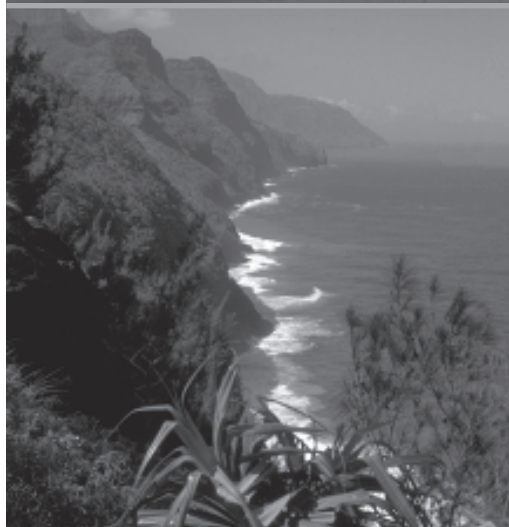
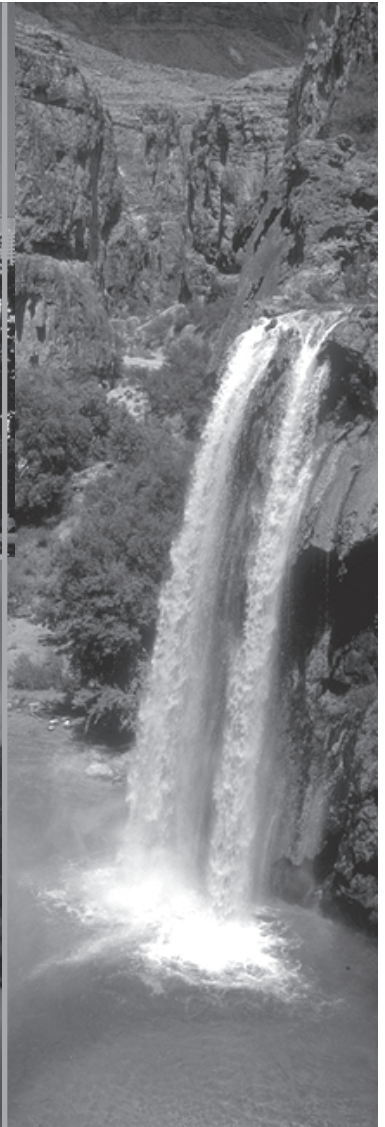




1999 Toxics Release Inventory

Public Data Release



Public Access to the Toxics Release Inventory (TRI)

TRI Data Products

| Data Product | Point of Access | Contact Information |
|---|---|--|
| 1999 TRI Executive Summary (reference EPA 260-S-01-001) | U.S. EPA's National Service Center for Environmental Publications (NSCEP) | (800) 490-9198 (513) 489-8190 FAX: (513) 489-8695 order online: http://www.epa.gov/ncepihom |
| 1999 TRI Public Data Release Report (reference EPA 260-R-01-001) | | |
| 1999 State Fact Sheets Report (reference EPA 260-F-01-001) | U.S. EPA Toxics Release Inventory (TRI) Website — 1999 Data Release | http://www.epa.gov/tri/tri99 |
| 1999 State Data Files in Dbase format | U.S. EPA Toxics Release Inventory (TRI) Website | http://www.epa.gov/tri/tri99 |
| Chemicals in Your Community (reference EPA 550-K-99-001) | NSCEP | (800) 490-9198 (513) 489-8190 FAX: (513) 489-8695 order online: http://www.epa.gov/ncepihom |

TRI Online Access

| Online Provider of TRI Data | Internet Access Address |
|--|--|
| TRI Explorer provides fast and easy access to the TRI data via U.S. EPA's latest TRI tool | http://www.epa.gov/triexplorer/ |
| U.S. EPA's TRI Program Homepage and 1999 data release page | http://www.epa.gov/tri/ http://www.epa.gov/tri/tri99/ |
| U.S. EPA Envirofacts provides access to TRI data via U.S. EPA's Envirofacts Data Warehouse Query Engine | http://www.epa.gov/enviro/html/toxic_releases.html |
| Right-to-Know Network, operated by two nonprofit organizations (OMB Watch and the Center for Public Data Access), provides free access to TRI data | http://www.rtknet.org/trisearch.html |
| TOXNET@the National Library of Medicine's (NLM) Toxicology Data Network, provides free access to TRI data | http://toxnet.nlm.nih.gov/ |

1999 Toxics Release Inventory Public Data Release

**U.S. Environmental Protection Agency
Office of Environmental Information (2810)
Washington, D.C. 20460**

1999 Toxics Release Inventory



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Toxics Release Inventory 1999

Executive Summary

BACKGROUND

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

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

as for analyzing progress in reducing releases.

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

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

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



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

1999 DATA RELEASE

The time period covered by the 1999 data release is the reporting year 1999. A reporting year is equal to a calendar year. The 1999 data, which were submitted to EPA by July 1, 2000, are the focus of the *1999 Toxics Release Inventory Public Data Release* (the

Public Data Release report). Compiled here is an analysis of the 1999 TRI data and trends in the data from 1988 to 1999.

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

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

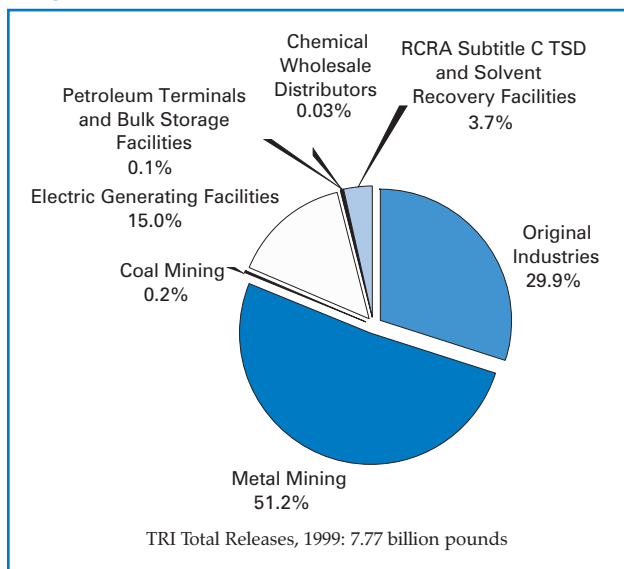
Table E-1. TRI On-site and Off-site Releases by Industry, Original and New Industries, 1999

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

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



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



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

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

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

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

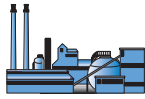
On-site air emissions totaled 2.03 billion pounds, more than one-quarter of the total releases. More than half of all air emissions were reported by the original industries. Electric generating facilities accounted for another 40 percent. The second largest type of release was on-site land releases,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

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

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

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

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



Toxics Release Inventory 1999 Executive Summary

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

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

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

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



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

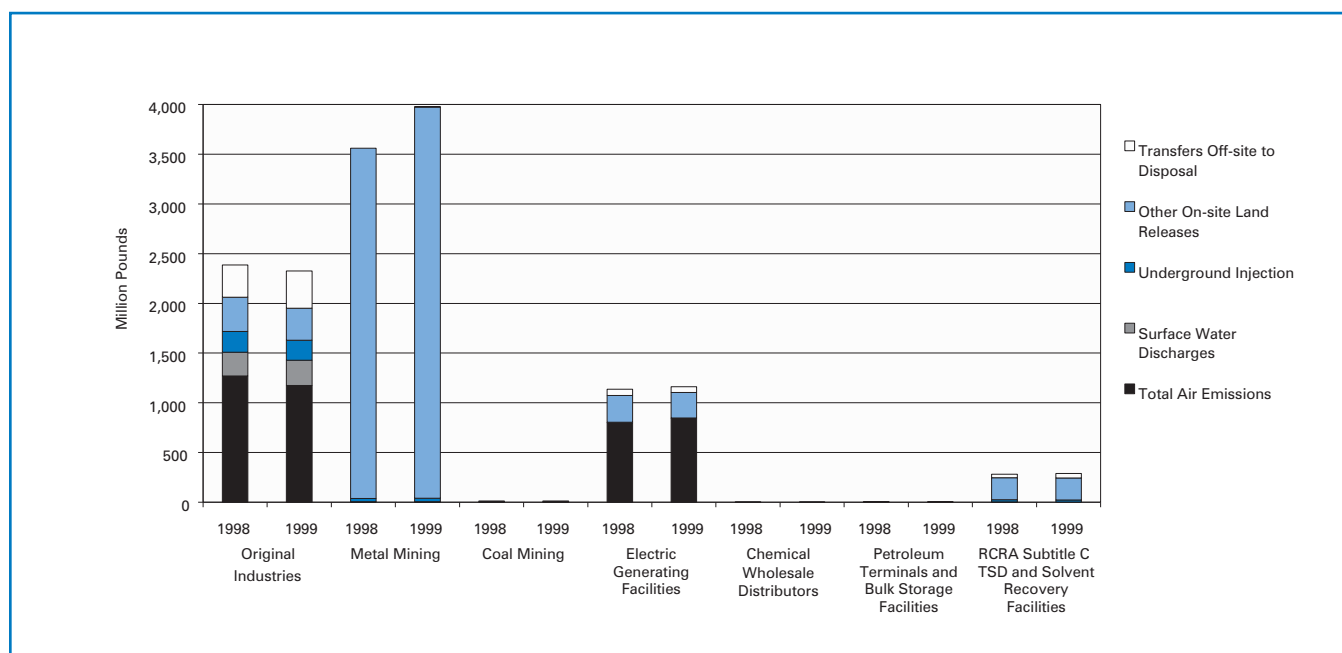
| SIC Code | Industry | Total On-site and Off-site Releases | | | |
|-----------|---|-------------------------------------|----------------------|----------------------------|------------|
| | | 1998 Pounds | 1999 Pounds | Change 1998-1999 Pounds | Percent |
| 20-39 | Original Industries | 2,386,229,289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

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

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

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Figure E-2. TRI Total Releases, Original and New Industries, 1998-1999



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



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

Waste Management Data, 1998–1999

During 1999, a total of 29.49 billion pounds of TRI chemicals in production-related

waste was reported as managed. More than three-quarters of the production-related waste was managed by original industry facilities. Another 12 percent was reported by metal mining, and electric generating facilities reported managing 6 percent. (See Table E–4 and Figure E–3.)

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

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

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

Note: Data are from Section 8 of Form R.

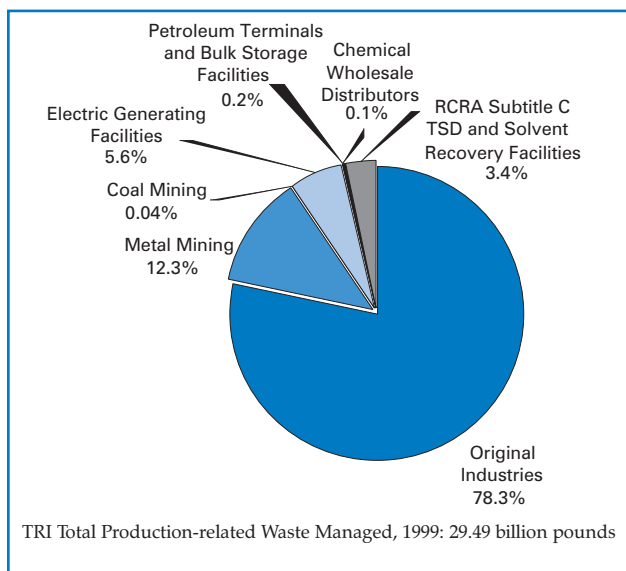
Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20–39. If the facility reported in any year prior to 1998 and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

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

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



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



Note: Data are from Section 8 of Form R.

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

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

ly. The total amount overstated is about 4,500 pounds for each year.

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

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

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

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



Toxics Release Inventory 1999 Executive Summary

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

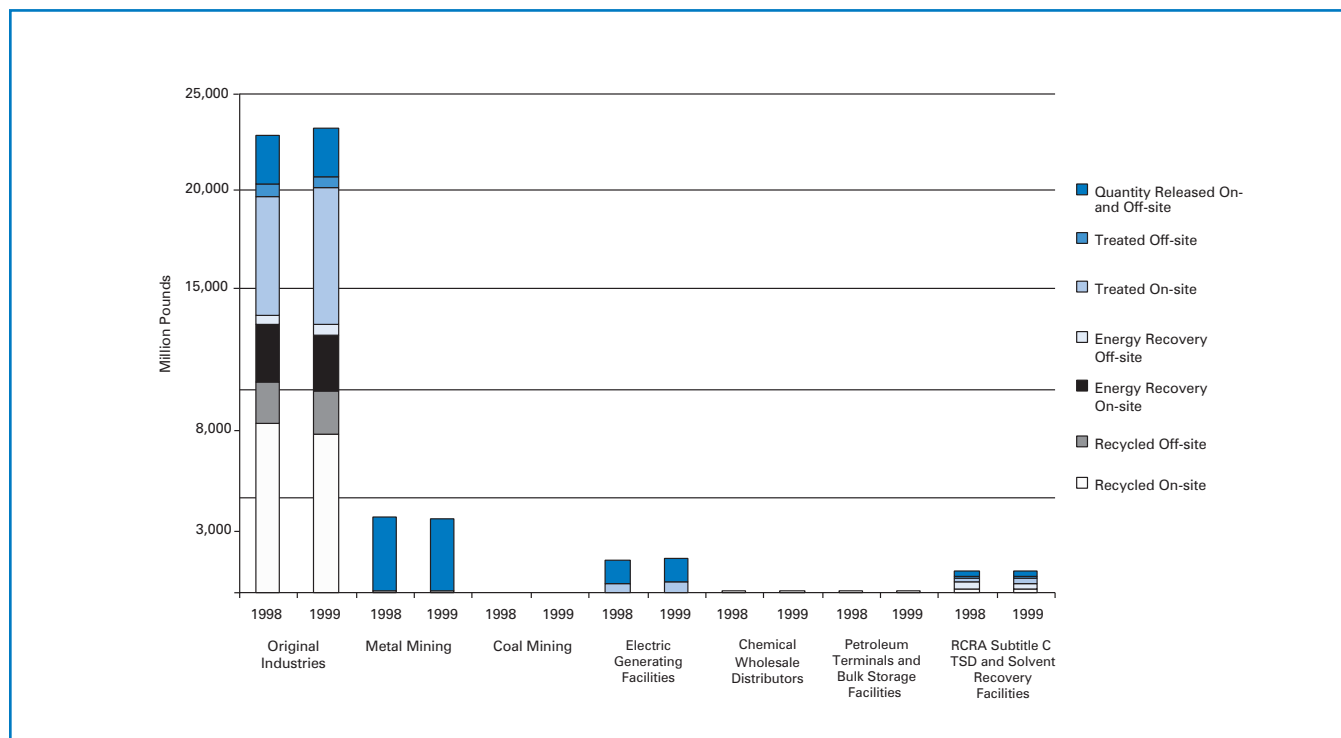
| Waste Management Activity | Original Industries | | | New Industries | | | All TRI Industries | | |
|---------------------------------------|-----------------------|-----------------------|------------|----------------------|----------------------|-------------|-----------------------|-----------------------|------------|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

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

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

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

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



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



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

| | 1988 | 1995 | 1998 | 1999 | Change 1988-1999 | |
|---|----------------------|----------------------|----------------------|----------------------|-----------------------|----------------|
| | Number | Number | Number | Number | Number | Percent |
| Total Forms | 60,312 | 60,921 | 58,521 | 57,001 | -3,311 | -5.5 |
| Form Rs | 60,312 | 55,913 | 50,308 | 48,913 | — | — |
| Form As | — | 5,008 | 8,213 | 8,088 | — | — |
| On-site Releases | Pounds | Pounds | Pounds | Pounds | Pounds | Percent |
| Total Air Emissions | 2,180,639,873 | 1,204,241,021 | 926,738,884 | 858,480,472 | -1,322,159,401 | -60.6 |
| Fugitive Air Emissions | 680,462,991 | 307,062,214 | 217,594,652 | 200,342,670 | -480,120,321 | -70.6 |
| Point Source Air Emissions | 1,500,176,882 | 897,178,807 | 709,144,232 | 658,137,802 | -842,039,080 | -56.1 |
| Surface Water Discharges | 41,919,468 | 16,976,022 | 17,328,531 | 14,260,544 | -27,658,924 | -66.0 |
| Underground Injection | 161,915,411 | 154,739,353 | 114,704,830 | 109,315,219 | -52,600,192 | -32.5 |
| On-site Land Releases | 405,909,382 | 268,346,160 | 332,307,146 | 311,947,947 | -93,961,435 | -23.1 |
| Total On-site Releases | 2,790,384,134 | 1,644,302,556 | 1,391,079,391 | 1,294,004,182 | -1,496,379,952 | -53.6 |
| Off-site Releases | | | | | | |
| Storage Only ^a | 13,830,674 | 2,233,190 | 5,504,460 | 5,934,163 | -7,896,511 | -57.1 |
| Solidification/Stabilization ^b | 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 | 422,713,934 | 293,333,923 | 422,119,574 | 455,727,003 | 33,013,069 | 7.8 |
| (Transfers Off-site to Disposal) | | | | | | |
| Total On-site and Off-site Releases | 3,213,098,068 | 1,937,636,479 | 1,813,198,965 | 1,749,731,185 | -1,463,366,883 | -45.5 |

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

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

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

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

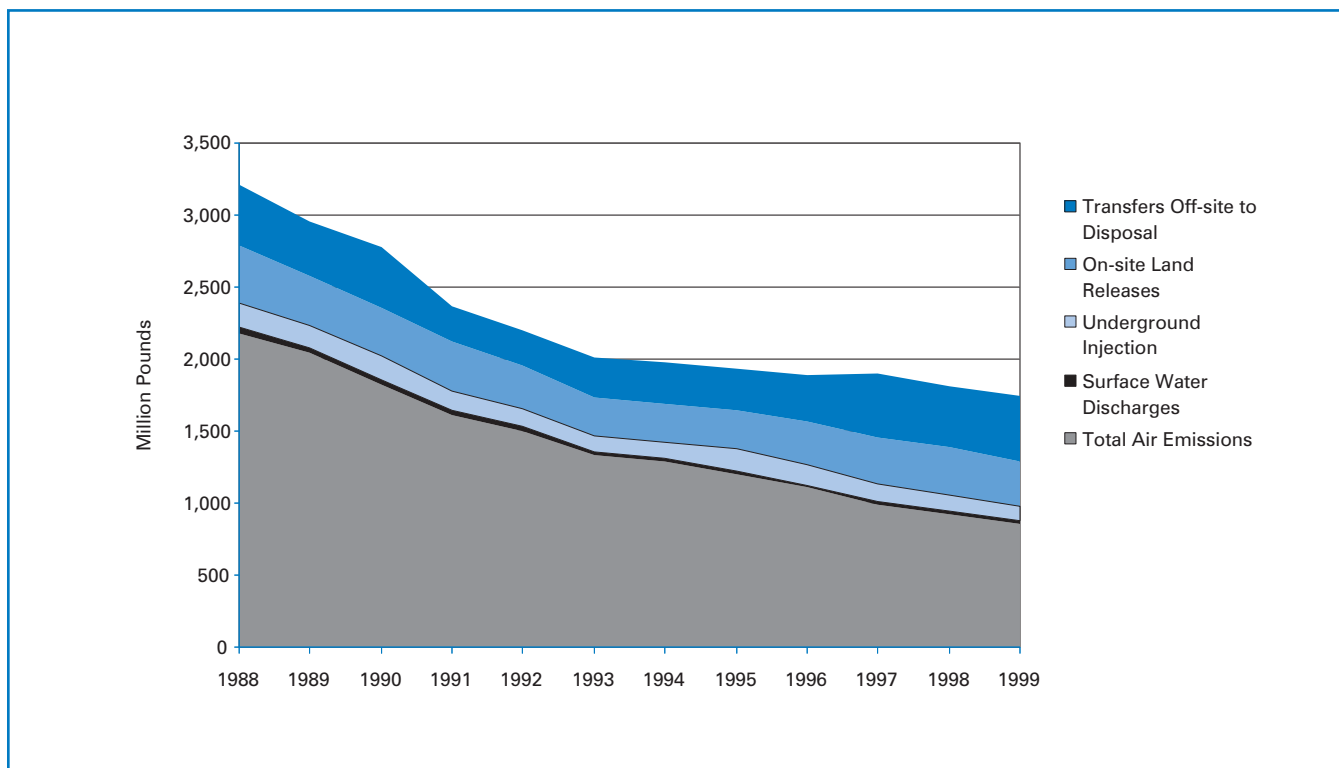
^c Beginning in reporting year 1997, transfers to wastewater treatment (excluding POTWs) of metals and metal compounds (waste treatment code M61) are reported separately from transfers to wastewater treatment of non-metal TRI chemicals (waste treatment code M60). Because wastewater treatment does not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

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

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



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



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

UNDERSTANDING THE USES, SCOPE AND LIMITS OF TRI DATA

While TRI provides the public, industry, and state and local governments an invaluable source of key environmental data, it has some limitations that must be considered when using the data. Although the Agency has expanded the number of industries that must report, the program does not cover all sources of releases and other waste management activities of TRI chemicals. Although TRI is successful in capturing information on a significant portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. In addition, facilities that do not meet

the TRI threshold levels (those with fewer than 10 full-time employees or those not meeting TRI quantity thresholds) are not required to report. Thus, while the TRI includes 84,068 reports from 22,639 facilities for 1999, the 7.77 billion pounds of on-and off-site releases reported represent only a portion of all toxic chemical releases nationwide.

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



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

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

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

TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management

activities of toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical after it is released, the locality of the release, and the populations that are exposed to the chemical after its release.

ACCESSING THE TRI DATA

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

Chapter 1

Toxics Release Inventory Reporting and the 1999 Public Data Release

Chapter 1



Toxics Release Inventory Reporting and the 1999 Public Data Release

INTRODUCTION

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

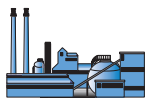
Section 313 of EPCRA established the Toxics Release Inventory (TRI) Program, a national database that identifies facilities, chemicals manufactured and used at the identified facilities, and the annual amounts of these chemicals released (in routine operations and in accidents and other one-time events)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

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

chemicals as well as for analyzing progress in reducing releases.

