

Chapter 3
1999 TRI Data and 1995–1999
Trends
(Original Industries Only)

Chapter 3



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

INTRODUCTION

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

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

examined. Data for all TRI chemicals appear in the appendices to this volume.

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

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

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

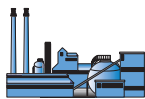


Table 3–1. TRI Facilities and Forms, 1995 and 1998–1999, Original Industries

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

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

TRI RELEASES, 1995–1999

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

Almost 15 percent of the 1999 original industry submissions were Form A certification statements rather than Form Rs, the standard TRI reports. EPA established the Form A certification option, beginning with the 1995 reporting year, for facilities that meet TRI reporting thresholds but that do not have a total annual reportable amount for a listed chemical exceeding 500 pounds and that do not manufacture, process, or otherwise use more than 1 million pounds

of the chemical.¹ As explained in **How Do Facilities Report?** in Chapter 1, Form A certification statements do not report amounts of chemical releases, including transfers, or other waste management activities.

On- and Off-site Releases

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

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

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



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

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

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

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

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

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

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

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

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

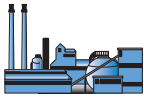
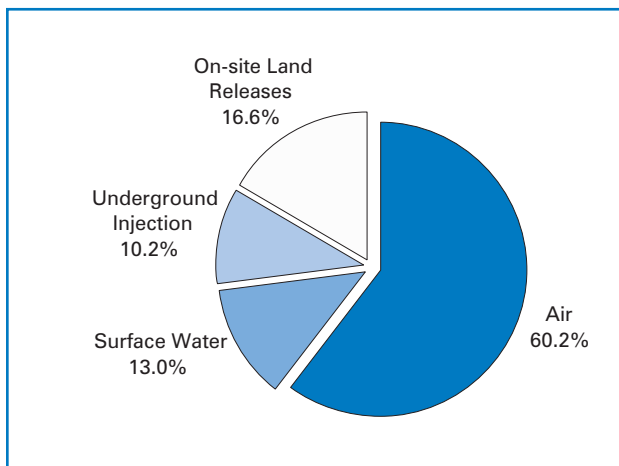


Figure 3–1. 1999 TRI On-site Releases, Original Industries



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

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

On-site Releases

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

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

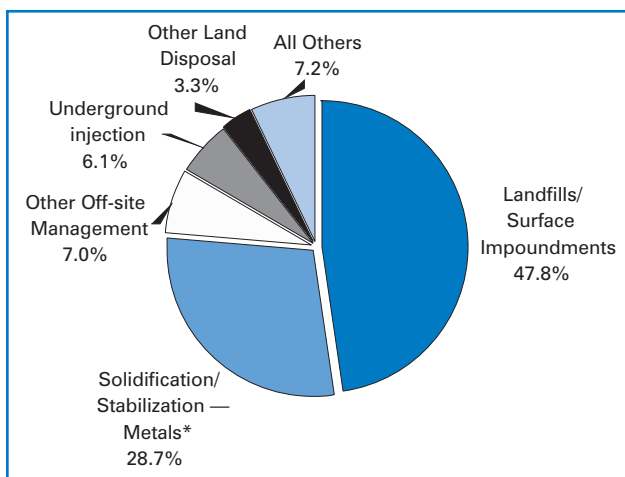
Air emissions fell 26.1 percent between 1995 and 1998, and this decrease of 415.6 million pounds was the largest factor in the overall reduction of on-site releases for the original industries. Underground injection showed a reduction of 19.8 percent (49.4 million pounds). Both surface water discharges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

Off-site Releases

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



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



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

* See notes to Table 3–2.

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

compounds for 1999 appear in Appendix B.)

