and match those contaminants released.

Q **What is our ability to actually measure the EPCRA section 313 compounds in the environment?**

A EPA has official methods for 146 of the 308 chemicals on the EPCRA section 313 list.

Q **Has EPA been developing methods for those compounds for which adequate methods are not yet available? If not, why not?**

A We have considered developing analytical methods for the remaining 162 pollutants. These would cost somewhere between $1.5 million and $2.0 million.

We are learning about new chemicals in the environment at a very rapid rate. Data reporting efforts like the TRI are a good mechanism for us to use in deciding which methods to develop next and which chemicals to regulate next.

Q **Who should we see to get the analytical methods that EPA considers most appropriate? Who in EPA is responsible for developing these analytical methods?**

A Three offices have responsibilities for developing analytical methods: the Office of Water Regulations and Standards, the Office of Solid Waste, and the Office of Research and Development. These analytical methods are available from:

Office of Water Regulations and Standards
Bill Telliard/Ben Honaker (202-260-5131)

Office of Solid Waste
Alec McBride (202-260-4761)

Office of Research and Development
Gary McGee (513-569-7303)

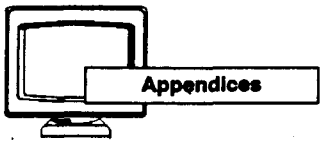
Q **How will EPA use the TRI data to improve the management of the permit program?**

A EPA will investigate the feasibility of EPA HQ/Regions/States using TRI data to determine whether permits issued to some or all of these facilities control contaminants listed as releases in the TRI report.

Office of Wastewater Enforcement and Compliance (OWEC) used TRI data to begin to identify new undetected significant industrial users discharging to POTWs and to identify illegal unpermitted discharges.

OWEC sent data to identify if additional local limits are needed for industrial users to identify whether all necessary controls have been incorporated in NPDES permits.

OWEC/Regions/States will use the data for geographic and national planning and targeting of activities to high priority areas (i.e., near coastal areas, wetlands) and to target inspections to suspected violators which could lead to permit modification, new or revised limits when the permit is reissued, or an enforcement action.



Q How will EPA use the TRI data in its coastal protection programs?

A EPA will use the TRI data in the development of management plans in the National Estuary Program and the Near Coastal Waters Program. The data will be used to identify sources of toxic discharges into nationally significant estuaries and coastal water in order to provide a basis upon which to prioritize problems and protection programs.

Q How will EPA use the TRI data in the dredging and disposal programs.

A EPA will use the TRI data in the evaluation of the potential contamination of dredged materials that are proposed for disposal in marine waters.

Underground Injection Questions

Q How is the TRI data used in the Underground Injection Control (UIC) program of the Safe Drinking Water Act?

A EPA and the implementing States verify the accuracy of TRI-reported underground injection operations to determine if these operations are properly authorized and in compliance with the program's requirements.

Q What does the TRI data show as underground injection operations?

A Generally, the largest number of listed facilities are Class I wells which are industrial or municipal disposal wells injecting below the lowermost underground sources of drinking water. These wells are expressly designed to prevent the movement of formation and disposed fluids into protected aquifers when constructed and operated in compliance with program requirements. The next group of injection wells listed are Class V wells; these wells are important since they may be directly discharging into aquifers protected by the program and are a high priority for inspection and enforcement follow-up. EPA bans injection of hazardous waste at or above underground sources of drinking water (USDWs).

Q Does EPA have any estimation of what percentage of the TRI releases to underground injection wells are going to Class I (deep underground injection or industrial or municipal wastes) wells?

A EPA receives TRI data attributable to underground injection in general as a release category. This is owing to the current structure of the reporting form, Form R, which does not differentiate between underground injection releases by well type. Other UIC volume data, reported by the States and the Regions indicate that the major percentage of TRI releases are from Class I industrial (nonhazardous) and Class I hazardous injection wells.

Q How are Class I injection wells monitored to assure against any toxic releases to the environment?

A All Class I wells are rigorously monitored to prevent any loss of injected fluids emplaced in the receiving geologic formations. Class I wells must be properly sited and adequately cased and cemented to protect USDWs and isolate the injection zone; the well casing, tubing, and annular seal must be tested for mechanical integrity; a test for any fluid movement along the borehole must be run at least every five years, and the operator must identify all wells within a specified distance from the injection well bore to assure that all abandoned wells are properly plugged so that there is no potential for fluid movement by these paths.

Q Have any Class I wells released fluids to USDWs; and if so, were these wells adequately repaired?

A Contamination of USDWs by Class I wells have been rare. EPA and the States have identified only two cases where hazardous injected wastes contaminated USDWs, and one case where a Class I well was suspected of causing contamination. All three cases occurred prior to the implementation of a State or Federal UIC program. EPA also identified eight cases where leakage from Class I hazardous wells entered non-USDW formations. These leaks were minor in nature and immediately adjacent to the well bore. Current UIC monitoring regulations would have prevented these failures. All of these cases were properly addressed by either repairing the wells, or properly plugging and abandoning operations. Class I underground injection wells are safer than virtually all other waste disposal practices.

Q What does a TRI injection discharge listing mean to an area's ground water resources?

A A listing for any particular facility may, depending on well classification and operating status, pose a threat to underground sources of drinking water. For that reason, each underground injection listing in the TRI database is checked against authorized facilities. If not properly authorized, the operation would be subject to State or EPA enforcement action. If authorized, the operation would be subject to a compliance review on prescribed schedule.

Solid and Hazardous Waste Questions

Q How can a Local Emergency Planning Committee (LEPC), and the community, use the TRI data?

A First, LEPCs can use the TRI data for emergency planning for response to chemical accidents. Specifically, they can use TRI data along with reports on chemical accidents as a risk screening tool around manufacturing facilities. The LEPCs receive notifications of accidental releases under section 304 of EPCRA. They can compare the data received under section 304 to the TRI data to help screen the risks posed by manufacturing

facilities in their community. More broadly, reviewing this information along with chemical inventory information submitted by facilities under sections 311 and 312 of EPCRA can enable communities, and LEPCs, to obtain a "chemical profile" of their community for use in planning for response to chemical accidents.

Second, the chemical profile now possible with information from EPCRA can be used to examine community-wide risks and be used in a variety of strategies to reduce those risks.

Additionally, the LEPCs can use the TRI data in conjunction with the Material Data Safety Sheets available under EPCRA and other information to respond to community requests for information under the right-to-know provisions of EPCRA.

Q What role does TRI data play in chemical accident prevention?

A TRI data are used to support two activities related to chemical accident prevention:

- TRI data are used to identify chemical-handling facilities which could benefit from information on chemical process safety for preventing accidental chemical releases.
- TRI data are used as one source of background material in learning more about facility activities. This data can assist a team in preparing for a chemical safety audit at a particular chemical-handling facility, for example.

Q Are the toxic chemicals under EPCRA regulated under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)?

A Approximately 200 toxic chemicals listed under EPCRA section 313 are also CERCLA hazardous substances. Toxic chemicals that are also CERCLA hazardous substances are subject to all of the requirements of CERCLA, as amended, such as reporting, liability, financial responsibility, cleanup, and penalties.

Q How are the EPCRA section 313 reporting requirements similar to CERCLA reporting requirements?

A There are few similarities between the reporting requirements of EPCRA section 313 and those of CERCLA section 103. Section 313 requires the owner or operator of a facility where a toxic chemical is manufactured, processed, or otherwise used to submit a toxic chemical release form to the EPA when the quantity of the toxic chemical exceeds the threshold quantity established by section 313(f) of EPCRA.

The reporting requirements of section 103 of CERCLA require any person in charge of a vessel or facility to report the release of a hazardous substance into the environment, in a quantity equal to or greater than its reportable quantity, to the National Response Center. The purpose of reporting under CERCLA section 103 is to allow the Federal government to assess each reported release to determine if a response action is warranted.