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

Since TRI began in 1987, the program has grown. In particular, 1998 marked the first reporting by seven additional industry sectors: metal mining, coal mining, electrical utilities that combust coal and/or oil, hazardous waste treatment and disposal facilities, chemical wholesale distributors, petroleum bulk stations and terminals, and solvent recovery services (see **Who Must Report?** in this chapter for specific industry identification). Since 1994, federal facilities have been added to TRI, the number of reportable chemicals has nearly doubled,



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

Now in the second decade of the TRI Program, many challenges in the Right-to-Know Program remain to be met. TRI was designed to be a program that would evolve, over time, to meet the changing needs of an informed and involved public. The program will never be static and will never be “finished.” As new chemicals of concern are identified, they will be added. Sectors that appear to contribute significantly to environmental loadings will be added. Data collection will be modified to meet new information needs and access technologies will be developed over time to assure enhanced public access to the TRI data.

1999 PUBLIC DATA RELEASE

This 1999 Toxics Release Inventory Public Data Release provides a detailed view of the information collected through TRI. This volume summarizes data collected for calendar year 1999, along with changes since 1998, 1995, 1991, and 1988. The companion volume, 1999 TRI Public Data Release: State Fact Sheets, supplies TRI data in greater detail for each state and territory. The online TRI Explorer, a new Web tool for searching TRI data, available at <http://www.epa.gov/triexplorer>, includes data collected for all years, including those not found in this report. In addition, the TRI data can be accessed through EPA's Envirofacts data warehouse at <http://www.epa.gov/enviro>.

The *1999 Toxics Release Inventory Public Data Release* contains five chapters plus an exec-

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

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

TRI REPORTING

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

Each year, facilities that meet certain thresholds must report their releases and



other waste management activities for listed toxic chemicals to EPA and to the state or tribal entity in whose jurisdiction the facility is located. The TRI list for 1999 included more than 600 chemicals and 28 chemical categories. Each facility submits a TRI reporting form for each TRI chemical it has manufactured, processed, or otherwise used during 1999 in amounts exceeding the thresholds (see **How Do Facilities Report?** later in this chapter).

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

Who Must Report?

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

- Metal mining (SIC code 10, except 1011, 1081, and 1094),
- Coal mining (SIC code 12, except 1241),
- Electrical utilities that combust coal and/or oil (SIC codes 4911, 4931, and 4939),

- RCRA subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953),
- Chemical wholesalers (SIC code 5169),
- Petroleum terminals and bulk stations (SIC code 5171), and
- Solvent recovery services (in SIC code 7389).

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

Thresholds for manufacturing and processing are currently 25,000 pounds for each listed chemical, while the threshold for otherwise using is 10,000 pounds per chemical.

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

What Must Be Reported?

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



Box 1-1. Who Must Report to TRI?

A facility must report to TRI if it:

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

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

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

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

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

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

Facilities provide specific identifying information, such as:

- Name
- Location
- Type of business

- Contact names
- Name of parent company
- Environmental permit numbers

They also provide information about the manufacture, process, and otherwise use of the listed chemical at the facility and the maximum amount of the chemical on-site during the year. Facilities provide information about methods used to treat waste streams containing the toxic chemicals at the site and the efficiencies of those treat-



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

Information reported by facilities includes:

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

ment methods. In addition to information about the amount of toxic chemicals sent off-site for waste management, facilities also must specify the destination of these transfers. Beginning with the 1991 reports, facilities were required to provide information about source reduction activities, along with the quantities managed in waste by activities such as recycling. Companies must provide a production index that can help relate changes in reported quantities of toxic chemicals in waste managed to changes in production.

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

Box 1-2 summarizes what facilities must report to TRI. See **TRI Releases and Other Waste Management: Data Analyzed in the 1999 TRI Public Data Release**, later in this chapter for more detail on the data that facilities report, as those data are presented and analyzed throughout this book.

How Do Facilities Report?

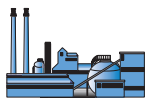
TRI facilities may file their TRI reports either electronically, using the TRI reporting software, or in hard copy. Each facility submits a Form R for each TRI chemical for which it meets the reporting requirements. Starting with the 1995 reporting year, facilities with lower levels of reportable amounts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

Form R

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

Form A

While expanding chemical and industry coverage, EPA has also provided a burden-reducing option for facilities with relatively low quantities of listed toxic chemicals in waste. Beginning in 1995, as the expanded



chemical list went into effect, facilities whose total annual reportable amount of a listed toxic chemical does not exceed 500 pounds can apply a higher activity threshold in determining their reporting obligations. The total annual reportable amount is defined as the sum of the waste management categories that would be reported to TRI: quantities released (including disposal), recovered as a result of on-site recycling operations, combusted on-site for energy recovery, and treated at the facility, plus amounts transferred off-site for recycling, energy recovery, treatment, and disposal. These amounts correspond to total production-related waste in this report.

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

What Are the Benefits and Limitations of the Data?

Benefits

The TRI Program has given the public unprecedented direct access to toxic chemical release and other waste management data at the local, state, regional, and national level. Use of this information can enable the public to identify potential concerns, gain a better understanding of potential

risks, and work with industry and government to reduce toxic chemical releases and the risks associated with them. When combined with hazard and exposure data, this information can allow informed environmental priority-setting at the local level.

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

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

Completion of three major efforts in EPA's strategy to enhance TRI's effectiveness has significantly increased the usefulness of TRI data. These actions were the TRI chemical expansion for the 1995 reporting year, facility expansion to include new industries with the 1998 reporting year, and expanded coverage of persistent, bioaccumulative toxic (PBT) chemicals through lower reporting thresholds and addition of certain PBT chemicals to the TRI chemical list beginning with the 2000 reporting year.



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

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

Limitations

While TRI provides the public, industry, and state and local governments an invaluable source of key environmental data, it has some limitations that must be considered when using the data. **What to Consider When Using TRI Data**, later in this chapter, describes specific information to keep in mind when analyzing TRI data.

Even with the expanded industry coverage, TRI does not address all sources of releases and other waste management activities of TRI chemicals. Although TRI is successful in capturing information on a significant

portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. In addition, facilities that do not meet the TRI threshold levels (those with fewer than 10 full-time employees or those not meeting TRI quantity thresholds) are not required to report. The new PBT chemical reporting thresholds expand the information TRI will collect, but only for a subset of the TRI chemicals. Thus, while the TRI includes 84,068 reports from 22,639 facilities for 1999, the 7.77 billion pounds of on- and off-site releases reported represent only a portion of all toxic chemical releases nationwide.

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

Furthermore, facilities report estimated data to TRI, and the program does not mandate that they monitor their releases. Various estimation techniques are used when monitoring data are not available, and EPA has published estimation guidance for the regulated community. Variations between facilities can result from the use of different estimation methodologies. These factors should be taken into account when considering data accuracy and comparability.

As discussed above, the TRI data summarized in this report reflect chemical releases and other waste management activities that occur in a given calendar year. Patterns of releases and other waste management activities can change dramatically from one year to the next. Thus, it is important to



recognize that current facility activities may be different from those reported for 1999 or prior years.

TRI reports reflect releases and other waste management activities of chemicals, not exposures of the public to those chemicals. Release estimates alone are not sufficient to determine exposure or to calculate potential adverse effects on human health and the environment. Although additional information is necessary to assess exposure and risk, TRI data can be used to identify areas of potential concern. Furthermore, TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management activities of toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical after it is released, the locality of the release, and the populations that are exposed to the chemical after its release.

TRI IN PERSPECTIVE

When Congress passed the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), 300-plus chemicals and chemical categories were included in the “TRI Chemical List” and only the manufacturing sector in SIC codes 20–39 was required to report under EPCRA section 313. Further, data coverage was initially confined to information on releases and certain transfers off-site for further waste management.

Passage of the Pollution Prevention Act of 1990 expanded TRI to include additional information on toxic chemicals in waste and on source reduction methods.

Beginning in 1991, covered facilities were required to report quantities of TRI chemicals recycled, combusted for energy recovery, and treated on- and off-site. Over time, EPA has worked to expand TRI to cover other industrial sectors and other chemicals that may have potential adverse impacts on our environment. Towards that end, the Agency has pursued an expansion strategy that has enlarged the boundaries of TRI in several directions.

Chemical Expansion

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

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

The second expansion was the addition of 286 chemicals and chemical categories on November 30, 1994 (59 FR 61432)¹. The

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



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

Facility Expansion

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

Factors used to evaluate industries for this expansion included other available data on toxic chemical releases and other waste

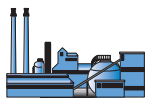
management activities, the interrelationship of non-manufacturing operations to manufacturing operations, the degree to which reporting would be expected to occur, and the potential burden that TRI reporting might impose on these facilities.

On May 1, 1997, EPA published a final rule (62 FR 23833) adding seven industry sectors to TRI: metal mining, coal mining, electrical utilities that combust coal and/or oil, hazardous waste treatment and disposal facilities, chemical wholesale distributors, petroleum bulk stations and terminals, and solvent recovery services (Who Must Report?, earlier in this chapter, identifies the SIC codes for the added industries). EPA has also conducted an aggressive outreach campaign, including guidance, training, and technical assistance to assist these new industries in understanding their reporting obligations. Guidance documents for these industries are available from EPA's Web site at <http://www.epa.gov/tri>.

Persistent, Bioaccumulative Toxic Chemicals (PBTs)

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

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



2000. The PBT chemicals are of particular concern not only because they are toxic, but also because they remain in the environment for long periods of time and are not readily destroyed (i.e., they are persistent), and they build up or accumulate in body tissue (i.e., they bioaccumulate). Relatively small releases of PBT chemicals can pose human and environmental health threats. Consequently, these chemicals warrant recognition by communities as potential health threats and information about their releases and other waste management need to be captured by the TRI Right-to-Know Program.

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

In addition to the chemical category of dioxin and dioxin-like compounds (a total of 17 substances), six individual PBT chemicals have been added to TRI: benzo(g,h,i)perylene, benzo(j,k)fluorene (fluoranthene) (as part of the PACs category), 3-methylcholanthrene (as part of the PACs category), octachlorostyrene, pentachlorobenzene, and tetrabromobisphenol A. New reporting thresholds apply to the following chemicals already on the TRI list: aldrin, chlordane, heptachlor, hexachlorobenzene, isodrin, methoxychlor,

pendimethalin, polycyclic aromatic compounds, polychlorinated biphenyls, toxaphene, trifluralin, mercury and mercury compounds.

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

TRI RELEASES AND OTHER WASTE MANAGEMENT: DATA ANALYZED IN 1999 TRI PUBLIC DATA REPORT

What to Consider When Using TRI Data

Users of TRI information should be aware that TRI data reflect releases and other waste management of chemicals, not whether (or how much) the public has been exposed to those chemicals. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management activities which involve toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical, and the amount and length of human or other exposure to the chemical after it is released. Listed below are some of the factors that should be considered when reviewing TRI data. Box 1–3 highlights some of these factors.

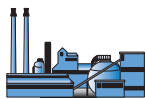
Toxicity of the Chemical

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



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

- **Toxicity of the Chemical:** TRI chemicals vary widely in their ability to produce toxic effects. Some high-volume releases of less-toxic chemicals appear to be a more serious problem than lower-volume releases of highly toxic chemicals, when just the opposite may be true.
 - **Exposure Considerations:** The potential for exposure is greater the longer the chemical remains unchanged in the environment. Sunlight, heat, or microorganisms may or may not decompose the chemical. For example, microorganisms readily degrade some chemicals, such as methanol, into less-toxic chemicals, whereas metals are persistent and will not degrade when released to the environment. Chemical exposure of a population depends on the environmental medium (air, water, land, etc.) to which a chemical is released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion.
- Some high-volume releases of less toxic chemicals may appear to be a more serious problem than lower-volume releases of more toxic chemicals, when just the opposite may be true. For example, phosgene is toxic in smaller quantities than methanol. A comparison between these two chemicals for setting hazard priorities or estimating potential health concerns, solely on the basis of volumes released, may be misleading.
- Exposure Considerations**
- **Potential degradation or persistence of the chemical in the environment.** Exposure to a chemical is dependent upon the chemical being available. The longer the chemical remains unchanged in the environment, the greater the potential for exposure. Sunlight, heat, or microorganisms may or may not decompose the chemical.
 - For example, microorganisms readily degrade some chemicals, such as methanol, into less toxic chemicals; volatile organic compounds, such as ethylene and propylene, react in the atmosphere and contribute to the formation of smog; metals are persistent and will not degrade upon release to the environment.
 - As a result, smaller releases of a persistent, highly toxic chemical may create a more serious problem than larger releases of a chemical that is rapidly converted to a less toxic form.
 - **Bioconcentration of the chemical in the food chain.** As a chemical becomes incorporated in the food chain, it may concentrate or disperse as it moves up the food chain.
 - Some chemicals, such as mercury, accumulate as they move up the food chain.
 - Small releases of a chemical that bioaccumulates may result in significant exposures to consumers.
 - **The environmental medium (air, water, land, or underground injection) to which the toxic chemical has been released.** Chemical exposure of a population depends on the environmental medium to which a chemical is released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion.
 - Releases of a chemical to the air can result in exposures to organisms living near and downwind from facilities releasing toxic chemicals to the atmosphere. Persistent chemicals may fall or precipitate from air onto land or into water bodies, resulting

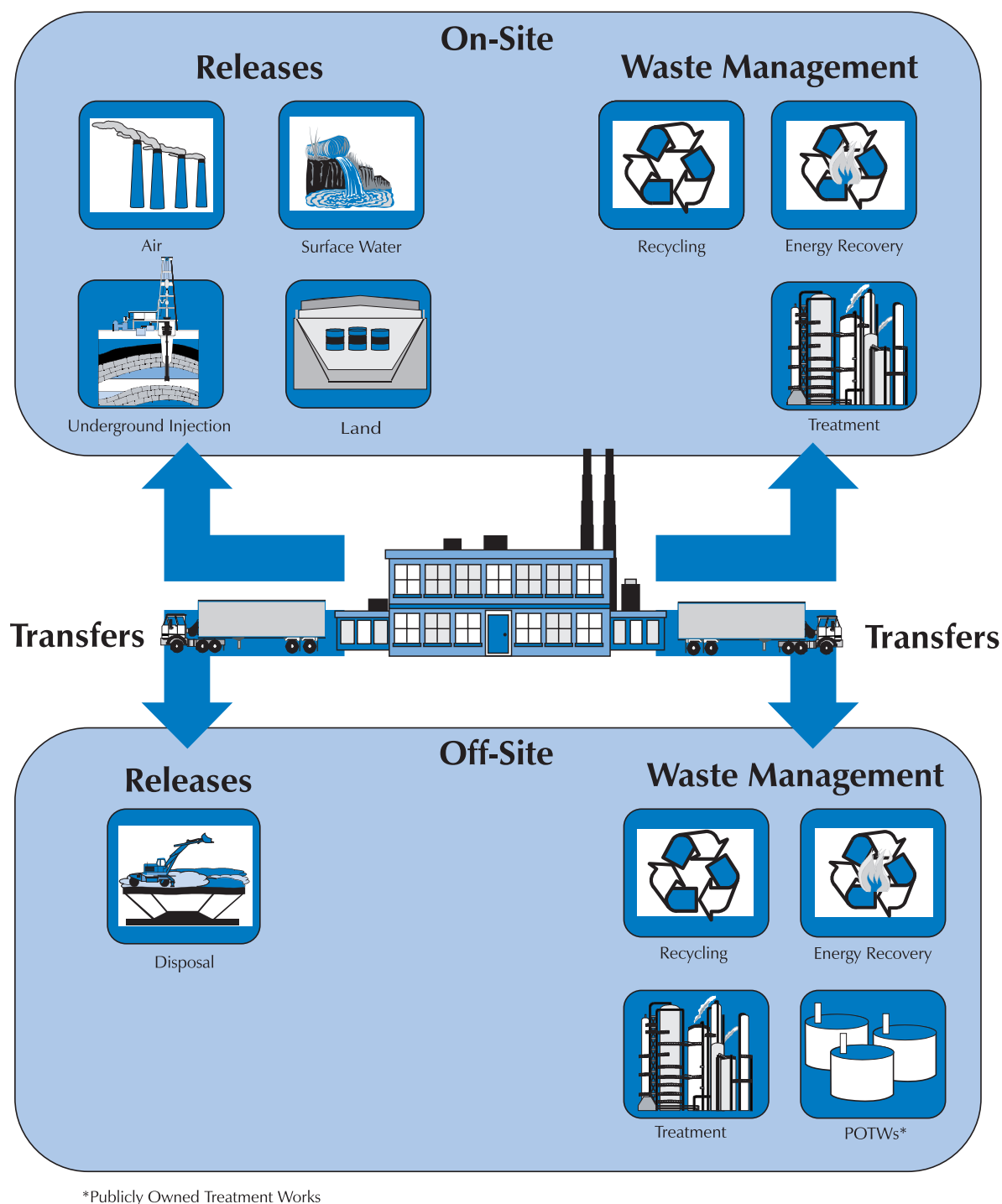


in exposures via these environmental media.

- Exposures that may result from releases to water bodies (streams, lakes, etc.) depend in part on the downstream uses of the water, including drinking, cooking, and bathing.
- Injection of toxic chemicals into properly designed and constructed Class I wells will result in substantially lower exposure potential than more direct forms of environmental release. These wells are designed to entomb liquid wastes for at least 10,000 years.
- **The type of off-site facility receiving the chemical and the efficiency of its waste management practices.** The amount of a toxic chemical that ultimately enters the environment depends on how the chemical was handled during disposal, treatment, energy recovery, or recycling activities. Several factors to keep in mind when considering amounts sent off-site are presented below.
 - The efficiency of recycling operations varies depending on the method of recycling and the chemical being recycled.
 - Use of a combustible toxic chemical for energy recovery typically results in the destruction of 95 percent to 99 percent or more of the toxic chemical. The remaining quantity may be either released to air or disposed of in ash to land.
 - The efficiency of the treatment of toxic chemicals in waste sent to sewage treatment plants varies depending on the chemical and the sewage plant. Some high-volume pollutants, such as methanol, are readily degraded by most sewage treatment plants. Other chemicals, such as methyl ethyl ketone (MEK), may be partially treated and partially released. Other high-volume chemicals, such as ammonia, are not readily treated by most sewage treatment plants and will pass through the plant into the aquatic environment. In addition, metals sent to sewage treatment plants may be removed with solid wastes and sent to landfills, or they may pass through the plant and be discharged into surface waters; they are not, however, destroyed.
- The efficiency of other treatment methods, such as incineration, also depends upon the specifications of the treatment facility and the nature of the chemical.
- Toxic chemicals in waste sent off-site for disposal are typically released to land or injected underground.
- **On-site waste management of the toxic chemical.** As with off-site waste management, the amount of the toxic chemical released to the environment depends on how the chemical was handled during disposal, treatment, energy recovery, or recycling activities. However, since the waste management is on-site, any amount of the chemical that enters the environment after waste management is reported to TRI as part of that facility's releases.



Figure 1-1. Information Collected Under TRI





On- and Off-site Releases

Figure 1–1 illustrates on-site and off-site releases, on-site waste management activities, and transfers off-site for further waste management, reportable to TRI. Box 1–4 describes reportable releases that may

occur on-site at the facility and identifies types of activities that may contribute releases to various media. Box 1–5 describes releases that may ultimately result when a facility transfers chemicals off-site for disposal.

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

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

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

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

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

- Class I industrial, municipal, and manufacturing wells inject fluids into deep, confined, and isolated formations below potable water supplies.
- Class II oil- and gas-related wells re-inject produced fluids for disposal, enhanced recovery of oil, or hydrocarbon storage.
- Class III wells are associated with the solution mining of minerals.
- Class IV wells may inject hazardous or radioactive fluids directly or indirectly into USDW, only if the injection is part of an authorized CERCLA/RCRA clean-up operation.
- Class V wells, which include all types of injection wells that do not fall under I–IV, may inject only if they do not endanger USDW, public health, or the environment. Class V wells are, generally, shallow drainage wells, such as floor drains connected to dry wells or drain fields.

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

On-site Land Releases. On-site releases to land occur within the boundaries of the reporting facility. Releases to land include disposal of toxic chemicals in landfills (in which wastes are buried), land treatment/application farming (in which a waste containing a listed chemical is applied to or incorporated into soil), surface impoundments (which are uncovered holding areas used to volatilize and/or settle waste materials), and other land disposal methods (such as waste piles) or releases to land (such as spills or leaks). Beginning with the 1996 reporting year, facilities separately report amounts released to RCRA subtitle C landfills from amounts released to other on-site landfills.



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

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

Transfers to Disposal. Toxic chemicals in waste that are transferred off-site for disposal generally are either released to land at an off-site facility or are injected underground. (See discussion of on-site releases to land and underground injection for a description of these release types.)

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

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

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

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

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

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

(continued)



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

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

Recycling

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

Energy Recovery

| | |
|-----|--|
| M56 | Energy Recovery |
| M92 | Transfer to Waste Broker—Energy Recovery |

Treatment

| | |
|-----|--|
| M40 | Solidification/Stabilization |
| M50 | Incineration/Thermal Treatment |
| M54 | Incineration/Insignificant Fuel Value |
| M61 | Wastewater Treatment (Excluding POTWs) |

| | |
|-----|--|
| M69 | Other Waste Treatment |
| M95 | Transfer to Waste Broker—Waste Treatment |

Disposal

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

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

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

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

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



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

Off-site releases (transfers to disposal) in tables in this report include the quantities of metals and metal compounds that were reported using the incorrect waste management codes, M40 and M61, in Section 6.2 (e.g., waste treatment codes instead of recycling or disposal codes) along with the quantities of metals and metal compounds that were reported correctly in Section 6.2. For the years prior to 1997 (presented in Chapter 3), EPA has also included the quantities of metals and metal compounds that were reported using the two waste management codes, M40 and M61, as off-site releases rather than off-site waste treatment. In addition, when discussing off-site releases of TRI chemicals, EPA has included those quantities of metals and metals compounds reported as discharges to POTWs in Section 6.1 of the Form R.

