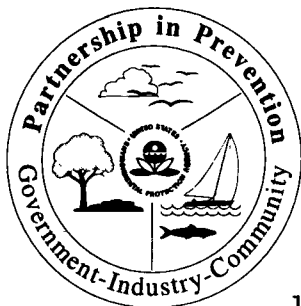




EPA's 33/50 Program Fourth Progress Update

*Interim Reduction Goal Achieved
One Year Early*





EPA'S 33/50 PROGRAM: REDUCING RISKS THROUGH VOLUNTARY ACTION

The 33/50 Program, an EPA voluntary pollution prevention initiative, derives its name from its overall goals — an interim goal of a 33% reduction by 1992 and an ultimate goal of a 50% reduction by 1995 in emissions of 17 high-priority toxic chemicals (see box), using 1988 TRI reporting as a baseline. 12,800 facilities reported that 1.474 billion pounds of 33/50 Program chemicals were either directly released to the environment or transferred off-site to waste management facilities during 1988. The aim of the 33/50 Program is to reduce this 1.474 billion pounds of pollution by at least 50% — 737 million pounds — by 1995, with an interim reduction target of more than 486 million pounds by 1992.

1992 INTERIM GOAL OF 33/50 PROGRAM ACHIEVED ONE YEAR EARLY

On May 25, 1993, EPA officially released the Toxics Release Inventory (TRI) reporting data for 1991. One of the more noteworthy findings revealed in the 1991 TRI reporting data is that releases and transfers of 33/50 Program chemicals declined by 34% between 1988 and 1991, **surpassing the Program's 1992 interim 33% national reduction goal a full year ahead of schedule** (see Figure 1). Data reported by facilities to TRI for 1991 indicate that releases and transfers of 33/50 Program chemicals declined from 1.474 billion pounds in the Program's 1988 baseline year to 973 million pounds in 1991, when categories of reporting in 1991 that were not required for reporting in 1988 are excluded (see below). The **501 million pound reduction** in reported emissions through 1991 exceeds by nearly 15 million pounds the amount required to achieve the Program's 1992 interim 33% reduction goal. The early achievement of the Program's 1992 reduction goal, together with an analysis of facilities' projected on-site releases and off-site transfers to treatment and disposal of the 17 target chemicals through 1993 (reported for the first time in 1991), offers strong encouragement that the 33/50 Program's ultimate goal of a 50% reduction by 1995 will be achieved.

Many states, a number of industry associations, and numerous individual companies include 33/50 Program chemicals within the scope of their own reduction programs. Twenty-six states had established toxics use reduction and pollution prevention programs prior to establishment of the 33/50 Program, and these contributed to its design. Others have used the 33/50 Program as a model. EPA views the 33/50 Program as an umbrella under which the federal government, states, industry, and communities work in partnership to achieve common goals. Any progress in reducing emissions of 33/50 Program chemicals **reflects the efforts of all these partners.**

17 PRIORITY CHEMICALS TARGETED BY THE 33/50 PROGRAM

BENZENE
CADMIUM & COMPOUNDS
CARBON TETRACHLORIDE
CHLOROFORM
CHROMIUM & COMPOUNDS
CYANIDES
DICHLOROMETHANE
LEAD & COMPOUNDS
MERCURY & COMPOUNDS
METHYL ETHYL KETONE
METHYL ISOBUTYL KETONE
NICKEL & COMPOUNDS
TETRACHLOROETHYLENE
TOLUENE
TRICHLOROETHANE
TRICHLOROETHYLENE
XYLENES

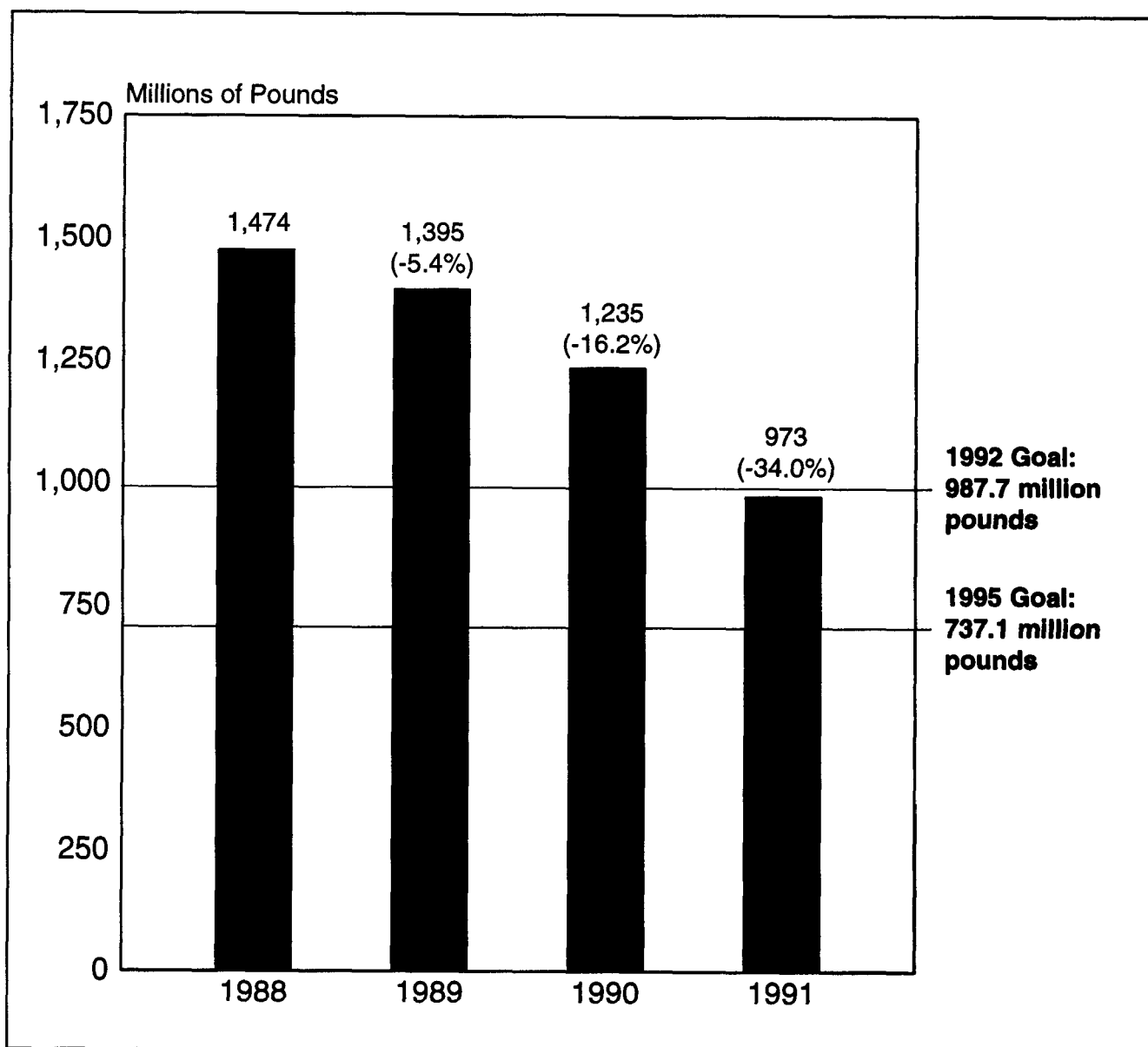


Figure 1. TRI Releases and Transfers of 33/50 Program Chemicals, 1988-1991.

EXCLUSIONS OF NEW TRI REPORTING DATA

TRI reporting requirements were significantly expanded for 1991 as a result of Congress' passage of the Pollution Prevention Act of 1990 (PPA). (A detailed description of the new TRI reporting requirements and related modifications to Form R, the TRI reporting form, is provided in the Appendix to this report.) However, analyses of the progress of the 33/50 Program consider only environmental releases reported in Section 5 of Form R and those off-site transfers reported in Section 6 that facilities were required to report under 1988 TRI reporting requirements: transfers to POTWs and other transfers for treatment and disposal (as well as "other," which includes reports with missing or invalid off-site transfer codes).

Accordingly, the following quantities of the 17 33/50 Program chemicals that are reported by facilities in Sections 6 and 8 of Form R are excluded when comparing 1991 and future years' TRI data to the Program's 1988 baseline:

- Off-site Transfers to Energy Recovery (Form R Section 6.2);
- Off-site Transfers to Recycling (Form R Section 6.2);
- All Quantities Reported for Items in the new Mandatory Source Reduction and Recycling Activities Section (Form R Section 8.1 - 8.10).

These new reporting categories do, however, **provide valuable information** to EPA, the public, and the reporting facilities themselves, and are discussed later in this report. These data will be used by the 33/50 Program extensively in the future to determine **how** facilities achieve reductions in environmental releases.

COMPANY PARTICIPATION IN THE 33/50 PROGRAM

The 33/50 Program represents an **innovative experiment** aimed at demonstrating whether voluntary reduction programs can **augment** the Agency's traditional command-and-control approach to protecting the environment by achieving targeted reductions more quickly than would regulations alone. The Program is part of a broad group of EPA activities designed to **encourage pollution prevention** as the best means of achieving reductions in toxic chemical emissions. The 33/50 Program seeks to **instill a pollution prevention ethic** throughout the highest echelons of American businesses.

Initial communications about the 33/50 Program are directed to the Chief Executive Officers of the parent companies of the more than 16,400 industrial facilities that have reported to EPA's Toxics Release Inventory (TRI) emitting any of the Program's 17 target chemicals between 1988 and 1990. To date, more than 7,600 companies have been invited to participate, and more than 700 additional companies identified as being associated with 33/50 Program chemicals for the first time in the 1991 TRI data will be contacted by EPA this fall. The Program achieved a major milestone in November 1992 when the 1,000th company committed to reducing its releases of toxic chemicals into the environment. **As of August 1993, 1,172 companies have elected to participate, pledging to reduce voluntarily nearly 355 million pounds of pollution** (see Figure 2). Company participation in the 33/50 Program has risen steadily from its inception in early 1991, increasing **twofold** from July 1991 to February 1992 (publication dates for the Program's first two Progress Reports), and again by **more than 50%** in the Program's second year.

Reduction pledges continue to approach the Program's national goals, their slower growth rate reflecting the fact that companies with the greatest amounts of releases and transfers (the "Top 600") were the first to be contacted. In addition, the 355 million pounds of reductions pledged to date represent a **lower bound**, as

More About 33/50...

Want to find out more about EPA's 33/50 program? See the back page of this report for **what's** available, **whom** to contact, and **where** to call, visit, or write.

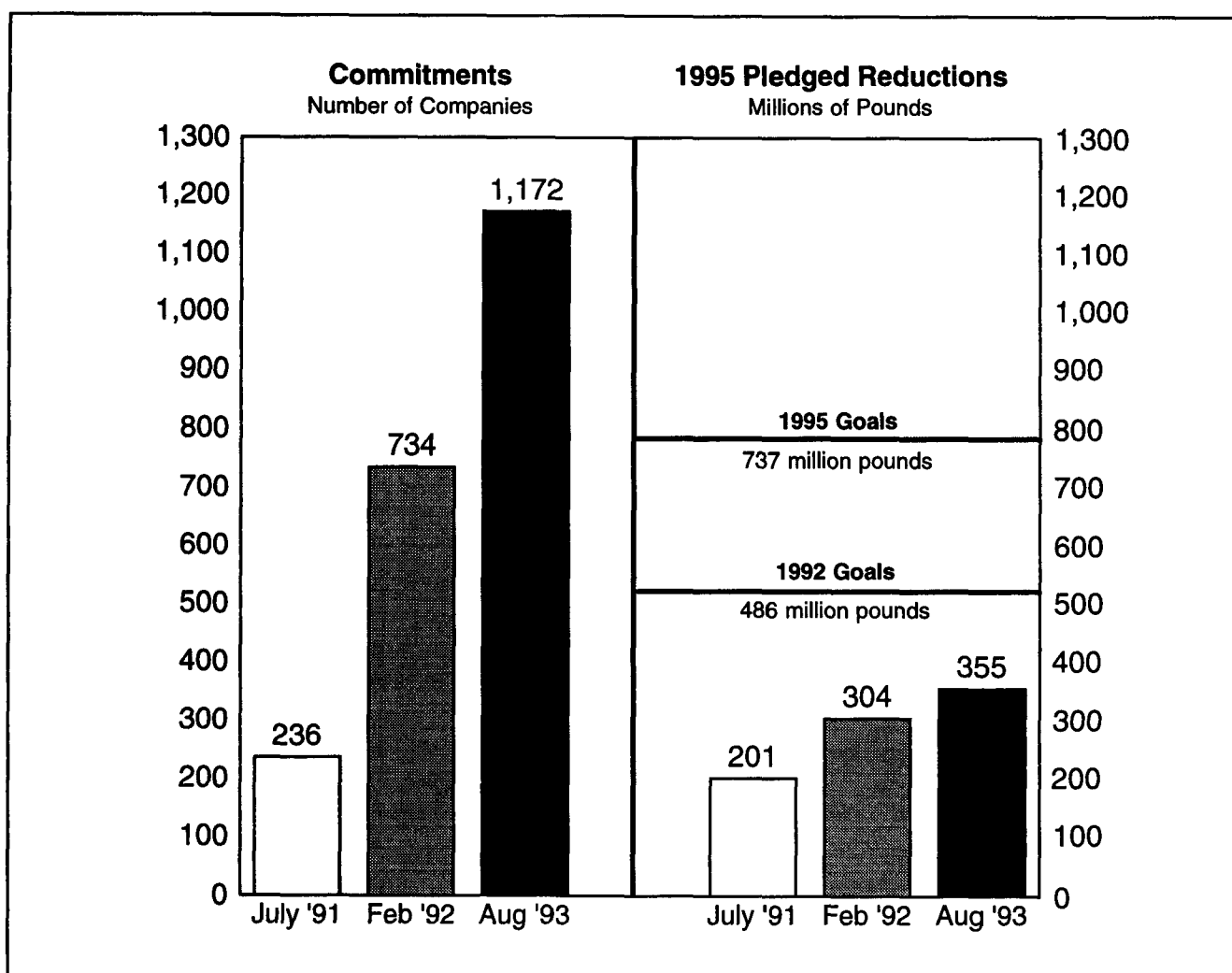


Figure 2. 33/50 Program Commitment Status, August 1993.

numeric reduction targets are still being set by about a third of the participating companies, and companies appear to be achieving **greater reductions than they initially anticipated**.

Facilities owned by companies that have elected to participate in the 33/50 Program are **reporting greater reductions** in emissions of the 17 target chemicals than are the facilities associated with nonparticipating companies. Between 1988 and 1991, participating companies reported a nearly **40% decrease** in releases and transfers of Program chemicals, compared to a 25% decline reported by nonparticipants. The difference between participants and nonparticipants is somewhat greater for on-site environmental releases: a 36% reduction in releases for participants versus a 20% reduction for nonparticipants. Participating companies, representing only 15% of the companies invited to participate, were responsible for 62% of the total releases and transfers of Program chemicals in the 1988 baseline year and 57% in 1991.

Table 1. 33/50 Program Commitment Status Overview, August 4, 1993.

	"Top 600" Contacted in March 1991	"5400" Companies Contacted in July 1991	New in 1989 Contacted in July 1992	New in 1990 Contacted in January 1993	New in 1991 Not Yet Contacted	Total from All Companies as of 08/04/93
Numbers of Companies						
Companies Contacted by EPA	542	5,028	1,085	971	725	8,351
Responses with Commitments to 33/50 Program	321	767	54	30	0	1,172
Responses with Quantifiable Commitments	242	446	2	7	0	697
Quantities of the 17 Targeted Chemicals Covered by the 33/50 Program (Millions of Pounds, 1988)						
Total Releases and Transfers Reported to TRI in 1988	1,053	398	3.34	13.97	6	1,474
Total from the Companies Making Commitments	823	84	0.86	4.77	0	913
Total from the Companies with Quantifiable Commitments	724	54	0.86	4.72	0	784
Amount of Reductions Pledged by 1995 in Quantifiable Commitments	328	25	0.23	1.69	0	355

Assessing the success of our efforts to encourage companies to participate in the 33/50 Program yields two conclusions. EPA's outreach to the larger companies has proven **highly successful**, with nearly 60% choosing to enroll (see Table 1). However, getting the message across to the more numerous smaller companies has been **decidedly more difficult**; only one in ten has elected to participate. Accordingly, EPA is **initiating new outreach approaches to encourage smaller companies to participate**, such as calling facilities directly to discuss the benefits of the Program and to identify and address any barriers that prevent them from participating.

33/50 PROGRAM CHEMICAL RELEASES AND TRANSFERS, 1988-1991

Figure 3 and Table 2 present facilities' reports of on-site releases and off-site transfers to treatment and disposal for 1988 through 1991. The data are aggregated for all TRI chemicals that have been included in TRI reporting requirements for each of the four years. In addition, 33/50 Program chemicals are broken out in aggregate for comparison to all other TRI chemicals.