In addition, EPCRA section 304 requires reporting of these releases to State and local authorities.

Q How many EPCRA section 313 chemicals are regulated under the Resource Conservation and Recovery Act (RCRA)?

A Approximately two-thirds of the EPCRA section 313 chemicals are regulated under RCRA.

The criteria used for listing wastes as hazardous does include the presence of hazardous constituents, many of which are toxic chemicals. As such, many of the EPCRA section 313 chemicals are regulated under RCRA when present in hazardous wastes.

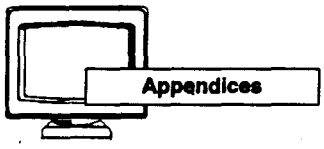
Thirty-five of the EPCRA section 313 chemicals are currently used to identify a waste as a characteristic hazardous waste. When such chemicals are found in the waste above specified levels, the waste is subject to RCRA regulation.

In addition, 135 of the EPCRA section 313 chemicals are also listed as hazardous wastes when they are unused, discarded commercial chemical products.

Q Are all land releases reported to the inventory regulated under RCRA?

A Some land releases may be accidental releases that are not regulated by RCRA. Most of the land releases reported to the inventory fall under one of the following categories: on-site disposal of hazardous wastes which are regulated under RCRA or authorized state hazardous waste programs; industrial solid waste or waste from mining and mineral processing activities that would be regulated under state solid waste management programs in so far as they do exist. Some mineral processing wastes are regulated as hazardous wastes.

Under EPCRA section 313, facilities that manufactured or processed 25,000 pounds or used 10,000 pounds of a listed chemical must report. Under RCRA, only those facilities that generate more than 100 kilograms (kg) of hazardous waste per month must report.



Q Can you make direct comparisons between TRI data and data in the RCRA program for amounts of hazardous waste generated, waste minimization, etc.?

A It is difficult to make comparisons for several reasons:

The TRI database reports individual chemical constituent data; RCRA reports wastes in wastestreams which are substantially larger volumes. RCRA hazardous waste stream may or may not contain EPCRA section 313 chemicals.

TRI reports toxic chemicals released to air, land, water; data collected in the RCRA program reports hazardous waste generation and management in regulated land disposal, incineration, storage, or treatment units.

RCRA also distinguishes between regulated and exempt wastes. A particular EPCRA section 313 chemical may occur in a waste that is exempt and need not be reported under RCRA. EPCRA section 313 does not make this distinction. (Example: Certain wastewater treatment activities are exempt from RCRA, as are small quantity generators who generate less than 100 kg/month of hazardous waste).

Standard Industrial Classification (SIC) code data in TRI are limited to categories 20 through 39; RCRA is not limited by SIC code.

Under RCRA, hazardous waste generators are required to report on existing or planned waste minimization activities at facilities on a biennial basis. The current reporting forms request information on reduction the volume of waste generated. These data differ from TRI data in that they are reported specifically on RCRA waste streams rather than individual chemical constituents. EPA's Office of Solid Waste is exploring approaches to refine the utility of the waste minimization data collected through the biennial reporting system and to coordinate results with TRI data.

The biennial report does request the CAS number of EPCRA section 313 chemicals that are contained in RCRA wastestreams, to facilitate a link between the two data sources.

Q How many facilities are regulated by the RCRA program and what is the overlap with facilities that report for TRI?

A Under Subtitle C, RCRA regulates about 4800 treatment, storage, incineration, and land disposal facilities: including 1500 land disposal facilities; 350 incinerators; 3000 storage/ treatment facilities; more than 200,000 large and small quantity generators; and about 18,000 transporters. These sites and facilities are listed in the Resource, Conservation and Recovery Information System (RCRIS) and may be cross-checked with EPCRA section 313 facilities by EPA ID number.

Of the 200,000 large and small quantity generators that are regulated under Subtitle C of RCRA, approximately 17,000 of the large quantity generators (LQGs) report to RCRA's biennial reporting system. Approximately 10,000 of these LQGs are listed in EPCRA section 313 SIC codes 20 - 39, and of these, approximately 7,000 sites report for TRI.

Q How are TRI releases that are hazardous wastes regulated?

A Hazardous wastes must be stored, treated, or disposed in hazardous waste management units regulated under the RCRA or under authorized state laws. Hazardous waste land disposal units, including landfills, land treatment, surface impoundments and waste piles must meet applicable design and operating controls such as liners and leak detection systems and ground water monitoring systems to detect releases out of the unit. All facilities that store, treat, or dispose of hazardous wastes are subject to corrective action requirements to clean up hazardous wastes or hazardous constituents which migrate from any waste management unit at the facility. Although EPCRA section 313 counts placement of toxic chemicals in some of these management units as releases, they are not uncontrolled releases to the environment.

Q How will the TRI data be useful for hazardous waste minimization efforts?

A The data collected in the TRI differ from the RCRA data in some significant ways. Industry profiles of emissions and pollution prevention efforts from the TRI database may help supplement RCRA data for targeting multi-media pollution prevention problems. However, the data are not directly comparable because EPCRA section 313 requires reporting of facility release data based on a list of specific chemical names, whereas RCRA collects data on process specific waste streams, which may have mixtures of chemicals. The TRI and RCRA databases also have different criteria for determining who must report data.

TOXICS RELEASE INVENTORY DATA QUALITY PROGRAM

The goals of the U.S. Environmental Protection Agency's (EPA's) data quality program for the Toxics Release Inventory (TRI) are to (1) identify and assist facilities that must report so that data submitted will be of the highest quality; (2) insure high quality data entry; (3) correct and normalize as much of the submitted data as possible in order to maximize the utility of the data; and (4) accurately assess the relative validity of release estimates and other data.

Identification and Assistance to Facilities

Through mass mailings to all facilities within the manufacturing sector of the economy, work with a wide variety of trade associations, hosting local and national seminars and enforcement activities, EPA has endeavored to locate all facilities required to report under section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and inform them of their obligations. In addition, EPA has prepared various materials to assist facilities in complying with the Act. These include detailed reporting instructions, a question-and-answer document, magnetic media reporting instructions, and 18 industry-specific guidance documents. In addition, EPA maintains a toll-free hotline to answer technical and other questions to assist facilities.

Data Entry Quality Activities

EPA continues to place a high emphasis on data entry accuracy within the Toxics Release Inventory Database. EPA's internal review of 3% of the records showed a data entry accuracy rate of over 99%. This is up from a Reporting Year 1987 rate of 97.5%. EPA continued the computerized edit checks at the point of data entry, including a high percent of verification and formalization of data reconciliation activities. EPA mailed copies of the emission numbers to all reporting facilities to allow them to verify the entered data. EPA also received over 4000 facilities reporting on magnetic media which ensure against data entry errors.

Normalization of Data

Because Congress has required that EPA make the TRI data available to the public through computer telecommunications, EPA has found it necessary to undertake a variety of activities to make the data more useable. This is due to the fact that computers only retrieve data in exactly the format as requested (e.g., if asked for "Los Angeles," the computer will not be able to identify facilities listed under "LA"), and facilities report their data in a wide variety

of ways. As a result, EPA has taken steps to use a consistent name for all counties, used a variety of nomenclature standards for names within the database (to ensure, for example, that all filings for a particular company can readily be identified), inserted latitude and longitude for the center of the zip code in which the facility is found, and took other steps to assist in the utilization of the data.

EPA generates a facility identification number at the time of data entry. Linkage between all years of reports has been made to the best of EPA's ability. This allows easy retrieval of cross-year data even when a facility is sold or changes its name. The identification number has been sent to all facilities. Facilities are required to use this number on all future Form R reports submitted to the Agency. Use of this number facilitates data quality and cross-year analysis.