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

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

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

To avoid counting the transfers to the TSD facilities that are also reported to TRI as on-site releases by the TSD facilities, off-site transfers to disposal to these TSD facilities must be omitted from tables that compare or summarize on-site and off-site releases for all industries, including the newly added industries. Only the on-site releases from the TSD facilities are included in such analyses. In the *1999 TRI Public Data Release*, this applies to tables presented in Chapters 2 and 4.

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

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

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

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

(continued)



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

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

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

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

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

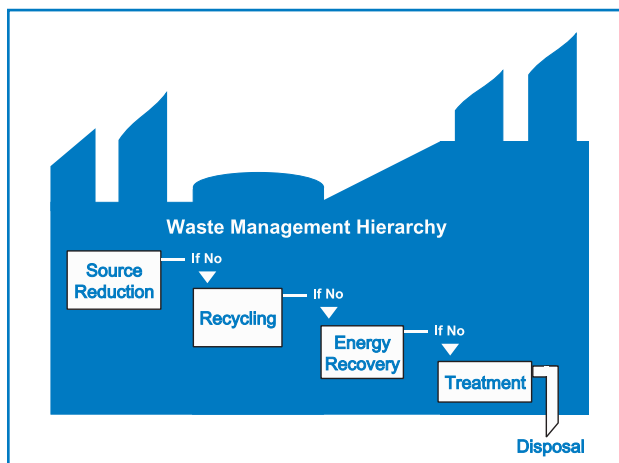
Waste Management

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

national policy that source reduction is the preferred approach to managing waste. Source reduction is defined as an activity that prevents the generation of waste. The PPA also established as national policy a hierarchy of waste management options, illustrated in Figure 1–2, for situations where source reduction cannot be implemented feasibly.

Although source reduction is the preferred method of reducing risk, environmentally sound recycling shares many of its advantages. Like source reduction, recycling reduces the need for treatment or disposal

Figure 1-2. Waste Management Hierarchy





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

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

Box 1–9 describes the waste management information facilities must report to TRI. The amount of TRI chemicals in waste reported includes both waste generated by the facility and waste received by the facility for the purpose of waste management. Facilities report these data as estimates for the reporting year (1999) and the previous year (1998) and as projections for the two

Box 1-9. An Explanation of Waste Management Information

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

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

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

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

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

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

(continued)



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

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

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

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

following years (2000 and 2001). The PPA requires this data projection to encourage facilities to consider their future waste generation, opportunities for source reduction, and potential improvement in waste management options as presented in the hierarchy. Future-year estimates are not commitments that facilities reporting to TRI must meet.

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

routine production operations at a facility during that year.

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

It is important to note that facilities may vary in how they interpret some of the reporting requirements under the PPA. EPA has not yet specifically defined in regulations the reporting requirements for these data elements, so some facilities may



include in their reports amounts that other facilities do not believe they must include. Because of this, higher quantities of TRI chemicals in waste for a particular state or industry may reflect not only differences in actual quantities, but also different interpretations of the reporting requirements.

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

Transfers Off-site for Further Waste Management

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

Making Year-to-Year Comparisons of TRI Data

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

1995–1999

In addition to the industry expansion undertaken in 1998, EPA has made a few changes during the 1995–1999 period to the list of chemicals that must be reported. EPA has the authority both to add chemicals to the TRI reporting list if they meet the statutory toxicity criteria and to delete chemicals from the list if EPA determines that they do

not meet the toxicity criteria. On November 30, 1994, 286 chemicals and chemical categories were added to the TRI chemical list based on their high or moderately high toxicity characteristics. This addition raised the number of chemicals and chemical categories reporting to TRI to more than 600. Of the 286 chemicals, 20 were diisocyanates and 19 were polycyclic aromatic compounds. Since 1995, EPA has deleted three chemicals from the TRI list, including phosphoric acid in 1999. These chemicals are excluded from analyses of the 1995–1999 data. The reporting by new industries is also excluded from the 1998 and 1999 data for analyses covering the 1995–1999 period.

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

1991–1999

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



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

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

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

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

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

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

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

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

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

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



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

1988–1999

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

- In 1989, the reporting thresholds for manufacture and processing of TRI chemicals was reduced from 50,000 pounds to 25,000 pounds. This may affect data for 1988 and 1989, but not for subsequent years.
- Off-site transfers to recycling and energy recovery became reportable in 1991. Comparisons between 1988 and 1999 include only the transfer types that were reportable in 1988.
- Reporting of amounts injected underground into Class I wells separately from amounts injected into underground wells of other classes (II–V), and reporting of on-site land releases to RCRA subtitle C landfills separately from other types of on-site land releases began in 1996. These release types cannot be analyzed separately for 1988 to 1999.

Reasons for Change

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

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

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

Source Reduction

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

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



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

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

Real Changes

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

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

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

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

“Paper” Changes

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

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

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

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

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



Box 1-13. What Is Source Reduction?

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

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

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

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

How Can I Obtain Additional TRI Information?

The TRI data are available in on-line databases and in a variety of common computer and hard copy formats to ensure that everyone can easily use the information. Information about accessing the TRI database is provided on the inside front cover of this report. The TRI User Support Service (202-260-1531) can provide assis-

tance in accessing and using the TRI data. On-line services include the TRI Explorer, EPA's Envirofacts, and the National Library of Medicine's TOXNET system.

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

Other potential sources of TRI information include the state EPCRA section 313 contacts, the EPA Regional Offices, or the facilities themselves. EPA regional and state EPCRA section 313 contacts appear in Appendix E of this report, the *1999 TRI Public Data Release: State Fact Sheets*, and on the TRI web site.

Chapter 2

Toxics Release Inventory Data Overview, 1998 and 1999

Chapter 2



Toxics Release Inventory Data Overview, 1998 and 1999

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

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

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

TRI DATA FOR ORIGINAL AND NEW INDUSTRIES, 1998 AND 1999

As shown in Table 2–1, in 1999, 20,698 facilities in the original industries submitted 69,471 TRI forms (both Forms R and Forms A). In 1999, 1,941 facilities in the new indus-

tries submitted 14,597 forms. Although these industries constituted only 8.6 percent of all TRI facilities reporting, they submitted 17.4 percent of the TRI forms. (In 1998, the new facilities accounted for 8.5 percent of all TRI facilities and 17.6 percent of all forms.) The numbers of facilities reporting and of forms submitted were slightly lower, by 2 to 3 percent, in 1999 than in 1998, for both original and new industries and for TRI industries as a whole.

On- and Off-site Releases

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

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



Chapter 2 —Toxics Release Inventory Data Overview, 1998 and 1999

Table 2-4. TRI On-site and Off-site Releases, Original and New Industries, 1998-1999

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

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

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

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

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

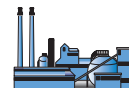
^aStorage only (disposal code M10) indicates that the toxic chemical is sent off-site for storage because there is no known disposal method. Amounts reported as transferred to storage only are included as a form of disposal (off-site release). See Box 1-5.

^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 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 as 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).



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

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

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

The original industries reported off-site releases of 324.1 million pounds in 1998 and 374.6 million pounds in 1999, a 15.6 percent increase. The main categories in which the original industries reported increases were underground injection, from 7.6 million pounds to 20.8 million

pounds (174.8 percent); solidification/stabilization, from 42.8 million pounds to 53.1 million pounds (24.1 percent); land treatment, from 1.4 million pounds to 4.2 million pounds (203.5 percent); and wastewater treatment, excluding publicly owned treatment works (POTWs), from 3.8 million pounds to 6.5 million pounds (72.0 percent). The only category of releases by the original industries to register a decrease was transfers to waste brokers for disposal, from 14.1 million pounds to 11.1 million pounds, a decline of 20.9 percent.

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

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

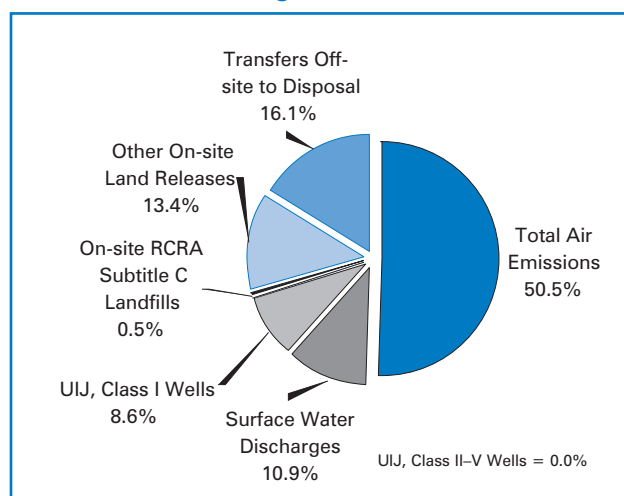


Transfers to landfills/surface impoundments constituted the largest type of off-site release for both original and new industries. Facilities in the new industries reported 62.9 million pounds in this category in 1999, or 1.2 percent of total releases from the new industry group. In 1999, the original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

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

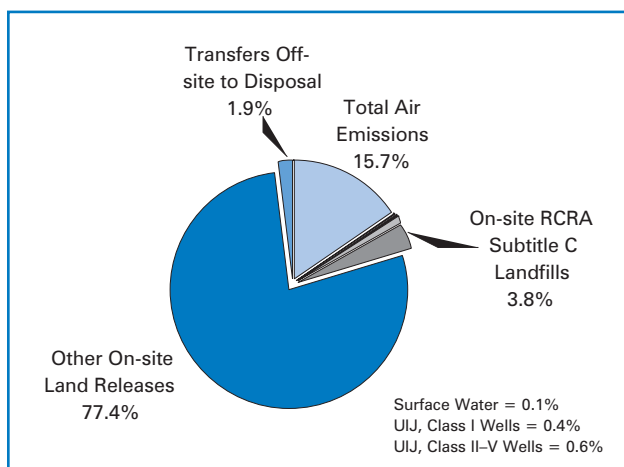
The large proportion of on-site land releases by the new industries substantially influences the distribution of other release types. For example, Figures 2-1 and 2-2 show that in 1999 air emissions accounted for 50.5 percent of total releases by the original industries but for only 15.7 percent of total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

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



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

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



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



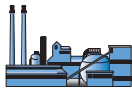
Box 2-1. Duplication of Off-site Transfers to Disposal, 1998 and 1999

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

The following shows the results of the analysis for 1998 and 1999 and how much is omitted from tables that present total releases for all TRI industries in this chapter and in Chapter 4.

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

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



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

Starting in 1998, hazardous waste treatment and disposal facilities in SIC code 4953 were required to report to TRI. The result is that TRI chemicals in waste may be sent by one TRI facility (which reports the amounts as transfers off-site to disposal) to another TRI facility (which reports the amounts as on-site releases). Box 2-1 shows how much of the off-site transfers to disposal were also reported as on-site releases in 1998 and 1999.

Waste Management Data

Quantities of TRI Chemicals in Waste

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

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

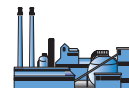
Table 2-2. Quantities of TRI Chemicals in Waste by Waste Management Activity, Original and New Industries, 1998-1999

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

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

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

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



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

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

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

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

On-site energy recovery for the original industries and for all TRI industries declined slightly between 1998 and 1999, by

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

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

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



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

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

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

ly. The total amount overstated is about 4,500 pounds for each year.

Transfers Off-site for Further Waste Management/Disposal

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

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

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



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

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

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

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

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

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

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

cent, and those of nonmetals decreased by 2.0 percent.

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

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

As described in **Waste Management** in Chapter 1, on each Form R that it submits, a facility reports actual waste management quantities for the current and prior years and projected quantities for the next two years. TRI facilities (both original and new



Chapter 2 —Toxics Release Inventory Data Overview, 1998 and 1999

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

waste from 21.7 percent in 1999 to a projected 19.2 percent in 2001.

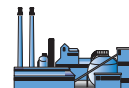
Quantities released on- and off-site are expected to decrease, for both original and new industries and for TRI industries as a whole. Releases on- and off-site represent the least-desirable option under the waste management hierarchy described in **Waste Management** in Chapter 1. The projected decrease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

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

| Waste Management Activity | Original Industries | | | New Industries | | |
|---------------------------------------|-----------------------|-----------------------|-----------------------|--------------------------------|---------------------------|---------------------------|
| | 1999 Pounds | 2000 Pounds | 2001 Pounds | 1999 Pounds | 2000 Pounds | 2001 Pounds |
| Recycled On-site | 7,839,852,848 | 7,813,877,076 | 8,488,898,837 | 198,496,815 | 193,850,040 | 193,458,146 |
| Recycled Off-site | 2,134,897,467 | 2,123,946,416 | 2,159,583,461 | 35,157,658 | 32,579,155 | 29,862,573 |
| Energy Recovery On-site | 2,806,098,993 | 2,798,226,054 | 2,901,923,158 | 10,762,603 | 5,234,611 | 5,252,671 |
| Energy Recovery Off-site | 511,631,406 | 490,326,952 | 508,060,464 | 267,664,335 | 222,350,235 | 224,605,934 |
| Treated On-site | 6,850,326,119 | 6,465,227,785 | 6,559,499,666 | 754,327,458 | 763,242,958 | 732,082,011 |
| Treated Off-site | 571,669,556 | 535,158,963 | 543,776,497 | 72,630,384 | 64,921,430 | 78,596,620 |
| Quantity Released On- and Off-site | 2,384,303,476 | 2,277,326,241 | 2,261,450,905 | 5,056,288,914 | 4,625,585,250 | 4,319,500,294 |
| Total Production-related Waste | 23,098,779,865 | 22,504,089,487 | 23,423,192,988 | 6,395,328,167 | 5,907,763,679 | 5,583,358,249 |
| Waste Management Activity | All TRI Industries | | | Projected Change 1999-2001 | | |
| | 1999 Pounds | 2000 Pounds | 2001 Pounds | Original Industries Percent | New Industries Percent | All Industries Percent |
| Recycled On-site | 8,038,349,663 | 8,007,727,116 | 8,682,356,983 | 8.3 | -2.5 | 8.0 |
| Recycled Off-site | 2,170,055,125 | 2,156,525,571 | 2,189,446,034 | 1.2 | -15.1 | 0.9 |
| Energy Recovery On-site | 2,816,861,596 | 2,803,460,665 | 2,907,175,829 | 3.4 | -51.2 | 3.2 |
| Energy Recovery Off-site | 779,295,741 | 712,677,187 | 732,666,398 | -0.7 | -16.1 | -6.0 |
| Treated On-site | 7,604,653,577 | 7,228,470,743 | 7,291,581,677 | -4.2 | -2.9 | -4.1 |
| Treated Off-site | 644,299,940 | 600,080,393 | 622,373,117 | -4.9 | 8.2 | -3.4 |
| Quantity Released On- and Off-site | 7,440,592,390 | 6,902,911,491 | 6,580,951,199 | -5.2 | -14.6 | -11.6 |
| Total Production-related Waste | 29,494,108,032 | 28,411,853,166 | 29,006,551,237 | 1.4 | -12.7 | -1.7 |

Note: Current year (1999) and projected (2000 and 2001) amounts are from Section 8 of Form R for 1999. Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category. One facility, Phelps Dodge Miami Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

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



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

ECONOMIC OVERVIEW, BY INDUSTRY

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

Basic economic information provides another tool for identifying certain industry characteristics. Table 2–5 presents two economic measures—employment, and the dollar value of sales, receipts, shipments, or revenue—that suggest the relative size of the new industries. Economic analyses use data on the value of production (sales, receipts, shipments, or revenue) as one way

of indicating the size of industrial sectors, in as much as no direct comparison can be drawn among the products and services of the sectors. The economic data in Table 2–5 are from the 1997 Economic Census, the latest consistent data available across all TRI industries, original and new.

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

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



Chapter 2 —Toxics Release Inventory Data Overview, 1998 and 1999

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

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

Note: Paid Employees and Sales, Receipts, Shipments or Revenue from U.S. Census Bureau, 1997 Economic Census <http://www.census.gov/epcd/www/econ97.html> [accessed June 4, 2000]. These data are preliminary and are subject to change; includes only establishments with payroll. Data are in current dollars and have not been adjusted for inflation.

Total Production-related Waste Managed from Section 8 (total of 8.1 through 8.7, Column B) of TRI Form for 1999. **Total Production-related Waste Managed** in this table does not include forms reporting more than one 2-digit SIC code and forms reporting SIC codes outside the 20-39 range.

^a 1997 Economic Census data were collected and published using the 1997 North American Industry Classification System (NAICS). Data presented here with the 1987 Standard Industrial Classification (SIC) Codes, used by TRI, follow the U.S. Census Bureau crosswalk between the two systems.

^b Economic data for SIC code 10, metal mining, include activities not covered by TRI (processing or otherwise use of TRI chemical in mining overburden).

^c Economic data for SIC code 12, coal mining, include extraction activities not covered by TRI.

^d 1997 Economic Census data revised March 2000.

Chapter 3

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

Chapter 3



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

INTRODUCTION

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

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

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

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

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

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



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

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

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

TRI RELEASES, 1995-1999

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

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

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

On- and Off-site Releases

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

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

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.

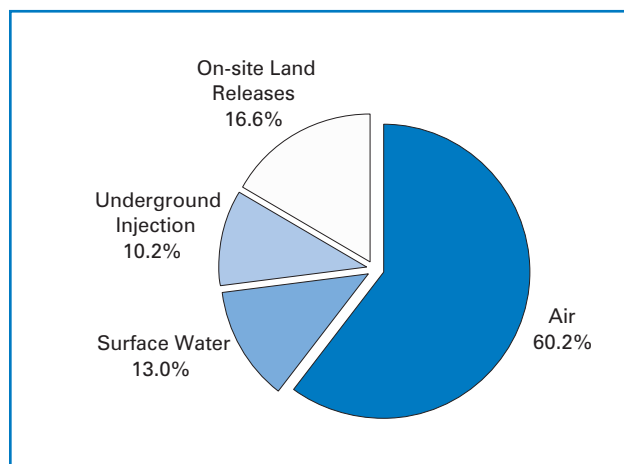
^c Beginning in reporting year 1997, transfers to wastewater treatment (excluding POTWs) of metals and metal compounds (waste treatment code M61) are reported separately from transfers to wastewater treatment of non-metal TRI chemicals (waste treatment code M60). Because wastewater treatment does not 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.

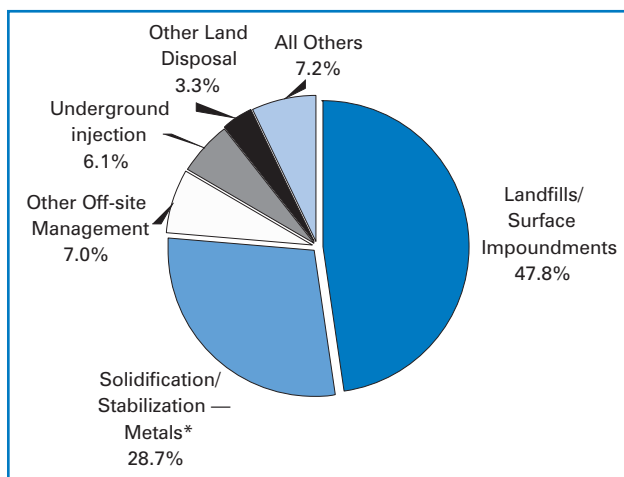
Air emissions fell 26.1 percent between 1995 and 1998, and this decrease of 415.6 million pounds was the largest factor in the overall reduction of on-site releases for the original industries. Underground injection showed a reduction of 19.8 percent (49.4 million pounds). Both surface water discharges 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 |

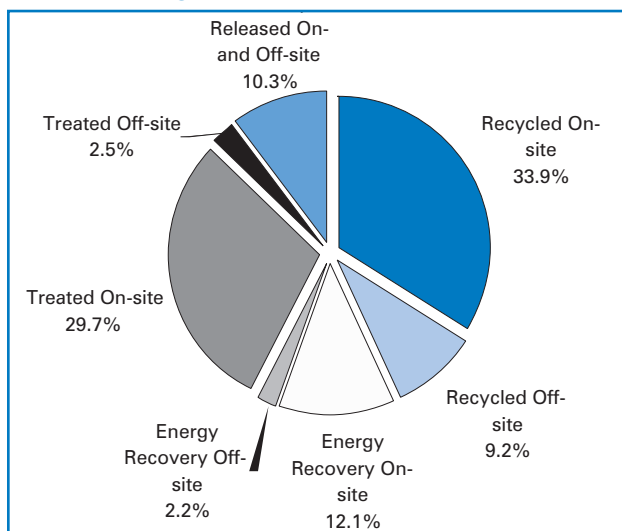
Note: All data are from Section 8 of Form R for the year indicated.

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 |

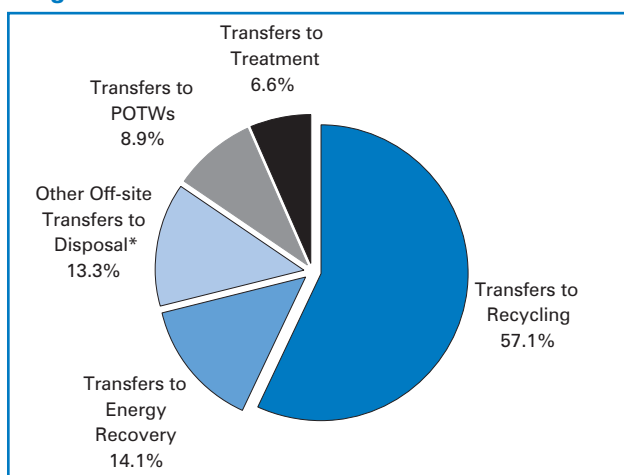
Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.