Facilities' 1991 TRI reports show that, in the first year after formal announcement of the 33/50 Program, the 17 target chemicals **experienced substantially greater proportional reductions** (-21%) than all other TRI chemicals (-8%). This represents **a significant change in the reduction pattern** from the two previous years. Prior to 1991, reductions in the releases

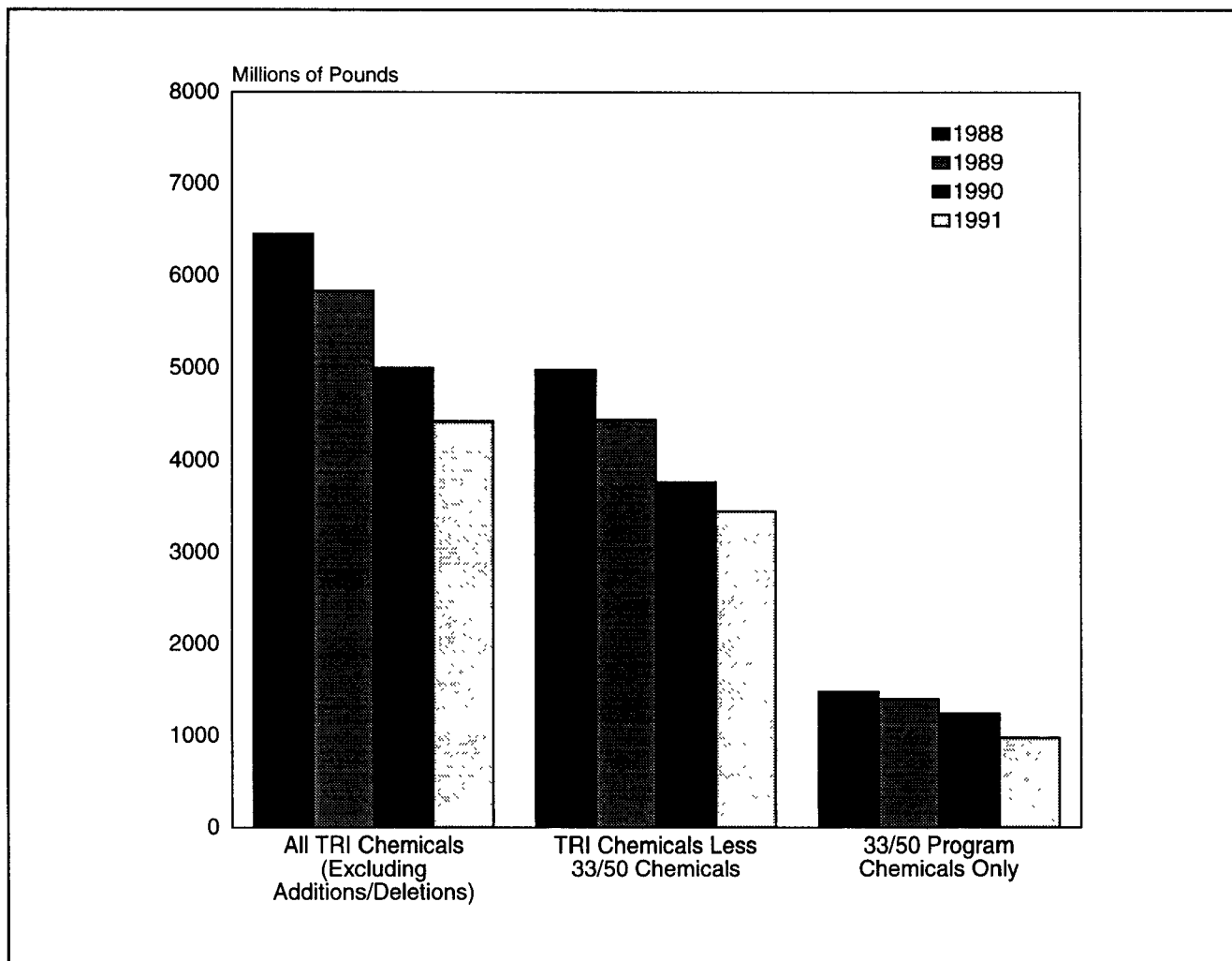


Figure 3. Releases and Transfers of 33/50 Program Chemicals Compared to Other TRI Chemicals, 1988-1991.

and off-site transfers of the 17 33/50 Program chemicals lagged significantly behind reductions in other TRI chemicals. When the 17 33/50 Program chemicals are subtracted, remaining TRI releases and transfers declined by 23% from 1988 through 1990, from just under 5 billion pounds to 3.7 billion pounds. During that same period, emissions of the 17 targeted 33/50 Program chemicals were reduced by only 16%, from 1.47 billion pounds to 1.24 billion pounds (see Table 1).

At the time that EPA was formulating the 33/50 Program (late 1990 – early 1991), 1988 was the most recent year for which TRI data were available. The Program's baseline and goals were set accordingly. Reductions that companies achieved between 1988 and 1990 therefore contribute to the 33/50 Program's national reduction goals. However, **these prior reductions should not be viewed as resulting from the 33/50 Program**, as companies were first informed about the Program in February of 1991.

Table 2. Releases and Transfers of 33/50 Program Chemicals Compared to Other TRI Chemicals, 1988-1991.

Year	All TRI Chemicals (Excluding Additions/ Deletions)	TRI Chemicals Less 33/50 Chemicals	33/50 Program Chemicals Only
	Pounds	Pounds	Pounds
1988	6,450,516,964	4,976,369,274	1,474,147,690
1989	5,829,763,906	4,434,701,979	1,395,061,927
1990	4,996,203,787	3,760,960,034	1,235,243,753
1991	4,419,162,282	3,446,042,372	973,119,910
	Percent Change	Percent Change	Percent Change
1988-1991	-31.4%	-30.7%	-33.9%
1988-1990	-22.5%	-24.4%	-16.2%
1990-1991	-11.5%	-8.3%	-21.2%

Commencing in 1991, the 17 33/50 Program chemicals appear to have been the focus of increased reduction activities at TRI facilities. The 21.2% reduction in releases and transfers of Program chemicals reported by facilities for 1990 - 1991 is nearly **twice the amount of reductions reported in the previous year** (11.5% between 1989 and 1990), and fully **four times greater** than the reductions observed between 1988 and 1989 (5.4%). 33/50 Program chemicals also contributed significantly to aggregate TRI release and transfer reductions observed between 1990 and 1991. While representing only 22% of the total volume of 1988-comparable TRI releases and transfers in 1991, **33/50 Program chemicals accounted for nearly half (45%) of the total TRI 1990 - 1991 reductions**. Of the 577 million pounds in total TRI release/transfer reductions reported for 1991, 262 million are associated with the Program's 17 target chemicals.

Facilities' 1991 TRI reports on releases and off-site transfers of 33/50 Program chemicals, as well as updated reports for 1988 through 1990, are summarized by chemical and release medium/transfer management method in Table 3 (organics are listed first). **Off-site transfers of 33/50 Program chemicals have declined at a much higher rate than have their on-site environmental releases**. Transfers are down 50% from 1988, 39% in the last year alone. On-site releases, which accounted for 80% of the 33/50 Program 1988 release/transfer baseline, declined by 30% through 1991 and 17% in the last year (compared to 9% for all other TRI chemicals).

Figures 4 and 5 present reduction trends for 33/50 Program chemicals aggregated by on-site release medium/off-site transfer type and by chemical, respectively.

Table 3. TRI Releases and Transfers of 33/50 Chemicals, 1988-1991.

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
Benzene	91	9,971,308	7,503,182	26,896	834,242	111,928	18,447,556
	90	14,516,266	10,686,871	24,524	689,066	722,486	26,639,213
	89	15,045,660	11,694,181	169,274	668,610	120,355	27,698,080
	88	20,235,191	11,027,298	46,998	825,035	127,920	32,262,442
Carbon tetrachloride	91	528,100	1,018,701	2,844	42,470	2,152	1,594,267
	90	419,001	1,320,225	4,718	31,557	1,005	1,776,506
	89	943,133	2,507,116	15,656	122,043	1,616	3,589,564
	88	1,081,552	2,695,101	15,627	98,054	14,759	3,905,093
Chloroform	91	7,660,997	11,421,891	769,569	65,089	22,150	19,939,696
	90	8,388,150	14,138,445	1,005,860	89,560	57,924	23,679,939
	89	8,872,690	16,841,084	1,177,743	64,338	70,265	27,026,120
	88	7,566,776	17,469,790	1,126,484	36,002	68,546	26,267,598
Dichloromethane	91	31,726,830	47,611,641	98,877	1,317,706	117,788	80,872,842
	90	37,744,015	62,532,366	190,500	850,018	21,024	101,337,923
	89	42,295,554	81,864,100	226,823	1,937,469	15,894	126,339,840
	88	48,751,550	79,242,388	350,050	1,478,834	157,211	129,980,033
Methyl ethyl ketone	91	33,149,766	70,271,889	141,354	355,736	180,492	104,099,237
	90	42,863,784	85,627,333	77,514	146,199	50,423	128,765,253
	89	41,693,966	94,365,489	71,781	200,703	171,347	136,503,286
	88	38,687,923	97,348,615	91,344	253,762	166,458	136,548,102
Methyl isobutyl ketone	91	8,411,877	18,786,642	167,405	161,600	177,939	27,705,463
	90	9,688,471	18,021,527	53,798	52,221	24,733	27,840,750
	89	10,850,259	20,673,502	449,407	81,850	20,891	32,075,909
	88	13,015,362	18,610,414	762,108	116,650	31,770	32,536,304
Tetrachloroethylene	91	6,482,575	10,204,876	7,448	14,000	23,302	16,732,201
	90	9,074,857	13,321,145	21,510	11,012	1,255	22,429,779
	89	11,966,038	15,512,638	53,940	50,005	10,791	27,593,412
	88	16,125,229	19,668,296	33,314	72,250	82,144	35,981,233
Toluene	91	73,620,294	124,944,414	104,645	1,373,207	185,012	200,227,572
	90	84,413,528	157,264,379	198,500	1,432,918	383,904	243,693,229
	89	93,193,936	176,358,467	182,297	620,403	427,055	270,782,158
	88	102,808,393	189,388,805	197,820	1,473,666	741,301	294,609,985
1,1,1-Trichloroethane	91	69,230,762	68,274,801	21,803	2,805	171,807	137,701,978
	90	83,389,447	81,112,035	16,722	1,581	62,176	164,581,961
	89	91,649,649	84,215,221	27,309	2,318	70,630	175,965,127
	88	90,767,027	86,001,968	95,934	1,000	187,786	177,053,715
Trichloroethylene	91	16,642,065	18,416,403	12,750	800	62,991	35,135,009
	90	18,565,243	20,358,601	14,210	805	12,554	38,951,413
	89	22,579,951	26,769,836	15,849	390	8,686	49,374,712
	88	25,879,146	27,900,517	13,802	390	21,186	53,815,041
Xylenes	91	31,107,600	92,889,918	60,644	139,963	344,052	124,542,177
	90	35,488,852	109,258,390	46,920	105,394	434,245	145,333,801
	89	39,705,859	124,577,635	193,497	70,161	486,326	165,033,478
	88	38,303,001	126,721,344	211,898	144,978	651,589	166,032,810
Cadmium and cadmium compounds	91	18,923	55,518	4,241	1,540	251,127	331,349
	90	31,249	78,820	3,339	1,575	404,423	519,406
	89	41,571	79,336	4,731	1,772	350,503	477,913
	88	32,649	90,293	4,397	2,409	389,729	519,477

Table 3. TRI Releases and Transfers of 33/50 Chemicals, 1988-1991, Continued.

Chemical	Year	Transfers to POTWs Pounds	Transfers Off-site for Treatment Disposal/Other Pounds	Total Transfers Pounds
Benzene	91	613,449	1,799,039	2,412,488
	90	634,025	2,221,216	2,855,241
	89	1,107,975	1,839,858	2,947,833
	88	1,135,172	2,295,959	3,431,131
Carbon tetrachloride	91	621	980,569	981,190
	90	42,050	1,082,188	1,124,238
	89	3,841	1,716,813	1,720,654
	88	5,014	1,350,511	1,355,525
Chloroform	91	809,427	1,827,299	2,636,726
	90	802,260	1,321,726	2,123,986
	89	1,101,731	865,533	1,967,264
	88	1,226,573	1,369,922	2,596,495
Dichloromethane	91	1,308,202	12,605,336	13,913,538
	90	1,281,832	9,163,437	10,445,269
	89	921,911	12,813,000	13,734,911
	88	1,830,832	22,688,907	24,519,739
Methyl ethyl ketone	91	772,861	9,998,866	10,771,727
	90	867,891	20,323,777	21,191,668
	89	886,502	28,506,748	29,393,250
	88	962,868	28,620,683	29,583,551
Methyl isobutyl ketone	91	816,066	2,274,295	3,090,361
	90	1,258,294	4,548,341	5,806,635
	89	1,286,727	6,468,802	7,755,529
	88	1,509,030	10,323,972	11,833,002
Tetrachloroethylene	91	234,637	3,830,559	4,065,196
	90	450,787	4,433,734	4,884,521
	89	467,081	4,279,472	4,746,553
	88	586,288	5,511,471	6,097,759
Toluene	91	1,266,355	22,006,245	23,272,600
	90	1,724,465	39,898,984	41,623,449
	89	3,001,993	63,484,088	66,486,081
	88	3,549,792	61,614,018	65,163,810
1,1,1-Trichloroethane	91	293,508	8,000,615	8,294,123
	90	169,540	12,472,740	12,642,280
	89	312,010	16,662,054	16,974,064
	88	304,103	19,513,105	19,817,208
Trichloroethylene	91	72,845	2,793,368	2,866,213
	90	11,353	3,690,232	3,701,585
	89	31,269	4,966,856	4,998,125
	88	79,252	6,401,817	6,481,069
Xylenes	91	1,593,182	20,542,421	22,135,603
	90	1,948,480	24,427,444	26,375,924
	89	3,970,355	33,828,419	37,798,774
	88	4,224,204	37,878,912	42,103,116
Cadmium and cadmium compounds	91	265,771	1,449,863	1,715,634
	90	14,278	1,325,800	1,340,078
	89	19,564	748,958	768,522
	88	21,613	1,289,122	1,310,735

Table 3. TRI Releases and Transfers of 33/50 Chemicals, 1988-1991, Continued.

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
Chromium and chromium compounds	91	585,757	532,744	352,522	35,150	25,916,872	27,423,045
	90	582,076	596,901	448,076	83,222	28,257,128	29,967,403
	89	1,624,574	737,750	546,412	59,803	34,477,025	37,445,564
	88	615,838	713,310	400,837	54,902	40,228,739	42,013,626
Cyanide compounds	91	125,870	1,899,044	119,860	4,727,763	26,785	6,899,322
	90	240,688	1,620,330	129,089	4,981,212	24,320	6,995,639
	89	313,594	1,485,888	160,186	8,025,123	29,499	10,014,290
	88	657,222	1,606,398	197,201	5,445,176	108,969	8,014,966
Lead and lead compounds	91	553,782	1,285,604	138,433	928	17,022,789	19,001,536
	90	917,589	1,569,431	132,656	1,648	19,069,275	21,690,599
	89	757,704	1,664,854	149,235	1,564	20,075,314	22,648,671
	88	858,635	1,821,383	241,243	2,760	26,962,797	29,886,818
Mercury and mercury compounds	91	11,912	7,830	671	9	5,315	25,737
	90	14,798	8,759	809	21	4,199	28,586
	89	18,112	11,482	1,568	36	5,202	36,400
	88	17,037	8,724	1,656	27	13,779	41,223
Nickel and nickel compounds	91	469,498	322,989	126,954	370,948	1,672,468	2,962,857
	90	375,830	315,836	146,456	268,958	6,060,825	7,167,905
	89	819,300	319,959	206,813	288,212	4,413,068	6,047,352
	88	414,913	285,076	219,780	239,263	3,629,809	4,788,841
Total	91	290,297,916	475,448,087	2,156,916	9,443,956	46,294,969	823,641,844
	90	346,713,844	577,831,394	2,515,201	8,746,967	55,591,899	991,399,305
	89	382,371,550	659,678,538	3,652,521	12,194,800	60,754,467	1,118,651,876
	88	405,817,444	680,599,720	4,010,493	10,245,158	73,584,492	1,174,257,307
Total less 33/50 Chemicals	91	319,467,748	894,132,227	241,340,401	700,804,048	374,865,144	2,530,609,568
	90	360,034,463	998,123,454	194,317,559	736,666,595	407,087,493	2,696,229,564
	89	411,226,231	1,108,918,301	184,372,712	1,163,389,036	394,274,534	3,262,180,814
	88	417,921,098	1,161,770,936	307,060,098	1,333,388,310	453,962,230	3,674,102,672
Total for All TRI Chemicals	91	609,765,664	1,369,580,314	243,497,317	710,248,004	421,160,113	3,354,251,412
	90	706,748,307	1,575,954,848	196,832,760	745,413,562	462,679,392	3,687,628,869
	89	793,597,781	1,768,596,839	188,025,233	1,175,583,836	455,029,001	4,380,832,690
	88	823,738,542	1,842,370,656	311,070,591	1,343,633,468	527,546,722	4,848,359,979

Table 3. TRI Releases and Transfers of 33/50 Chemicals, 1988-1991, Continued.