Accuracy Evaluations

EPA will continue the practice instituted for the 1987 Reporting Year of contacting by telephone facilities failing certain edit checks for quality of the technical data submitted on the TRI Reporting Form. Emphasis will be placed on significant changes in reported releases between 1987, 1988, 1989, and 1990 submissions.

Similarly, EPA will continue its program of conducting site visits to evaluate the accuracy of emissions estimates. Data from site visits to reporting facilities are being used to evaluate quantitatively the accuracy for reported releases, and to educate reporting facilities so that the quality of submissions will improve in the future as well.

In addition, EPA has developed a guidance manual for EPA Regional inspectors on what to look for when auditing an EPCRA reporting facility. The manual contains detailed guidance on how to determine if a facility has identified all reportable chemicals and calculated thresholds properly and if the releases seem reasonable.

EPA will continue to review the quality and useability of the TRI data to identify additional ways to insure the high consistency and reliability of the TRI data.

SUMMARY OF EPA PROGRAM OFFICE, REGIONAL OFFICE AND STATE USES OF THE TOXICS RELEASE INVENTORY DATA

OFFICE OF AIR AND RADIATION (OAR)

OAR has used the Toxics Release Inventory (TRI) data for a variety of tasks related to the implementation of the Clean Air Act Amendments of 1990 (CAAA). Title III of the CAAA requires EPA to develop Maximum Achievable Control Technology (MACT) standards for major sources of 189 toxic air pollutants. TRI was used to estimate the number of major sources (greater than 10 tons per year of any single toxic or 25 tons per year of total toxics) in each of 700 source categories. This information helped to prioritize the source categories for regulatory development. In addition, the impacts of a potential lower major source definition for 47 highly toxic compounds were also analyzed using TRI data. TRI currently requires reporting for all but 16 of the 189 toxic compounds specified in Title III of the CAAA. Expansion of TRI to cover most of these 16 is anticipated in the near future.

OAR also used TRI to identify specific facilities which will be impacted by the first MACT standards, so that they could be contacted about applying for the Early Reductions Program. This program is a means of getting enforceable reductions of toxic emissions before a regulation is put in place.

TRI was used to help identify the 30 air toxic compounds to be included in the Urban Area Source Program mandated by section 112(k) of the CAAA. OAR has also used TRI to expand the coverage of our "Locating and Estimating" series of documents, which help State and local air agencies identify potential source categories of air toxics in their communities. Similar data have been incorporated into the Crosswalk database, which identifies which source categories emit which toxic compounds. OAR is developing a series of air quality indicators to track progress in implementing the CAAA. Trends in the TRI data are envisioned to be a part of those indicators.

OFFICE OF POLLUTION PREVENTION AND TOXICS (OPPT)

The OPPT Existing Chemicals Program continues to use the TRI data for risk screening, testing and pollution prevention activities in the RM1 and RM2 assessment processes. TRI data serve as a major input to exposure and risk assessments in OPPT. The TRI is especially important to OPPT's new initiatives on pollution prevention. TRI data are used for targeting chemicals, uses, and facilities for pollution prevention assessment and for evaluating pollution prevention actions. TRI data are also used by the Chemical Assessment Desk and other OPPT outreach efforts in responding to inquiries from a variety of sources.

OPPT's Economics and Technology Division (ETD) has developed software that contains health and ecotoxicity information on most of the section 313 chemicals. This software called PC-TRIFACTS enables the TRI data user to better understand the potential health and ecological effects of chemical releases identified in the Toxics Release Inventory. TRIFACTS was made available in January, to a wide audience of TRI data users, and has had a very positive response.

ETD has used media specific TRI releases for several SIC codes to determine markets and chemicals for a pilot project called the Information Disclosure Project Study. This is a program designed to investigate what problems exist in communicating pollution prevention information about chemicals from the manufacturers to end users.

Since 1989, OPPT has prepared annual reports that summarize and compare current and historical TRI data. Although this effort will generally continue in 1992, the TRI data will assume a new role as OPPT produces a new annual report to supersede the TRI national reports. Beginning this year, ETD will be consolidating TRI information on toxic chemical releases and transfers with related information about pollution prevention, progress in the 33/50 Program and commercial chemical production data. The purpose of the new report is to better integrate chemical waste stream data with the broader issue of chemicals in society. Tentatively titled "Pollution Prevention and Toxics - 1992", the report should help create a new framework for thinking about toxic chemical pollution in the context of commercial chemical use.

OPPT's Pollution Prevention Division (PPD) used TRI data as a screening tool to prioritize proposed regulations and industrial source categories to promote prevention in rulemaking. As a result, the Pollution Prevention Senior Policy Council has identified a number of regulatory development efforts that will be targeted to incorporate prevention. PPD is continuing to work with the 33/50 Program to develop a plan that will use TRI data to measure progress made in reaching the 33/50 goals.

Furthermore, PPD is using the TRI data to conduct a study of the reported differences in releases of TRI chemicals from 1989 and 1990. The study will help to distinguish the changes due to estimation/measurement methods or production activities versus changes due to other

factors such as source reduction, recycling or treatment. The results of this project will be used to further develop the methodology to assess changes over time using the source reduction and recycling data that will become available with the 1991 reporting year.

Office of Enforcement (OE) and Office of Compliance Monitoring (OCM)

OE, OCM and the EPA Regions continue to use TRI data as a tool in inspection targeting and enforcement. In addition, the TRI data are being constantly evaluated with an eye towards sector-wide EPCRA initiatives. Finally, the data are included in a new enforcement data base system which is being used to develop and implement multi-media/multi-statute cases and initiatives.

OCM and OE cross-check data collected under EPCRA and the Toxic Substances Control Act (TSCA) to identify those facilities or types of businesses which reported for some but not all of the reporting rules. Enforcement personnel are able to identify additional facilities owned by the same corporation or by the same parent company that may be subject to liability, by using TRI data and the Facility and Company Tracking System (FACTS).

OCM uses the TRI data in its EPCRA Targeting System (ETS), which provides local access to TRI and FACTS data for all facilities subject to EPCRA section 313 requirements. ETS supports creation of prioritized inspection targeting lists, generated from a wide array of selection criteria, and daily targeting activities such as contacts with facilities and tracking tips and complaints. Currently, nine out of ten Regional field offices have been introduced to this new system.

The Multi-media Coordination Team (MCT), which was established in OE during the summer of 1991 as an experimental unit, is using TRI data through the Integrated Data for Enforcement Analysis (IDEA) System. IDEA provides integrated data on individual facilities' compliance records for most of the statutes administered by EPA through access to approximately ten separate data bases, including the Toxics Release Inventory System (TRIS). The TRI data aid OE in developing enforcement initiatives by providing a point of departure for distinguishing between industrial sectors based on potential risk, in terms of types of chemicals reported, total pounds of toxic chemicals released, types of releases, and average pounds released per facility.

OE staff routinely access TRI data on facilities for which violations under other statutes have been identified, with an eye toward including EPCRA violations in the same case or using the information as leverage in negotiations.

TRI data continue to be extremely helpful in identifying pollution prevention projects. Enforcement staff use data on releases and transfers to identify (or evaluate) projects that will significantly reduce emissions, or those that will help prevent or minimize the release of extremely hazardous substances under EPCRA section 302.

OCM places a high priority on enhancing the use of TRI data among Regional field personnel. During FY 1993, OCM is planning to issue additional guidance to the field offices on the resources available to their inspectors in identifying non-reporters, late reporters and data quality errors. These resources provide the inspectors with valuable information extrapolated from the Toxics Release Inventory, such as facility reporting rates, processes, and releases.

Office of Solid Waste and Emergency Response (OSWER)

TRI data may assist in priority setting for waste minimization efforts by OSWER. In combination with other information OSWER collects on waste minimization, TRI data are useful in analyzing long-term trends and identifying particular industry practices that warrant attention by the program. These are some of the ways in which TRI data can serve OSWER pollution prevention goals.