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

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

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

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

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

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

*Seven facilities in the food processing industry (SIC code 20) reported from 150 million pounds to 1 billion pounds each in on-site recycling of n-hexane in 1995, for a total of 4.0 billion pounds. In 1996 these facilities reported no on-site recycling of n-hexane. On their 1996 Form Rs, these facilities also reported zero for on-site recycling of n-hexane for the prior year (1995). However, they have not revised their 1995 forms. These amounts of on-site recycling in 1995 have been omitted from this table.

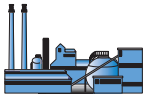
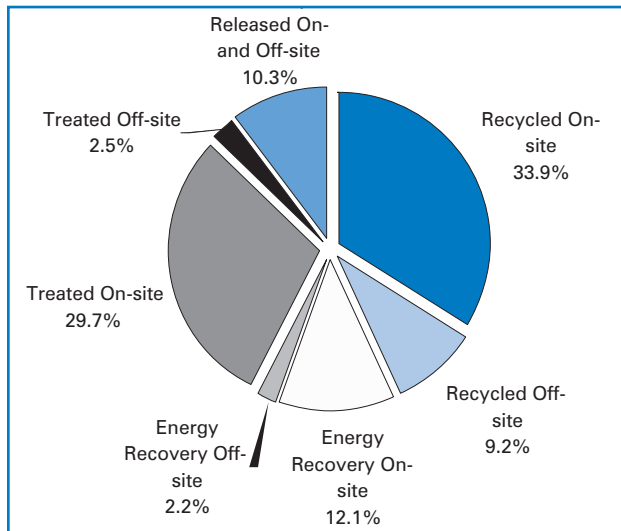


Figure 3–3. 1999 Quantities of TRI Chemicals in Waste, Original Industries



Note: Data are from Section 8 of Form R.

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

WASTE MANAGEMENT DATA, 1995–1999

Quantities of TRI Chemicals in Waste

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

Most waste management occurs on-site. The largest waste management quantity reported was in on-site recycling, 7.84 bil-

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

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

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

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



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

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

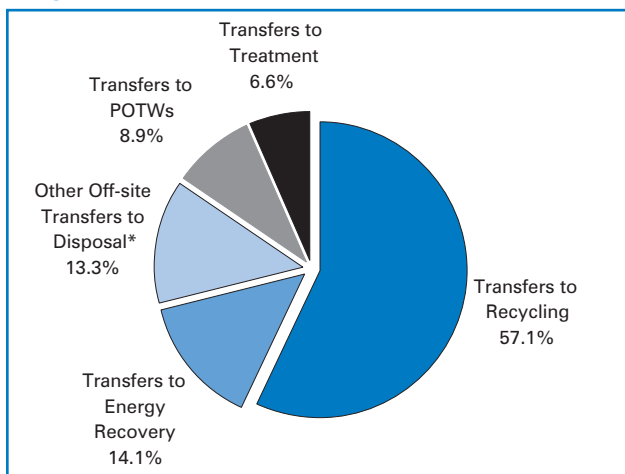
Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R. Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility’s other off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising other off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.

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

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

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

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



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

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

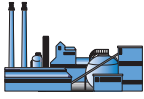
**Other Off-site Transfers are transfers reported without a valid waste management code.

Transfers Off-site for Further Waste Management and Disposal

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

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

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



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

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

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

TRI DATA BY STATE, 1995–1999

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

On- and Off-site Releases by State

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

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

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

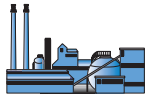


Table 3–5. TRI On-site and Off-site Releases by State, 1995 and 1998–1999, Original Industries

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

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

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



Chapter 3 — 1999 TRI Data and 1995–1999 Trends (Original Industries Only)

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

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

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

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

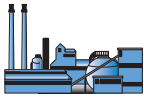


Table 3–6. TRI On-site and Off-site Releases by State, 1999, Original Industries (continued)