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,

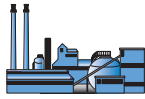


Table 3-5. TRI On-site and Off-site Releases by State, 1995 and 1998–1999, Original Industries

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

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

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



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)

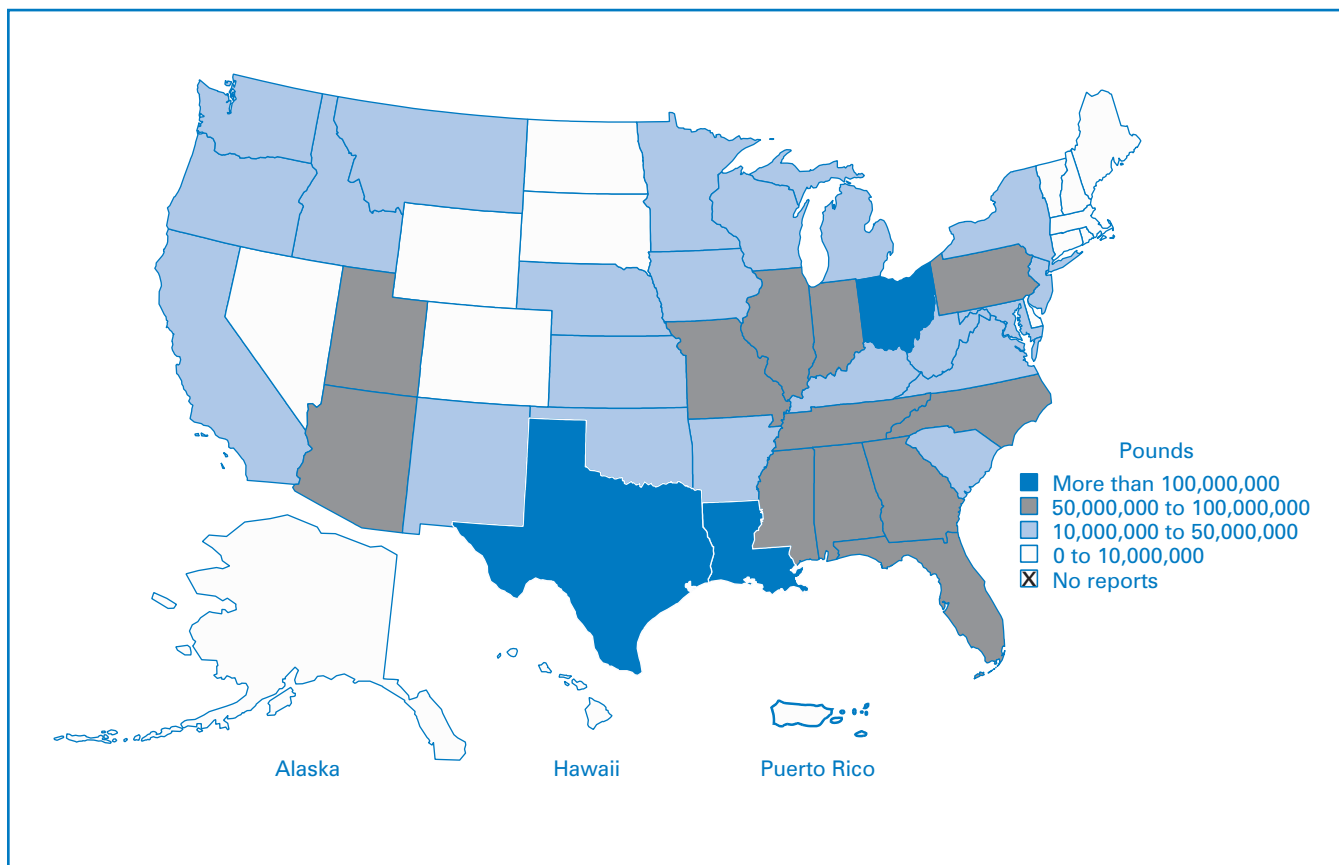
| On-site Releases | | | | | Total On-site Releases Pounds | Off-site Releases Transfers Off-site to Disposal Pounds | Total On- and Off-site Releases Pounds |
|-----------------------|------------------------------|------------------------------------|------------------------------|---------------|--------------------------------------|---|---|
| On-site Land Releases | | | | | | | |
| State | Land Treatment Pounds | Surface Impoundments Pounds | Other Disposal 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



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

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).



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

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 ^c 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 Pounds | Transferred Within State Pounds | Transferred Into State 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.



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

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

| State | Transferred Within or Into State | | Total Transferred Within and Into State | Transferred Out of State |
|----------------------|------------------------------------|----------------------------------|---|--------------------------|
| | Transferred Within State 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.

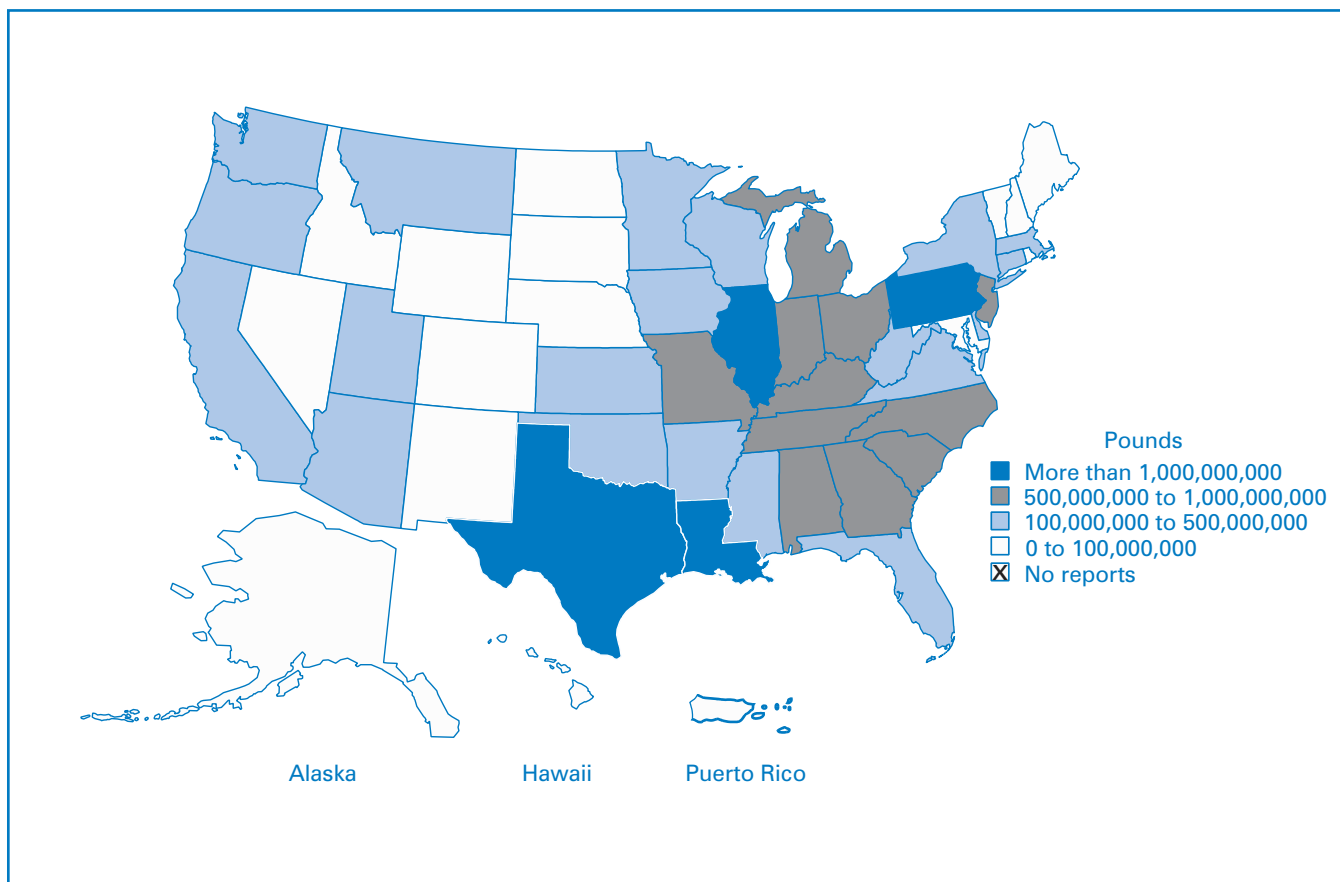
Management of TRI Chemicals in Waste by State

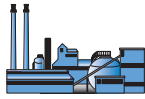
Nationwide, TRI facilities in the original industries managed 23.10 billion pounds of production-related waste in 1999. Texas ranked first among states and territories for total production-related waste managed, with 4.67 billion pounds, as shown in Table 3–10. Louisiana was second, with 2.32 billion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





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

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 | 545,186,595 | 59,122 |
| Montana | 36,466,718 | 180,530 | 7,559,811 | 22,434 | 7,916,220 | 30,689 | 49,842,158 | 102,018,560 | 6,898 |
| Nebraska | 1,884,598 | 41,240,163 | 311,185 | 365,777 | 7,594,782 | 1,166,097 | 23,171,454 | 75,734,056 | 226,883 |
| Nevada | 65,595,518 | 1,178,696 | 0 | 21,160 | 9,045,979 | 61,950 | 4,362,990 | 80,266,293 | 27,096 |
| New Hampshire | 17,095,576 | 15,483,788 | 1,446,912 | 2,664,256 | 15,569,091 | 1,018,177 | 3,035,296 | 56,313,096 | 21,206 |
| New Jersey | 90,609,387 | 38,954,247 | 192,070,114 | 46,684,889 | 133,101,076 | 41,396,542 | 20,996,994 | 563,813,249 | 65,799 |
| New Mexico | 1,541,221 | 4,559,295 | 24,151,974 | 86,723 | 5,590,356 | 694,733 | 22,896,622 | 59,520,924 | 9 |
| New York | 155,961,572 | 78,820,848 | 26,617,963 | 6,192,842 | 105,436,700 | 15,678,021 | 32,947,844 | 421,655,790 | 4,127,502 |
| North Carolina | 327,414,744 | 84,106,160 | 32,825,939 | 11,149,800 | 136,464,165 | 5,170,785 | 67,054,426 | 664,186,019 | 850,800 |
| North Dakota | 2,480 | 520,138 | 0 | 41,491 | 4,053,454 | 528,994 | 2,543,318 | 7,689,875 | 3 |
| Northern Marianas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ohio | 221,607,081 | 179,252,320 | 139,872,485 | 32,105,026 | 152,530,203 | 34,641,356 | 148,856,278 | 908,864,749 | 1,072,725 |
| Oklahoma | 39,567,380 | 22,990,740 | 231,400 | 1,525,109 | 34,661,231 | 1,784,576 | 22,806,188 | 123,566,624 | 42,764 |
| Oregon | 24,552,174 | 18,762,619 | 11,258,882 | 2,575,095 | 140,021,069 | 7,401,006 | 32,276,873 | 236,847,718 | 34,813 |
| Pennsylvania* | 350,066,276 | 180,352,997 | 51,115,733 | 20,435,839 | 248,978,886 | 49,943,621 | 138,983,952 | 1,039,877,304 | 1,336,554 |
| Puerto Rico | 13,660,194 | 10,663,327 | 54,091 | 18,218,540 | 26,556,033 | 10,539,593 | 6,255,204 | 85,946,982 | 6,491 |
| Rhode Island | 6,496,043 | 12,007,673 | 186,574 | 818,660 | 5,905,324 | 719,334 | 1,233,975 | 27,367,583 | 5,689 |
| South Carolina | 456,029,197 | 59,431,431 | 164,249,561 | 19,809,233 | 103,518,595 | 10,708,091 | 62,529,069 | 876,275,177 | 280,999,863 |
| South Dakota | 262,082 | 729,930 | 1,294,300 | 377,359 | 2,013,247 | 631,408 | 3,504,320 | 8,812,646 | 3,248 |
| Tennessee | 186,892,360 | 69,347,509 | 70,758,123 | 5,579,717 | 80,882,672 | 6,660,518 | 95,458,734 | 515,579,633 | 114,475 |
| Texas | 1,057,277,403 | 134,063,195 | 865,991,370 | 81,620,986 | 2,194,073,787 | 75,722,610 | 264,703,891 | 4,673,453,242 | 3,613,370 |
| Utah | 2,126,718 | 2,807,088 | 2,236,541 | 33,548 | 236,048,188 | 1,294,689 | 82,256,052 | 326,802,824 | 6,803,887 |
| Vermont | 145,062 | 1,390,069 | 0 | 9,317 | 1,378,272 | 382,312 | 444,303 | 3,749,335 | 3,512 |
| Virgin Islands | 864,705 | 159,347 | 0 | 4,184 | 13,041,037 | 18,692 | 699,019 | 14,786,984 | 480 |
| Virginia | 133,276,080 | 25,108,105 | 36,279,012 | 8,234,163 | 103,975,102 | 19,151,167 | 54,611,285 | 380,634,914 | 126,270 |
| Washington | 37,945,844 | 12,746,258 | 15,687,058 | 615,451 | 65,525,005 | 3,841,430 | 24,719,261 | 161,080,307 | 68,437 |
| West Virginia | 43,188,478 | 6,236,674 | 35,264,759 | 12,914,537 | 114,498,331 | 7,778,347 | 21,733,723 | 241,614,849 | 80,947 |
| Wisconsin | 62,455,920 | 57,992,583 | 13,025,800 | 13,661,973 | 111,613,249 | 14,802,366 | 39,179,381 | 312,731,272 | 148,650 |
| Wyoming | 1,810,802 | 91,100 | 159,140 | 5,100 | 3,412,392 | 5,083 | 10,515,392 | 15,999,009 | 2 |
| Total | 7,839,852,848 | 2,134,897,467 | 2,806,098,993 | 511,631,406 | 6,850,326,119 | 571,669,556 | 2,384,303,476 | 23,098,779,865 | 305,727,127 |

Note: Data are from Section 8 of Form R.

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

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

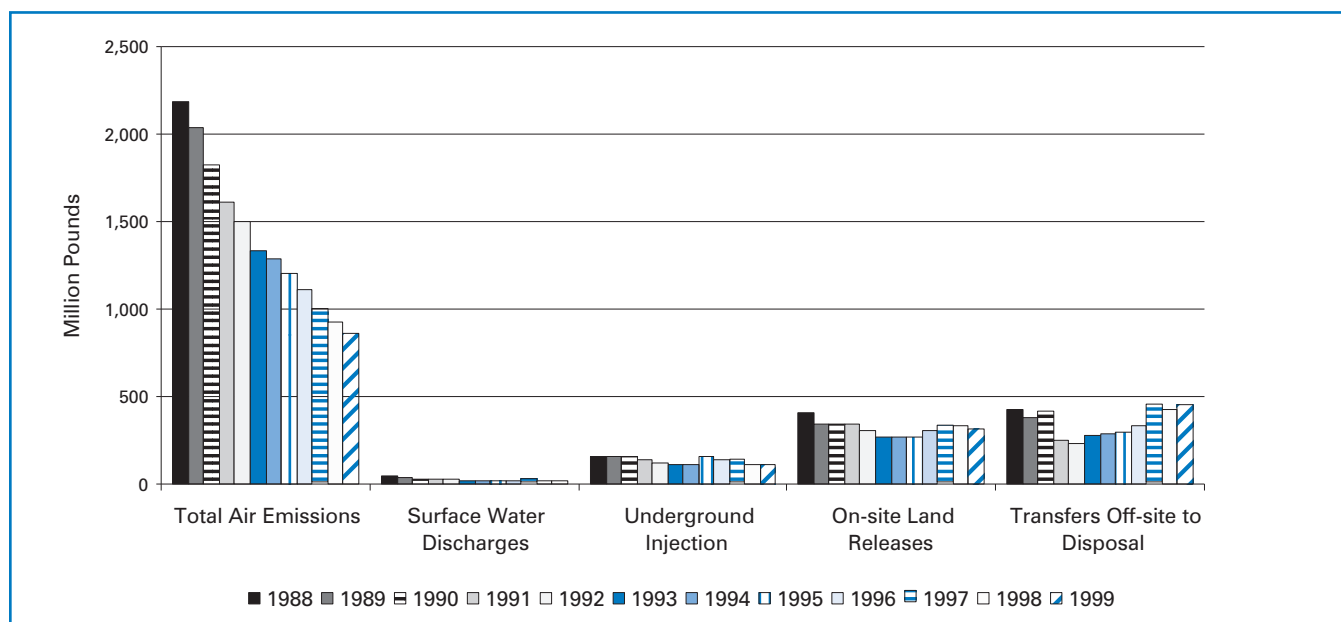
As noted in **Making Year-to-Year Comparisons of TRI Data** in Chapter 1, comparisons of TRI data across years must be based on a consistent set of chemicals and industries. Tables in this section address only data for the chemicals that were reportable in all years 1988 through 1999. Because reporting 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 | | Projected Change 2000-2001 | | Projected Change 1999-2001 | |
| | Percent | | Percent | | Percent | |
| Recycled On-site | -0.3 | | 8.6 | | 8.3 | |
| Recycled Off-site | -0.5 | | 1.7 | | 1.2 | |
| Energy Recovery On-site | -0.3 | | 3.7 | | 3.4 | |
| Energy Recovery Off-site | -4.2 | | 3.6 | | -0.7 | |
| Treated On-site | -5.6 | | 1.5 | | -4.2 | |
| Treated Off-site | -6.4 | | 1.6 | | -4.9 | |
| Quantity Released On- and Off-site | -4.5 | | -0.7 | | -5.2 | |
| Total Production-related Waste | -2.6 | | 4.1 | | 1.4 | |

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

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

Chapter 4

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

Chapter 4



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

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

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

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

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

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

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

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

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



NEW INDUSTRIES

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

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

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

1998–1999 TRI Data

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

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

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



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

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

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

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

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

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

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

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

pounds; electric utilities reported the next-highest increase, 24.9 million pounds.

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



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

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

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

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

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

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

As Table 4–4 shows, in 1999, transfers off-site to recycling made up more than half of total transfers for further waste management and disposal by all industries (2.11

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



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

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

Note: Data are from Section 8 of Form R.

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

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

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change 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.

non-metal TRI chemicals to POTWs. The exception is metal mines where most transfers to POTWs were for metals.

Total Releases by State

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

The states with the largest releases by new industries were Nevada, with 1.16 billion pounds; Utah, with 1.08 billion pounds;

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



Chapter 4 –Toxics Release Inventory Data for New Industries and Federal Facilities, 1998–1999

(off-site releases) for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal amounts (off-site releases) for manganese compounds from 5,584,900 pounds to below 500 pounds. Louisiana,

which in 1998 ranked second in total releases by original industries, was in fourth place in 1999, with 134.8 million pounds.

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

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

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

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

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

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



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

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

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

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

Metal Mining (SIC Code 10)

Introduction

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

Mining operations are classified according to the ores they extract. Facilities in six categories reported to TRI for the first time in the 1998 reporting year (see Box 4–2). These

categories include copper (SIC code 1021), lead and zinc (SIC code 1031), gold (SIC code 1041), and silver (SIC code 1044). Also covered are ferroalloy ores (SIC code 1061, alloys containing iron), such as chromium, manganese, molybdenum, nickel ore, and tungsten, and miscellaneous metal ores (SIC code 1099), which includes ores of aluminum, antimony, bauxite, beryllium, mercury, thorium, tin, and others. Three mining-related SIC codes are currently not subject to TRI reporting: iron ores (SIC code 1011), metal mining services (SIC code 1081), and uranium-radium-vanadium ores (SIC code 1094).

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

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

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

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



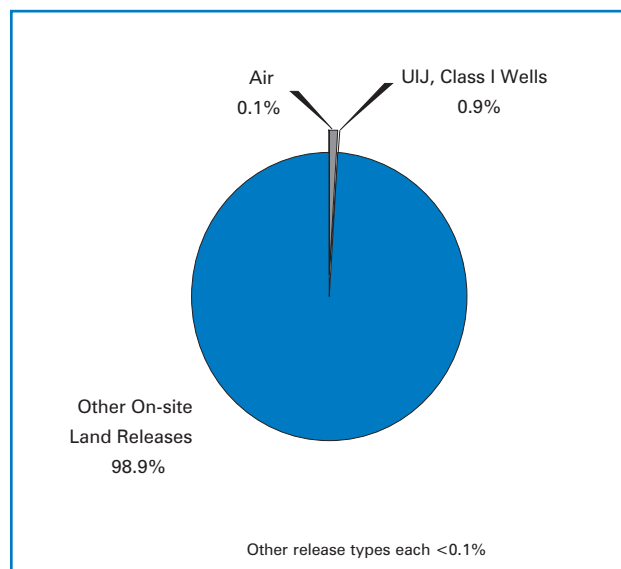
production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release Inventory Public Data Release* report (EPA 745-R-00-007).

1999 TRI Data for Metal Mining

On- and Off-site Releases

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

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



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

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

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

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Forms that reported more than one 4-digit SIC Code within SIC Code 10 are assigned to the multiple codes category.

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



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

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

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

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

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

Total TRI releases from the metal mining industry rose 11.7 percent between 1998 and 1999 (Table 4-7). Off-site releases rose 71.9 percent, from 1.3 million pounds to 2.2 million pounds, with landfills/surface

impoundments and transfers to POTWs accounting for most of the increase. On-site releases rose 11.7 percent. Within this category, total air emissions declined by 3.9 percent and surface water discharges decreased by 16.0 percent. Underground injection (entirely to Class II–V wells) rose 6.3 percent. On-site land releases rose 11.7 percent due to increase of 25.7 percent in the category of other disposal. Much of this increase can be accounted for by reporting by one facility in Utah that retired a leach pad in 1999, and therefore, had a large one-year increase of 505 million pounds reported as on-site land releases, in the other disposal category.