With respect to enforcement, TRI data supplement other existing data sources and can be called on to assist in the development of OSWER enforcement priorities. TRI data also are valuable as a means of establishing liability under both the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Resource Conservation Recovery Act of 1976 (RCRA) statutory authorities.

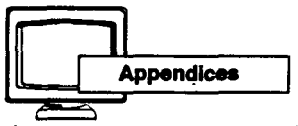
Another site-specific function of the TRI data base relates to its role in providing emission information that can be used when developing emission inventories for the Superfund site discovery program and when undertaking Superfund preliminary assessments of sites. In the reportable quantity (RQ) program, TRI data could be used in analysis to support future rulemaking under CERCLA (e.g. designation of additional hazardous substances). In addition, states will be using the TRI data in conjunction with other data obtained under EPCRA for accident prevention planning.

Office of Water (OW)

OW has used TRI data for identifying candidates for the National Primary Drinking Water Regulations. Chemicals were identified that had a dramatic overall increase (doubling or more) of discharges and releases via routes relevant to drinking water contamination. These chemicals were considered good candidates for regulation development in drinking water.

TRI data were used as a screening mechanism for possible sources of wellhead contamination. Using TRI and other relevant data in a Geographic Information System (GIS) potential contamination sources have been identified. These sources may affect community groundwater systems in the development and implementation of wellhead protection programs. Regions are continuing to coordinate ground-water programs, using GIS as a cross-program tool.

OW is also using the TRI data in development of management plans to identify the sources of toxic discharges into selected estuaries and coastal waters. In addition, the data are being used to identify sources of toxic discharges that may contaminate sediments that are proposed for ocean dumping.



Under the Watershed Protection Approach (WPA), the Regions are using TRI data along with other data in assessing loadings to their watersheds. They are identifying multi-media sources of toxic discharges to receiving waters.

Office of Water Enforcement and Compliance (OWEC) identified industrial users with the greatest contribution of toxic pollutants to city sewer systems. The industries were identified and facility names were provided to the regions for further evaluation.

OWEC used TRI data to identify industrial users (IUs) subject to pretreatment standards that are located in cities which are not required to have pretreatment programs. Further work will compare location of users to cities without approved pretreatment programs and may be a way of identifying IUs for which EPA is responsible. The data were also used in compiling the *Report to Congress on the National Pretreatment Program*. The data and analysis were used to examine what the next steps of the national pretreatment program should be. TRI data were used in providing a broad picture of the types and sources of pollutants discharged to POTWs, and in setting priorities.

OW in developing effluent guidelines needs to understand which pollutants are released from pesticide manufacturing facilities and the pattern of releases when considering an industrial category for effluent guideline development.

Some TRI data are useful for screening purposes. However, Effluent Guidelines Program screens for a number of pollutants not in TRI. Many pollutants and industries that will be addressed by effluent guidelines are currently reported in TRI.

EPA Regional Offices' Use of TRI Data

The Regions continue to focus their efforts in enforcement and outreach with the TRI program. The scope of enforcement is broadened now to include multi-media targeting for inspections that include EPCRA, TSCA, Air, Water, and the RCRA programs. Region 5 is also using it in their Lead Enforcement Assessment Project (LEAP). Use of the TRIS database has increased. Most regional program offices access TRIS directly. Several Regions report that states are now accessing TRIS directly, most frequently in their environmental protection departments.

TRI data are being used to look for reductions in section 313 chemical releases, this is to follow-up on facility pollution prevention efforts. The 33/50 Regional programs are using the TRI data to target facilities for workshops and regional meetings.

The Chesapeake Bay (Region 3) and Great Lakes Programs (Regions 2, 3, and 5) continue to update their databases to survey toxic chemicals entering the Bay and Great Lakes Basins.

The Gulf of Mexico Program (OW) is developing information management capabilities to use the TRI data to support the following efforts in the gulf coast region: nutrient enrichment, living aquatic resources, marine debris, habitat degradation, public health, coastal and shore line erosion, and toxics and pesticides content.

States' Use of TRI Data

There has been an evolution in state TRI programs, particularly noticeable in the past year. The processing of TRI data has become more computerized, 27 of the states currently have entered the TRI data on computer (some states have a very limited data set, others the complete database). As a result, outreach activities are now focusing not just on how to complete the Form R, but making the data more accessible to the public. The states are now providing technical assistance to industry that enables them to provide better estimates and a more complete data set and enables the public to better understand the data. Press releases are generally provided to the local media, with explanations on what the releases mean at the state and local level.

State use of the TRI data has from the start been used for outreach and enforcement purposes. The past year is showing that the states are now using the data in their media programs and to measure pollution prevention. The results of these analyses are being included in state annual reports on toxic chemical releases. Last year 17 states published TRI annual reports.

FACT SHEET FOR EPA'S 33/50 PROJECT

BACKGROUND

- Administrator negotiates voluntary reduction agreements with the nine "ATERIS" companies for an 83% reduction by 1993 (August 1989)
- Science Advisory Board report (9/90) and Pollution Prevention Act (10/90) embody the principles of multimedia pollution prevention
- Administrator announces goals of 33% reduction by 1992, 50% by 1995 for high priority chemicals, through a voluntary program stressing pollution prevention (9/90)

FORMALIZING THE 33/50 PROJECT

- EPA identifies 17 chemicals, all of which (a) are serious health and environmental concerns, (b) are high volume industrial chemicals with substantial releases, and (c) can be reduced through pollution prevention
- EPA forms the Special Projects Office to staff 33/50, with Agency-wide workgroup to help coordinate efforts
- 33/50 staff identifies 13,000 TRI facilities (over 7,000 companies) that reported one or more of the 17 chemicals
- Administrator letter mailed to the 600 companies with the largest releases and transfers (1/9/91)
- Numerous meetings with industry groups, beginning with the Chemical, Petroleum, Paper and Transportation industries
- Press conference formally announces the 33/50 Program (2/7/91)
- Letters mailed to remaining 6,000 companies (July 91)
- First 33/50 Progress Report released, and Program Certificates mailed to first round of participants (July 1991)

CURRENT STATUS OF 33/50 PROJECT

- Company reduction letters are available to the public through a Public Docket, and other distribution channels
- Second Progress Report released March 1992
- Over 1,000 company responses thus far, with more than 730 firm commitments to the program for reductions of at least 304 million pounds by 1995.

Contact Susan Hazen or William Burch at 202-260-6394
For Further Information.

Table 26. 33/50 Chemicals, Releases and Transfers, 1988-1990.

Chemical	1988		1989		1990	
	Releases Pounds	Transfers Pounds	Releases Pounds	Transfers Pounds	Releases Pounds	Transfers Pounds
Benzene	31,797,436	3,496,498	28,134,603	3,060,042	25,810,289	2,859,450
Cadmium and cadmium compounds	518,965	1,310,795	476,390	733,699	516,117	1,294,665
Carbon tetrachloride	3,896,681	1,354,775	3,583,303	1,720,485	1,708,298	1,121,527
Chloroform	25,096,706	2,695,995	27,274,015	1,944,369	22,911,364	1,953,009
Chromium and chromium compounds	41,998,369	27,938,280	37,558,151	29,146,124	22,936,025	26,196,222
Cyanide compounds	8,064,267	4,074,463	9,860,390	2,575,622	6,935,847	1,706,145
Dichloromethane	127,982,606	25,709,366	127,763,823	14,375,962	93,551,682	9,766,926
Lead and lead compounds	30,331,618	30,637,030	23,149,105	31,019,706	22,682,234	53,606,084
Mercury and mercury compounds	41,223	277,365	35,900	190,168	28,591	204,651
Methyl ethyl ketone	136,527,240	31,742,093	135,230,911	30,341,487	121,591,413	19,428,687
Methyl isobutyl ketone	33,589,350	12,761,065	32,456,613	7,808,030	27,445,494	5,745,393
Nickel and nickel compounds	4,777,552	14,013,442	6,311,211	17,032,688	7,374,847	11,846,127
Tetrachloroethylene	35,826,930	5,925,840	27,353,964	4,697,663	21,678,530	4,716,786
Toluene	290,531,489	68,213,050	266,758,414	66,846,769	235,791,973	40,070,781
1,1,1-Trichloroethane	174,951,149	19,992,360	173,545,576	16,765,058	161,480,342	12,197,379
Trichloroethylene	54,659,253	6,611,568	50,019,600	4,946,400	37,926,116	3,630,897
Xylene (mixed isomers)	163,297,326	45,097,130	162,101,453	38,364,377	149,623,442	24,004,118
Total	1,163,888,160	301,851,115	1,111,613,422	271,568,649	959,992,604	220,348,847