Chemical	Year	Transfers to POTWs Pounds	Transfers Off-site for Treatment Disposal/Other Pounds	Total Transfers Pounds
Chromium and chromium compounds	91	1,188,103	20,265,897	21,454,000
	90	1,113,077	35,623,076	36,736,153
	89	1,330,666	32,774,374	34,105,040
	88	2,125,066	31,664,881	33,789,947
Cyanide compounds	91	121,728	824,994	946,722
	90	119,291	1,589,950	1,709,241
	89	149,462	2,436,901	2,586,363
	88	1,152,581	2,719,125	3,871,706
Lead and lead compounds	91	592,526	20,156,681	20,749,207
	90	191,277	56,043,501	56,234,778
	89	152,316	31,041,273	31,193,589
	88	211,951	30,708,010	30,919,961
Mercury and mercury compounds	91	64	193,973	194,037
	90	316	213,305	213,621
	89	2,058	188,144	190,202
	88	2,141	275,017	277,158
Nickel and nickel compounds	91	639,048	9,339,653	9,978,701
	90	314,721	14,521,060	14,835,781
	89	449,440	18,593,857	19,043,297
	88	902,504	15,835,967	16,738,471
Total	91	10,588,393	138,889,673	149,478,066
	90	10,943,937	232,900,511	243,844,448
	89	15,194,901	261,215,150	276,410,051
	88	19,828,984	280,061,399	299,890,383
Total less 33/50 Chemicals	91	400,008,494	515,424,310	915,432,804
	90	455,179,147	609,551,323	1,064,730,470
	89	543,380,257	629,140,908	1,172,521,165
	88	554,216,396	748,050,206	1,302,266,602
Total for All TRI Chemicals	91	410,596,887	654,313,983	1,064,910,870
	90	466,123,084	842,451,834	1,308,574,918
	89	558,575,158	890,356,058	1,448,931,216
	88	574,045,380	1,028,111,605	1,602,156,985

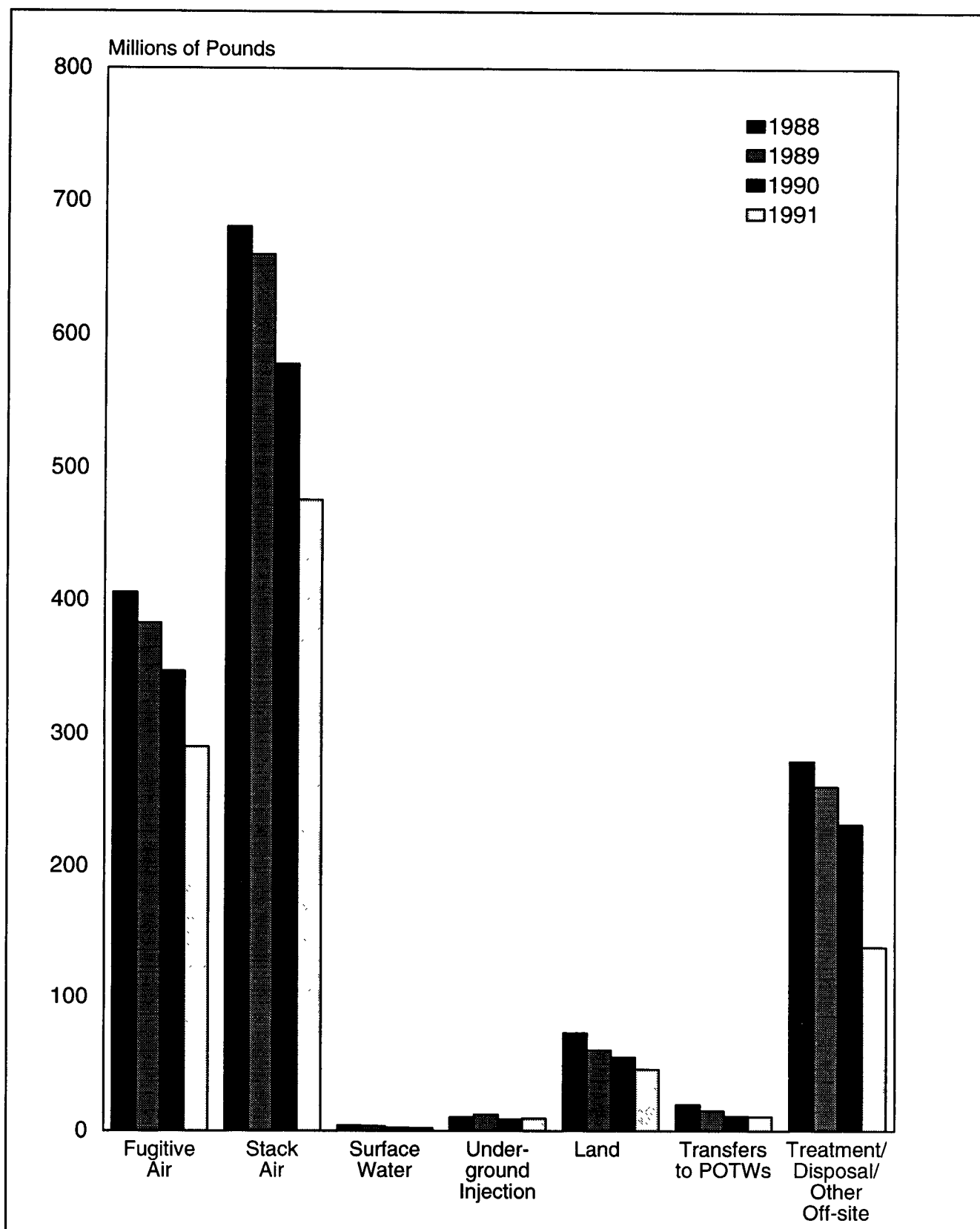


Figure 4. Total TRI Releases and Transfers of 33/50 Program Chemicals, by On-site Release Medium/Transfer Management Type, 1988-1991.

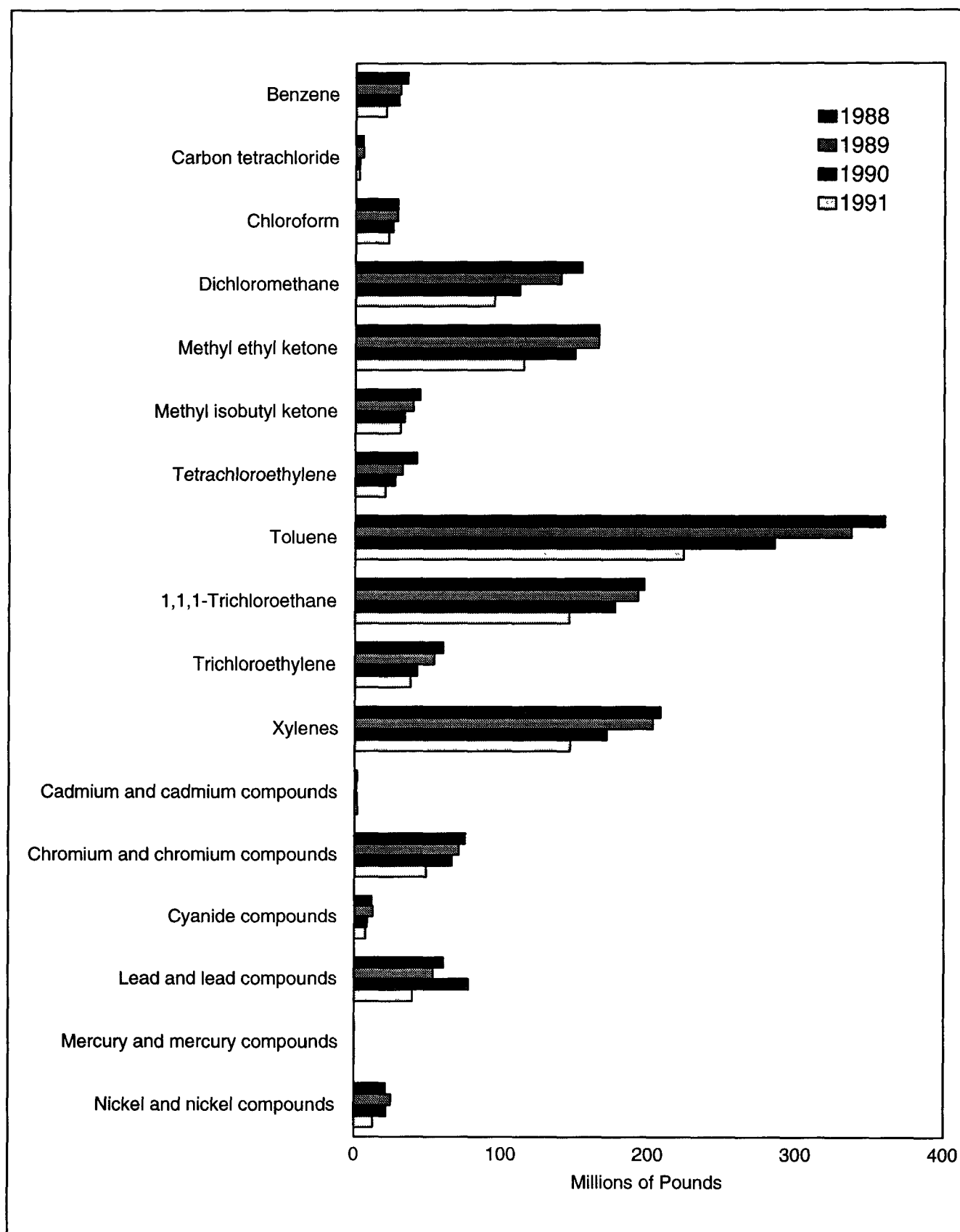


Figure 5. Total TRI Releases and Transfers of 33/50 Program Chemicals, by Chemical, 1988-1991.

TRI POLLUTION PREVENTION ACT DATA FOR 33/50 PROGRAM CHEMICALS

As described in the Appendix to this report, the Pollution Prevention Act of 1990 substantially expanded the scope of TRI to include **reporting on additional toxic chemical management activities**. Off-site transfers to energy recovery and recycling processes are now reported in Section 6.2 of Form R in addition to the previously reported transfers to POTWs and other treatment and disposal facilities. Off-site transfers to energy recovery and recycling facilities are also reported in Section 8 of Form R, which was made mandatory under the PPA, in addition to amounts of toxic chemicals combusted for on-site energy recovery or recovered in on-site recycling processes. Section 8 also includes reporting on amounts of toxic chemicals destroyed in on-site treatment systems and amounts sent to off-site treatment facilities, as well as an aggregate of the amounts of each chemical the facility released to the environment as a result of on-site operations plus the amounts shipped off-site for disposal.

Section 8 reporting items described above pertain only to chemical quantities contained in wastes that are the result of regular production-related activities. Toxic chemical quantities contained in wastes that are generated at the facility through non-routine activities, such as spill cleanups and other catastrophic events, are reported in a separate Section 8 reporting item. Each of the items reported for production-related wastes in Section 8 is reported in aggregate, by chemical, for the reporting year (1991), the prior year (1990), and **forecasted** by facilities for the two successive years (1992 and 1993).

33/50 TRANSFERS TO ENERGY RECOVERY AND RECYCLING

Tables 4 and 5 present a complete summary of 1991 on-site releases and off-site transfers reported by facilities in Sections 5 and 6 of Form R for each 33/50 Program chemical, by on-site release medium and off-site transfer type. Release reporting in Section 5, summing to 823.6 million pounds, is identical in nature to reporting in prior years. **Reporting on off-site transfers, however, has been significantly affected** by the new PPA requirement to include transfers to energy recovery (216.4 million pounds) and transfers to recycling (523.2 million pounds). Each of these new reporting categories on its own **exceeds the total for all off-site transfers that were previously required to be reported** (149.5 million pounds).

These new data indicate that the bulk of 33/50 Program **metals and their associated compounds were shipped off-site for recycling**. Some quantities of metals erroneously have been reported as sent off-site for energy recovery, as metals do not contribute to the heating value of the wastes in which they are contained and are not destroyed in energy recovery processes. Off-site recycling of lead and its compounds alone accounted for nearly 40% of all such transfers of 33/50 Program chemicals. Greater quantities of the organic chemicals were also recycled than were burned for energy. Energy recovery was a more prevalent off-site management method than recycling only for benzene, methyl ethyl ketone, toluene, and xylenes.

MANAGEMENT OF 33/50 PROGRAM CHEMICALS IN WASTES

Tables 6 through 10 present **all four years of Section 8 reporting data** for each 33/50 Program chemical, by waste management activity (non-production-related wastes are reported only for 1991). Again, the magnitude of the quantities associated with new report-

Table 4. TRI Releases of 33/50 Chemicals, 1991.

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
Benzene	9,971,308	7,503,182	26,896	834,242	111,928	18,447,556
Carbon tetrachloride	528,100	1,018,701	2,844	42,470	2,152	1,594,267
Chloroform	7,660,997	11,421,891	769,569	65,089	22,150	19,939,696
Dichloromethane	31,726,830	47,611,641	98,877	1,317,706	117,788	80,872,842
Methyl ethyl ketone	33,149,766	70,271,889	141,354	355,736	180,492	104,099,237
Methyl isobutyl ketone	8,411,877	18,786,642	167,405	161,600	177,939	27,705,463
Tetrachloroethylene	6,482,575	10,204,876	7,448	14,000	23,302	16,732,201
Toluene	73,620,294	124,944,414	104,645	1,373,207	185,012	200,227,572
1,1,1-Trichloroethane	69,230,762	68,274,801	21,803	2,805	171,807	137,701,978
Trichloroethylene	16,642,065	18,416,403	12,750	800	62,991	35,135,009
Xylenes	31,107,600	92,889,918	60,644	139,963	344,052	124,542,177
Cadmium and cadmium compounds	18,923	55,518	4,241	1,540	251,127	331,349
Chromium and chromium compounds	585,757	532,744	352,522	35,150	25,916,872	27,423,045
Cyanide compounds	125,870	1,899,044	119,860	4,727,763	26,785	6,899,322
Lead and lead compounds	553,782	1,285,604	138,433	928	17,022,789	19,001,536
Mercury and mercury compounds	11,912	7,830	671	9	5,315	25,737
Nickel and nickel compounds	469,498	322,989	126,954	370,948	1,672,468	2,962,857
Total	290,297,916	475,448,087	2,156,916	9,443,956	46,294,969	823,641,844
Total less 33/50 Chemicals	336,081,480	908,726,582	241,356,856	700,933,181	375,133,175	2,562,231,274
Total for All TRI Chemicals	626,379,396	1,384,174,669	243,513,772	710,377,137	421,428,144	3,385,873,118

ing categories is **overwhelming relative to the amounts for previously reported releases and transfers**. On-site recycling (4.3 billion pounds) dominates the waste management picture for the 17 Program chemicals, more than quadrupling the 1988-comparable figures in 1991. As expected, quantities associated with on-site waste management activities are substantially greater than off-site transfers to similar management methods.

Analysts will note significant discrepancies between reported off-site transfers to energy recovery and recycling in Sections 6 and 8. Less significant discrepancies can also be observed in the reporting of off-site shipments to treatment. The causes and meaning of these discrepancies are discussed in the Appendix to this report. Figure 6 presents two profiles of 1991 reporting data for 33/50 Program chemicals to **illustrate the impact of the expansions to TRI reporting** brought about by the PPA. Two profiles are presented to accommodate the significant discrepancies in reporting for off-site energy recovery and recycling between Sections 6 and 8. In one profile (left), off-site energy recovery and recycling data are taken from Section 6. In the other profile (right), off-site energy recovery and recycling data are taken from Section 8. In both profiles, Section 8 data for off-site treatment (77 million pounds) are omitted, as their inclusion would duplicate off-site treatment quantities (102.5 million pounds) included in the 1988-comparable release/transfer amount reported in Section 6. Section 8.1 reporting for on-site releases and off-site

Table 5. TRI Transfers of 33/50 Chemicals, 1991.

Chemical	Transfers to POTWs Pounds	Transfers to Treatment Pounds	Transfers to Disposal Pounds	Transfers to Energy Recovery Pounds	Transfers to Recycling Pounds	Other Off-site Transfers Pounds	Total Transfers Pounds
Benzene	613,449	1,656,194	142,460	3,675,466	353,205	385	6,441,159
Carbon tetrachloride	621	939,774	39,111	11,061	390,625	1,684	1,382,876
Chloroform	809,427	1,755,778	71,518	255,288	2,077,870	3	4,969,884
Dichloromethane	1,308,202	11,956,118	495,762	3,717,385	29,163,629	153,456	46,794,552
Methyl ethyl ketone	772,861	9,365,077	512,746	35,111,556	26,033,673	121,043	71,916,956
Methyl isobutyl ketone	816,066	2,112,745	155,643	18,801,198	20,346,186	5,907	42,237,745
Tetrachloroethylene	234,637	3,580,303	112,237	1,232,887	10,694,611	138,019	15,992,694
Toluene	1,266,355	20,171,434	1,636,162	80,207,715	24,882,493	198,649	128,362,808
1,1,1-Trichloroethane	293,508	6,743,974	969,200	3,212,938	27,237,545	287,441	38,744,606
Trichloroethylene	72,845	2,577,754	115,974	802,290	6,785,517	99,640	10,454,020
Xylenes	1,593,182	19,283,497	1,001,342	69,220,174	38,913,506	257,582	130,269,283
Cadmium and cadmium compounds	265,771	388,557	1,019,701	7,460	2,266,912	41,605	3,990,006
Chromium and chromium compounds	1,188,103	3,969,938	15,972,793	69,423	68,437,500	323,166	89,960,923
Cyanide compounds	121,728	447,295	365,309	500	82,660	12,390	1,029,882
Lead and lead compounds	592,526	4,559,119	15,494,344	68,833	204,841,122	103,218	225,659,162
Mercury and mercury compounds	64	65,531	128,442	5	445,451	0	639,493
Nickel and nickel compounds	639,048	2,318,764	6,648,274	12,353	60,230,889	372,615	70,221,943
Total	10,588,393	91,891,852	44,881,018	216,406,532	523,183,394	2,116,803	889,067,992
Total less 33/50 Chemicals	401,318,705	260,541,316	254,161,433	221,818,810	1,830,940,192	7,433,076	2,976,213,532
Total for All TRI Chemicals	411,907,098	352,433,168	299,042,451	438,225,342	2,354,123,586	9,549,879	3,865,281,524

transfers to disposal (846.3 million pounds) is also excluded in favor of their counterparts from Section 5 and 6 (823.6 million pounds of on-site releases plus 44.9 million pounds of transfers to disposal).