Waste Management Data

Quantities of TRI Chemicals in Waste

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Metal Mining (SIC Code 10)

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

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

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

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

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

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

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

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



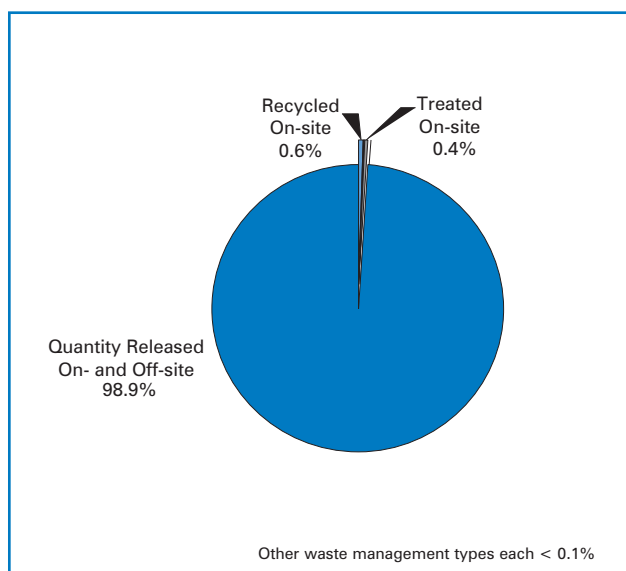
Table 4-8. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Metal Mining

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

Note: Data are from Section 8 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 10 are assigned to the multiple codes category.

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

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



Note: Data are from Section 8 of Form R.

Gold mining facilities reported 11.5 million pounds treated on-site, the largest amount in this category. Metal mines sent little of their TRI chemicals in waste off-site for

recycling (3.3 million pounds, mainly from copper mining) or treatment (less than 15,000 pounds). Lead and zinc mining reported the largest quantity recycled on-site (10.4 million pounds); next were miscellaneous metal mining (6.0 million pounds) and gold mining (5.3 million pounds). Only relatively small amounts of energy recovery, on- or off-site, were reported.

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Metal Mining (SIC Code 10)

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

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

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

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

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

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

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

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

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

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

Transfers Off-site for Further Waste Management/Disposal

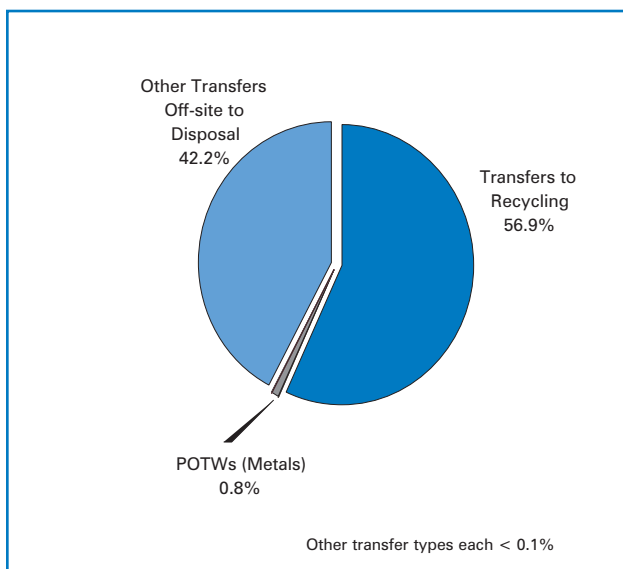
Transfers off-site for further waste management/disposal by the metal mining industry totaled 5.1 million pounds, as shown in Table 4-10. Over half (56.9 percent) of this

amount was transfers to recycling. The category other transfers off-site to disposal accounted for almost all the remainder—42.2 percent (see Figure 4-3).

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



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



Note: Data are from Section 6 of Form R.

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

Table 4–11 shows changes in the disposition of waste sent off-site for further waste management or disposal. The total amount transferred rose sharply, from 2.3 million pounds to 5.1 million pounds, a 117.8 percent increase. Transfers to recycling rose

226.1 percent. Transfers to treatment showed a large increase (1,392.9 percent), but from a small base. Transfers to POTWs fell from almost 103,000 pounds to 40,500 pounds (60.6 percent). The category other off-site transfers to disposal rose from 1.3 million pounds to 2.1 million pounds, a 59.7 percent increase.

TRI Data by State

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

On- and Off-site Releases

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

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

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

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

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

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

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



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

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

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

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

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

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



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

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

Note: Data are from Section 8 of Form R.

Waste Management Data

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

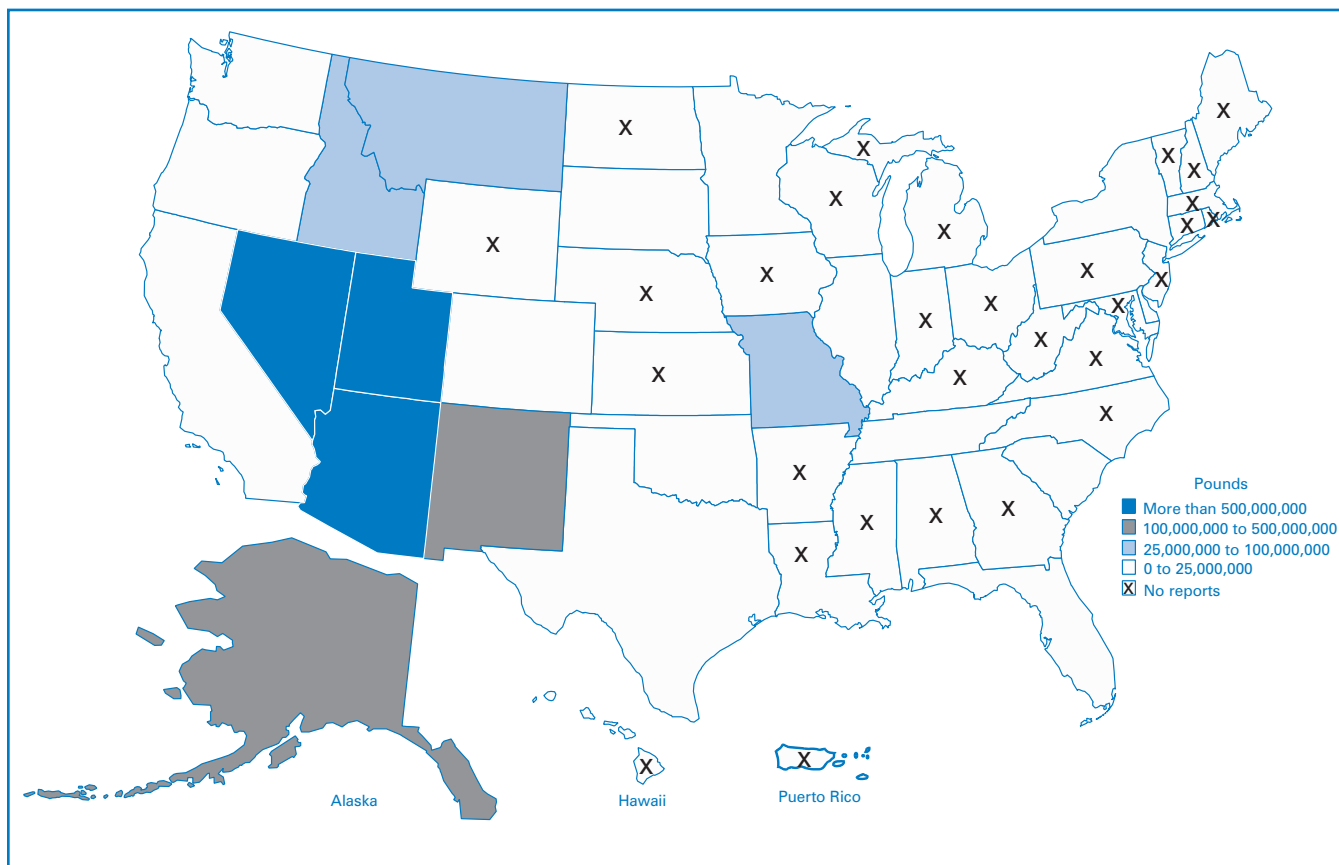
Quantities released on- and off-site accounted for more than 97 percent of total production-related waste in 15 states. Of these, Nevada, Arizona, and Utah reported the largest quantities: 1.16 billion pounds for Nevada, 1.01 billion pounds for

Arizona, and 553.7 million pounds for Utah.

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



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



Top 15 Chemicals for On- and Off-site Releases

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

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

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

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

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



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

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

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

releases are projected to fall from 3.59 billion pounds in 1999 to 2.91 billion pounds in 2001. Even with this 18.9 percent reduction, quantity released, as a share of total production-related waste, was expected to decrease only slightly, from 98.9 percent to 98.7 percent. On- and off-site releases are the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 1–2).

Source Reduction

In 1999, the metal mining industry filed 32 forms reporting source reduction activity (see Table 4–16). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the genera-

tion of waste—is the preferred waste management option.

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Metal Mining (SIC Code 10)

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Metal Mining (SIC Code 10)**



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

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

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

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

| SIC Code | Industry | Total Form Rs Number | Forms Reporting Source Reduction Activity | | Category of Source Reduction Activity | | | | | | | |
|--------------|--|----------------------|---|--------------------------------|---------------------------------------|--------------------------|----------------------------------|-----------------------------------|------------------------------|--------------------------------|--|------------------------------|
| | | | Number | Percent of All Form Rs Percent | Good Operating Practices Number | Inventory Control Number | Spill and Leak Prevention Number | Raw Material Modifications Number | Process Modifications Number | Cleaning and Degreasing Number | Surface Preparation and Finishing Number | Product Modifications Number |
| 1021 | Copper Ores | 167 | 8 | 4.8 | 1 | 0 | 4 | 0 | 5 | 0 | 0 | 0 |
| 1031 | Lead and Zinc Ores | 64 | 12 | 18.8 | 1 | 0 | 19 | 0 | 6 | 0 | 0 | 0 |
| 1041 | Gold Ores | 266 | 11 | 4.1 | 7 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| 1044 | Silver Ores | 40 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1061 | Ferroalloy Ores, Except Vanadium | 29 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1099 | Miscellaneous Metal Ores, n.e.c.* | 18 | 1 | 5.6 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Multiple within SIC Code 10 | 37 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SIC Code 1021 and SIC Code 33 (Primary Metals) | 30 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SIC Code 1021 and SIC Code 4931 (Electric Utilities) | 16 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | 667 | 32 | 4.8 | 9 | 1 | 24 | 0 | 13 | 0 | 0 | 1 |

Note: All source reduction activities on a form are counted in the corresponding category. Totals do not equal the sum of the categories because forms may report more than one source reduction activity. Forms that reported more than one 4-digit SIC Code within the SIC Code 10 are assigned to the multiple category.

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

Coal Mining (SIC Code 12)

Introduction

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

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

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

1999 TRI Data for Coal Mining

On- and Off-site Releases

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

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

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Coal Mining (SIC Code 12)

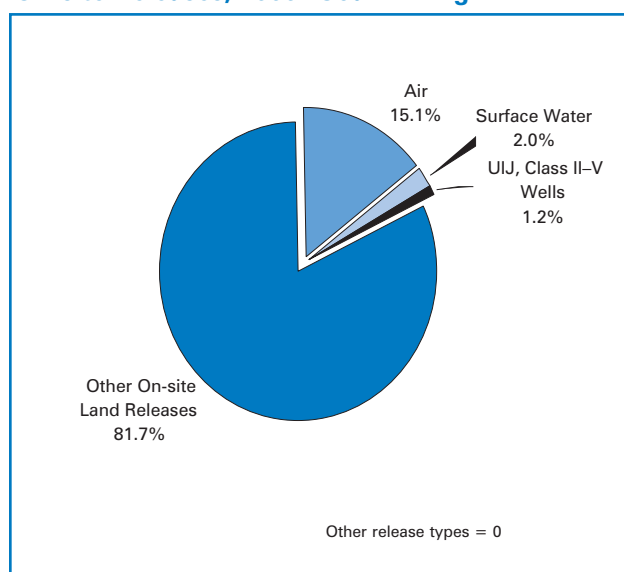
Table 4-17. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: Coal Mining

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

Note: On-site Releases from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Forms that reported more than one 4-digit SIC code within SIC code 12 are assigned to the “multiple codes” category.

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

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



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

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

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999:
Coal Mining (SIC Code 12)**



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

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

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

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

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

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

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

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



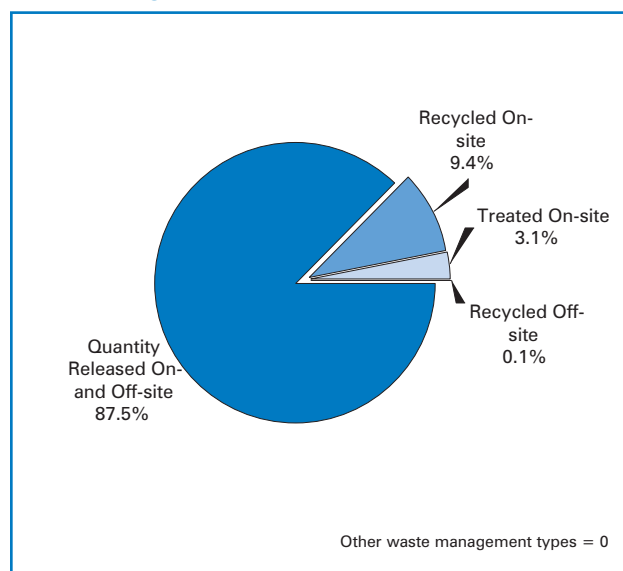
declined by 1.3 million pounds, or 9.7 percent. Total air emissions rose 60.3 percent, from 1.1 million pounds to 1.8 million pounds. Surface water discharges decreased 23.4 percent, and underground injection rose 58.8 percent, but both amounts were relatively modest. On-site land releases fell 16.6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

Waste Management Data

Quantities of TRI Chemicals in Waste

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

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



Note: Data are from Section 8 of Form R.

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

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

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

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



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

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

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

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

Transfers Off-site for Further Waste Management/Disposal

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

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

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

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

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 12 are assigned to the multiple codes category.

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Coal Mining (SIC Code 12)

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

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

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

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

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

TRI Data by State

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

On- and Off-site Releases

As shown in Table 4-23, coal mining facilities in New Mexico reported the largest

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

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

| State | Total Forms Number | On-site Releases | | | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|-----------------------|-------------------------------|------------------------------------|-------------------------|----------------------------|-------------------------------------|---------------------------------------|----------------------------------|--|---|
| | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection | | On-site Land Releases | | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| | | | | Class I Wells Pounds | Class II-V Wells Pounds | RCRA Subtitle C Landfills Pounds | Other On-site Land Releases Pounds | | | |
| Alabama | 2 | 19 | 96 | 0 | 109,000 | 0 | 337 | 109,452 | 0 | 109,452 |
| Colorado | 7 | 430 | 127 | 0 | 0 | 0 | 2,037,119 | 2,037,676 | 0 | 2,037,676 |
| Illinois | 52 | 1,340 | 11,098 | 0 | 0 | 0 | 2,642,435 | 2,654,873 | 0 | 2,654,873 |
| Indiana | 18 | 1,152,469 | 0 | 0 | 0 | 0 | 107,641 | 1,260,110 | 0 | 1,260,110 |
| Maryland | 5 | 12,733 | 1,515 | 0 | 34,700 | 0 | 42,150 | 91,098 | 0 | 91,098 |
| Montana | 1 | 0 | 0 | 0 | 0 | 0 | 12,217 | 12,217 | 0 | 12,217 |
| New Mexico | 23 | 0 | 0 | 0 | 0 | 0 | 4,345,334 | 4,345,334 | 0 | 4,345,334 |
| North Dakota | 2 | 0 | 0 | 0 | 0 | 0 | 145,225 | 145,225 | 0 | 145,225 |
| Ohio | 61 | 2,390 | 1,502 | 0 | 0 | 0 | 750 | 4,642 | 0 | 4,642 |
| Pennsylvania | 11 | 36,600 | 0 | 0 | 0 | 0 | 187,682 | 224,282 | 0 | 224,282 |
| Virginia | 1 | 9,100 | 0 | 0 | 0 | 0 | 1,000 | 10,100 | 0 | 10,100 |
| West Virginia | 19 | 556,467 | 220,929 | 0 | 0 | 0 | 86,433 | 863,829 | 0 | 863,829 |
| Wyoming | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 205 | 1,771,548 | 235,267 | 0 | 143,700 | 0 | 9,608,323 | 11,758,838 | 0 | 11,758,838 |

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



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

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

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

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

was 1.2 million pounds in Indiana, a rise of 1,571.9 percent.

Waste Management Data

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

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

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

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

Note: Data are from Section 8 of Form R.



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Coal Mining (SIC Code 12)

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

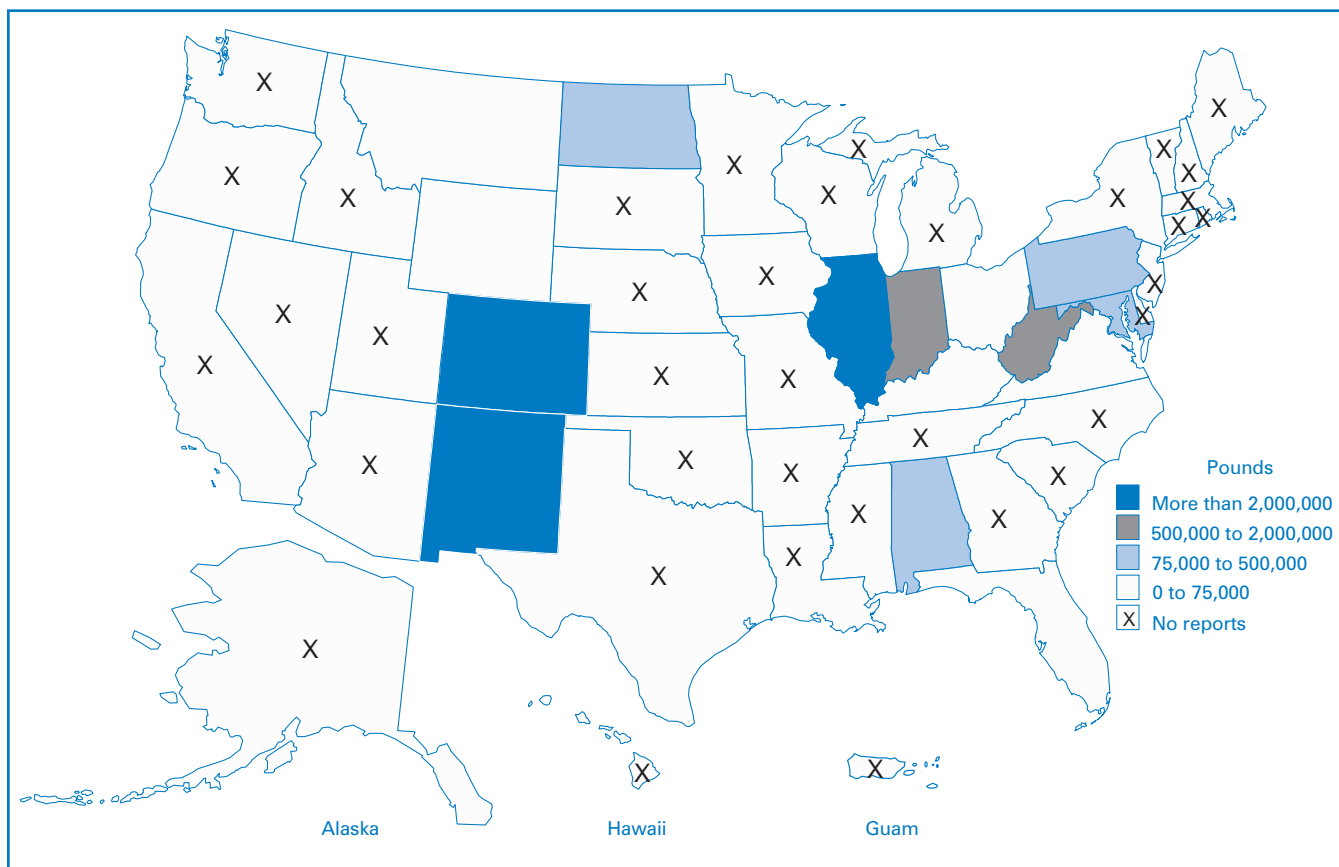


Table 4-24. TRI Total Releases by State, 1998–1999: Coal Mining

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

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



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

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

Top 15 Chemicals for On- and Off-site Releases

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

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

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

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



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

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

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

Table 4–26 shows the coal mining industry's expected changes in quantities released on- and off-site between 1999 and 2001. Facilities reporting to TRI expected to increase their production-related waste slightly during that period, from a total of

12.15 million pounds to 12.24 million pounds, or 0.7 percent. The projected increase represents a reduction of 0.2 percent in 2000 followed by an increase of 0.9 percent in 2001.

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

Source Reduction

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

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

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

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

Electric Utilities That Combust Coal and/or Oil

(SIC Codes 491 and 493)

Introduction

Electric utilities may use a variety of fuels to generate electricity, but only facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce must report to TRI. These facilities report under SIC codes 4911, 4931, and 4939, as identified in Box 4-4. Other electric utilities in these SIC codes—those fueled only by natural gas, nuclear, hydroelectric, or other sources—are not required to report. Electric power generation by utilities takes place across the United States. The states with the highest utility net generation are those with the largest popula-

tion densities and industrial centers: California, Texas, Illinois, Ohio, Pennsylvania, and Florida. Different areas of the country use different energy sources. Coal and petroleum-fired power plants are found in the East, while gas-fired plants are located in the coastal South.