NEW FORM R DATA REQUIREMENTS UNDER THE POLLUTION PREVENTION ACT OF 1990

The new data elements to be reported under the Toxics Release Inventory (TRI) beginning in 1991 are described in Section 6607(b) of the Pollution Prevention Act of 1990. In addition, Section 6607(d) provides for facilities to submit optional information in addition to the items detailed in (1) through (8) below:

(1) The quantity of the chemical entering any waste stream (or otherwise released into the environment) prior to recycling, treatment, or disposal during the calendar year for which the report is filed and the percentage change from the previous year. The quantity reported shall not include any amount reported under paragraph (7). When actual measurements of the quantity of a toxic chemical entering the waste streams are not readily available, reasonable estimates should be made on best engineering judgement.

(2) The amount of the chemical from the facility which is recycled (at the facility or elsewhere) during such calendar year, the percentage change from the previous year, and the process of recycling used.

(3) The source reduction practices used with respect to that chemical during such year at the facility. Such practices shall be reported in accordance with the following categories unless EPA finds other categories to be more appropriate.

- (A) Equipment, technology, process, or procedure modifications.
- (B) Reformulation or redesign of products.
- (C) Substitution of raw materials.
- (D) Improvement in management, training, inventory control, materials handling, or other general operational phases of industrial facilities.

(4) The amount expected to be reported under paragraphs (1) and (2) for the two calendar years immediately following the calendar year for which the report is filed. Such amount shall be expressed as a percentage change from the amount reported in paragraphs (1) and (2).

(5) A ratio of production in the production (reporting) year to production in the previous year. The ratio should be calculated to most closely reflect all activities involving the toxic chemical. In specific industrial classifications subject to this section, where a feedstock or some variable other than production is the primary influence on waste characteristics or volumes, the report may provide an index based on that primary variable for each toxic chemical. The Administrator is encouraged to develop production indexes to accommodate individual industries for use on a voluntary basis.

(6) The techniques which were used to identify source reduction opportunities. Techniques listed should include, but are not limited to, employee recommendations, external and internal audits, participative team management, and material balance audits. Each type of source reduction listed under paragraph (3) should be associated with the techniques or multiples of techniques used to identify the source reduction technique.

(7) The amount of any toxic chemical released into the environment which resulted from a catastrophic event, remedial action, or other one-time event, and is not associated with production processes during the reporting year.

(8) The amount of the chemical from the facility which is treated (at the facility or elsewhere) during such calendar year and the percentage change from the previous year. For the first year of reporting under this subsection, comparison with the previous year is required only to the extent such information is available.

ADDITIONAL OPTIONAL INFORMATION - Any person filing a report under this section for any year may include with the report additional information regarding source reduction, recycling, and other pollution control techniques in earlier years.

PUBLIC ACCESS TO THE TOXICS RELEASE INVENTORY

EPA believes that increased citizen and community awareness of environmental issues and their involvement in the decision-making process is important to developing successful environmental programs. In addition, the Agency recognizes that effective pollution control and prevention depends on state and local government, industry, and the public, as well as the Federal government. EPA is fully committed to carrying out the Emergency Planning and Community Right-to-Know Act (EPCRA), which mandates that the Toxics Release Inventory (TRI) be made available to the public through telecommunications and other means. The Agency is providing many avenues of access and technical assistance to meet the needs of the varied TRI users to enable them to obtain and use the data collected by EPA.

As an integral part of EPA's efforts, the Agency has implemented an outreach program which identifies intermediary groups, such as librarians, journalists, trade associations, national public interest and environmental groups, and States, to assist in making the various constituencies aware of the availability and potential uses of the TRI. Developing the appropriate mix of products, activities, and routes of access for a variety of interested users is crucial to meeting EPA's goals for public access to TRI data.

A chart of TRI and TRI related products and activities, and their routes of access is shown below.

Product/Activity	Route of Access
Public Database for Toxics Release Inventory (online access) and training and materials	National Library of Medicine 301-496-6531
Hardcopies of TRI Reporting Forms--original or from database for 1987, 1988, 1989 and 1990	Title III Reporting Center 202-488-1501; State TRI Contacts
Magnetic Tapes of the TRI Database, including 1990 data	National Technical Information Service (NTIS) 703-487-4763; Government Printing Office (GPO) 202-275-0186

Product/Activity	Route of Access
State Diskettes in dBASE or LOTUS format for all reporting years (1990 data available in June 1992); a MacIntosh version is available for 1989 and will be available for all subsequent years	NTIS or GPO
Compact Disk--Read Only Memory (CD-ROM) version 1987-1989; (1987-1990 available July 1992)	NTIS, GPO, Depository Libraries, EPA Regions and some States
The TRI National Reports (covering 1987-1989 data)	EPCRA Information Hotline 800-535-0202
"Chemicals in Your Community; A Guide to the Emergency Planning and Community Right-to-Know Act"	EPCRA Information Hotline
Public Database for Integrated Risk Information System (IRIS)--online access and training and materials for obtaining information on TRI chemicals	National Library of Medicine TOXNET System 301-496-6531
Roadmap Database to provide assistance to TRI users for identifying regulations and risk assessments on TRI chemicals	EPCRA Information Hotline
"Risk Screening Guide"--methodology for evaluating TRI data for environmental managers	EPCRA Information Hotline
TRI User Support Service Search Assistance NLM/TOXNET online search training	TRI US 202-260-1531
"Chemicals, the Press and the Public"--A Journalists' Guide to Reporting on Chemicals in the Community	Environmental Health Center National Safety Council 1050 17th. St., NW, Suite 770 Washington, DC 20036

NATIONAL LIBRARY OF MEDICINE FACT SHEET

TRI Defined

The TRI (the Toxics Release Inventory) series of files contains information on the annual estimated releases of toxic chemicals to the environment. Based upon data collected by the Environmental Protection Agency (EPA), this file is publicly accessible online through the National Library of Medicine's (NLM) Toxicology Data Network (TOXNET).

TRI Background

Mandated by section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, the Inventory contains provisions for the reporting, by industry, on the releases of over 300 toxic chemicals into the air, water, and land. Data submitted to EPA include names and addresses of facilities which manufacture, process, or otherwise use these chemicals, as well as amounts released to the environment or transferred to waste sites. EPCRA section 313 calls for the EPA to collect this data nationwide on an annual basis. The Law mandates that the data be made publicly available through a computer database. The online TRI files are being widely used by industry, state and local environmental agencies, emergency planning committees, the Federal Government, and other regulatory groups. Another important user group is concerned citizens who, on their own or through public interest groups and public libraries, can use TRI to ask questions about chemical releases in their communities.