As indicated in Figure 6, the 140 million pound discrepancy between Section 6 and Section 8 reporting for transfers to energy recovery and recycling, while nearly equal to the total for all other off-site transfers of 33/50 Program chemicals, is less significant in the context of total waste management for the 17 Program chemicals. More importantly, the figure illustrates that **1988-comparable releases and off-site transfers play a relatively small role in the management of 33/50 Program chemicals in wastes**. When all quantities in Section 8.1 through 8.8 are summed, the total amount of 33/50 Program chemicals in wastes reported by facilities to TRI for 1991 is 7.3 billion pounds. (A similar total is developed, 50 million pounds (less than 1%) greater, when summing the figures used from Sections 5, 6, and 8 in constructing the right bar of Figure 6.) The 973 million pounds of releases and transfers that are the focus of the 33/50 Program's reduction goals account for **only 13% of this total**.

Figures 7 and 8 present the data reported for 33/50 Program chemicals in Section 8 of Form R, aggregated by management method and chemical, respectively.

SOURCE REDUCTION REPORTING HIGHEST FOR 33/50 PROGRAM CHEMICALS

Facilities are also required to report in Section 8 of Form R any source reduction efforts that were directed toward TRI chemicals during the reporting year. Table 11 summarizes facilities' reporting of source reduction activities for each of the 17 33/50 Program chemicals. As a group and individually, 33/50 Program chemicals evidenced **higher rates of source reduction** reporting than other TRI chemicals. Of the more than 21,000 Form R's reporting that a source reduction activity was implemented during 1991, fully 40% (8,609) were for the 17 33/50 Program chemicals, even though Program chemicals account for only 30% of total TRI Form R's. More than a third of the Form R's for 33/50 Program chemicals reported the occurrence of source reduction, compared to slightly more than a fifth of the forms for other TRI chemicals.

Individual 33/50 Program chemicals had some of the **highest rates of reporting on source reduction**. The three TRI chemicals with the greatest number of Form R's reporting source reduction, and four of the top five, **were 33/50 Program chemicals** (1,1,1-trichloroethane, toluene, xylenes, and methyl ethyl ketone). The high ranking for 33/50 Program chemicals is partially due to the fact that they rank among the highest TRI chemicals in total number of Form R's submitted, but they also evidenced some of the highest percentages of Form R submissions indicating source reduction.

Sixteen 33/50 Program chemicals are among the top 35 TRI chemicals reporting source reduction. Of these, organic chemicals generally evidenced higher percentages of Form R's reporting source reduction than did the metals, ranging from 30% to 45% for the nine organic chemicals with the largest number of source reduction reports. Among the three 33/50 Program metals with large numbers of Form R's, lead came the closest to achieving a similarly high source reduction reporting rate (28%). Twenty percent of the reports for cadmium, the most frequently reported metal, indicated source reduction, as did 16.5% of the reports for nickel.

Facilities described the type of source reduction activity that they implemented for each chemical (see Table 11). 33/50 Program chemicals as a group did not differ significantly from other TRI chemicals in the types of activities employed. Improvement in facility operating practices is the most common approach. If, however, Form R source reduction activity categories for Cleaning and Degreasing and for Surface Preparation and Finishing are aggregated into another category, Process Modifications, **Process Modifications would rank as the most frequently employed source reduction activity, particularly so for 33/50 Program chemicals**.

Facilities also described the methods they employed in **identifying source reduction opportunities**. Table 12 summarizes facilities' reporting of source reduction activity identification methods for each of the 17 33/50 Program chemicals. Here again, facilities did not seem to treat Program chemicals differently than other TRI chemicals in their search for source reduction opportunities. For the most part, **facilities are drawing on their own resources to investigate pollution prevention options**, either by conducting formal audits (Pollution Prevention Opportunity Audits or Materials Balance Audits) or by developing ideas from management teams and employees. The 33/50 Program is built on the premise

Table 6. TRI Data Collected under the Pollution Prevention Act for 33/50 Chemicals, 1990-1993: Quantity Recycled(a).

Chemical	1990 On-site Pounds	1991 On-site Pounds	Projected Data	
			1992 On-site Pounds	1993 On-site Pounds
Benzene	186,221,940	196,393,605	202,417,036	205,490,682
Carbon tetrachloride	13,809,422	10,238,966	14,299,143	14,824,425
Chloroform	4,120,879	4,125,901	4,149,851	4,189,401
Dichloromethane	153,704,577	182,108,296	171,887,424	175,443,735
Methyl ethyl ketone	860,316,285	864,307,237	873,842,445	877,203,944
Methyl isobutyl ketone	172,649,101	184,837,606	183,517,967	179,009,876
Tetrachloroethylene	141,398,774	118,584,078	100,085,824	100,707,105
Toluene	1,044,915,519	1,118,482,253	1,126,516,579	1,108,863,252
1,1,1-Trichloroethane	188,056,560	204,077,933	170,420,702	104,844,395
Trichloroethylene	223,411,546	253,517,471	253,726,305	250,591,479
Xylenes	176,416,278	207,081,028	173,057,124	176,307,518
Cadmium and cadmium compounds	3,680,759	3,865,283	3,800,234	3,765,578
Chromium and chromium compounds	66,854,044	91,951,101	84,412,237	86,717,179
Cyanides	4,826,689	3,815,454	5,370,332	4,666,497
Lead and lead compounds	722,419,745	774,086,405	843,333,074	896,477,272
Mercury and mercury compounds	1,544,836	1,282,925	946,870	951,870
Nickel and nickel compounds	40,416,570	48,601,735	44,418,955	46,024,696
Subtotal On-site for 33/50 Chemicals	4,004,763,524	4,267,357,277	4,256,202,102	4,236,078,904
Subtotal On-site less 33/50 Chemicals	10,447,403,204	12,111,751,405	11,643,298,317	11,765,547,167
Subtotal On-site for All TRI Chemicals	14,452,166,728	16,379,108,682	15,899,500,419	16,001,626,071

Chemical	1990 Off-site Pounds	1991 Off-site Pounds	Projected Data	
			1992 Off-site Pounds	1993 Off-site Pounds
Benzene	825,048	1,414,752	1,314,877	814,678
Carbon tetrachloride	9,901	390,538	367,312	366,722
Chloroform	301,029	2,078,744	2,041,306	2,041,313
Dichloromethane	27,349,922	26,224,925	23,995,107	19,742,164
Methyl ethyl ketone	26,615,454	24,888,298	25,029,100	24,040,995
Methyl isobutyl ketone	12,259,999	17,952,566	17,722,322	18,119,834
Tetrachloroethylene	8,587,970	9,035,196	7,963,251	7,924,658
Toluene	19,940,589	24,557,245	24,863,740	23,355,561
1,1,1-Trichloroethane	29,815,008	28,751,600	22,123,251	14,070,105
Trichloroethylene	7,142,607	7,446,327	6,052,720	4,984,824
Xylenes	25,237,600	33,701,307	30,886,210	32,032,227
Cadmium and cadmium compounds	2,536,773	2,039,641	2,060,981	2,081,824
Chromium and chromium compounds	64,485,821	106,599,026	94,945,018	99,739,938
Cyanides	62,415	38,280	44,074	8,465
Lead and lead compounds	274,126,453	273,499,683	281,759,583	294,874,150
Mercury and mercury compounds	111,001	274,247	336,080	336,334
Nickel and nickel compounds	51,718,854	78,737,821	72,225,397	73,600,958
Subtotal Off-site for 33/50 Chemicals	551,126,444	637,630,196	613,730,329	618,134,750
Subtotal Off-site less 33/50 Chemicals	1,983,231,225	2,624,350,735	2,602,497,818	2,598,748,897
Subtotal Off-site for All TRI Chemicals	2,534,357,669	3,261,980,931	3,216,228,147	3,216,883,647

Total for 33/50 Chemicals	4,555,889,968	4,904,987,473	4,869,932,431	4,854,213,654
Total less 33/50 Chemicals	12,430,634,429	14,736,102,140	14,245,796,135	14,364,296,064
Total for All TRI Chemicals	16,986,524,397	19,641,089,613	19,115,728,566	19,218,509,718

Table 7. TRI Data Collected under the Pollution Prevention Act for 33/50 Chemicals, 1990-1993: Quantity Used for Energy Recovery(a).

Chemical	1990 On-site Pounds	1991 On-site Pounds	Projected Data	
			1992 On-site Pounds	1993 On-site Pounds
Benzene	21,176,508	33,714,288	28,812,538	26,158,418
Carbon tetrachloride	3,288,879	5,964,156	15,555,356	18,746,865
Chloroform	1,990,067	5,499,527	7,519,104	9,496,582
Dichloromethane	15,632,408	14,270,049	15,310,887	16,221,100
Methyl ethyl ketone	90,352,222	94,341,416	95,158,244	107,555,209
Methyl isobutyl ketone	42,654,440	36,906,508	37,823,204	42,955,740
Tetrachloroethylene	12,382,080	4,013,084	4,226,835	4,452,966
Toluene	250,558,252	254,980,246	262,443,091	288,619,559
1,1,1-Trichloroethane	7,363,780	14,001,816	14,637,770	15,354,150
Trichloroethylene	6,083,419	6,188,130	6,212,991	6,581,666
Xylenes	197,292,824	217,136,701	223,801,420	239,747,588
Cadmium and cadmium compounds	0	0	0	0
Chromium and chromium compounds	0	0	1	0
Cyanides	42,279,210	22,849,436	20,922,422	21,279,382
Lead and lead compounds	83,604	116,475	118,500	119,200
Mercury and mercury compounds	0	0	0	0
Nickel and nickel compounds	0	0	10	10
Subtotal On-site for 33/50 Chemicals	691,137,693	709,981,832	732,542,373	797,288,435
Subtotal On-site less 33/50 Chemicals	2,070,035,242	2,476,813,901	2,491,144,959	3,157,142,198
Subtotal On-site for All TRI Chemicals	2,761,172,935	3,186,795,733	3,223,687,332	3,954,430,633

Chemical	1990 Off-site Pounds	1991 Off-site Pounds	Projected Data	
			1992 Off-site Pounds	1993 Off-site Pounds
Benzene	3,372,068	4,932,365	4,529,408	4,943,593
Carbon tetrachloride	1,835	10,849	5,281	291
Chloroform	346,140	720,671	621,330	546,922
Dichloromethane	5,746,239	6,066,234	5,319,225	4,906,635
Methyl ethyl ketone	36,653,958	38,424,594	36,077,565	34,365,357
Methyl isobutyl ketone	12,022,235	19,306,703	18,676,693	19,096,258
Tetrachloroethylene	909,105	1,504,622	1,080,036	893,510
Toluene	72,799,299	86,805,609	86,510,188	84,352,277
1,1,1-Trichloroethane	3,493,538	3,913,519	3,033,116	2,131,378
Trichloroethylene	1,002,311	1,045,752	811,472	581,760
Xylenes	64,803,135	78,056,842	75,318,262	71,066,260
Cadmium and cadmium compounds	6,282	8,317	7,620	6,968
Chromium and chromium compounds	53,683	74,993	74,344	66,578
Cyanides	14	24	415	3,915
Lead and lead compounds	32,312	69,831	66,704	64,264
Mercury and mercury compounds	0	3,241	9,435	500
Nickel and nickel compounds	13,875	9,629	4,701	4,694
Subtotal Off-site for 33/50 Chemicals	201,256,029	240,953,795	232,145,795	223,031,160
Subtotal Off-site less 33/50 Chemicals	225,699,366	256,803,676	253,747,321	249,733,225
Subtotal Off-site for All TRI Chemicals	426,955,395	497,757,471	485,893,116	472,764,385

Total for 33/50 Chemicals	892,393,722	950,935,627	964,688,168	1,020,319,595
Total less 33/50 Chemicals	2,295,734,608	2,733,617,577	2,744,892,280	3,406,875,423
Total for All TRI Chemicals	3,188,128,330	3,684,553,204	3,709,580,448	4,427,195,018

Table 8. TRI Data Collected under the Pollution Prevention Act for 33/50 Chemicals, 1990-1993: Quantity Treated(a).

Chemical	1990 On-site Pounds	1991 On-site Pounds	Projected Data	
			1992 On-site Pounds	1993 On-site Pounds
Benzene	21,865,259	31,256,769	30,799,920	31,517,292
Carbon tetrachloride	13,123,649	15,074,894	14,924,565	15,362,639
Chloroform	33,086,010	26,581,978	26,600,006	26,773,101
Dichloromethane	31,161,206	34,185,873	36,339,814	38,081,156
Methyl ethyl ketone	33,969,950	45,423,894	48,814,259	48,466,536
Methyl isobutyl ketone	9,079,196	11,765,185	11,945,634	12,198,975
Tetrachloroethylene	19,531,235	15,284,084	15,786,368	15,981,873
Toluene	99,851,002	128,268,450	142,527,931	163,838,919
1,1,1-Trichloroethane	3,620,168	3,047,769	2,439,239	2,850,333
Trichloroethylene	1,798,181	4,886,629	4,698,415	4,790,711
Xylenes	32,087,790	49,180,388	52,651,046	55,059,974
Cadmium and cadmium compounds	962,670	712,333	705,249	612,729
Chromium and chromium compounds	25,996,738	35,697,855	40,377,635	42,648,217
Cyanides	49,102,212	50,527,548	51,209,641	52,074,846
Lead and lead compounds	44,258,209	42,243,213	42,763,966	42,621,846
Mercury and mercury compounds	35,157	35,853	37,450	99,321
Nickel and nickel compounds	18,885,365	19,545,273	18,863,329	18,847,258
Subtotal On-site for 33/50 Chemicals	438,413,997	513,717,988	541,484,467	571,825,726
Subtotal On-site less 33/50 Chemicals	8,608,976,557	9,269,656,632	9,615,878,074	9,584,434,494
Subtotal On-site for All TRI Chemicals	9,047,390,554	9,783,374,620	10,157,362,541	10,156,260,220

Chemical	1990 Off-site Pounds	1991 Off-site Pounds	Projected Data	
			1992 Off-site Pounds	1993 Off-site Pounds
Benzene	2,662,027	2,163,924	1,956,285	1,819,685
Carbon tetrachloride	971,935	840,933	1,020,048	658,157
Chloroform	1,935,098	2,007,797	2,090,584	1,485,414
Dichloromethane	8,345,059	10,528,620	11,176,243	11,040,959
Methyl ethyl ketone	7,708,590	7,757,468	6,933,344	5,865,304
Methyl isobutyl ketone	3,207,654	2,532,919	2,304,960	2,050,784
Tetrachloroethylene	2,841,310	3,305,286	2,458,500	858,165
Toluene	16,850,242	13,865,706	15,388,873	13,451,138
1,1,1-Trichloroethane	4,633,476	5,253,041	4,008,457	2,752,287
Trichloroethylene	2,472,268	2,630,021	2,593,185	2,440,062
Xylenes	11,536,274	11,994,985	8,251,526	7,538,476
Cadmium and cadmium compounds	187,530	357,559	459,238	386,540
Chromium and chromium compounds	5,481,567	4,972,054	3,903,276	3,205,968
Cyanides	364,474	418,974	328,280	263,037
Lead and lead compounds	6,759,380	5,719,036	5,763,383	5,232,153
Mercury and mercury compounds	100,779	64,797	41,108	31,997
Nickel and nickel compounds	4,391,217	2,593,065	1,625,926	1,555,650
Subtotal Off-site for 33/50 Chemicals	80,448,880	77,006,185	70,303,216	60,635,776
Subtotal Off-site less 33/50 Chemicals	773,451,024	797,279,247	702,432,610	675,556,541
Subtotal Off-site for All TRI Chemicals	853,899,904	874,285,432	772,735,826	736,192,317

Total for 33/50 Chemicals	518,862,877	590,724,173	611,787,683	632,461,502
Total less 33/50 Chemicals	9,382,427,581	10,066,935,879	10,318,310,684	10,259,991,035
Total for All TRI Chemicals	9,901,290,458	10,657,660,052	10,930,098,367	10,892,452,537

Table 9. TRI Data Collected under the Pollution Prevention Act for 33/50 Chemicals, 1990-1993: Quantity Released (Includes Off-site Disposal)(a).