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

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

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

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

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



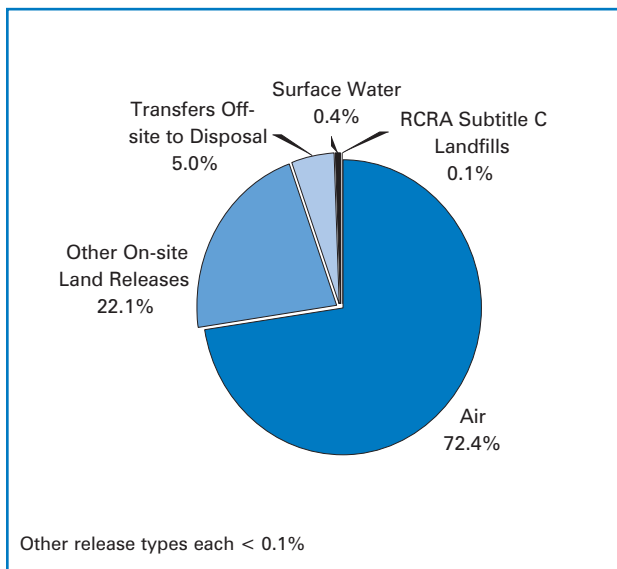
1999 TRI Data for Electric Utilities

On- and Off-site Releases

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

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

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



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

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

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

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

Note: On-site Releases from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Forms that reported more than one 4-digit SIC Code within SIC Code 49 are assigned to the multiple codes category.

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



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

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

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

Waste Management Data

Quantities of TRI Chemicals in Waste

Electric utilities reported managing 1.65 billion pounds of total production-related waste in 1999, as shown in Table 4-29. The quantity released on- and off-site totaled 1.17 billion pounds, or 71.1 percent of the

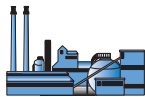
industry's production-related waste (see Figure 4-7). The industry's on-site treatment amounted to 463.6 million pounds, or 28.1 percent of the total. Off-site recycling accounted for 7.6 million pounds and on-site energy recovery for 5.3 million pounds.

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

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

Transfers Off-site for Further Waste Management/Disposal

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



Chapter 4 –Toxics Release Inventory Data for New Industries, 1998–1999: Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)

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

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

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

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

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

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

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

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



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

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

Note: Data are from Section 8 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 49 are assigned to the multiple codes category.

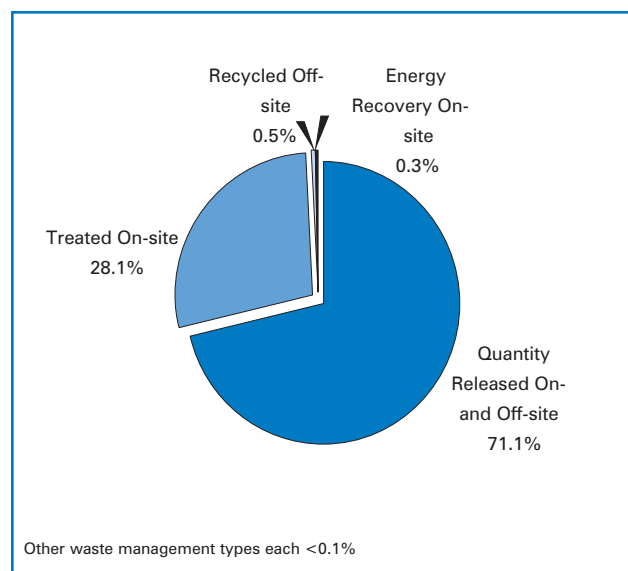
* n.e.c.: not elsewhere classified.

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

Table 4-32 shows changes in the disposition of off-site transfers for further waste man-

agement and disposal by reporting electric utilities between 1998 and 1999. Total transfers fell by 2.8 percent. Transfers to recycling rose 19.7 percent, from 3.5 million pounds to 4.2 million pounds. Transfers to treatment rose dramatically, by 1,309.3 percent, from less than 30,000 pounds to over 400,000 pounds. The category other off-site transfers to disposal declined by 4.6 percent, from 63.6 million pounds to 60.6 million pounds.

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



Note: Data are from Section 8 of Form R.

TRI Data by State

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

On- and Off-site Releases

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)

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

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

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

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

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

Note: **Total Transfers Off-site** for Further Waste Management/Disposal are from Section 6 of Form R. Forms that reported more than one 4-digit SIC Code within SIC Code 49 are assigned to the multiple codes category.

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

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

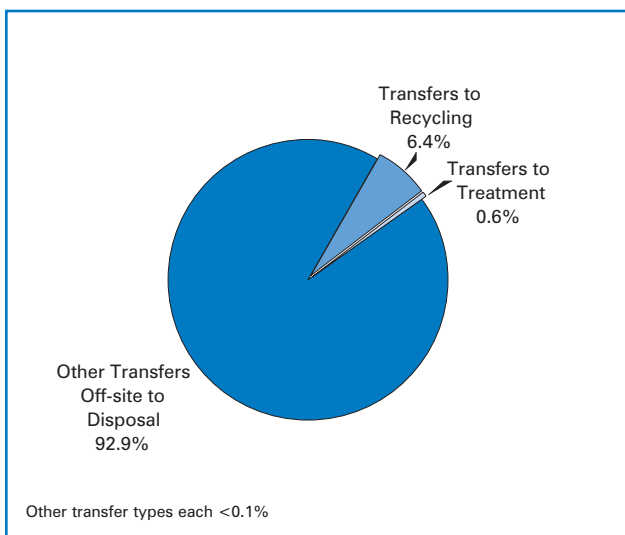
*** Does not include transfers to POTWs of metals and metal compounds.

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

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



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



Note: Data are from Section 6 of Form R.

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

Waste Management Data

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

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

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

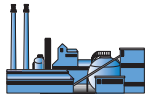
Table 4-32. TRI Transfers Off-site for Further Waste Management/Disposal, 1998-1999: Electric Utilities

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

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

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

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



Chapter 4 –Toxics Release Inventory Data for New Industries, 1998–1999: Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)**



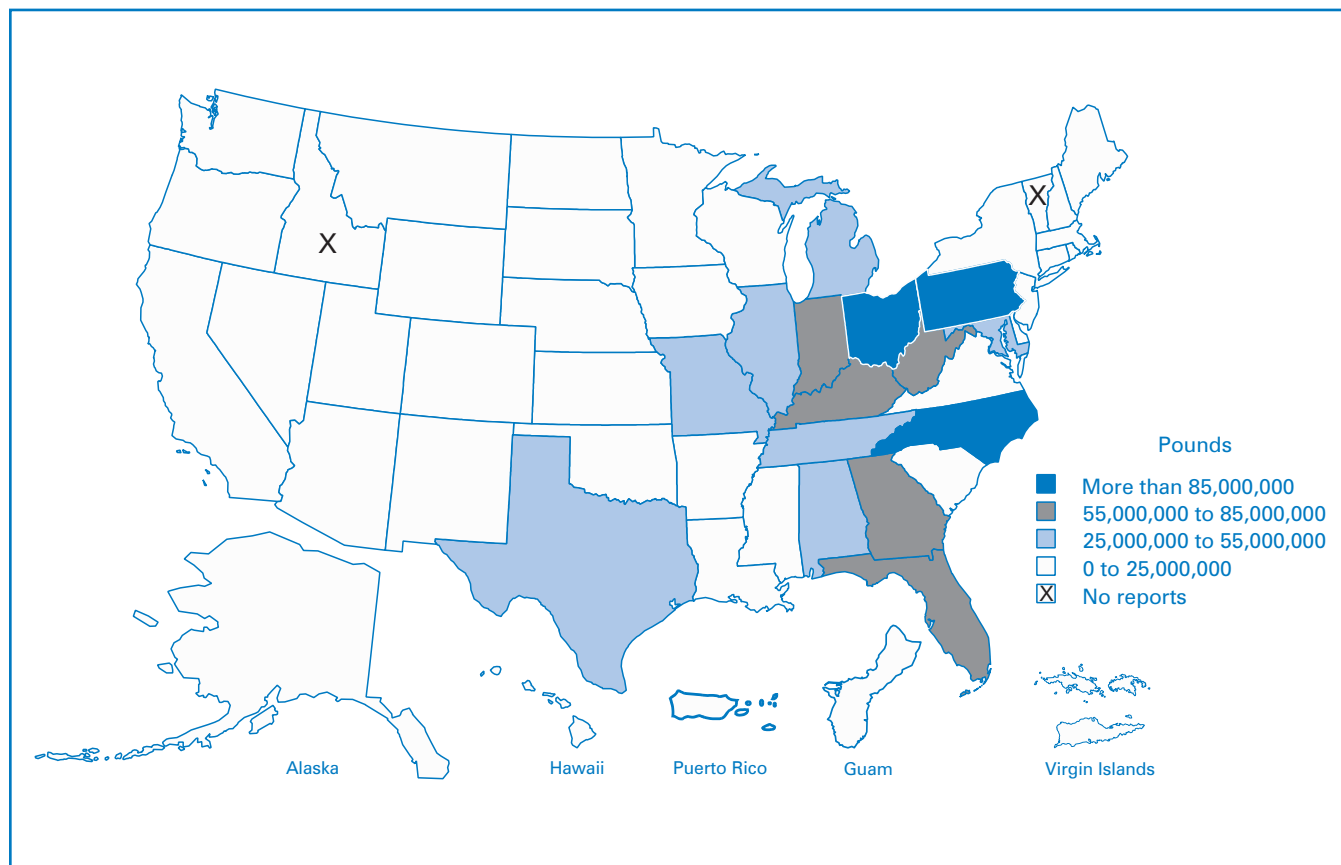
Table 4-33. Summary of TRI Information by State, 1999: Electric Utilities (continued)

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

Note: Data are from Section 8 of Form R.



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



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

Top 15 Chemicals for On- and Off-site Releases

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

For barium compounds, ranked second with 180.8 million pounds, most of the releases were other on-site land releases,

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

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)**



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

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)

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

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

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

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

percent, but to decrease in 2001, by 6.1 percent, for an increase over the period of 2.4 percent.

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



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

Source Reduction

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

Facilities that combine electric services and coal mining operations reported source reduction activities on 30 forms, 20.3 per-

cent of the Form Rs submitted by this group. Facilities providing only electric services reported source reduction activity on 452 forms, representing 12.1 percent of the Form Rs from these facilities.

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

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

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

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



**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999:
Electric Utilities That Combust Coal and/or Oil (SIC Codes 491 and 493)**

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

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

Note: All source reduction activities on a form are counted in the corresponding category. Totals do not equal the sum of the categories because forms may report more than one source reduction activity. Forms that reported more than one 4-digit SIC Code within the SIC Code 49 are assigned to the multiple category.

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

Chemical Wholesale Distributors (SIC Code 5169)

Introduction

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

More details for this industry sector on products and services, employment and production, general environmental issues, processes involving toxic chemicals and the management of toxic chemicals in waste can be found in the *1998 Toxics Release*

Inventory Public Data Release report (EPA 745-R-00-007).

1999 TRI Data for Chemical Wholesale Distributors

On- and Off-site Releases

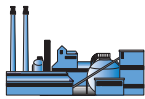
Chemical wholesale distributors required to report to TRI released 2.0 million pounds of TRI chemicals on- and off-site in 1999, as shown in Table 4–38. The largest type of release was 1.3 million pounds of air emissions, 66.9 percent of the industry’s total releases (see Figure 4–9).

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

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

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

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



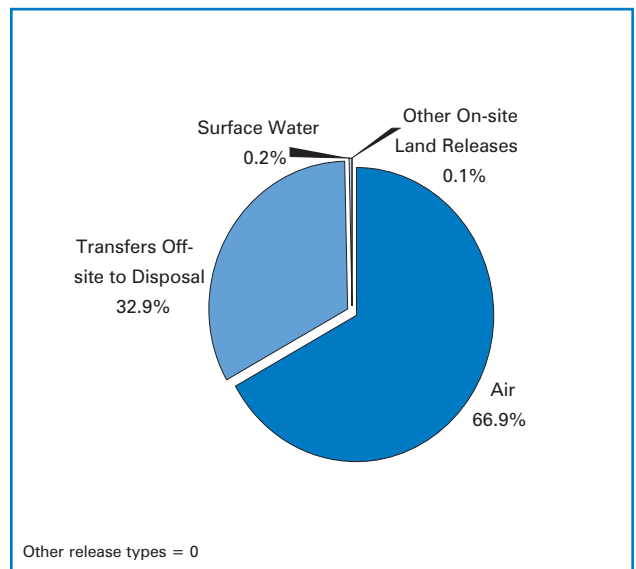
Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Chemical Wholesale Distributors (SIC Code 5169)

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

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

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

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



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

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

| SIC Code Industry Total Forms Number | | | On-site Releases | | | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---|---|-------|-------------------------------|------------------------------------|-------------------------|----------------------------|-------------------------------------|---------------------------------------|----------------------------------|-------------------|---|
| | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection | | On-site Land Releases | | Total On-site Releases Pounds | | |
| | | | | | Class I Wells Pounds | Class II-V Wells Pounds | RCRA Subtitle C Landfills Pounds | Other On-site Land Releases Pounds | | | |
| 5169 | Chemical Wholesale Distributors | 3,363 | 1,269,938 | 824 | 0 | 0 | 0 | 447 | 1,271,209 | 620,031 | 1,891,240 |
| | SIC Code 5169 and SIC Code 5171 (Petroleum Bulk Terminals) | 13 | 7,713 | 25 | 0 | 0 | 0 | 0 | 7,738 | 0 | 7,738 |
| | SIC Code 5169 and SIC Code 7389 (Solvent Recovery Services) | 40 | 27,338 | 0 | 0 | 0 | 0 | 334 | 27,672 | 26,987 | 54,659 |
| | SIC Code 5169 and SIC Code 28 (Chemical Products) | 43 | 13,406 | 2,495 | 0 | 0 | 0 | 500 | 16,401 | 1,621 | 18,022 |
| Total | | 3,459 | 1,318,395 | 3,344 | 0 | 0 | 0 | 1,281 | 1,323,020 | 648,639 | 1,971,659 |

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Chemical Wholesale Distributors (SIC Code 5169)**



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

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

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

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

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

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

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Chemical Wholesale Distributors (SIC Code 5169)

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

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

Note: Data are from Section 8 of Form R.

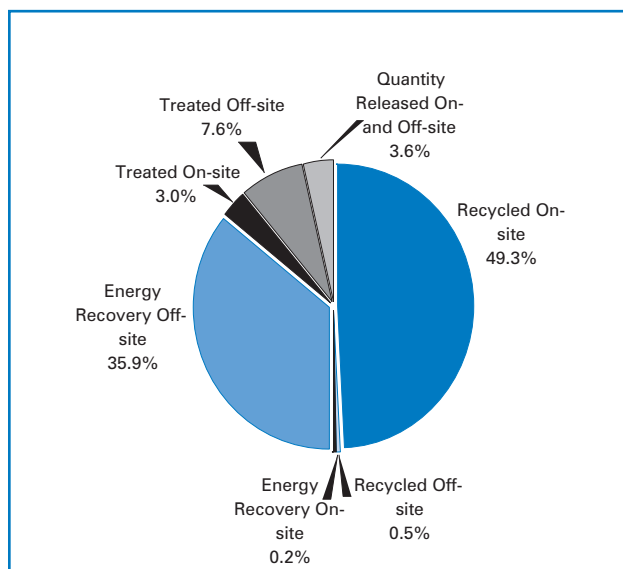
Waste Management Data

Quantities of TRI Chemicals in Waste

The chemical wholesale distribution industry reported managing 39.8 million pounds of total production-related waste in 1999, as shown in Table 4–40. On-site recycling totaled 19.6 million pounds, or 49.3 percent of the industry’s production-related waste

(see Figure 4–10). Off-site energy recovery totaled 14.3 million pounds, 35.9 percent. Off-site treatment amounted to 3.0 million pounds, and on-site treatment to 1.2 million pounds. Quantities released on- and off-site were 1.4 million pounds.

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



Note: Data are from Section 8 of Form R.

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

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



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

Transfers Off-site for Further Waste Management/Disposal

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

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

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

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

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

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

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

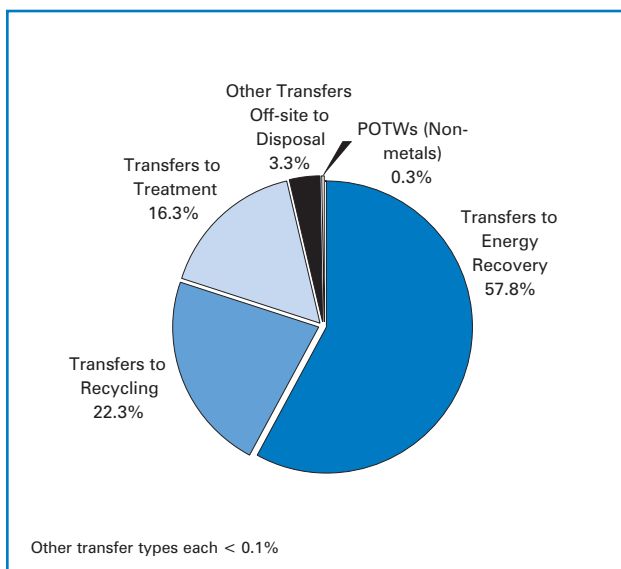
Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.

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

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



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



Note: Data are from Section 6 of Form R.

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

Table 4-43 shows changes in transfers between 1998 and 1999. Total transfers off-

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

TRI Data by State

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

On- and Off-site Releases

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

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

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

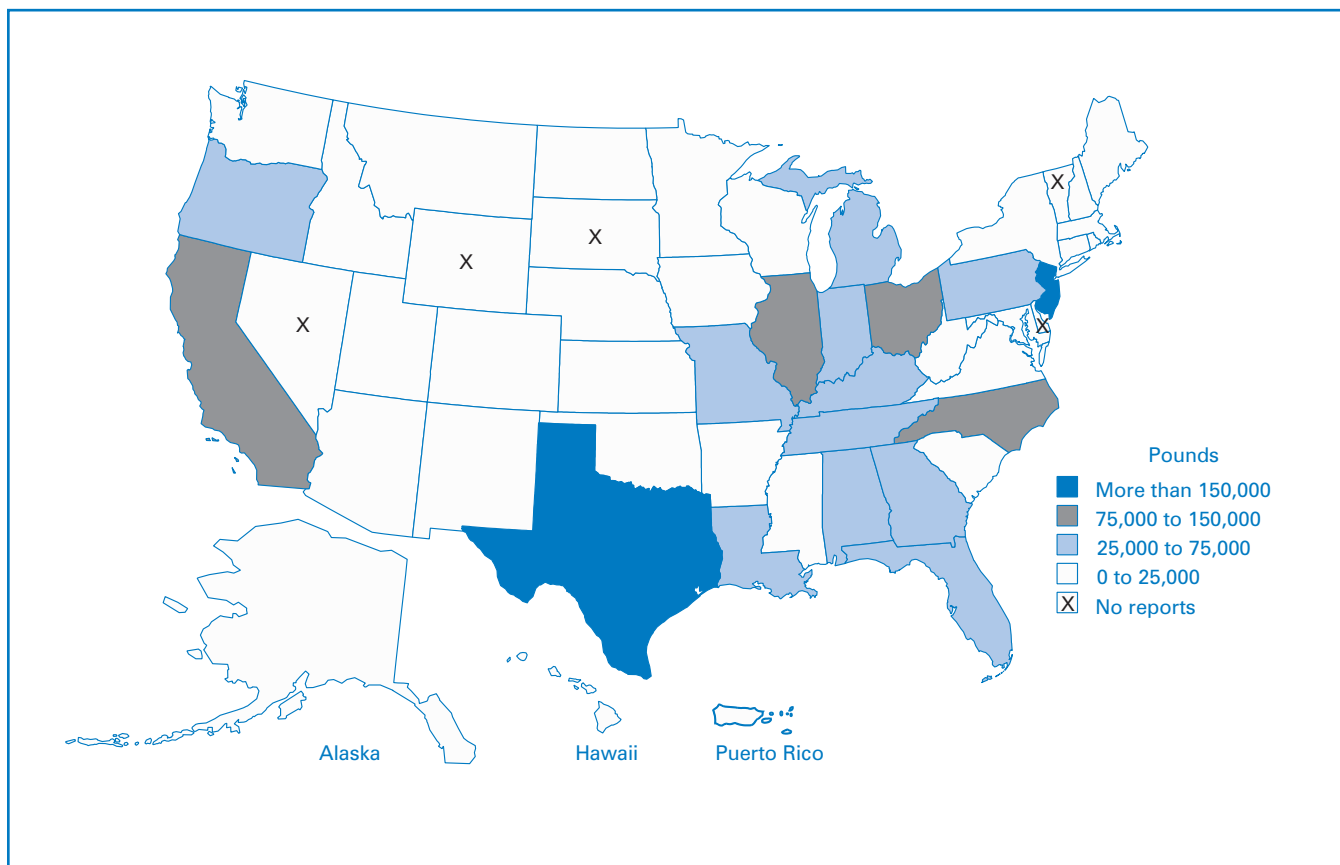
Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.

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

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



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



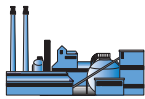
Jersey was more than 180,000 pounds, almost all in the form of air emissions. Next in rank were Ohio, North Carolina, California, and Illinois. Only Texas, New Jersey, Ohio, and North Carolina had releases of more than 100,000 pounds from the industry.

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

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

Waste Management Data

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



Chapter 4 –Toxics Release Inventory Data for New Industries, 1998–1999: Chemical Wholesale Distributors (SIC Code 5169)

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Chemical Wholesale Distributors (SIC Code 5169)**



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

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

Note: Data are from Section 8 of Form R.



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Chemical Wholesale Distributors (SIC Code 5169)

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

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

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



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

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

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

Top 15 Chemicals for On- and Off-site Releases

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

Methanol ranked second, with 315,030 pounds, 93.4 percent of which was air releases. Five other chemicals had total on- and off-site releases greater than 100,000 pounds each: toluene (140,935 pounds), methyl ethyl ketone (140,606 pounds),

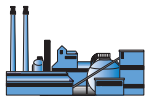
dichloromethane (126,949 pounds), chlorodifluoromethane (107,851 pounds), and ammonia (100,176 pounds). For all of these chemicals except methyl acrylate, air emissions accounted for more than 85 percent of total on- and off-site releases. Only 3 of the top 15 chemicals—methyl acrylate, zinc compounds, and ethylene glycol—reported more than 50 percent of their total releases as off-site transfers to disposal; for methyl acrylate and zinc compounds, the share was more than 97 percent.