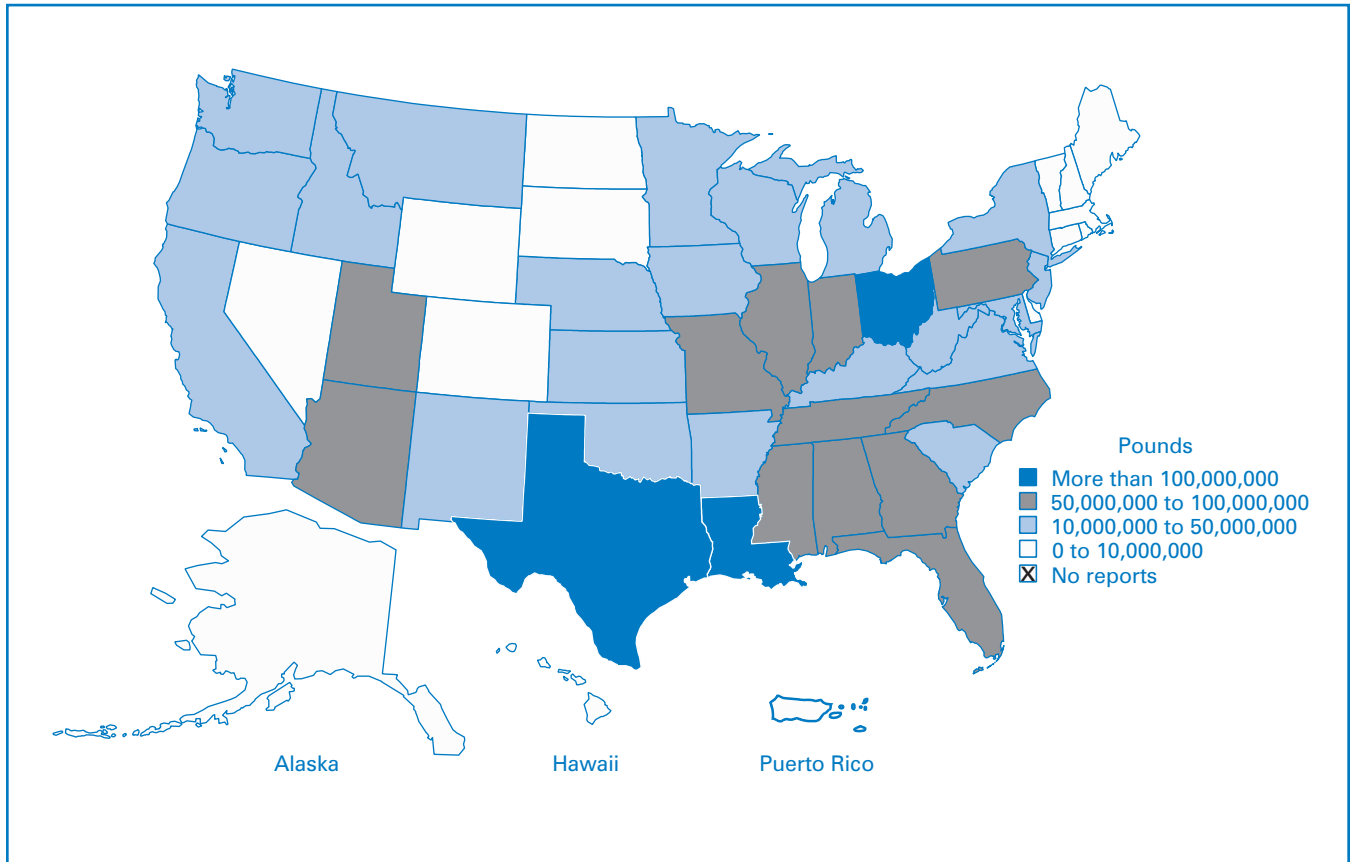
| State | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases Transfers Off-site to Disposal Pounds | Total On- and Off-site Releases Pounds |
|----------------------|--------------------------|--------------------------------|--|--------------------------|----------------------------------|-------------------------------------------------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

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

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



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



12.7 million pounds, occurred between 1998 and 1999.