Chemical	1990 Pounds	1991 Pounds	Projected Data	
			1992 Pounds	1993 Pounds
Benzene	22,777,071	18,760,658	14,341,727	12,669,477
Carbon tetrachloride	1,711,637	1,649,063	1,359,662	1,272,155
Chloroform	23,184,204	19,739,220	16,871,435	14,278,092
Dichloromethane	90,259,930	80,189,944	64,243,069	57,398,045
Methyl ethyl ketone	117,221,288	102,309,424	86,053,440	76,789,187
Methyl isobutyl ketone	26,480,175	28,194,835	27,164,097	25,506,386
Tetrachloroethylene	19,170,142	16,407,683	11,940,254	9,051,251
Toluene	215,032,891	196,784,903	171,886,924	156,803,806
1,1,1-Trichloroethane	141,349,697	132,160,136	104,897,302	72,454,478
Trichloroethylene	38,020,135	34,532,204	29,156,169	23,989,725
Xylenes	123,317,694	122,964,725	111,356,550	107,104,561
Cadmium and cadmium compounds	1,319,468	1,235,362	1,256,353	1,179,702
Chromium and chromium compounds	38,085,219	40,080,347	38,551,411	37,435,248
Cyanides	8,810,822	7,055,445	7,068,939	6,716,208
Lead and lead compounds	42,676,945	35,455,972	32,792,185	30,778,099
Mercury and mercury compounds	133,963	98,786	205,295	54,531
Nickel and nickel compounds	13,215,548	8,708,102	7,797,482	7,470,241
Total Released On-site/Disposed of Off-site for 33/50 Chemicals	922,766,829	846,326,809	726,942,294	640,951,192
Total Released On-site/Disposed of Off-site less 33/50 Chemicals	2,873,922,207	2,924,868,083	2,831,907,246	2,466,510,911
Total Released On-site/Disposed of Off-site for All TRI Chemicals	3,796,689,036	3,771,194,892	3,558,849,540	3,107,462,103

and promise of forging partnerships to achieve pollution prevention, and companies appear to be **relying heavily on partnerships with their employees and managers in seeking source reduction opportunities.**

Where facilities have sought outside assistance in identifying prevention opportunities, material/product/process vendors are the dominant choice. Facilities report little reliance on State and Federal programs for assistance in their source reduction endeavors. This may be a consequence of the fact that most government pollution prevention assistance programs are in their infancies. But the heavy reliance on internal resources suggests that **familiarity with facility-specific conditions is critical to successful identification of source reduction opportunities.**

POLLUTION PREVENTION TECHNICAL ASSISTANCE FROM THE 33/50 PROGRAM

The 33/50 Program is developing ways to **promote pollution prevention through information collection and exchange** and is facilitating the use and growth of existing technical assistance programs and resources across the country. Some of EPA's pollution prevention technology assistance and transfer efforts are listed below.

Table 10. TRI Data Collected under the Pollution Prevention Act for 33/50 Chemicals, 1990-1993: Total Wastes(a).

Chemical	Projected Data				1991 Non-Production Related Wastes Pounds
	1990	1991	1992	1993	
	Total Production Related Wastes Pounds	Total Production Related Wastes Pounds	Total Production Related Wastes Pounds	Total Production Related Wastes Pounds	
Benzene	258,899,921	288,636,361	284,171,791	283,413,825	108,722
Carbon tetrachloride	32,917,258	34,169,399	47,531,367	51,231,254	101,757
Chloroform	64,963,427	60,753,838	59,893,616	58,810,825	124,714
Dichloromethane	332,199,341	353,573,941	328,271,769	322,833,794	490,093
Methyl ethyl ketone	1,172,837,747	1,177,452,331	1,171,908,397	1,174,286,532	164,607
Methyl isobutyl ketone	278,352,800	301,496,322	299,154,877	298,937,853	57,244
Tetrachloroethylene	204,820,616	168,134,033	143,541,068	139,869,528	221,631
Toluene	1,719,947,794	1,823,744,412	1,830,137,326	1,839,284,512	666,612
1,1,1-Trichloroethane	378,332,227	391,205,814	321,559,837	214,457,126	293,081
Trichloroethylene	279,930,467	310,246,534	303,251,257	293,960,227	161,449
Xylenes	630,691,595	720,115,976	675,322,138	688,856,604	633,162
Cadmium and cadmium compounds	8,693,482	8,218,495	8,289,675	8,033,341	115,133
Chromium and chromium compounds	200,957,072	279,375,376	262,263,922	269,813,128	370,195
Cyanides	105,445,836	84,705,161	84,944,103	85,012,350	3,508
Lead and lead compounds	1,090,356,648	1,131,190,615	1,206,597,395	1,270,166,984	830,774
Mercury and mercury compounds	1,925,736	1,759,849	1,576,238	1,474,553	5,299
Nickel and nickel compounds	128,641,429	158,195,625	144,935,800	147,503,507	145,458
Total for 33/50 Chemicals	6,889,913,396	7,292,974,082	7,131,955,496	7,147,945,943	4,493,439
Total less 33/50 Chemicals	26,982,718,825	30,461,523,679	30,182,301,425	30,137,673,433	26,957,593
Total for All TRI Chemicals	33,872,632,221	37,754,497,761	37,314,256,921	37,285,619,376	31,451,032

*Pollution Prevention Information Clearinghouse and
the Pollution Prevention Information Exchange System (PIES)*

The Clearinghouse contains technical, policy, programmatic, legislative, and financial information on pollution prevention activities across the country and abroad. The Clearinghouse is a free, non-regulatory service of EPA and may be reached by personal computer modem (via PIES), telephone, or mail. **PIES is a free computer bulletin board** that allows users to access the full range of information contained in the Clearinghouse. Since the PIES system is interactive, users can address questions to other users and Clearinghouse technical staff, order documents, and exchange information. PIES contains message centers, technical databases, issue-specific "mini-exchanges," bulletins on pollution prevention events, and a calendar of pollution prevention conferences and events. PIES contains a specialized bulletin board, or **mini-exchange, devoted to the 33/50 Program**. To

(a) Submission of prior year (1990) data was optional in this first year of reporting. Data for 1992 and 1993 were estimated projections by the facilities submitting Form Rs for the 1991 reporting year. They do not represent reported totals for the 1992 or 1993 reporting years (Tables 4-5 through 4-9).

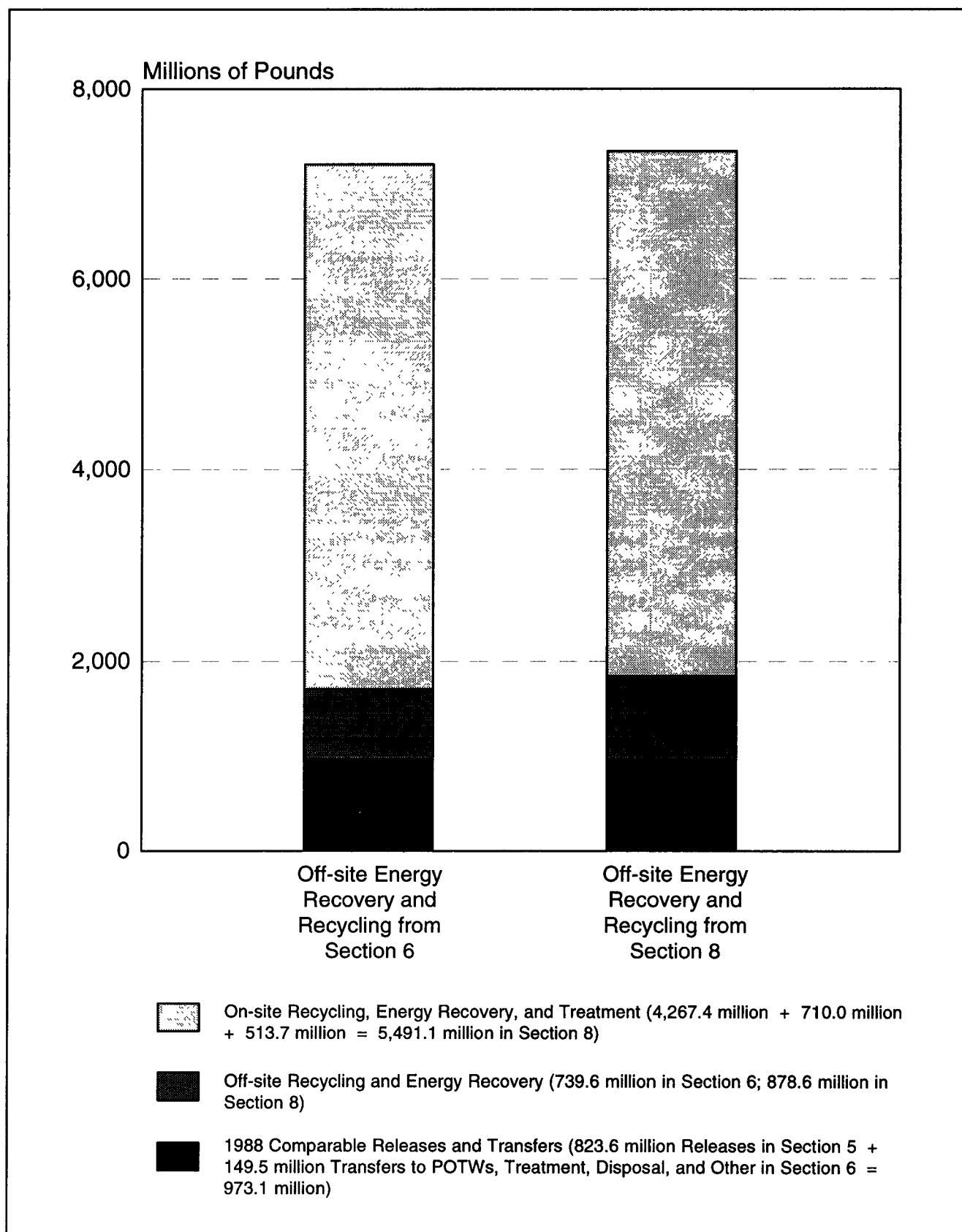


Figure 6. New Reporting under the Pollution Prevention Act in 1991 for 33/50 Program Chemicals.

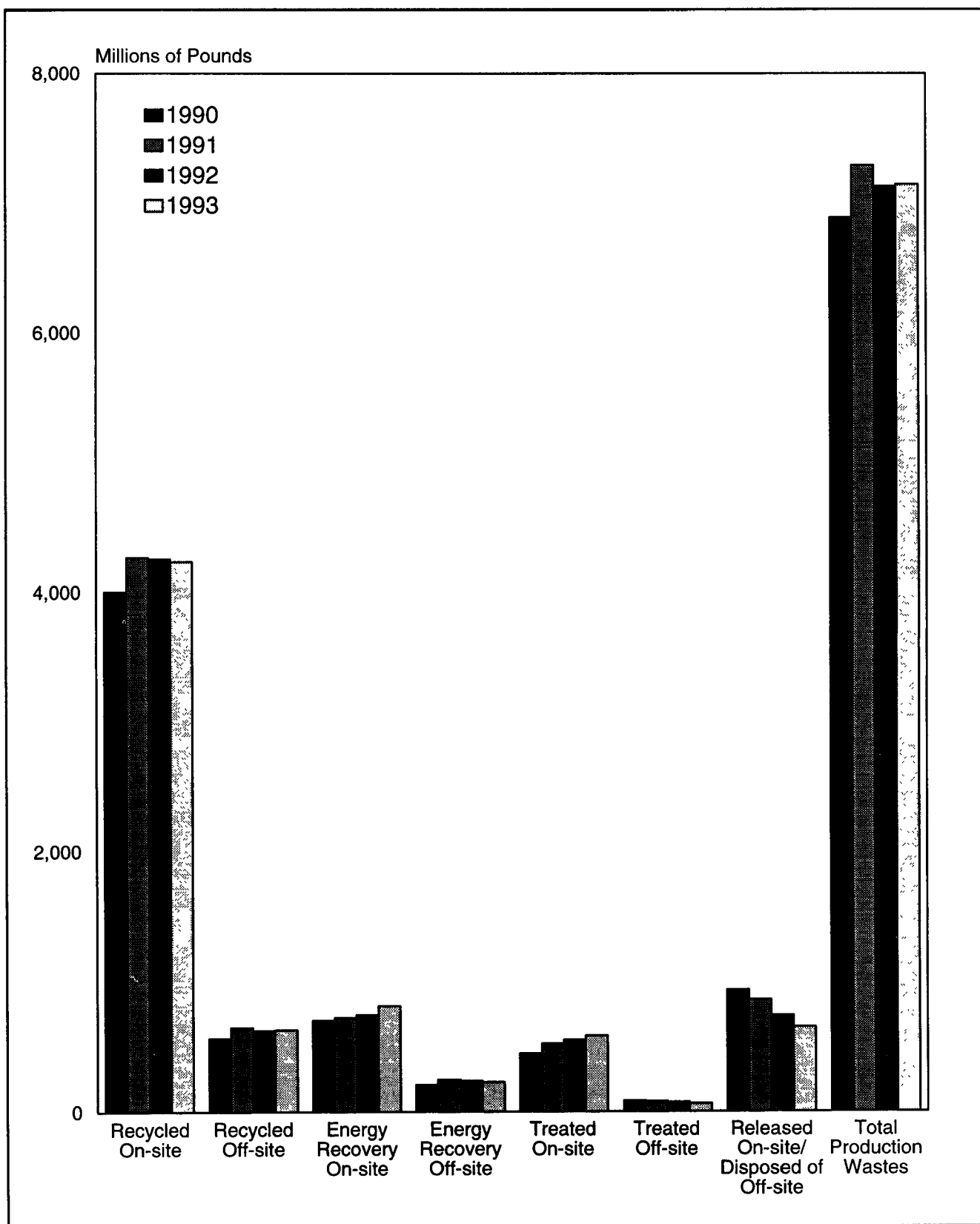


Figure 7. TRI Data Collected under the Pollution Prevention Act for 33/50 Program Chemicals, by Management Method, 1990-1993.

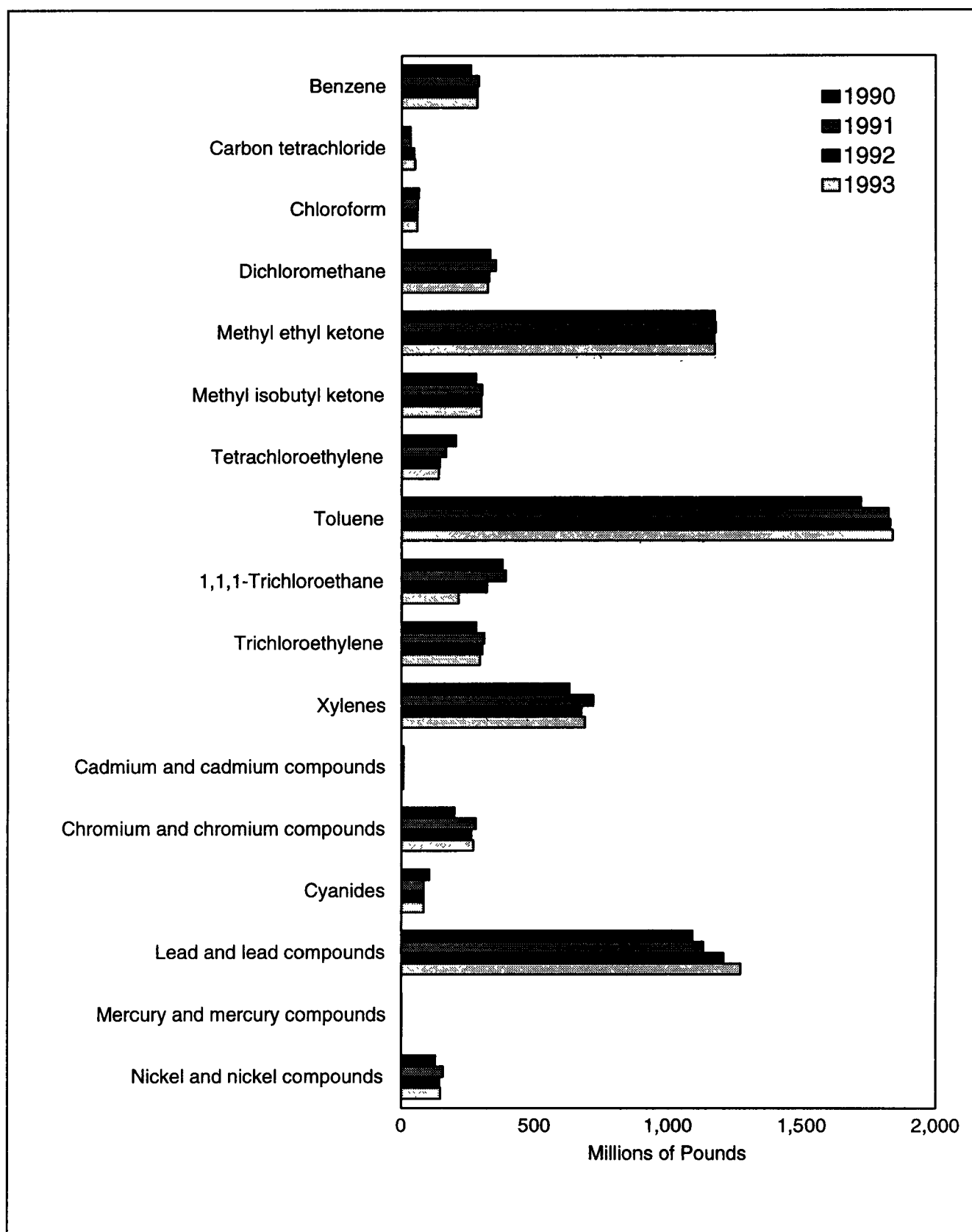


Figure 8. Total Production Wastes for 33/50 Program Chemicals, by Chemical, 1990-1993.