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

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

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

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Chemical Wholesale Distributors (SIC Code 5169)

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

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

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

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

Source Reduction

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



Facilities with only chemical wholesale distribution operations reported 180 forms with source reductions activities, representing 10.3 percent of the total 1,741. These facilities identified good operating practices on 112 forms and spill and leak prevention on 105. Facilities with combinations of chemical wholesale distribution and other operations filed smaller numbers of forms but reported source reduction activity on a greater percentage of them. Facilities that

combined chemical wholesale distribution with petroleum bulk terminals or with manufacture of chemical products reported source reduction activity on about 70 percent of their Form Rs. These facilities identified as their main source reduction activities spill and leak prevention (25 forms for the two groups) and good operating practices (23 forms).

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

| Waste Management Activity | Current Year 1999 | | Projected 2000 | | Projected 2001 | |
|---------------------------------------|----------------------------|------------------|----------------------------|------------------|----------------------------|------------------|
| | Total Pounds | Percent of Total | Total Pounds | Percent of Total | Total Pounds | Percent of Total |
| Recycled On-site | 19,615,110 | 49.3 | 20,308,682 | 46.6 | 20,615,628 | 47.6 |
| Recycled Off-site | 206,542 | 0.5 | 143,232 | 0.3 | 143,388 | 0.3 |
| Energy Recovery On-site | 72,746 | 0.2 | 81,018 | 0.2 | 81,018 | 0.2 |
| Energy Recovery Off-site | 14,272,788 | 35.9 | 16,719,067 | 38.4 | 17,033,061 | 39.4 |
| Treated On-site | 1,188,795 | 3.0 | 435,666 | 1.0 | 436,303 | 1.0 |
| Treated Off-site | 3,016,945 | 7.6 | 4,554,572 | 10.5 | 3,661,683 | 8.5 |
| Quantity Released On- and Off-site | 1,419,993 | 3.6 | 1,311,017 | 3.0 | 1,294,814 | 3.0 |
| Total Production-related Waste | 39,792,919 | 100.0 | 43,553,254 | 100.0 | 43,265,895 | 100.0 |
| Waste Management Activity | Projected Change 1999-2000 | | Projected Change 2000-2001 | | Projected Change 1999-2001 | |
| | Percent | | Percent | | Percent | |
| Recycled On-site | 3.5 | | 1.5 | | 5.1 | |
| Recycled Off-site | -30.7 | | 0.1 | | -30.6 | |
| Energy Recovery On-site | 11.4 | | 0.0 | | 11.4 | |
| Energy Recovery Off-site | 17.1 | | 1.9 | | 19.3 | |
| Treated On-site | -63.4 | | 0.1 | | -63.3 | |
| Treated Off-site | 51.0 | | -19.6 | | 21.4 | |
| Quantity Released On- and Off-site | -7.7 | | -1.2 | | -8.8 | |
| Total Production-related Waste | 9.4 | | -0.7 | | 8.7 | |

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



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Chemical Wholesale Distributors (SIC Code 5169)

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

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

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

Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)

Introduction

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

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

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

1999 TRI Data for Petroleum Terminals and Bulk Storage Facilities

On- and Off-site Releases

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

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

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

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

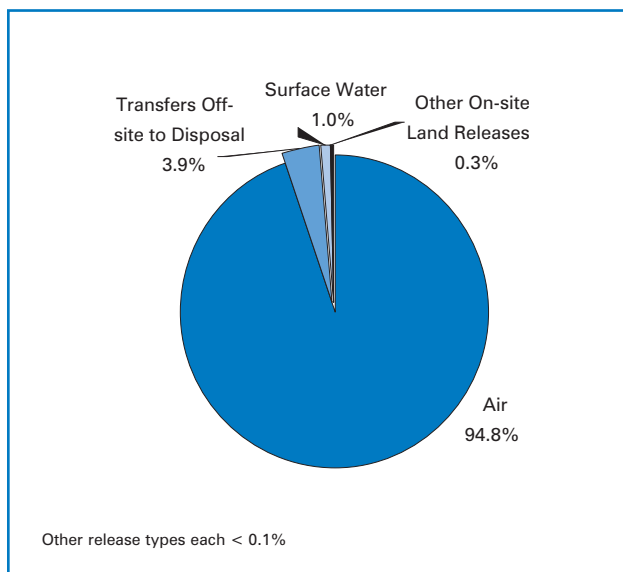


The second-largest release type, off-site releases (transfers off-site to disposal), totaled about 166,000 pounds, or 3.9 percent of total releases. Petroleum terminals and bulk storage facilities also reported about 44,000 pounds discharged to surface waters and almost 15,000 pounds of on-site land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

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

Table 4–50 shows changes in releases from petroleum terminals and bulk storage facilities between 1998 and 1999. Total releases declined by 5.5 percent, on-site releases decreased 4.3 percent, and off-site releases fell 26.7 percent. Air emissions decreased by 3.9 percent. Surface water discharges and land treatment rose, although the

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



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

amounts were modest. Off-site transfers to storage, solidification/stabilization, and underground injection all showed large percentage increases, but from small bases. The unknown category decreased by 81.8 percent, from almost 75,000 pounds to about 13,500 pounds.

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)**



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

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

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

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

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

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

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

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



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

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

Note: Data are from Section 8 of Form R.

Waste Management Data

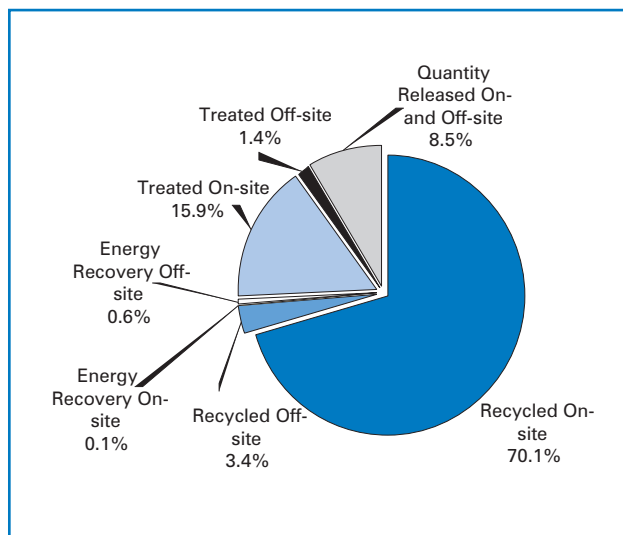
Quantities of TRI Chemicals in Waste

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

site recycling amounted to 1.6 million pounds (3.4 percent). The total for on-site and off-site energy recovery was about 330,000 pounds.

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

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



Note: Data are from Section 8 of Form R.

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



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

Transfers Off-site for Further Waste Management/Disposal

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

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

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

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

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

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

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

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

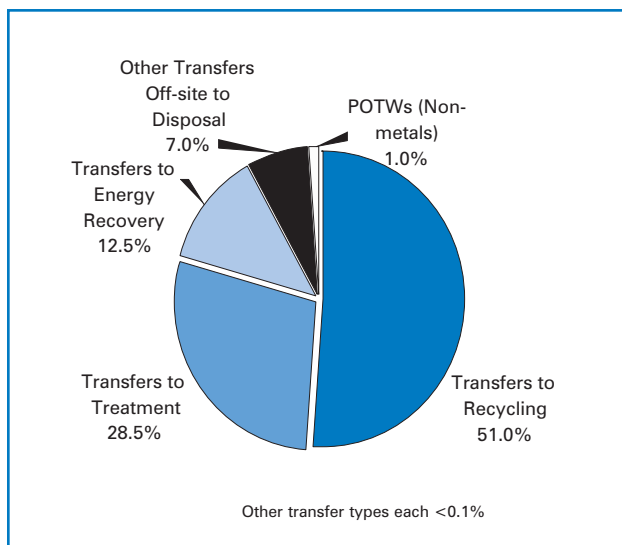
Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.

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

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



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



Note: Data are from Section 6 of Form R.

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

TRI Data by State

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

On- and Off-site Releases

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

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

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

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

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

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

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

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



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

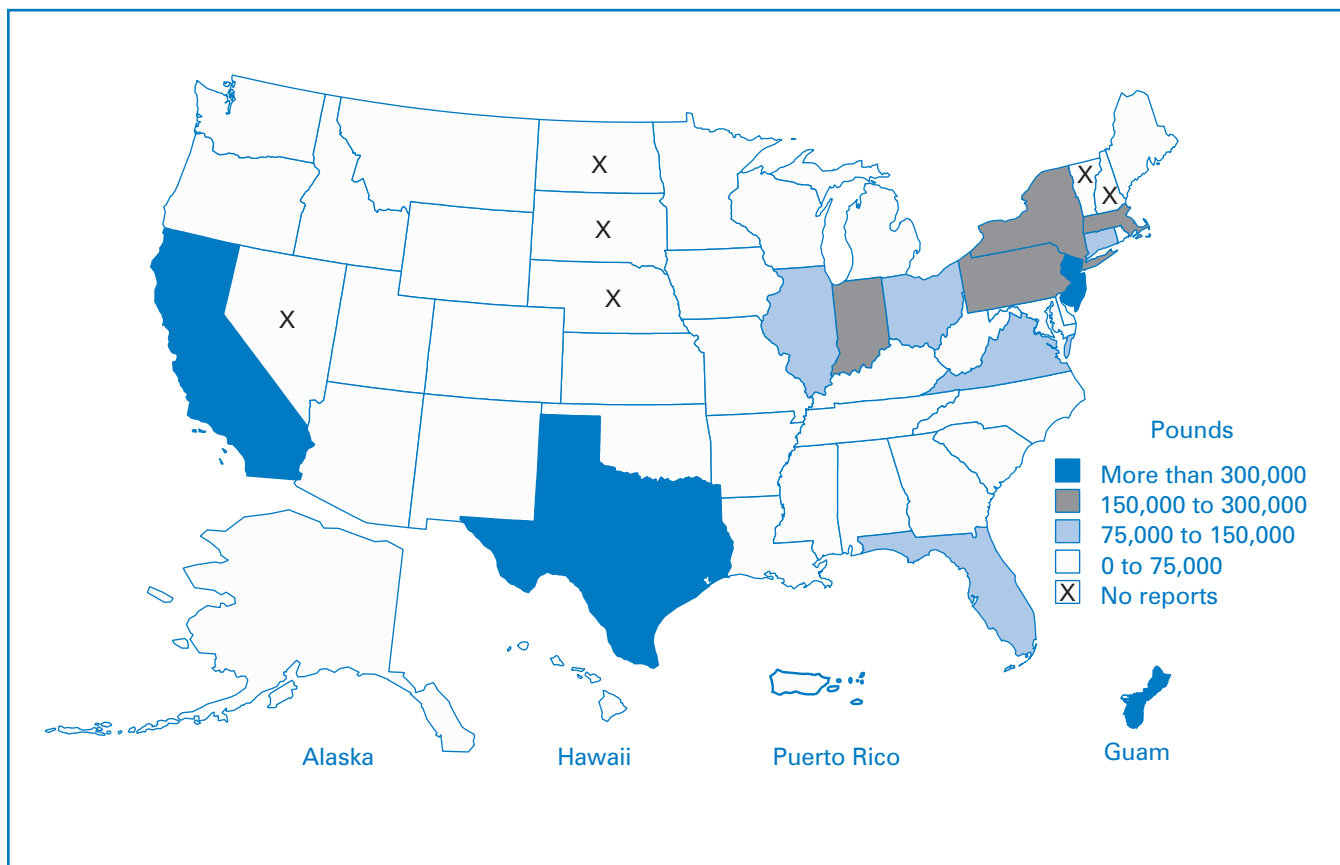


Table 4-56 summarizes the changes in total on-site and off-site releases by petroleum terminals and bulk storage facilities, by state, between 1998 and 1999. The largest increase was for Guam; releases jumped by 4,431.6 percent, from about 11,000 pounds to a little over 500,000 pounds. The largest absolute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

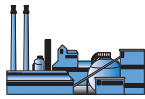
Waste Management Data

Texas, with 16.4 million pounds, was the state with the largest total production-related waste in petroleum terminals and bulk storage facilities (see Table 4-55). Texas facilities in this industry reported 13.4 million

pounds recycled on-site—the largest amount of on-site recycling in the industry, 39.2 percent of the total 34.2 million pounds for the category in this industry. Texas facilities also reported 2.0 million pounds of on-site treatment, or 25.5 percent of the total 7.7 million pounds of on-site treatment in the industry.

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

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



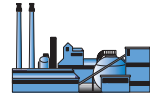
Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)

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

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

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998-1999:
Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)**



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

| State | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | 0 | 900 | 0 | 0 | 6,833 | 30 | 10,746 | 18,509 | 8 |
| Alaska | 12,410 | 0 | 0 | 998 | 9,227 | 56 | 39,137 | 61,828 | 14 |
| American Samoa | 0 | 0 | 0 | 1,724 | 0 | 0 | 5,630 | 7,354 | 183 |
| Arizona | 0 | 189 | 0 | 0 | 0 | 259,148 | 56,197 | 315,534 | 0 |
| Arkansas | 15,553 | 0 | 0 | 0 | 0 | 0 | 16,017 | 31,570 | 0 |
| California | 3,065,821 | 425,270 | 59 | 859 | 824,117 | 54,552 | 389,039 | 4,759,717 | 2,517 |
| Colorado | 0 | 155 | 0 | 138 | 621,625 | 1,520 | 46,392 | 669,830 | 274 |
| Connecticut | 0 | 0 | 0 | 0 | 36,459 | 156 | 81,708 | 118,323 | 0 |
| Delaware | 0 | 0 | 0 | 0 | 0 | 0 | 2,455 | 2,455 | 0 |
| District of Columbia | 0 | 2,282 | 0 | 0 | 0 | 0 | 871 | 3,153 | 0 |
| Florida | 1,511,567 | 7,797 | 0 | 15,827 | 404,268 | 5,456 | 148,388 | 2,093,303 | 4,706 |
| Georgia | 3,993,600 | 4,050 | 31,540 | 22 | 35,587 | 6,652 | 52,801 | 4,124,252 | 139 |
| Guam | 0 | 0 | 0 | 0 | 0 | 67 | 501,143 | 501,210 | 113 |
| Hawaii | 0 | 0 | 0 | 5 | 9,500 | 94 | 52,892 | 62,491 | 1,941 |
| Idaho | 0 | 0 | 0 | 0 | 164,839 | 326 | 26,458 | 191,623 | 99 |
| Illinois | 581,250 | 13 | 0 | 32 | 266,930 | 70,405 | 96,742 | 1,015,372 | 106,732 |
| Indiana | 967,030 | 5,500 | 0 | 180 | 308,118 | 3,863 | 217,956 | 1,502,647 | 0 |
| Iowa | 4,510 | 0 | 0 | 0 | 0 | 0 | 9,891 | 14,401 | 89 |
| Kansas | 17,559 | 15 | 0 | 0 | 73,813 | 17 | 34,840 | 126,244 | 20,908 |
| Kentucky | 1,925,973 | 2 | 0 | 2,858 | 0 | 22,471 | 61,763 | 2,013,067 | 0 |
| Louisiana | 565,236 | 168,700 | 0 | 0 | 0 | 10,953 | 11,581 | 756,470 | 0 |
| Maine | 0 | 0 | 0 | 0 | 11,400 | 3,053 | 48,861 | 63,314 | 0 |
| Maryland | 18 | 332 | 0 | 609 | 267,641 | 8,900 | 67,576 | 345,076 | 586 |
| Massachusetts | 339,432 | 812 | 0 | 566 | 0 | 24,879 | 193,287 | 558,976 | 4,391 |
| Michigan | 3,071,455 | 883 | 0 | 23 | 9,361 | 52,149 | 51,333 | 3,185,204 | 512 |
| Minnesota | 1,590 | 770 | 0 | 0 | 70,345 | 18 | 2,125 | 74,848 | 118 |
| Mississippi | 0 | 0 | 0 | 0 | 0 | 1 | 7,120 | 7,121 | 0 |
| Missouri | 920 | 8,465 | 0 | 4,925 | 884,471 | 10,874 | 53,525 | 963,180 | 2,609 |
| Montana | 0 | 0 | 0 | 0 | 0 | 1,439 | 20,077 | 21,516 | 0 |
| New Jersey | 91 | 2,398 | 0 | 0 | 95,468 | 16,561 | 300,031 | 414,549 | 142 |
| New Mexico | 0 | 0 | 0 | 0 | 108,110 | 1,172 | 11,864 | 121,146 | 143 |
| New York | 1,170,500 | 47,897 | 0 | 149,886 | 181,311 | 22,302 | 265,548 | 1,837,444 | 9,131 |
| North Carolina | 30,911 | 22,927 | 0 | 12 | 93,529 | 19,494 | 58,787 | 225,660 | 3,232 |
| Northern Marianas | 0 | 0 | 0 | 0 | 0 | 0 | 3,387 | 3,387 | 0 |
| Ohio | 2,803,711 | 22,968 | 0 | 399 | 660,203 | 10,676 | 100,048 | 3,598,005 | 1,655 |
| Oklahoma | 0 | 0 | 0 | 0 | 67,128 | 23 | 29,585 | 96,736 | 0 |
| Oregon | 118,500 | 249,947 | 0 | 3,642 | 2,010 | 1,844 | 69,619 | 445,562 | 0 |
| Pennsylvania | 78,499 | 259,243 | 0 | 0 | 6,054 | 43,267 | 159,655 | 546,718 | 113,134 |
| Puerto Rico | 0 | 0 | 0 | 1,830 | 0 | 256 | 32,614 | 34,700 | 3 |
| Rhode Island | 0 | 0 | 0 | 242 | 151,289 | 1,932 | 51,933 | 205,396 | 0 |
| South Carolina | 0 | 0 | 0 | 0 | 0 | 1,459 | 10,439 | 11,898 | 0 |
| Tennessee | 4,152 | 3,096 | 0 | 0 | 0 | 77 | 38,038 | 45,363 | 3 |
| Texas | 13,406,341 | 409,702 | 0 | 112,548 | 1,970,231 | 12,715 | 472,148 | 16,383,685 | 103 |
| Utah | 0 | 0 | 0 | 0 | 0 | 5 | 8,109 | 8,114 | 0 |
| Virgin Islands | 0 | 0 | 0 | 0 | 0 | 0 | 3,750 | 3,750 | 0 |
| Virginia | 57,674 | 2,414 | 0 | 44 | 318,522 | 1,413 | 123,385 | 503,452 | 14 |
| Washington | 426,140 | 64 | 0 | 94 | 76,513 | 10,837 | 62,511 | 576,159 | 0 |
| West Virginia | 0 | 0 | 0 | 613 | 0 | 0 | 7,413 | 8,026 | 23 |
| Wisconsin | 783 | 2,764 | 0 | 0 | 0 | 0 | 7,133 | 10,680 | 37 |
| Wyoming | 0 | 0 | 0 | 0 | 2 | 2 | 26,555 | 26,559 | 6 |
| Total | 34,171,226 | 1,649,555 | 31,599 | 298,076 | 7,734,904 | 681,114 | 4,149,103 | 48,715,577 | 273,565 |

Note: Data are from Section 8 of Form R.



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)

Table 4-56. TRI Total Releases by State, 1998–1999: Petroleum Terminals and Bulk Storage Facilities

| State | Total On-site and Off-site Releases | | | |
|----------------------|-------------------------------------|------------------|------------------|-------------|
| | 1998 | 1999 | Change 1998-1999 | |
| | Pounds | Pounds | Pounds | Percent |
| Alabama | 9,535 | 11,058 | 1,523 | 16.0 |
| Alaska | 17,330 | 39,083 | 21,753 | 125.5 |
| American Samoa | 5,147 | 5,628 | 481 | 9.3 |
| Arizona | 57,397 | 57,836 | 439 | 0.8 |
| Arkansas | 24,216 | 16,017 | -8,199 | -33.9 |
| California | 499,086 | 416,371 | -82,715 | -16.6 |
| Colorado | 114,573 | 52,618 | -61,955 | -54.1 |
| Connecticut | 203,393 | 80,613 | -122,780 | -60.4 |
| Delaware | 2,100 | 2,455 | 355 | 16.9 |
| District of Columbia | 970 | 871 | -99 | -10.2 |
| Florida | 158,535 | 140,016 | -18,519 | -11.7 |
| Georgia | 35,668 | 49,877 | 14,209 | 39.8 |
| Guam | 11,058 | 501,108 | 490,050 | 4,431.6 |
| Hawaii | 56,143 | 57,594 | 1,451 | 2.6 |
| Idaho | 30,224 | 26,455 | -3,769 | -12.5 |
| Illinois | 114,989 | 96,962 | -18,027 | -15.7 |
| Indiana | 181,858 | 220,461 | 38,603 | 21.2 |
| Iowa | 9,978 | 9,888 | -90 | -0.9 |
| Kansas | 29,075 | 60,946 | 31,871 | 109.6 |
| Kentucky | 34,040 | 73,637 | 39,597 | 116.3 |
| Louisiana | 9,647 | 11,807 | 2,160 | 22.4 |
| Maine | 67,953 | 53,883 | -14,070 | -20.7 |
| Maryland | 91,117 | 69,540 | -21,577 | -23.7 |
| Massachusetts | 286,910 | 200,188 | -86,722 | -30.2 |
| Michigan | 130,069 | 60,100 | -69,969 | -53.8 |
| Minnesota | 2,557 | 2,261 | -296 | -11.6 |
| Mississippi | 29,372 | 7,090 | -22,282 | -75.9 |
| Missouri | 69,420 | 55,320 | -14,100 | -20.3 |
| Montana | 23,586 | 22,590 | -996 | -4.2 |
| New Jersey | 311,388 | 302,051 | -9,337 | -3.0 |
| New Mexico | 42,135 | 12,556 | -29,579 | -70.2 |
| New York | 343,936 | 238,435 | -105,501 | -30.7 |
| North Carolina | 70,646 | 62,308 | -8,338 | -11.8 |
| Northern Marianas | 3,086 | 3,412 | 326 | 10.6 |
| Ohio | 121,865 | 104,733 | -17,132 | -14.1 |
| Oklahoma | 49,020 | 32,363 | -16,657 | -34.0 |
| Oregon | 60,607 | 71,893 | 11,286 | 18.6 |
| Pennsylvania | 222,182 | 163,331 | -58,851 | -26.5 |
| Puerto Rico | 22,351 | 35,314 | 12,963 | 58.0 |
| Rhode Island | 84,115 | 53,130 | -30,985 | -36.8 |
| South Carolina | 28,234 | 10,448 | -17,786 | -63.0 |
| Tennessee | 45,493 | 38,818 | -6,675 | -14.7 |
| Texas | 530,011 | 483,223 | -46,788 | -8.8 |
| Utah | 5,988 | 8,979 | 2,991 | 49.9 |
| Virgin Islands | 3,676 | 4,970 | 1,294 | 35.2 |
| Virginia | 131,826 | 126,977 | -4,849 | -3.7 |
| Washington | 92,168 | 66,921 | -25,247 | -27.4 |
| West Virginia | 13,904 | 15,416 | 1,512 | 10.9 |
| Wisconsin | 26,030 | 7,221 | -18,809 | -72.3 |
| Wyoming | 0 | 23,779 | 23,779 | — |
| Total | 4,514,607 | 4,268,551 | -246,056 | -5.5 |

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



Top 15 Chemicals for On- and Off-site Releases

Table 4-57 presents data for the 15 chemicals released in the largest amounts by petroleum terminals and bulk storage facilities. Methyl tert-butyl ether was the chemical with the largest amount of on- and off-site releases in this industry: 1.3 million pounds, mostly in the form of air emissions.