In five states—Indiana, Florida, Arkansas, Idaho, and Arizona—total on- and off-site releases for the original industries rose by more than 10 million pounds between 1995 and 1999. Indiana facilities reported an increase of 19.0 million pounds, making a total of 134.6 million pounds in 1999. In Florida, the increase was 18.9 million pounds, and the 1999 total was 77.4 million pounds. Arkansas facilities reported an increase of 11.9 million pounds, with a 1999 total of 51.8 million pounds. The increase in Idaho was 10.6 million pounds, and the 1999 total was 26.6 million pounds. Arizona’s increase of 10.4 million pounds brought that state’s releases in 1999 to 50.9 million pounds. Idaho’s percentage rise

was the steepest, 65.7 percent; Florida’s was 32.2. In Arkansas, Arizona, and Indiana, percentage growth for 1995–1999 was less than 30 percent. The apparent increase of 30.5 million pounds in Pennsylvania, as discussed above, was due to a data entry error and was actually less than 10 million pounds.

On-site Releases

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



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

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

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

Off-site Releases

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

result in some of the same types of releases as those facilities report on-site.

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

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

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

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



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

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

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

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

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

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

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

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

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



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

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

Note: Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change off-site transfers to disposal (other off-site management) amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal (other off-site management) for manganese compounds from 5,584,900 pounds to below 500 pounds.

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

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

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

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

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

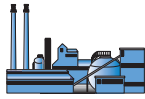


Table 3–7. TRI Off-site Releases (Transfers Off-site to Disposal), 1999, Original Industries (continued)

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

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

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

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

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

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

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

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



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

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

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

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

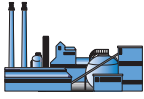
^aStorage only (disposal code M10) indicates that the toxic chemical is sent off-site for storage because there is no known disposal method. Amounts reported as transferred to storage only are included as a form of disposal (off-site release). See Box 1–5.

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

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

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

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



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

Transfers Within and Among States

Off-site Releases

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

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

Most off-site releases were transferred within the state where they originated. The total amount transferred within states was 274.8 million pounds, 56.5 percent of the

total of off-site releases transferred within the state and those transferred into the state. A total of 212.0 million pounds nationwide was sent by facilities in one state to locations in another.

Transfers Off-site for Further Waste Management

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

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

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



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

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

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

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

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

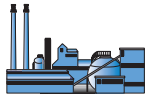
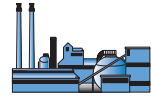


Table 3–9. TRI Transfers Off-site for Further Waste Management Among and Within State, 1999, Original Industries

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

Note: Transfers Off-site for Further Waste Management are from Section 6 (excluding transfers off-site to disposal) of Form R.