Table 11. Number of Forms Reporting Source Reduction, by Source Reduction Category, by Chemical, 1991.

Chemical	Number of TRI Forms	Forms Reporting Source Reduction Activities	
		Number	Percent of All Forms
Benzene	480	155	32.3
Carbon tetrachloride	99	28	28.3
Chloroform	183	67	36.6
Dichloromethane	1,258	517	41.1
Methyl ethyl ketone	2,499	958	38.3
Methyl isobutyl ketone	1,015	382	37.6
Tetrachloroethylene	558	210	37.6
Toluene	3,794	1,475	38.9
1,1,1-Trichloroethane	3,563	1,590	44.6
Trichloroethylene	697	290	41.6
Xylenes	3,639	1,341	36.9
Cadmium and cadmium compounds	210	59	28.1
Chromium and chromium compounds	2,867	578	20.2
Cyanide compounds	308	91	29.5
Lead and lead compounds	1,739	480	27.6
Mercury and mercury compounds	54	12	22.2
Nickel and nickel compounds	2,218	364	16.4
Total for 33/50 Chemicals	25,181	8,597	34.1
Total less 33/50 Chemicals	57,112	12,784	22.4
Total for All TRI Chemicals	82,293	21,381	26.0

Table 12. Methods Used to Identify Source Reduction Activity, by Chemical, 1991.

Chemical	Number of Forms Reporting Source Reduction Activities	Pollution Prevention Opportunity Audit		Materials Balance Audit	Participative Team Management	Employee Recommendation	
		Internal	External			Informal	Formal Program
Benzene	155	71	16	14	37	19	14
Carbon tetrachloride	28	10	0	4	13	7	6
Chloroform	67	28	1	8	36	7	8
Dichloromethane	517	194	20	82	214	96	50
Methyl ethyl ketone	958	350	45	131	456	206	98
Methyl isobutyl ketone	382	149	19	53	183	76	45
Tetrachloroethylene	210	93	14	23	96	39	19
Toluene	1,475	512	76	178	650	289	143
1,1,1-Trichloroethane	1,590	680	87	197	690	306	212
Trichloroethylene	290	120	9	37	120	68	28
Xylenes	1,341	529	62	149	573	290	115
Cadmium and cadmium compounds	59	21	3	9	29	15	9
Chromium and chromium compounds	578	212	24	75	253	110	47
Cyanide compounds	79	35	6	12	41	14	7
Lead and lead compounds	480	183	31	54	223	101	50
Mercury and mercury compounds	12	5	2	1	4	2	3
Nickel and nickel compounds	364	138	13	57	169	85	30
Total for 33/50 Chemicals	8,585	3,330	428	1,084	3,787	1,730	884
Total less 33/50 Chemicals	12,796	4,878	556	1,549	5,793	2,590	1,288
Total for All TRI Chemicals	21,381	8,208	984	2,633	9,580	4,320	2,172

Table 11. Number of Forms Reporting Source Reduction, by Source Reduction Category, by Chemical, 1991, Continued.

Chemical	Category of Source Reduction Activity (number of forms reporting)							
	Good Operating Practices	Inventory Control	Spill and Leak Prevention	Raw Material Modifications	Process Modifications	Cleaning and Degreasing	Surface Preparation and Finishing	Product Modifications
Benzene	47	5	121	10	98	1	0	4
Carbon tetrachloride	17	0	17	2	14	0	1	0
Chloroform	21	0	13	30	53	2	0	3
Dichloromethane	202	31	109	138	153	152	22	51
Methyl ethyl ketone	433	184	187	265	267	134	296	106
Methyl isobutyl ketone	189	64	101	90	141	42	125	53
Tetrachloroethylene	117	17	61	25	45	88	4	7
Toluene	620	243	328	420	463	157	401	173
1,1,1-Trichloroethane	678	106	192	304	302	812	119	138
Trichloroethylene	132	18	44	16	71	168	6	9
Xylenes	562	221	338	300	450	112	485	145
Cadmium and cadmium compounds	29	4	14	26	23	8	0	11
Chromium and chromium compounds	263	64	112	133	252	49	38	60
Cyanide compounds	30	11	21	16	51	14	2	2
Lead and lead compounds	222	41	91	156	199	12	16	79
Mercury and mercury compounds	3	0	1	2	7	0	0	2
Nickel and nickel compounds	192	39	86	48	195	42	9	30
Total for 33/50 Chemicals	3,757	1,048	1,836	1,981	2,784	1,793	1,524	873
Total less 33/50 Chemicals	6,209	1,562	4,235	2,113	5,246	1,300	787	925
Total for All TRI Chemicals	9,966	2,610	6,071	4,094	8,030	3,093	2,311	1,798

Table 12. Methods Used to Identify Source Reduction Activity, by Chemical, 1991, Continued.

Chemical	State Program	Federal Program	Trade/ Industry Program	Vendor Assistance	Other	Number of Forms	Percent of Total Forms
Benzene	3	1	7	17	57	256	0.7
Carbon tetrachloride	0	0	0	3	5	48	0.1
Chloroform	0	0	10	7	18	123	0.3
Dichloromethane	6	4	26	117	104	913	2.4
Methyl ethyl ketone	11	5	81	299	145	1,827	4.8
Methyl isobutyl ketone	11	3	35	107	68	749	1.9
Tetrachloroethylene	2	1	21	49	37	394	1.0
Toluene	23	8	110	466	271	2,726	7.1
1,1,1-Trichloroethane	21	13	111	443	197	2,957	7.7
Trichloroethylene	6	1	11	76	51	527	1.4
Xylenes	21	4	99	458	243	2,543	6.6
Cadmium and cadmium compounds	1	0	3	17	10	117	0.3
Chromium and chromium compounds	7	4	45	132	110	1,019	2.7
Cyanide compounds	1	1	4	19	21	161	0.4
Lead and lead compounds	8	0	31	90	124	895	2.3
Mercury and mercury compounds	0	0	1	2	3	23	0.1
Nickel and nickel compounds	5	0	21	77	62	657	1.7
Total for 33/50 Chemicals	126	45	616	2,379	1,526	15,935	41.5
Total less 33/50 Chemicals	124	45	775	2,532	2,349	22,479	58.5
Total for All TRI Chemicals	250	90	1,391	4,911	3,875	38,414	100.0

university, and other pollution prevention programs across the country. For example, the guide contains a complete listing of state and university programs that offer technical assistance on pollution prevention and waste minimization to businesses and industry. Copies of this guide may be obtained by calling EPA's Clearinghouse at (703) 821-4800.

Industry-Specific Pollution Prevention Guidance Manuals

The Pollution Prevention Research Branch of EPA's Office of Research and Development is publishing a series of industry-specific *Guides to Pollution Prevention*. **Sixteen manuals have been published to date, and two additional manuals are scheduled for publication late this year.** The manuals supplement EPA's generic waste reduction manual, the *Facility Pollution Prevention Guide*. The industry-specific manuals and the generic manual are available by calling the Clearinghouse at (703) 821-4800, or by calling EPA's Center for Environmental Research Information in Cincinnati, OH, at (513) 569-7562. A complete list of these guidance manuals, as well as many other pollution prevention manuals, appears in Section 1 of the *1993 Reference Guide to Pollution Prevention Resources*.

Identifying Research Needs and Documenting Pollution Prevention Successes

EPA is identifying areas where new research efforts could lead to beneficial and readily transferable pollution prevention results. In addition, EPA is identifying successful and innovative pollution prevention practices that companies have implemented as part of the 33/50 Program, and sharing this information with others. Companies who are aware of pollution prevention needs, or that would like to share their pollution prevention successes with others, are encouraged to contact the 33/50 Program at (202) 260-6907, or leave an electronic message on the PIES system.

A summary of research opportunities related to the 17 targeted chemicals of the 33/50 Program was published this year by EPA's Risk Reduction Engineering Laboratory in Cincinnati, OH. The document, *Opportunities for Pollution Prevention Research to Support the 33/50 Program*, can be obtained by calling the Clearinghouse at (703) 821-4800.

LOOKING TO THE FUTURE: AN AGENDA FOR ACTION

The 33/50 Program faces an ambitious agenda as it matures. Despite the evidence that the Program's 1992 interim 33% reduction goal has been achieved a year early, efforts to expand company participation will continue. In addition to the reduction goals, the 33/50 Program strives to **promote the benefits of pollution prevention** as widely as possible throughout American industry. Accordingly, **industry trade associations are being asked to assist EPA in convincing smaller companies to participate**. The Program's communications with all companies include challenges to exceed their initial goals and stress the concept of continuous improvement.

Increasing attention is also being directed toward recognizing companies' environmental improvements. The Agency is following up on the Program's popular Certificates of Appreciation (sent to all Program participants) by recognizing companies when they achieve their reduction goals. More than 200 companies have already achieved some or all of the 33/50 Program reduction targets. EPA also is planning to conduct **a national 33/50 Program conference** in Spring of 1994 to showcase the accomplishments of the Program's company, state, and community partners.

Finally, preparations are underway to commence **evaluating the Program's success** formally by using the expanded pollution prevention data reported in facilities' 1991 and subsequent TRI reports. As detailed in the preceding pages, the 1991 TRI data suggest exciting developments to date. However, important issues remain that require in-depth analysis, including assessing the actual role played by the 33/50 Program in bringing about reported reductions in facilities' releases and transfers of the target chemicals. The new TRI data provide profiles of facilities' waste management patterns that will be useful in analyzing these and other issues.

NEW FORM R INFORMATION REQUIRED BY THE POLLUTION PREVENTION ACT (PPA) OF 1990 BEGINNING WITH THE 1991 REPORTING YEAR

Beginning with the 1991 reporting year, new information required by the Pollution Prevention Act (PPA) of 1990 on the prevention and management of toxic chemicals in wastes will be reported on Form R, the TRI Reporting Form. This new information gives, for the first time, a comprehensive look at the quantities of TRI chemicals in wastes, an indication of how those quantities are managed, and an indication of what efforts are being made to reduce or eliminate those quantities. This information expands the data collected under TRI, beyond on-site releases and off-site transfers for treatment and disposal, to include on-site recycling, energy recovery, and treatment, as well as off-site transfers to recycling and energy recovery facilities. It also provides a baseline for assessing progress in the prevention of quantities of toxic chemicals from entering wastes as well as for assessing the management of toxic chemicals that enter wastes.

Some of this information, such as the quantities released and the quantities sent off-site for treatment or disposal (including quantities released or transferred off-site due to catastrophic events), has been reported before 1991. The remainder of the information is completely new to Form R reporting. Still, other data that have been reported prior to 1991, such as the quantities released and the quantities sent off-site for treatment, are now aggregated and reported in a new and additional way. To assist readers in learning what this new information is, what it means, and how it relates to the information that has been collected in the past, a copy of the 1991 Form R has been included at the end of this appendix, along with a section-by-section annotation of differences between the Form R's for 1990 and 1991 (Figure A-3).

The following quantities of toxic chemicals in wastes are now required in Section 8 of EPA's Form R to meet the requirements of section 6607(b) of the PPA:

- quantity released at the facility and disposed off-site;
- quantity used for energy recovery at the facility;
- quantity used for energy recovery off-site;
- quantity recycled at the facility;
- quantity recycled off-site;
- quantity treated at the facility;
- quantity treated off-site; and
- quantity released or transferred off-site due to catastrophic events or remedial actions.

In addition to the quantities listed above, facilities are required to provide an indication of production or activity modification at the facility to help assess changes in the quantities of toxic chemicals in wastes relative to changes in production. Facilities also indicate any source reduction activities they have implemented to reduce or eliminate quantities of the reported toxic chemical in wastes and describe the methods they employ to identify source reduction opportunities. A discussion of each of these data elements is presented later in this document.

These new data categories required by the PPA provide important information to the EPA, the public and the reporting facilities themselves. In addition, this new information can help assess movement in the waste management hierarchy, established in the PPA as national policy:

- pollution should be prevented at the source whenever feasible;
- pollution that cannot be prevented should be recycled in an environmentally safe manner whenever feasible;
- pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and
- disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

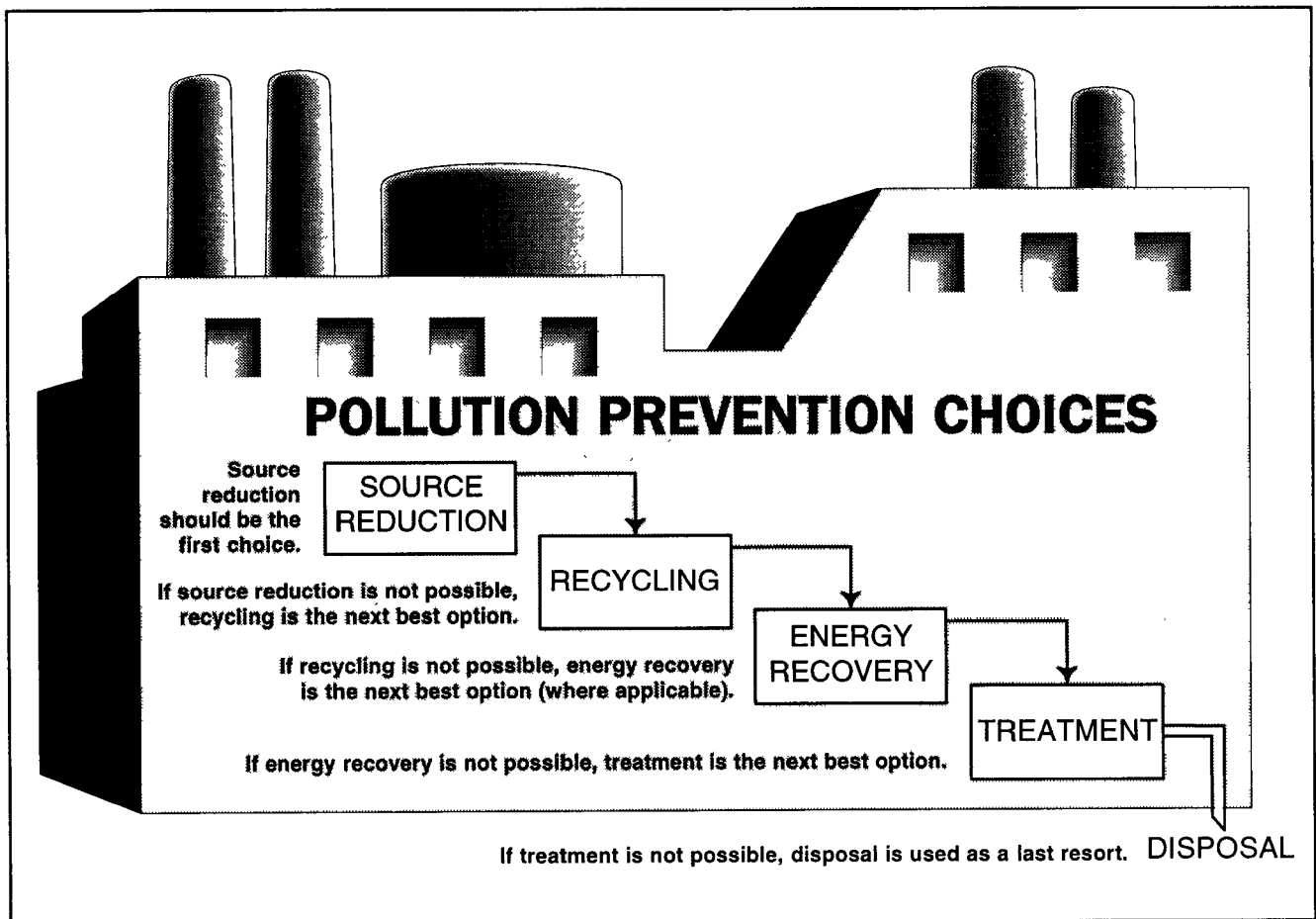


Figure A-1. Waste Management Hierarchy.

The decision-making process that should be used when determining how to prevent and manage toxic chemicals in wastes is illustrated in Figure A-1.

In separate items of Section 8, the new Form R requires the reporting of chemical quantities contained in wastes that are generated at a facility through production-related activities and non-routine activities (i.e. spills or other catastrophic events). The quantities of the toxic chemical contained in production-related wastes are to be reported for the reporting year, the year prior to and the two years following the current reporting year. Since 1991 was the first year for which this new Section 8 information was required, the PPA did not require facilities to report quantities for 1990 when they did not have adequate information to make a reasonable estimate. As a result, information for 1990 may not be available to make comparisons across the four years reported. It should be noted that the quantities reported for 1992 and 1993, the two years following the reporting year, are projections only and not commitments that facilities reporting under TRI are required to meet. The intent of requiring this information is to encourage facilities to implement source reduction activities and move up the waste management hierarchy.