TRI File Structure

TRI data are arranged in the following broad categories:

Facility Identification
Substance Identification
Environmental Releases of Chemical
Waste Treatment
Off-Site Waste Transfer

The data include the names, addresses and public contacts of plants manufacturing, processing or using the reported chemicals, the maximum amount stored on site, the estimated quantity emitted into the air (point and non-point emissions), discharged into bodies of water,

injected underground, or released to land, methods used in waste treatment and their efficiency, and data on the transfer of chemicals off-site for treatment/disposal, either to publicly owned treatment works or elsewhere.

SEARCHING TRI

TRI is a component of NLM's TOXNET system. Utilizing a free text search capability, full Boolean logic, a powerful and flexible command language and a variety of online user assistance features, TOXNET offers state-of-the-art user-friendly searching. Online and offline printing of entire or specified portions of records is available, as are a variety of customized print options. Special TRI features allow sorting and numerical manipulation of data. TOXNET's CROSSFILE capability enables users to search several years' worth of TRI data simultaneously. A menu-driven search package is also available for novice users to assist them in searching TRI.

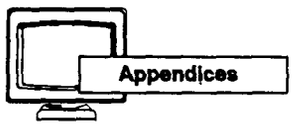
TRI IN ACTION

TRI searchers, through the use of command language and menu-driven interface, are able to pose such questions as:

- How much benzene was reported released to waterways last year by Virginia industrial plants?
- What waste minimization methods are reported by Marin County manufacturers of toluene?
- How much chlorine gas have entire plants of Company XYZ released into the air last year throughout the country?
- What are the names and addresses of Baltimore steel plants importing lead?
- What quantity of sulfuric acid at Boston's ABC Waste Treatment Facility is transferred there from outside the State of Massachusetts?

TRI AVAILABILITY

TRI is available 24 hours/day, 7 days/week.



TRI Access

Registered NLM online services users are able to access TRI on the TOXNET system by direct dial or through various telecommunication networks including SPRINTNET, TYMNET, or COMPUSERVE. TRI users also automatically have access to all TOXNET files and can access other NLM files, through the TOXNET Gateway. In addition to TRI, TOXNET contains HSDB (Hazardous Substances Data Bank), RTECS (Registry of Toxic Effects of Chemical Substances), CCRIS (Chemical Carcinogenesis Research Information System), DART (Developmental and Reproductive Toxicology), ETICBACK (Environmental Teratology Information Center Backfile), EMICBACK (Environmental Mutagen Information Center Backfile), GENE-TOX and IRIS (Integrated Risk Information System). Other NLM files, such as the TOXLINE/TOXLIT group, containing over 3 million references on literature related to toxic chemicals, may be used to obtain supporting information in such areas as health hazards and emergency handling of TRI chemicals.

TRI User Services

For further information about the TRI file and about access to it, contact:

TRI Representative
Specialized Information Services
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
Telephone (301) 496-6531

POTENTIAL HEALTH AND ENVIRONMENTAL EFFECTS OF 15 HIGH RELEASE/TRANSFER EPCRA SECTION 313 CHEMICALS

Summaries of health and environmental effects of the 15 EPCRA section 313 chemicals that were released or transferred off-site in greatest quantity in 1990 are given below. The list of 15 chemicals contains 12 discrete chemicals (xylene isomers are considered as one chemical here) and three groups of metal compounds (copper, manganese, and zinc compounds). Included in the list of 12 discrete chemicals are five nonmetal inorganic chemicals (ammonia, chlorine, hydrochloric acid, phosphoric acid, and sulfuric acid) and seven organic chemicals (acetone, dichloromethane, methanol, methyl ethyl ketone, toluene, 1,1,1-trichloroethane, and xylene).

Nonmetal Inorganic Chemicals

Ammonia

Ammonia is a corrosive and severely irritating gas with a pungent odor; it can also exist in aqueous solutions. Ammonia is irritating to the skin, eyes, nose, throat and upper respiratory system. For carcinogenicity EPA has categorized ammonia into Group D; EPA has classified ammonia as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects, EPA has established an inhalation reference concentration (RfC) of 0.1 milligram per cubic meter (mg/m^3) for ammonia. The RfC is based on data collected from a chronic occupational exposure study. The RfC assumes that a person, breathing 20 cubic meters a day, can be exposed over a lifetime to daily atmospheric amounts of less than 2 mg of ammonia without appreciable risk for adverse non-cancer effects.

Ammonia is expected to have moderate toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to be between 0.1 and 1 milligram per liter (mg/L). Ammonia may also affect the ability of an aquatic system to support life by being a source of nitrogen, an essential element for aquatic plant growth. In this capacity ammonia may contribute to eutrophication of standing or slow moving surface water. Eutrophi-

cation may stimulate the overgrowth of algae whose death and decay may lead to depletion of dissolved oxygen in the water. Low levels of dissolved oxygen in water can adversely alter the population structure of the aquatic system.

Chlorine

Chlorine is a corrosive and severely irritating gas with a suffocating odor. Contact with moisture (e.g., in mucous membranes) results in the formation of hydrochloric acid. This can result in severe damage to the skin, eyes, nose, throat, upper respiratory tract and the lung. EPA has not evaluated chlorine for potential carcinogenicity. EPA has not established an oral reference dose (RfD) or an inhalation reference concentration (RfC) for chlorine for non-cancer effects. An inhalation RfC is currently under Agency review.

Chlorine is expected to have high toxicity to aquatic organisms. Concentrations lethal to half the organisms in a test population are expected to be less than 0.1 milligram per liter (mg/L).

Hydrochloric Acid

Hydrochloric acid (HCl) is an aqueous solution of hydrogen chloride gas; its vapors have a pungent odor. Hydrochloric acid and hydrogen chloride gas are severely irritating to the skin, eyes, nose, throat and upper respiratory tract. EPA has not evaluated hydrochloric acid for carcinogenicity. For non-cancer effects, EPA has established an inhalation reference concentration (RfC) of 0.007 milligram per cubic meter (mg/m^3) for hydrochloric acid; the overall confidence in this RfC is low. The RfC assumes that a person, breathing 20 cubic meters a day, can be exposed over a lifetime to daily atmospheric amounts of less than 0.14 mg of hydrogen chloride without appreciable risk for adverse non-cancer effects.

Hydrochloric acid is expected to have low toxicity to aquatic organisms. Concentrations lethal to half the organisms in a test population are expected to exceed 1 milligram per liter (mg/L). However, depending on the buffering capacity of receiving water, hydrochloric acid can contribute to the lowering of pH. A pH lower than five is generally considered to be unsuitable for the reproduction of sensitive aquatic populations.

Phosphoric Acid

Phosphoric acid (H_3PO_4) exists as either a solid or thick liquid. Aqueous solutions of phosphoric acid are corrosive and irritating to the skin, eyes, and mucous membranes. EPA has not evaluated phosphoric acid for carcinogenicity. EPA has not established an oral reference dose or inhalation reference concentration for non-cancer effects of phosphoric acid.

Phosphoric acid is expected to have low toxicity to aquatic organisms. Concentrations lethal to half the organisms in a test population are expected to be greater than 1 milligram per liter (mg/L). However, depending on the buffering capacity of receiving water, phosphoric acid can contribute to the lowering of pH. A pH lower than five is generally considered to be unsuit-

able for the reproduction of sensitive aquatic populations. Phosphoric acid may also affect the ability of an aquatic system to support life by being a source of phosphorus (in the form of phosphate ions), an essential element for aquatic plant growth. In this capacity phosphoric acid may contribute to eutrophication of standing or slow moving surface water. Eutrophication may stimulate the overgrowth of algae whose death and decay may lead to depletion of the dissolved oxygen content of the water. Low levels of dissolved oxygen in water can adversely alter the population structure of the aquatic system.

Sulfuric Acid

Sulfuric acid (H_2SO_4) is a corrosive liquid that is severely irritating to the skin, eyes, nose, throat and upper respiratory tract. EPA has not evaluated sulfuric acid for potential carcinogenicity. EPA has not established a reference dose or reference concentration for potential non-cancer effects of sulfuric acid.