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



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

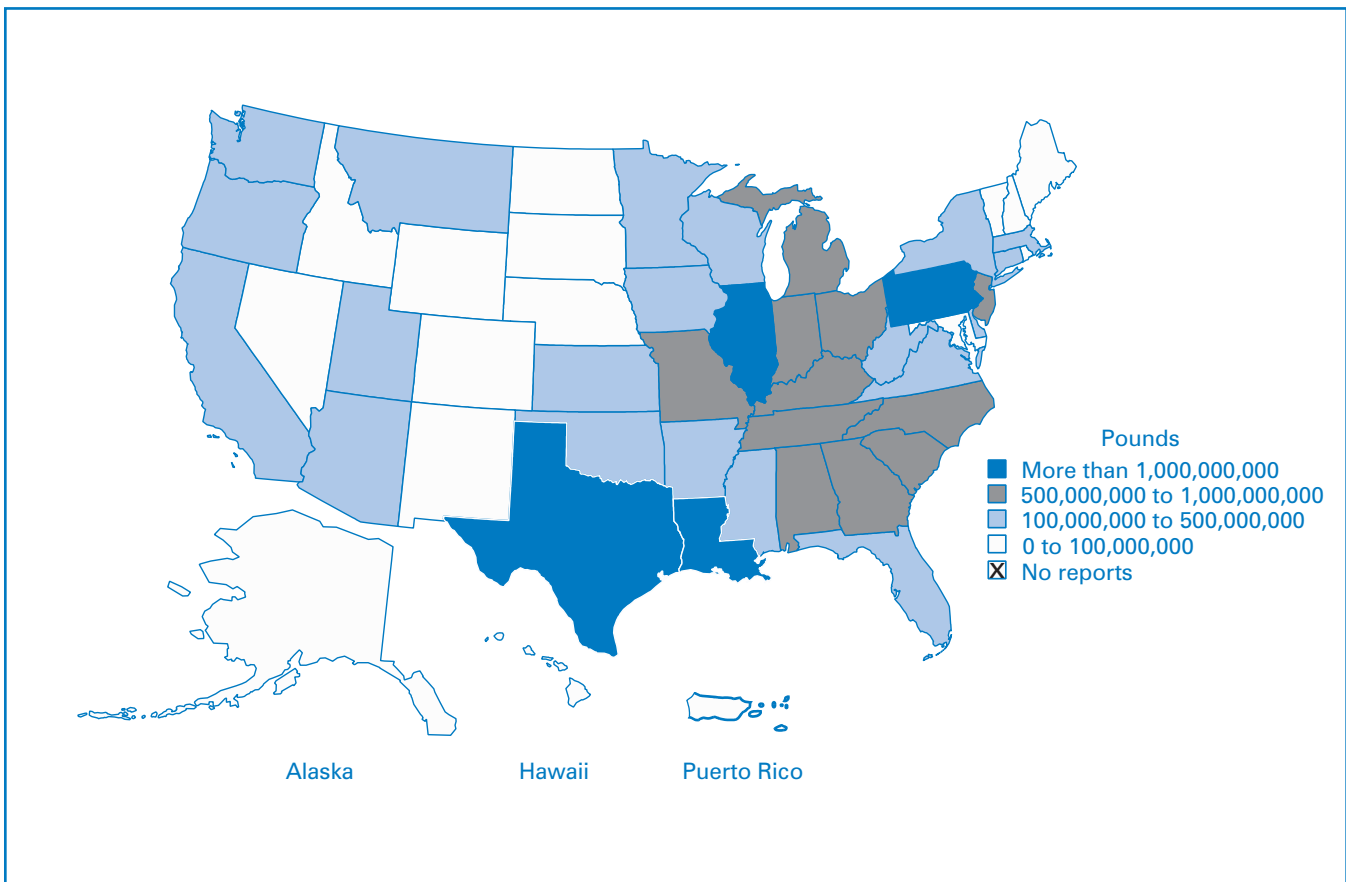
Management of TRI Chemicals in Waste by State

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

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

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

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



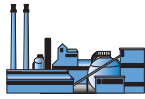


Table 3–10. Quantities of TRI Chemicals in Waste by State, 1999, Original Industries

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

Note: Data are from Section 8 of Form R.

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

**Chapter 3 — Toxics Release Inventory Data for New Reporting Industries:
Chemical Wholesale Distributors (SIC Code 5169)**



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

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

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

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

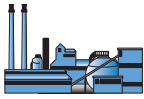
^aStorage only (disposal code M10) indicates that the toxic chemical is sent off-site for storage because there is no known disposal method. Amounts reported as transferred to storage only are included as a form of disposal (off-site release). See Box 1–5.