DATA REQUIRED BY THE POLLUTION PREVENTION ACT

To better understand the new information required by the PPA, a description for each of the new data categories is presented below.

What is Pollution Prevention?

Through pollution prevention, risks to people and the environment can be reduced, financial and natural resources can be saved that would otherwise have to be expended on environmental cleanup or pollution control, and industrial processes can become more efficient. Pollution prevention is source reduction, which is defined in the PPA as any practice that:

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

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

Quantity released (Section 8.1 of Form R). This is the total quantity that was released to the environment at the facility (directly discharged to air, land, and water, and injected underground) and sent off-site for the purposes of disposal. Because this quantity includes amounts disposed off-site, it differs from the total releases to the environment that facilities report in Section 5 of Form R.

Quantity used for energy recovery on-site (Section 8.2 of Form R). This is the quantity that was actually combusted for the purposes of energy recovery on-site. The reported toxic chemical has to have a heating value that is high enough to sustain combustion in some form of energy recovery device, such as a furnace (including kilns) or a boiler. For example, metals or metal compounds should not be reported as combusted for energy recovery because the parent metals do not contribute any heating value to the wastes being combusted. The parent metals would be discharged to air or remain in the ash, which is usually disposed. The amount reported should represent the amount actually destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler which, on average, combusted 98% of the toluene. The remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery, and the remaining 2,000 pounds is reported as released to air.

Quantity used for energy recovery off-site (Section 8.3 of Form R). This is the quantity that was sent off-site for the purposes of energy recovery. It is the quantity that left the facility boundary, not the amount actually combusted at the off-site location. The toxic chemical must have a significant heating value and the off-site location must have some form of energy recovery unit in place. These quantities should also have been reported in Section 6 of Form R as off-site transfers, along with the receiving facility's name and location.

Quantity recycled on-site (Section 8.4 of Form R). This is the quantity that was recovered and made available for further use at the facility. It is not the quantity that entered a recycling or recovery operation. This quantity may be greater than the actual amount of the toxic chemical managed at the facility, depending on how the facility reported. For example, a facility used a total of 15,000 pounds of 1,1,1-trichloroethane for cleaning and other purposes during the reporting year. The toxic chemical was recycled in batches for a total of 15 batches, resulting in 225,000 pounds of 1,1,1-trichloroethane recycled during that year. This quantity is much greater than the amount of the toxic chemical that was actually used at the facility, but reflects the amounts of 1,1,1-trichloroethane in wastes that were managed at the facility during the reporting year. However, not all facilities have reported in this manner.

Quantity recycled off-site (Section 8.5 of Form R). This is the quantity that was sent off-site for the purposes of recycling. It is the quantity that left the facility boundary, not the amount actually recovered at the off-site location. These quantities should also have been reported in Section 6 of Form R as off-site transfers, along with the receiving facility's name and location.

Quantity treated on-site (Section 8.6 of Form R). This is the quantity that was destroyed in on-site waste treatment operations, not the amount that entered any treatment operation. If 100,000 pounds of benzene were combusted in an incinerator that

destroyed 99% of the benzene, the facility would have reported 99,000 pounds as treated on-site. If the remaining 1,000 pounds were released through a stack, the 1,000 pounds would have been reported as a quantity released (Section 8.1). For this data element, "destroyed" means that the chemical no longer exists in its reportable form. For example, reduction of a certain quantity of hexavalent chromium to trivalent chromium would not be reported as a quantity treated because the chromium was not destroyed and was still in its reportable form.

Quantity treated off-site (Section 8.7 of Form R). This is the quantity that was sent to publicly owned treatment works (POTWs) and other off-site treatment locations. It is the quantity that left the facility boundary, not the amount actually treated at the off-site locations. Quantities included here should also be reported in Section 6 of Form R.

Data users should be aware that off-site locations can have varying levels of treatment capabilities, which means that a toxic chemical sent to a POTW or another off-site location may or may not have been treated in the sense that the chemical was destroyed and not released to the environment.

For example, metals and certain organic chemicals may have been "passed through" a POTW, meaning that they were discharged directly from the POTW. Metals may also have been contained in the sludges from POTWs, which were disposed of on land. As a result, quantities may have been reported as treated when they were ultimately released to the environment. This could also have occurred at other off-site locations in that the toxic chemical in wastes may have been treated and then disposed. In situations where the toxic chemical was stabilized and/or solidified, this is almost always a treatment step prior to disposal, usually in a landfill.

Quantity released to the environment due to one-time events (Section 8.8 of Form R). This is the quantity that was released to the environment or sent off-site for recycling, energy recovery, treatment, or disposal due to one-time events not associated with routine production practices. Such events include catastrophic events, such as accidental releases, and remedial actions. This quantity is separate from the quantities recycled, used for energy recovery, treated and released, to allow distinctions to be made between those quantities that are routinely associated with production operations and are more amenable to source reduction and those quantities that are not routinely associated with production processes and are not as amenable to source reduction since they are not readily anticipated. This separation of quantities is important in assessing progress in source reduction at facilities.

An important consideration when looking at and using these data is that the individual quantities are intended to be mutually exclusive of each other in order to avoid double-counting. This is important because the sum of the quantities reported as recycled (on- and off-site), used for energy recovery (on- and off-site), treated (on- and off-site) and released, provides the total production-related quantity of the toxic chemical in wastes that a facility must manage in that year.

ASSESSMENT OF PROGRESS IN SOURCE REDUCTION

Quantifying progress in waste reduction is a complex question that cannot be answered by simply comparing quantities over time. Many factors affect the quantity of toxic chemicals in wastes. One such factor is changes in production or activity at a facility. For this reason, the Pollution Prevention Act requires facilities to provide on Form R (Section 8.9) a production ratio or activity index as an indicator of whether production or activity involving the reported toxic chemical has increased, decreased, or remained steady from the prior year to the current reporting year. For the 1991 reporting year, the ratio is calculated by dividing the production or activity involving the reported toxic chemical in 1991 by the production or activity involving the reported toxic chemical in 1990. A ratio that is less than 1.0 indicates that production or activity is down in 1991 as compared to 1990. A ratio of 1.0 indicates that production or activity has remained steady. A ratio greater than 1.0 indicates that production or activity has increased. While the information reported on Form R can be used to estimate changes in the quantities of toxic chemicals in wastes relative to changes in production or activity, an accurate assessment of source reduction progress would require more detailed information than is currently included on Form R. This and other issues associated with the new information required on Form R are discussed later in this document.

WHAT IS BEING DONE TO REDUCE THESE WASTES?

As previously mentioned, facilities are required to provide information on any source reduction activity implemented during the reporting (calendar) year. Source reduction activities are those that reduced or prevented a quantity of the reported toxic chemical from being recycled, combusted for energy recovery, treated, or released (including disposal).

The categories or types of source reduction activities that can be reported are:

- Good operating practices
- Inventory control
- Spill and leak prevention
- Raw material modifications
- Process modifications
- Cleaning and degreasing
- Surface preparation and finishing
- Product modifications

For each of these categories, there are more detailed activities reported on Form R using specific codes. For example, raw material modifications include increasing the purity of raw materials, substitution of raw materials, and "other" raw material modifications.

The revised Form R also requires that facilities indicate the method(s) used to identify the reported source reduction activity. These methods include the following:

- Internal pollution prevention opportunity audit(s)
- External pollution prevention opportunity audit(s)
- Materials balance audits
- Participative team management
- Employee recommendation (independent of a formal company program)

- Employee recommendation (under a formal company program)
- State government technical assistance program
- Federal government technical assistance program
- Trade association/industry technical assistance program
- Vendor assistance
- Other

ISSUES ASSOCIATED WITH NEW FORM R REPORTING REQUIREMENTS

As with the first year of data collection under TRI (1987), EPA recognizes that the quality of the data required by the PPA and reported for the first time under TRI in 1991 is questionable. Just as the TRI program has developed over time since 1987, the issues and problems associated with the collection of these additional data will be resolved with the help of the public. EPA is currently providing as much guidance as possible through training courses and workshops held across the country.

From analyses performed for the 1991 TRI Data Release, four of the top twenty-five chemicals reported as treated on-site are metal compounds: zinc, copper, lead, and chromium. Because the amounts reported should reflect only the parent metal portion of the metal compound and because the parent metals are not destroyed in on-site treatment, the metal compounds should not be reported as treated on-site. If a facility interprets the quantity treated on-site to represent the amount of the toxic chemical removed from wastes and not the amount of toxic chemical in wastes destroyed, the facility may double-count the amount of toxic chemical in wastes and incorrectly categorize the ultimate disposition of the toxic chemical in wastes. Quantities of metals undergoing on-site treatment are not destroyed, but are either released on-site or transferred off-site, and should be reported as such. If a facility reports a metal as both treated on-site and released or disposed, this results in the double-counting of the quantity of the metal in waste. Because of this problem, metals should not be reported as treated on-site. Metals can, however, be reported as sent off-site for treatment. This is acceptable, because facilities are only required to report the ultimate known disposition of toxic chemicals transferred off-site and because quantities reported as treated off-site represent the quantities leaving the facility for the purposes of treatment, not the amount actually destroyed off-site. However, it should be realized that parent metals sent off-site for treatment will not be destroyed and will ultimately be released or disposed to the environment.

Further complicating this is the issue of how to report a quantity that is treated and subsequently disposed. In reporting transfers off-site, facilities should report the ultimate known disposition of the toxic chemical. In a situation where a metal is sent off-site and stabilized prior to disposal in a landfill, the quantity of the metal sent off-site should be reported as disposed, not treated, off-site in both Sections 6 and 8 of Form R. There may, however, be situations where the facility transfers the toxic chemical off-site and does not know that it is being landfilled or where it is being landfilled and the only information available to the facility is the treatment prior to disposal. While the quantity can be reported as

a quantity treated off-site, this makes it difficult to clearly categorize or assess the difference between the treatment and release/disposal categories of the waste management hierarchy.

The new information reported on Form R may not match exactly the release and transfer information in Sections 5 and 6 that has been collected since the inception of the TRI program (see Figure A-2). In some cases, information on the quantities of toxic chemicals transferred off-site as reported in Section 6 does not match with the new information; some facilities have reported quantities as sent off-site but did not provide a code indicating the activity to which the quantity was subject (recycle, energy recovery, treatment, or disposal). Some facilities reported quantities sent off-site, but provided codes that are not in the instructions for Form R; these codes cannot be assigned to any particular off-site activity and, along with the quantities that have no codes, are identified as "other" off-site activities.

Even with the use of valid codes, however, there still may exist some discrepancies. For example, the quantity released (including disposal) as reported in Section 8.1 of Form R may not equal the sum of the quantities reported as released on-site and the amounts reported as sent off-site for disposal (reported in Sections 5 and 6 respectively). EPA believes that this is a problem in relating the data that should be reported in different sections of Form R that will be reduced over time.

The largest discrepancy in the new information is the difference between what is reported as recycled off-site in Section 8 and what is reported as sent off-site for recycling in Section 6. This discrepancy may be due to factors beyond just relating the data reported in different sections of Form R. Facilities may have interpreted what was to be reported as recycled off-site for the new information (Section 8) differently from what was to be reported as sent off-site as a transfer in wastes (Section 6.2).

To resolve these and other complex outstanding issues, EPA has initiated a public dialogue process, in which members of environmental groups, industry, States, and academia are being brought together. The representatives of these groups will discuss the issues associated with reporting this new information and provide EPA with advice and recommendations as to how to resolve them. This process will insure that the intent of the PPA is met and that the users of TRI data are provided with meaningful information on the management of toxic chemicals in wastes.

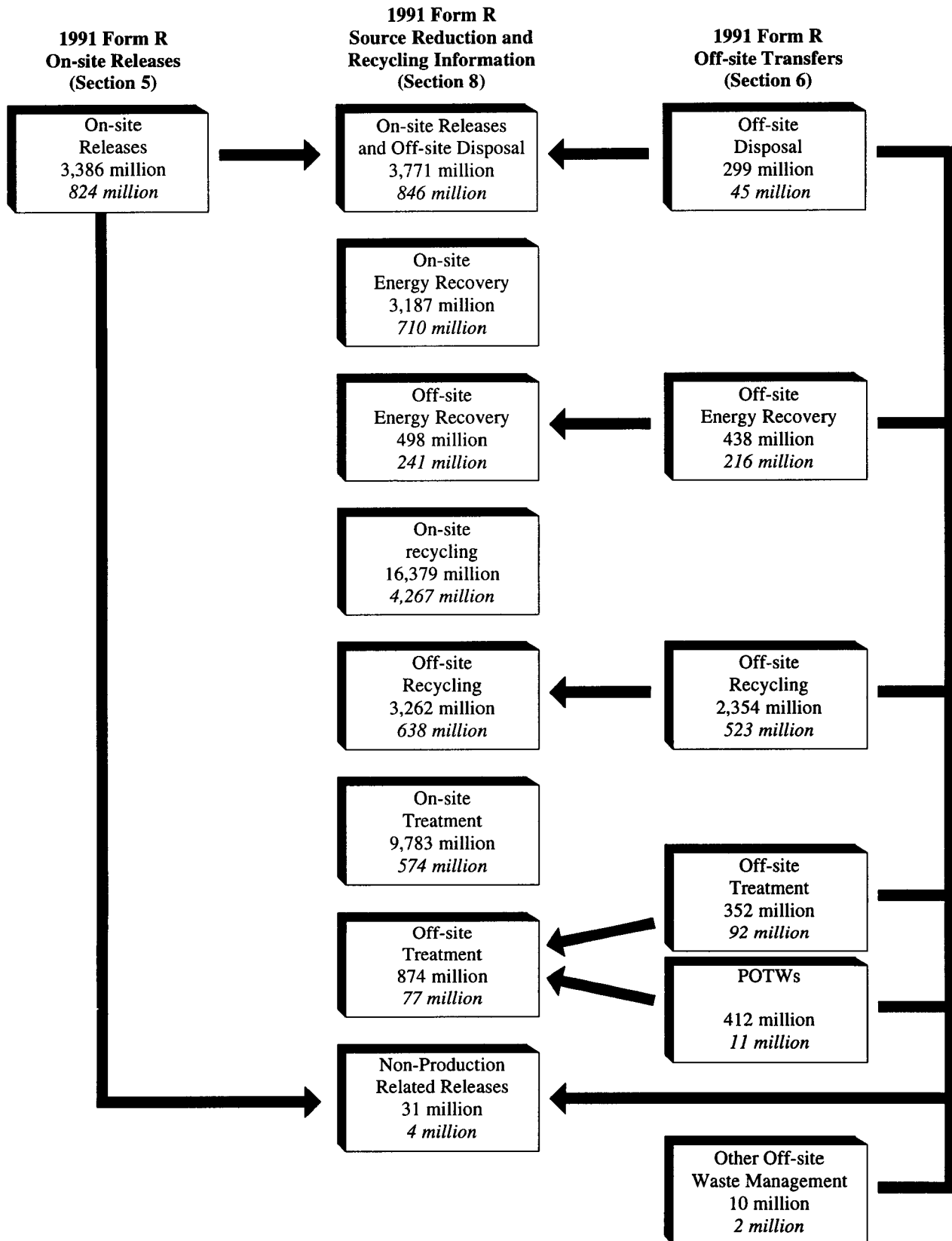


Figure A-2. Relationship of Data from Various Form R Sections (all TRI chemicals; 33/50 chemicals; amounts in pounds).