Sulfuric acid is expected to have moderate toxicity to aquatic organisms. Concentrations lethal to half the organisms in a test population are expected to be between 0.1 and 1 milligram per liter (mg/L).

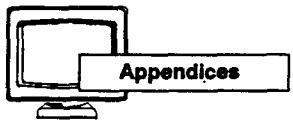
Depending on the buffering capacity of receiving water, sulfuric acid can contribute to the lowering of pH. A pH lower than five is generally considered to be unsuitable for the reproduction of sensitive aquatic populations.

Organic Chemicals

Acetone

Acetone (dimethylketone) is a flammable liquid that is likely to evaporate when exposed to air. Acetone is irritating to the skin, eye, nose, throat and upper respiratory tract. For carcinogenicity EPA has categorized acetone into Group D; EPA has classified acetone as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects EPA has established an oral reference dose (RfD) of 0.1 milligram per kilogram per day (mg/kg/day) for acetone. The RfD is based on a no-observed-effect level of 100 mg/kg/day from a 90-day rat gavage study. The RfD assumes that a 70 kg person could consume (by the oral route) up to 7 mg of acetone daily over a lifetime without appreciable risk of adverse non-cancer effects. Exposure to higher levels may result in adverse kidney effects. An inhalation reference concentration (RfC) for acetone is currently under Agency review.

Acetone is expected to have low toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to exceed 1 milligram per liter (mg/L). Because of its potential to volatilize acetone may contribute to formation of photochemical smog.



Dichloromethane

Dichloromethane (methylene chloride) is a liquid that is likely to evaporate when exposed to air. EPA has classified dichloromethane as a Group B2 or 'a probable human' carcinogen. This determination is based on sufficient evidence of cancer in animal studies but not in human studies. Dichloromethane has been shown to cause cancer in animals in oral and in inhalation studies. Non-cancer effects of dichloromethane include its potential to cause liver and kidney effects. For these effects EPA has established an oral reference dose (RfD) of 0.06 milligram per kilogram per day (mg/kg/day) for dichloromethane. The RfD is based on a no-observed-effect level of 5 mg/kg/day from a 2-year rat drinking water study. The RfD assumes that a 70 kg person could consume (by the oral route) up to 4.2 mg of dichloromethane daily for a lifetime without appreciable risk of adverse non-cancer effects. Exposure to higher levels could result in liver and kidney effects. An inhalation reference concentration (RfC) for dichloromethane is currently under Agency review.

Dichloromethane is expected to have moderate toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to be between 0.1 and 1 milligram per liter (mg/L). If dichloromethane were to reach the upper layers of the atmosphere, the chemical could be a source of ozone-destroying chlorine atoms.

Methanol

Methanol is a flammable liquid that is likely to evaporate when exposed to air. EPA has not evaluated methanol for potential carcinogenicity. For non-cancer effects EPA has established an oral reference dose (RfD) of 0.5 milligram per kilogram per day (mg/kg/day) for methanol. The RfD is based on a no-observed-effect level of 500 mg/kg/day from a 90-day gavage study in rats. The RfD assumes that a 70 kg person could consume (by the oral route) up to 35 mg of methanol daily over a lifetime without appreciable risk of adverse non-cancer effects. An inhalation reference concentration (RfC) for methanol is currently under Agency review.

Methanol is expected to have low toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to exceed 1 milligram per liter (mg/L).

Methyl Ethyl Ketone

Methyl ethyl ketone (MEK) is a flammable liquid that is likely to evaporate when exposed to air. Methyl ethyl ketone is irritating to the skin, eyes, nose, throat and upper respiratory tract. For carcinogenicity EPA has categorized MEK into Group D; EPA has classified MEK as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects, EPA has established an oral reference dose (RfD) of 0.05 milligram per kilogram per day (mg/kg/day) for methyl ethyl ketone. The RfD is based on a inhalation study in rats that showed no adverse effects at the highest dose tested (235 parts per million). The RfD assumes that a 70 kg person could consume (by the oral route) up to 3.5 mg of MEK daily for a lifetime

without appreciable risk of adverse non-cancer effects. Methyl ethyl ketone has been shown in animal studies to cause adverse effects in the developing fetus. An inhalation reference concentration (RfC) for methyl ethyl ketone is currently under Agency review.

Methyl ethyl ketone is expected to have low toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to exceed 1 milligram per liter (mg/L). Because of its potential to volatilize methyl ethyl ketone may contribute to formation of photochemical smog.

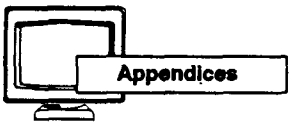
Toluene

Toluene is a flammable liquid that is likely to evaporate when exposed to air. For carcinogenicity EPA has categorized toluene into Group D; EPA has classified toluene as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects EPA has established an oral reference dose (RfD) of 0.2 milligram per kilogram per day (mg/kg/day) for toluene. The RfD is based on a no-observed-effect level of 312 mg/kg/day from a 90-day gavage study in rats. The RfD assumes that a 70 kg person could consume (by the oral route) up to 14 mg of toluene daily for a lifetime without appreciable risk of adverse non-cancer effects. Exposure to higher levels could result in adverse liver and kidney effects. Toluene has been shown in animal studies to cause adverse effects in the developing fetus. An inhalation reference concentration (RfC) for toluene is currently under Agency review.

Toluene is expected to have a moderate toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to be between 0.1 and 1 milligram per liter (mg/L). Because of its potential to volatilize toluene may contribute to formation of photochemical smog.

1,1,1-Trichloroethane

1,1,1-Trichloroethane (methylchloroform) is a liquid that is likely to evaporate when exposed to air. For carcinogenicity EPA has categorized methylchloroform into Group D; EPA has classified methylchloroform as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. Available evidence from short-term assays suggest 1,1,1-trichloroethane may be a mutagen. For non-cancer effects, EPA has established an oral reference dose (RfD) of 0.09 milligram per kilogram per day (mg/kg/day) for 1,1,1-trichloroethane. The RfD is based on a no-observed-effect level of 500 parts per million (ppm) from a 6-month guinea pig inhalation study. The RfD assumes that a 70 kg person could consume (by the oral route) up to 6.3 mg of methylchloroform daily over a lifetime without appreciable risk of adverse non-cancer effects. An inhalation reference concentration (RfC) for methylchloroform is currently under Agency review.



1,1,1-trichloroethane is expected to have low toxicity to aquatic organisms; concentrations lethal to half the organisms of a test population are expected to exceed 1 milligram per liter (mg/L). If methylchloroform were to reach the upper layers of the atmosphere, the chemical could be a source of ozone-destroying chlorine atoms.

Xylene

Xylene is the chemical name given to the three dimethyl benzene isomers; these chemicals are flammable liquids that are likely to evaporate when exposed to air. For carcinogenicity EPA has categorized xylene into Group D; EPA has classified xylene as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects EPA has established an oral reference dose (RfD) of 2 milligrams per kilogram per day (mg/kg/day) for xylene. The RfD is based on a no-observed-effect level of 250 mg/kg/day from a 2-year rat gavage study. The RfD assumes a 70 kg person could consume (by the oral route) up to 140 mg of xylene daily over a lifetime without appreciable risk of adverse non-cancer effects. Xylene has been shown in animal studies to cause adverse effects in the developing fetus. An inhalation reference concentration (RfC) for xylene is currently under Agency review.

Xylene is expected to have high toxicity to aquatic organisms. Concentrations lethal to one half the organisms of a test population are expected to be less than 0.1 milligram per liter (mg/L). Because of its potential to volatilize, xylene may contribute to formation of photochemical smog.