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

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

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

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



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

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

TRI RELEASES, 1988–1999

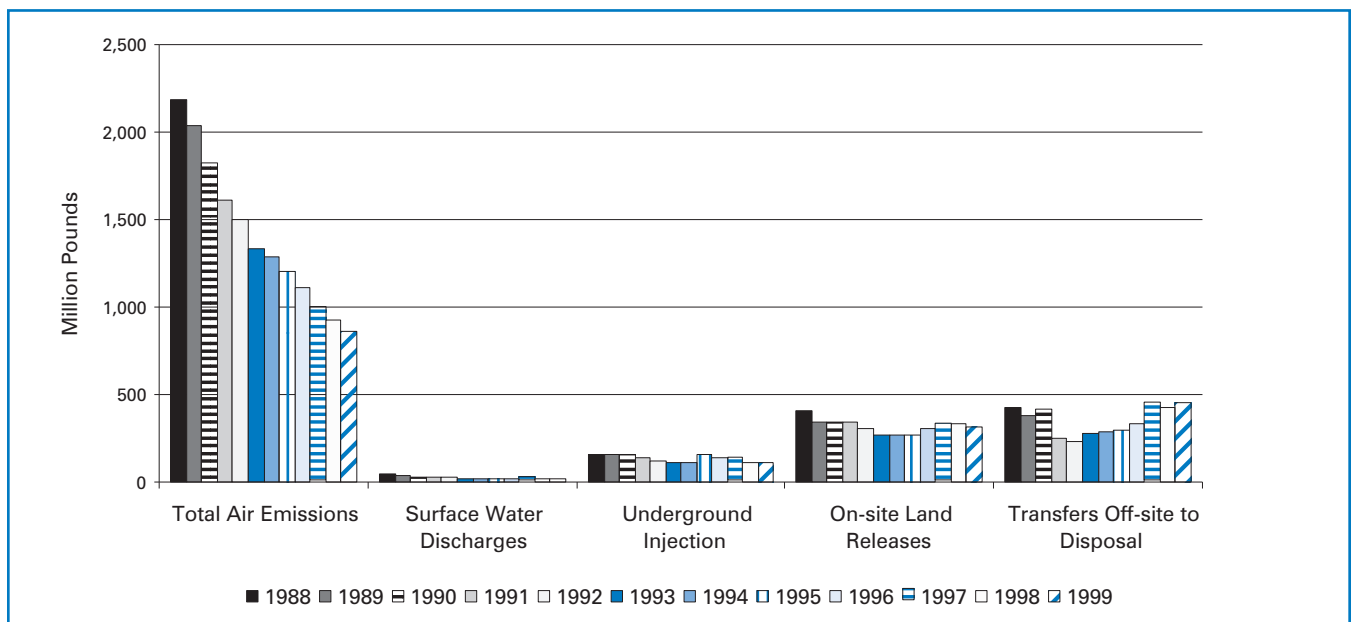
As noted in **Making Year-to-Year Comparisons of TRI Data** in Chapter 1, comparisons of TRI data across years must be based on a consistent set of chemicals and industries. Tables in this section address only data for the chemicals that were reportable in all years 1988 through 1999. Because reporting requirements for ammonia, hydrochloric acid, and sulfuric

acid changed during that period, these substances are not included in the 1988–1999 analyses. Reporting by facilities in the industries added to TRI beginning in 1998 is also excluded here.

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

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

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



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



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

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

SOURCE REDUCTION AND PROJECTIONS OF TRI CHEMICALS IN WASTE

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

Source Reduction

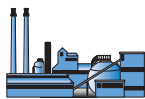
Source reduction activities are undertaken to reduce the amount of a toxic chemical that enters a wastestream or is otherwise released to the environment. By reducing the generation of toxic chemicals in waste, source reduction activities reduce the need to recycle, treat, or dispose of toxic chemicals.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

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

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

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

*Source reduction activity reporting is only done using the Form R. Form As do not contain source reduction activity information.



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

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

Facility Projections of TRI Chemicals in Waste

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

between 1999 and 2000 and a 4.1 percent projected increase between 2000 and 2001.

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

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



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

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

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

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