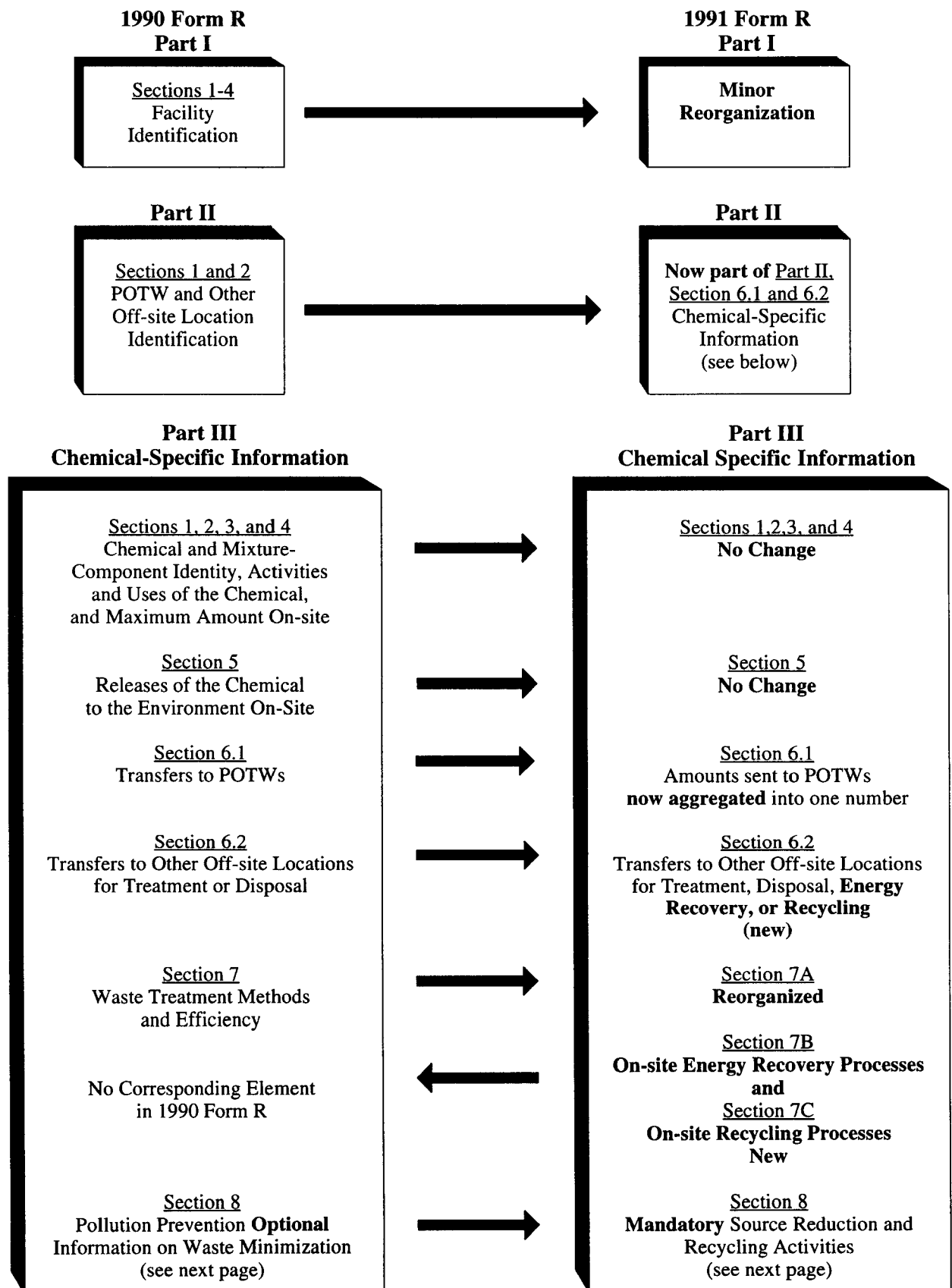


Figure A-3. Relationship of 1990 and 1991 Form R's.

**1990 Form R
Part III (continued)
Section 8 — Optional**

Section 8A
Type of Pollution Prevention
Modification

Section 8B
Quantity of the Chemical in Wastes
Prior to Treatment or Disposal

No Corresponding Element
in 1990 Form R

Section 8C
Index

Section 8D
Reason for Action

No Corresponding Element
in 1990 Form R



**1991 Form R
Part III (continued)
Section 8 — Mandatory**

No Corresponding Element
in 1991 Form R

Section 8.1
Quantity Released

Section 8.2
Quantity Used for
Energy Recovery On-site

Section 8.3
Quantity Used for
Energy Recovery Off-site

Section 8.4
Quantity Recycled On-site

Section 8.5
Quantity Recycled Off-site

Section 8.6
Quantity Treated On-site


Section 8.7
Quantity Treated Off-site

Section 8.8
Quantity Released to the Environment
as a Result of Remedial Actions,
Catastrophic Events, or
One-Time Events Not Associated with
Production Processes

Section 8.9
Quantity Production Ratio or
Activity Index

No Corresponding Element
in 1991 Form R

Section 8.10
Source Reduction Activities and
Methods to Identify Activity

 EPA United States Environmental Protection Agency	FORM R TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act	TRI FACILITY ID NUMBER
		Toxic Chemical, Category, or Generic Name


WHERE TO SEND COMPLETED FORMS:	1. EPCRA Reporting Center P.O. Box 23779 Washington, DC 20026-3779 ATTN: TOXIC CHEMICAL RELEASE INVENTORY	2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)	Enter "X" here if this is a revision
IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.			For EPA use only

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR	SECTION 2. TRADE SECRET INFORMATION	
	Are you claiming the toxic chemical identified on page 3 trade secret? <input type="checkbox"/> Yes (Answer question 2.2; Attach substantiation forms) <input type="checkbox"/> No (Do not answer 2.2; Go to Section 3)	
19 ____	If yes in 2.1, is this copy: <input type="checkbox"/> Sanitized <input type="checkbox"/> Unsanitized	

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)	
I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparer of this report.	
Name and official title of owner/operator or senior management official	
Signature	Date Signed

SECTION 4. FACILITY IDENTIFICATION		
4.1	Facility or Establishment Name	TRI Facility ID Number
	Street Address	
	City	County
	State	Zip Code
	Mailing Address (if different from street address)	
	City	PUT LABEL HERE
	State	
	Zip Code	

 <p>United States Environmental Protection Agency</p>	<h2 style="margin: 0;">EPA FORM R</h2> <h3 style="margin: 0;">PART I. FACILITY IDENTIFICATION INFORMATION (CONTINUED)</h3>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">TRI FACILITY ID NUMBER</td> </tr> <tr> <td style="height: 20px;"></td> </tr> <tr> <td style="padding: 2px;">Toxic Chemical Category, or Generic Name</td> </tr> <tr> <td style="height: 20px;"></td> </tr> </table>	TRI FACILITY ID NUMBER		Toxic Chemical Category, or Generic Name	
TRI FACILITY ID NUMBER						
Toxic Chemical Category, or Generic Name						

SECTION 4. FACILITY IDENTIFICATION (Continued)									
4.2	This report contains information for: (Important: check only one) <div style="display: flex; justify-content: space-between; margin-top: 5px;"> a. <input type="checkbox"/> An entire facility b. <input type="checkbox"/> Part of a facility </div>								
4.3	Technical Contact	Name					Telephone Number (include area code)		
4.4	Public Contact	Name					Telephone Number (include area code)		
4.5	SIC Code (4-digit)	a.	b.	c.	d.	e.	f.		
4.6	Latitude and Longitude	Latitude <small>Degrees Minutes Seconds</small>				Longitude <small>Degrees Minutes Seconds</small>			
4.7	Dun & Bradstreet Number(s) (9 digits)					a. b.			
4.8	EPA Identification Number(s) (RCRA I.D. No.) (12 characters)					a. b.			
4.9	Facility NPDES Permit Number(s) (9 characters)					a. b.			
4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)					a. b.			

SECTION 5. PARENT COMPANY INFORMATION		
5.1	Name of Parent Company <input type="checkbox"/> NA	
5.2	Parent Company's Dun & Bradstreet Number <input type="checkbox"/> NA (9 digits)	



EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you complete Section 2 below.)	
1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes." Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you complete Section 1 above.)	
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY (Important: Check all that apply.)	
3.1	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Manufacture the toxic chemical:</p> </div> <div style="width: 65%;"> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. <input type="checkbox"/> Produce</p> <p>b. <input type="checkbox"/> Import</p> </div> <div style="width: 50%;"> <p><u>If produce or import:</u></p> <p>c. <input type="checkbox"/> For on-site use/processing</p> <p>d. <input type="checkbox"/> For sale/distribution</p> <p>e. <input checked="" type="checkbox"/> As a byproduct</p> <p>f. <input type="checkbox"/> As an impurity</p> </div> </div> </div> </div>
3.2	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Process the toxic chemical:</p> </div> <div style="width: 65%;"> <p>a. <input type="checkbox"/> As a reactant</p> <p>b. <input type="checkbox"/> As a formulation component</p> <p>c. <input type="checkbox"/> As an article component</p> <p>d. <input type="checkbox"/> Repackaging</p> </div> </div>
3.3	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Otherwise use the toxic chemical:</p> </div> <div style="width: 65%;"> <p>a. <input type="checkbox"/> As a chemical processing aid</p> <p>b. <input type="checkbox"/> As a manufacturing aid</p> <p>c. <input type="checkbox"/> Ancillary or other use</p> </div> </div>

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING THE CALENDAR YEAR	
4.1	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; width: 60px; height: 20px; margin-right: 10px;"></div> <div>(Enter two-digit code from instruction package.)</div> </div>



EPA FORM R

PART II. CHEMICAL-SPECIFIC
INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 5. RELEASES OF THE TOXIC CHEMICAL TO THE ENVIRONMENT ON-SITE

		A. Total Release (pounds/ year) (enter range code from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions <input type="checkbox"/> NA			
5.2	Stack or point air emissions <input type="checkbox"/> NA			
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
5.3.1	Stream or Water Body Name			
5.3.2	Stream or Water Body Name			
5.3.3	Stream or Water Body Name			
5.4	Underground injections on-site <input type="checkbox"/> NA			
5.5	Releases to land on-site			
5.5.1	Landfill <input type="checkbox"/> NA			
5.5.2	Land treatment/ application farming <input type="checkbox"/> NA			
5.5.3	Surface impoundment <input type="checkbox"/> NA			
5.5.4	Other disposal <input type="checkbox"/> NA			

☐

Check here only if additional Section 5.3 information is provided on page 5 of this form.



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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER
Toxic Chemical, Category, or Generic Name

SECTION 5.3 ADDITIONAL INFORMATION ON RELEASES OF THE TOXIC CHEMICAL TO THE ENVIRONMENT ON-SITE

5.3	Discharges to receiving streams or water bodies (enter one name per box)	A. Total Release (pounds/year) (enter range code from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.3.____	Stream or Water Body Name			
5.3.____	Stream or Water Body Name			
5.3.____	Stream or Water Body Name			

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTW)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1 Total Transfers (pounds/year) (enter range code or estimate)	6.1.A.2 Basis of Estimate (enter code)

6.1.B POTW Name and Location Information

6.1.B.____ POTW Name	6.1.B.____ POTW Name
Street Address	Street Address
City	City
County	County
State	State
Zip Code	Zip Code

If additional pages of Part II, Sections 5.3 and/or 6.1 are attached, indicate the total number of pages in this box and indicate which Part II, Sections 5.3/6.1 page this is, here.

(example: 1, 2, 3, etc.)



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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER

Toxic Chemical, Category, or Generic Name

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. Off-site EPA Identification Number (RCRA ID No.)		
Off-Site Location Name		
Street Address		
City	County	
State	Zip Code	Is location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input type="checkbox"/> No
A. Total Transfers (pounds/year) (enter range code or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	M
2.	2.	M
3.	3.	M
4.	4.	M

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. Off-site EPA Identification Number (RCRA ID No.)		
Off-Site Location Name		
Street Address		
City	County	
State	Zip Code	Is location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input type="checkbox"/> No
A. Total Transfers (pounds/year) (enter range code or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	M
2.	2.	M
3.	3.	M
4.	4.	M

If additional pages of Part II, Section 6.2 are attached, indicate the total number of pages in this box and indicate which Part II, Section 6.2 page this is, here. (example: 1, 2, 3, etc.)



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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER

Toxic Chemical, Category, or Generic Name

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence (enter 3-character code(s))	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data?
7A.1a	7A.1b	7A.1c	7A.1d	7A.1e
	1 <input type="text"/> 2 <input type="text"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>
	3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/>		%	<input type="checkbox"/> <input type="checkbox"/>
	6 <input type="text"/> 7 <input type="text"/> 8 <input type="text"/>			
7A.2a	7A.2b	7A.2c	7A.2d	7A.2e
	1 <input type="text"/> 2 <input type="text"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>
	3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/>		%	<input type="checkbox"/> <input type="checkbox"/>
	6 <input type="text"/> 7 <input type="text"/> 8 <input type="text"/>			
7A.3a	7A.3b	7A.3c	7A.3d	7A.3e
	1 <input type="text"/> 2 <input type="text"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>
	3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/>		%	<input type="checkbox"/> <input type="checkbox"/>
	6 <input type="text"/> 7 <input type="text"/> 8 <input type="text"/>			
7A.4a	7A.4b	7A.4c	7A.4d	7A.4e
	1 <input type="text"/> 2 <input type="text"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>
	3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/>		%	<input type="checkbox"/> <input type="checkbox"/>
	6 <input type="text"/> 7 <input type="text"/> 8 <input type="text"/>			
7A.5a	7A.5b	7A.5c	7A.5d	7A.5e
	1 <input type="text"/> 2 <input type="text"/>			Yes <input type="checkbox"/> No <input type="checkbox"/>
	3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/>		%	<input type="checkbox"/> <input type="checkbox"/>
	6 <input type="text"/> 7 <input type="text"/> 8 <input type="text"/>			

If additional copies of page 7 are attached, indicate the total number of pages in this box and indicate which page 7 this is, here. (example: 1, 2, 3, etc.)



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PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER

Toxic Chemical, Category, or Generic Name

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1

2

3

4

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1

2

3

4

5

6

7

8

9

10



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PART II. CHEMICAL-SPECIFIC
INFORMATION (CONTINUED)

TRI FACILITY ID NUMBER

Chemical, Category, or Generic Name

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

All quantity estimates can be reported using up to two significant figures.		Column A 1990 (pounds/year)	Column B 1991 (pounds/year)	Column C 1992 (pounds/year)	Column D 1993 (pounds/year)
8.1	Quantity released *				
8.2	Quantity used for energy recovery on-site				
8.3	Quantity used for energy recovery off-site				
8.4	Quantity recycled on-site				
8.5	Quantity recycled off-site				
8.6	Quantity treated on-site				
8.7	Quantity treated off-site				
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)				
8.9	Production ratio or activity index				
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)			
8.10.1		a.	b.	c.	
8.10.2		a.	b.	c.	
8.10.3		a.	b.	c.	
8.10.4		a.	b.	c.	
8.11	Is additional optional information on source reduction, recycling, or pollution control activities included with this report? (Check one box)				YES <input type="checkbox"/> NO <input type="checkbox"/>

* Report releases pursuant to EPCRA Section 329(8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated on-site or off-site.

FOR MORE INFORMATION

Anyone interested in obtaining additional information about the 33/50 Program can do so by calling EPA's TSCA Assistance Hotline at **(202) 544-1404** Monday through Friday between 8:30 a.m. and 5:00 p.m. EST. Or contact us directly at EPA headquarters at **(202) 260-6907** or by directing letters to **Mail Code TS-799, Office of Pollution Prevention and Toxics, U.S. EPA, 401 M Street, SW, Washington, DC 20460**. Written communications from companies are maintained in a publicly available 33/50 Program Administrative Record. Copies of company communications and computer-generated lists of participating companies are available upon request.

Information about the 33/50 Program can also be obtained from **33/50 Program Coordinators** in EPA's ten Regional offices:

Region I

33/50 Program Coordinator (MS: ATR)
US Environmental Protection Agency
Pesticides & Toxics Substances
1 Congress Street
Boston, MA 02203
Phone: (617) 565-3230 Fax: (617) 565-4939
Connecticut, Massachusetts, Maine, New Hampshire,
Rhode Island, Vermont

Region II

33/50 Program Coordinator (MS: 105)
US Environmental Protection Agency
Environmental Services Division
2890 Woodbridge Avenue, Building 10
Edison, NJ 08837-3679
Phone: (908) 906-6890 Fax: (908) 321-6788
New Jersey, New York, Puerto Rico, Virgin Islands

Region III

33/50 Program Coordinator (MS: 3AT01)
US Environmental Protection Agency
841 Chestnut Street
Philadelphia, PA 19107
Phone: (215) 597-9302 Fax: (215) 580-2011
Delaware, District of Columbia, Maryland, Pennsylvania,
Virginia, West Virginia

Region IV

33/50 Program Coordinator
US Environmental Protection Agency
Title III & Toxics Section
345 Courtland Street, NE
Atlanta, GA 30365
Phone: (404) 347-1033 Fax: (404) 347-1681
Alabama, Florida, Georgia, Kentucky, Mississippi,
North Carolina, South Carolina, Tennessee

Region V

33/50 Program Coordinator (MS: SP-14J)
US Environmental Protection Agency
Pesticides & Toxic Substances Branch
77 West Jackson Blvd.
Chicago, IL 60604
Phone: (312) 353-5907 Fax: (312) 353-4342
Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

Region VI

33/50 Program Coordinator (MS: 6T-PT)
US Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733
Phone: (214) 655-7582 Fax: (214) 655-2164
Arkansas, Louisiana, New Mexico, Oklahoma, Texas

Region VII

33/50 Program Coordinator (MS: ARTX)
US Environmental Protection Agency
Air & Toxics Division
726 Minnesota Avenue
Kansas City, KS 66101
Phone: (913) 551-7600 Fax: (913) 551-7065
Iowa, Kansas, Missouri, Nebraska

Region VIII

33/50 Program Coordinator (MS: 8ART-AP)
US Environmental Protection Agency
999 18th Street, Suite 600
Denver, CO 80202-2405
Phone: (303) 294-7684 Fax: (303) 293-1229
Colorado, Montana, North Dakota, South Dakota,
Utah, Wyoming

Region IX

33/50 Program Coordinator (MS: A-4-3)
US Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
Phone: (415) 744-1069 Fax: (415) 744-1073
Arizona, California, Hawaii, Nevada, American Samoa,
Guam, Commonwealth of the Northern Mariana Islands

Region X

33/50 Program Coordinator (MS: AT-083)
US Environmental Protection Agency
Toxics Substances Section
1200 6th Avenue
Seattle, WA 98101
Phone: (206) 553-4762 Fax: (206) 553-8338
Alaska, Idaho, Oregon, Washington