Metals

Copper

Copper is an essential element in human growth and maintenance of health. For carcinogenicity EPA has categorized copper into Group D; EPA has classified copper as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects, EPA has not established an oral reference dose (RfD) or inhalation reference concentration (RfC) for copper. EPA is currently assessing the chronic toxicity of copper.

Copper and its salts are expected to have high toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to be less than 0.01 milligram per liter (mg/L). Copper is likely to persist in water; its concentration in aquatic tissue is expected to be considerably higher than its concentration in surrounding water.

Manganese

Manganese is an essential element in human growth and maintenance of health. Of the trace elements required for human health, manganese is probably one of the least toxic when it is ingested. Manganese toxicity, however, varies considerably with route of exposure. For

carcinogenicity EPA has categorized manganese into Group D; EPA has classified manganese as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects, EPA has established an oral reference dose (RfD) of 0.1 milligram per kilogram per day (mg/kg/day) for manganese. The RfD (for **dietary** ingestion only) is based on human chronic ingestion data that indicate a no-observed-effect level (for central nervous system effects) of 0.14 mg/kg/day for manganese. For non-cancer effects, EPA has established an inhalation reference concentration (RfC) of 0.0004 milligram per cubic meter (mg/m^3) for manganese. The RfC is based on chronic worker exposure studies that indicate a lowest-observed-effect level (for respiratory/ central nervous system effects) of 0.97 mg/m^3. Manganese may also cause adverse reproductive effects in humans by the inhalation route. Manganese compounds therefore are of particular concern for human health when they exist as dusts (its oxides and salts) or as fumes.

Manganese and its compounds are expected to have moderate toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to be between 0.1 and 1 milligram per liter (mg/L). Manganese is likely to persist in water; its concentration in aquatic tissue, however, is not expected to be significantly higher than its concentration in surrounding water.

Zinc

Zinc is an essential element in human growth and maintenance of health. For carcinogenicity EPA has categorized zinc into Group D; EPA has classified zinc as neither a positive nor a negative carcinogen. There are insufficient cancer data in humans and in animals to allow EPA to make a more definite determination. For non-cancer effects, EPA has not established an oral reference dose (RfD) or inhalation reference concentration (RfC) for zinc. An RfD for zinc is currently under Agency review. Zinc may adversely affect the developing fetus.

Zinc and its salts are expected to have high toxicity to aquatic organisms. Concentrations lethal to half the organisms of a test population are expected to be less than 0.1 milligram per liter (mg/L). Zinc is likely to persist in water; its concentration in aquatic tissue is expected to be considerably higher than its concentration in surrounding water.

Table 27. Health Advisories/Criteria for Environmental Levels of the Top 15 TRI Chemicals, 1990.

Chemicals	Health Advisories	Drinking Water Maximum Contaminant (mg/L) Goal	Drinking Water Maximum Contaminant (mg/L) Level	Air Standard Criteria
Nonmetal Inorganic Chemicals				
Ammonia	None	None	None	None
Chlorine	None	None	None	None
Hydrochloric Acid	None	None	None	None
Phosphoric Acid	None	None	None	None
Sulfuric Acid	None	None	None	None
Organic Chemicals				
Acetone	None	None	None	None
Dichloromethane	10-day (child): 2 mg/L Longer term (child): 0.5 mg/L (adult): 2 mg/L	0	0.005	None
Methanol	None	None	None	None
Methyl Ethyl Ketone	10-day (child): 8 mg/L Longer term (child): 3 mg/L Lifetime (adult): 0.2 mg/L	None	None	None
Toluene	10-day (child): 3 mg/L Longer term (child): 3 mg/L Lifetime (adult): 2 mg/L	1	1	None
1,1,1-Trichloroethane	10-day (child): 40 mg/L Longer term (child): 40 mg/L Lifetime (adult): 0.2 mg/L	0.2	0.2	None
Xylene	10-day (child): 40 mg/L Longer term (child): 40 mg/L Lifetime (adult): 10 mg/L	10	10	None
Metals				
Copper	None	None	None	None
Manganese	None	1.3 (proposed)		None
Zinc	None	None	None	None

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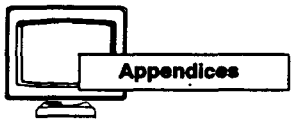

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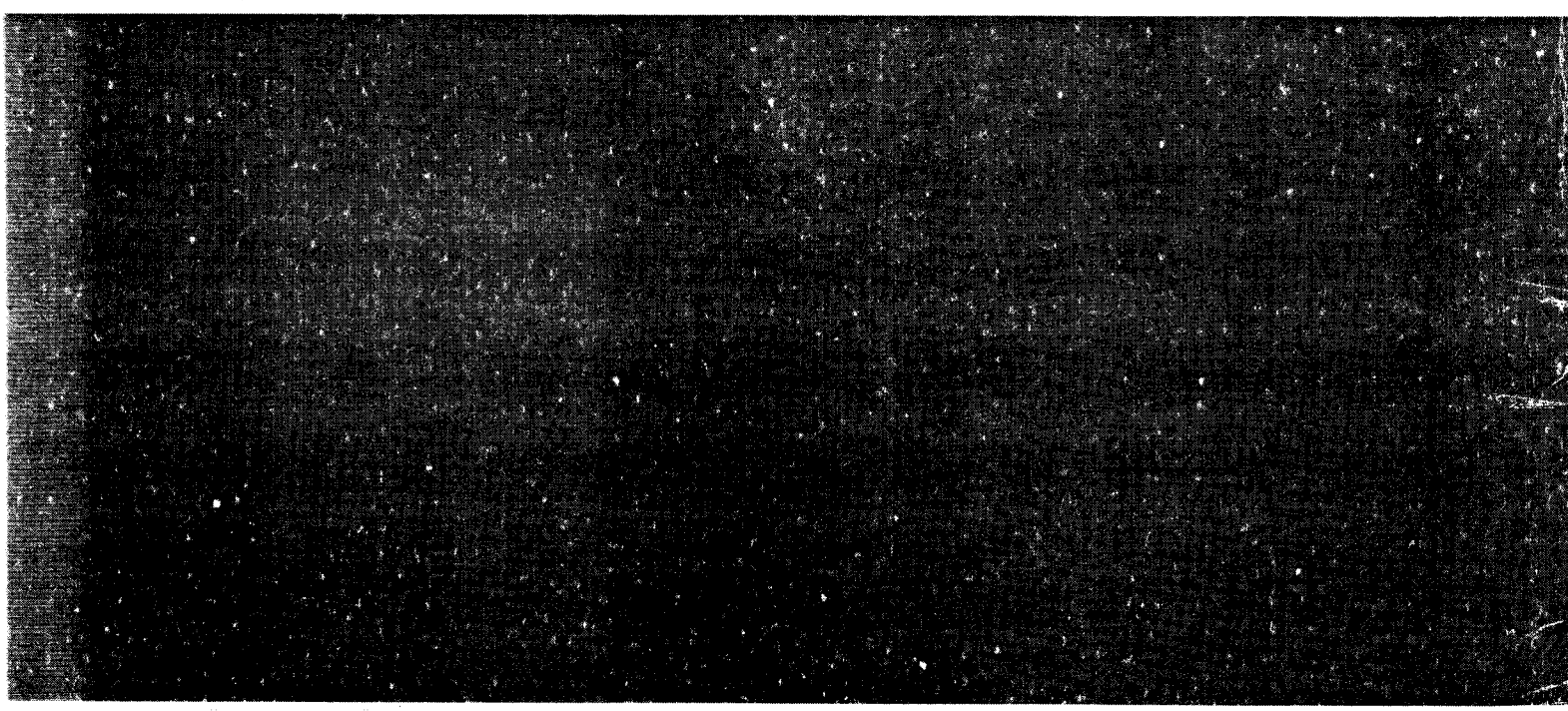
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