Second in rank was n-hexane, with 884,251 pounds, most of which was air releases. Total releases of toluene were 600,042 pounds. The other chemicals had total on- and off-site releases of less than 500,000 pounds.

For 14 of the top 15 chemicals, air emissions accounted for more than 80 percent of total on- and off-site releases. The exception was zinc compounds, which were mainly (97.8 percent) in the form of off-site releases (transfers to disposal). The largest discharges to surface water were for toluene and benzene, both approximately 14,200 pounds. No releases to underground injection were reported for the industry, and land releases did not exceed 3,200 for any chemical.

Releases of the 15 chemicals totaled 4.1 million pounds, 96.7 percent of the industry's total releases of 4.3 million pounds.

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

Petroleum terminals and bulk storage facilities reporting to TRI expected their production-related waste to increase by 1.2 percent between 1999 and 2001, as shown in Table 4-58. The projected increase repre-

sents a decrease of 0.5 percent in 2000, followed by an increase of 1.7 percent in 2000. The industry expects an increase in on-site recycling, from 34.2 million pounds to 35.3 million pounds, for a 3.4 percent rise. The category of on-site treatment is expected to grow from 7.7 million pounds to 8.3 million pounds, a 6.7 percent increase.

The quantity released on- and off-site is expected to fall from 4.1 million pounds to 3.7 million pounds, a decrease of 11.2 percent. That category is the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 2-1). Other types of off-site waste management are expected to decrease as well: off-site energy recycling by 18.9 percent (from 1.6 million pounds to 1.3 million pounds), off-site energy recovery by 94.6 percent (from almost 300,000 pounds to about 16,200 pounds), and off-site treatment by 7.4 percent, from about 681,000 pounds to over 630,000 pounds.

The projections indicate a continuation in the shift in the industry's waste management practices, away from off-site waste management activities and on- and off-site releases toward on-site recycling. The percentage of waste managed through on-site recycling would rise from 70.1 percent of total production-related waste in 1999 to 71.7 percent in 2001. The share of quantity released on- and off-site is expected to fall from 8.5 percent in 1999 to 7.5 percent in 2001, and reductions are also expected in the shares of off-site recycling, off-site energy recovery, and off-site treatment.

Source Reduction

Of the Form Rs submitted by petroleum terminals and bulk storage facilities in 1999, 7.4 percent reported source reduction activ-



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: Petroleum Terminals and Bulk Storage Facilities (SIC Code 5171)

Table 4-57. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: Petroleum Terminals and Bulk Storage Facilities

| CAS Number Chemical | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection | | On-site Land Releases | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|--|----------------------------------|--|----------------------------|-------------------------------|---|---|--|--|--|
| | | | Class I Wells Pounds | Class II-V Wells Pounds | RCRA Subtitle C Landfills Pounds | Other On-site Land Releases Pounds | | Transfers Off-site to Disposal Pounds | |
| 1634-04-4 Methyl tert-butyl ether | 1,241,571 | 2,286 | 0 | 0 | 0 | 1,020 | 1,244,877 | 21,641 | 1,266,518 |
| 110-54-3 n-Hexane | 868,187 | 2,773 | 0 | 0 | 113 | 444 | 871,517 | 12,734 | 884,251 |
| 108-88-3 Toluene | 561,025 | 14,208 | 0 | 0 | 78 | 3,124 | 578,435 | 21,607 | 600,042 |
| 71-43-2 Benzene | 346,746 | 14,290 | 0 | 0 | 51 | 824 | 361,911 | 10,417 | 372,328 |
| 1330-20-7 Xylene (mixed isomers) | 312,848 | 4,909 | 0 | 0 | 55 | 2,419 | 320,231 | 22,958 | 343,189 |
| 95-63-6 1,2,4-Trimethyl- benzene | 134,612 | 1,607 | 0 | 0 | 22 | 1,032 | 137,273 | 7,972 | 145,245 |
| 91-20-3 Naphthalene | 94,444 | 574 | 0 | 0 | 14 | 10 | 95,042 | 17,952 | 112,994 |
| 100-41-4 Ethylbenzene | 97,160 | 1,799 | 0 | 0 | 16 | 957 | 99,932 | 10,365 | 110,297 |
| 7782-50-5 Chlorine | 84,161 | 0 | 0 | 0 | 0 | 0 | 84,161 | 0 | 84,161 |
| 110-82-7 Cyclohexane | 64,299 | 25 | 0 | 0 | 157 | 6 | 64,487 | 3,807 | 68,294 |
| 74-85-1 Ethylene | 33,420 | 0 | 0 | 0 | 0 | 0 | 33,420 | 0 | 33,420 |
| — Zinc compounds | 392 | 304 | 0 | 0 | 0 | 0 | 696 | 31,406 | 32,102 |
| 75-65-0 tert-Butyl alcohol | 24,760 | 260 | 0 | 0 | 0 | 5 | 25,025 | 1,505 | 26,530 |
| 115-07-1 Propylene | 25,411 | 0 | 0 | 0 | 0 | 0 | 25,411 | 0 | 25,411 |
| 106-42-3 p-Xylene | 22,159 | 0 | 0 | 0 | 0 | 290 | 22,449 | 2,106 | 24,555 |
| Subtotal (top 15 chemicals) | 3,911,195 | 43,035 | 0 | 0 | 506 | 10,131 | 3,964,867 | 164,470 | 4,129,337 |
| Total (all chemicals) | 4,044,223 | 43,606 | 0 | 0 | 528 | 14,641 | 4,102,998 | 165,553 | 4,268,551 |

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

ity undertaken during the year (see Table 4–59). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Facilities with only petroleum terminals and bulk storage operations filed the

largest number of forms (3,025) and reported source reduction activities on 7.1 percent of them. These facilities identified spill and leak prevention on 191 forms and good operating practices on 112, making these practices the most frequently reported source reduction activities in the industry. The facilities with a combination of petrole-



um terminals and bulk storage operations and petroleum refining filed only 31 forms but reported source reduction activity on 35.5 percent of them (11 forms). These facil-

ities identified as source reduction activities spill and leak prevention (14 forms) and good operating practices (3 forms).

Table 4-58. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999-2001: Petroleum Terminals and Bulk Storage Facilities

| Waste Management Activity | Current Year 1999 | | Projected 2000 | | Projected 2001 | |
|---------------------------------------|----------------------------|------------------|----------------------------|------------------|----------------------------|------------------|
| | Total Pounds | Percent of Total | Total Pounds | Percent of Total | Total Pounds | Percent of Total |
| Recycled On-site | 34,171,226 | 70.1 | 34,965,087 | 72.1 | 35,326,825 | 71.7 |
| Recycled Off-site | 1,649,555 | 3.4 | 1,308,545 | 2.7 | 1,337,519 | 2.7 |
| Energy Recovery On-site | 31,599 | 0.1 | 34,684 | 0.1 | 37,974 | 0.1 |
| Energy Recovery Off-site | 298,076 | 0.6 | 41,291 | 0.1 | 16,203 | 0.0 |
| Treated On-site | 7,734,904 | 15.9 | 7,925,242 | 16.3 | 8,253,505 | 16.7 |
| Treated Off-site | 681,114 | 1.4 | 629,297 | 1.3 | 630,431 | 1.3 |
| Quantity Released On- and Off-site | 4,149,103 | 8.5 | 3,581,416 | 7.4 | 3,684,013 | 7.5 |
| Total Production-related Waste | 48,715,577 | 100.0 | 48,485,562 | 100.0 | 49,286,470 | 100.0 |
| Waste Management Activity | Projected Change 1999-2000 | | Projected Change 2000-2001 | | Projected Change 1999-2001 | |
| | Percent | | Percent | | Percent | |
| Recycled On-site | 2.3 | | 1.0 | | 3.4 | |
| Recycled Off-site | -20.7 | | 2.2 | | -18.9 | |
| Energy Recovery On-site | 9.8 | | 9.5 | | 20.2 | |
| Energy Recovery Off-site | -86.1 | | -60.8 | | -94.6 | |
| Treated On-site | 2.5 | | 4.1 | | 6.7 | |
| Treated Off-site | -7.6 | | 0.2 | | -7.4 | |
| Quantity Released On- and Off-site | -13.7 | | 2.9 | | -11.2 | |
| Total Production-related Waste | -0.5 | | 1.7 | | 1.2 | |

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

Table 4-59. Number of Forms Reporting Source Reduction Activity, 1999: Petroleum Terminals and Bulk Storage Facilities

| SIC Code | Industry | Total Form Rs Number | Forms Reporting Source Reduction Activity | | Category of Source Reduction Activity | | | | | | | |
|----------|--|----------------------|---|--------------------------------|---------------------------------------|--------------------------|----------------------------------|-----------------------------------|------------------------------|--------------------------------|--|------------------------------|
| | | | Number | Percent of All Form Rs Percent | Good Operating Practices Number | Inventory Control Number | Spill and Leak Prevention Number | Raw Material Modifications Number | Process Modifications Number | Cleaning and Degreasing Number | Surface Preparation and Finishing Number | Product Modifications Number |
| 5171 | Petroleum Terminals and Bulk Stations | 3,025 | 215 | 7.1 | 112 | 14 | 191 | 0 | 12 | 22 | 0 | 7 |
| | SIC Code 5171 and SIC Code 29 (Petroleum Refining) | 31 | 11 | 35.5 | 3 | 0 | 14 | 0 | 0 | 0 | 0 | 0 |
| | Total | 3,056 | 226 | 7.4 | 115 | 14 | 205 | 0 | 12 | 22 | 0 | 7 |

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

RCRA Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and Solvent Recovery Facilities (in SIC Code 7389)

Introduction

Facilities regulated under the Resource Conservation and Recovery Act (RCRA), Subtitle C, receive hazardous wastes from other facilities or from other operations at their own facilities and treat, store, and dispose of the wastes. These TSD facilities are categorized among refuse systems in SIC code 4953, as shown in Box 4–7. This SIC code also includes many refuse facilities that collect and dispose of non-hazardous waste; these facilities are not covered by RCRA Subtitle C and are not required to report to TRI.

For the purpose of release reporting analyses within this document, RCRA Subtitle C treatment, storage, and disposal (TSD) facilities (in SIC Code 4953) and solvent recovery facilities (in SIC Code 7389) are treated as a single category. The two industries conduct similar waste management activities and employ the use of like chemicals.

TSD facilities obtain RCRA Subtitle C hazardous waste permits from EPA that regulate how they may treat, store, and dispose of wastes. RCRA Subtitle C established a federal program to manage hazardous wastes “from cradle to grave,” to ensure

Box 4-7. SIC Codes 495, Sanitary Services, and 738, Miscellaneous Business Services: Codes and Classifications Required to Report to TRI

| | | |
|------|---|---|
| 4953 | Refuse Systems | Collection and disposal of refuse by processing or destruction. Operation of incinerators, waste treatment plants, landfills, or other disposal sites. <i>TRI reporting in SIC code 4953 is limited to facilities regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. section 6921 et seq.</i> |
| 7389 | Business Services, Not Elsewhere Classified | Furnishing business services not elsewhere classified. <i>TRI reporting in SIC code 7389 is limited to facilities primarily engaged in solvent recovery services on a contract or fee basis.</i> |

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



that such waste is handled in a manner that protects human health and the environment. The law regulates hazardous waste generators, transporters, and TSD facilities.

Solvent recovery facilities receive spent solvents and recover them for further use. Only facilities that recover solvents on a contract or fee basis are required to report to TRI. This business activity is one of many categorized in miscellaneous business services (SIC code 7389), also listed in Box 4–7.

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

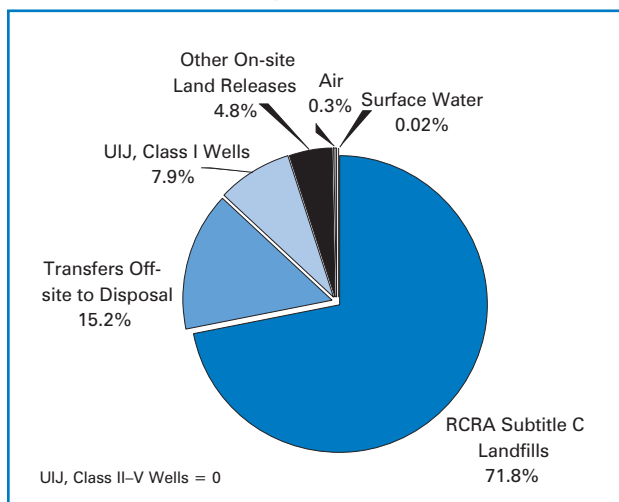
1999 TRI Data for RCRA Subtitle C TSD and Solvent Recovery Facilities

On- and Off-site Releases

RCRA Subtitle C TSD and solvent recovery facilities reported 288.0 million pounds of TRI chemicals released on- and off-site in 1999, as shown in Table 4–60. Most of the releases, 206.8 million pounds, went to on-site RCRA Subtitle C landfills. Releases to these landfills amounted to 71.8 percent of the industry’s total releases (see Figure 4–15).

The industry’s second-largest release type, off-site releases (transfers off-site to disposal), totaled 43.8 million pounds, 15.2 percent of total releases. The industry also

Figure 4-15. Distribution of TRI On-site and Off-site Releases, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities



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

reported 22.9 million pounds injected underground into Class I wells, representing 7.9 percent of total releases for this industry, and 13.7 million pounds of other on-site land releases, 4.8 percent of total releases. (Types of underground injection wells and on-site land releases are described in Box 1–4 in Chapter 1.)

Facilities with only RCRA Subtitle C TSD operations reported the largest total releases, with 261.4 million pounds, or 90.8 percent of total releases for this industry. These facilities reported 182.7 million pounds of TRI chemicals released on-site to RCRA Subtitle C landfills. Transfers off-site for disposal amounted to 42.2 million pounds. All of the industry’s underground injection was from this group.

Facilities that had both RCRA Subtitle C TSD and solvent recovery operations reported the second-largest total releases for this industry, 24.1 million pounds. Of



Table 4-60. TRI On-site and Off-site Releases by 4-digit SIC Code, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| SIC Code Industry Total Forms Number | | | On-site Releases | | | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--|--|-------|----------------------------|---------------------------------|-----------------------|-------------------------|----------------------------------|------------------------------------|-------------------------------|-------------------|--|
| | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection | | On-site Land Releases | | Total On-site Releases Pounds | | |
| | | | | | Class I Wells Pounds | Class II-V Wells Pounds | RCRA Subtitle C Landfills Pounds | Other On-site Land Releases Pounds | | | |
| | | | | | | | | | | | |
| 4953 | RCRA Subtitle C TSD Facilities | 2,039 | 311,083 | 50,671 | 22,861,227 | 0 | 182,725,050 | 13,264,572 | 219,212,603 | 42,202,456 | 261,415,059 |
| 7389 | Solvent Recovery Services | 324 | 412,654 | 0 | 0 | 0 | 0 | 0 | 412,654 | 954,052 | 1,366,706 |
| | SIC Code 4953 and SIC Code 7389 | 63 | 69,746 | 0 | 0 | 0 | 24,031,000 | 0 | 24,100,746 | 1,548 | 24,102,294 |
| | SIC Code 4953 and SIC Code 34 (Fabricated Metals) | 16 | 2,270 | 5 | 0 | 0 | 0 | 442,442 | 444,717 | 666,499 | 1,111,216 |
| | SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers) | 3 | 1,690 | 0 | 0 | 0 | 0 | 0 | 1,690 | 0 | 1,690 |
| | SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers) | 3 | 5,448 | 0 | 0 | 0 | 0 | 0 | 5,448 | 0 | 5,448 |
| | Total | 2,448 | 802,891 | 50,676 | 22,861,227 | 0 | 206,756,050 | 13,707,014 | 244,177,858 | 43,824,555 | 288,002,413 |

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

this quantity, 24.0 million pounds went to on-site RCRA Subtitle C landfills. Facilities with only solvent recovery operations had the third-largest total releases, with 1.4 million pounds, almost a million pounds of which were transferred off-site for disposal.

Table 4–61 summarizes the changes in total releases by RCRA Subtitle C TSD and solvent recovery facilities between 1998 and 1999. Total on- and off-site releases rose 2.7 percent, an increase of 7.6 million pounds. On-site releases decreased 0.4 percent, by a little over a million pounds. Decreases in this category were spread fairly evenly among total air emissions, surface water discharges (about half a million pounds each), underground injection (about 675,000 pounds), and surface impoundments (a little over 645,000 pounds). On-site land releases rose slightly, by 0.3 percent, but the subcategory other on-site landfills rose 23.6 percent, by 2.2 million pounds.

Total off-site releases to disposal rose 24.4 percent, from 35.2 million pounds to 43.8 million pounds. Storage declined 79.3 percent, from 2.1 million pounds to less than half a million pounds. Solidification/stabilization rose 49.0 percent, from 2.5 million pounds to 3.8 million pounds. Underground injection jumped 1,486.2 percent, from less than 170,000 pounds to 2.7 million pounds. Releases to landfills and surface impoundments decreased from 27.0 million pounds to 24.5 million pounds, a decline of 9.5 percent. Releases to other off-site management rose from 1.8 million pounds to 9.3 million pounds, an increase of 429.2 percent.

Waste Management Data

Quantities of TRI Chemicals in Waste

RCRA Subtitle C TSD and solvent recovery facilities reported managing 1.02 billion pounds of total production-related waste in 1999, as shown in Table 4–62. On-site treat-



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: RCRA Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and Solvent Recovery Facilities (in SIC Code 7389)

Table 4-61. TRI On-site and Off-site Releases, 1998–1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| | 1998 | 1999 | Change 1998-1999 | |
|--|--------------------|--------------------|-------------------|-------------|
| | Pounds | Pounds | Pounds | Percent |
| On-site Releases | | | | |
| Total Air Emissions | 1,342,426 | 802,891 | -539,535 | -40.2 |
| Fugitive Air Emissions | 727,199 | 428,059 | -299,140 | -41.1 |
| Point Source Air Emissions | 615,227 | 374,832 | -240,395 | -39.1 |
| Surface Water Discharges | 578,810 | 50,676 | -528,134 | -91.2 |
| Underground Injection | 23,536,753 | 22,861,227 | -675,526 | -2.9 |
| Class I Wells | 23,536,753 | 22,861,227 | -675,526 | -2.9 |
| Class II–V Wells | 0 | 0 | 0 | — |
| On-site Land Releases | 219,733,801 | 220,463,064 | 729,263 | 0.3 |
| RCRA Subtitle C Landfills | 207,564,621 | 206,756,050 | -808,571 | -0.4 |
| Other On-site Landfills | 9,286,711 | 11,479,552 | 2,192,841 | 23.6 |
| Land Treatment | 0 | 0 | 0 | — |
| Surface Impoundments | 2,872,520 | 2,227,442 | -645,078 | -22.5 |
| Other Disposal | 9,949 | 20 | -9,929 | -99.8 |
| Total On-site Releases | 245,191,790 | 244,177,858 | -1,013,932 | -0.4 |
| Off-site Releases | | | | |
| Storage Only ^a | 2,120,400 | 438,847 | -1,681,553 | -79.3 |
| Solidification/Stabilization ^b | 2,533,644 | 3,775,533 | 1,241,889 | 49.0 |
| Metals and Metal Compounds Only | | | | |
| Wastewater Treatment (excluding POTWs) ^c | 104,967 | 63,488 | -41,479 | -39.5 |
| Metals and Metal Compounds Only | | | | |
| Transfers to POTWs ^d | 411,897 | 14,417 | -397,480 | -96.5 |
| Metals and Metal Compounds Only | | | | |
| Underground injection | 169,964 | 2,695,939 | 2,525,975 | 1,486.2 |
| Landfills/Surface Impoundments | 27,023,891 | 24,467,085 | -2,556,806 | -9.5 |
| Land Treatment | 251 | 0 | -251 | -100.0 |
| Other Land Disposal | 474,185 | 615,135 | 140,950 | 29.7 |
| Other Off-site Management | 1,753,497 | 9,279,117 | 7,525,620 | 429.2 |
| Transfers to Waste Broker for Disposal | 283,047 | 2,044,430 | 1,761,383 | 622.3 |
| Unknown ^e | 345,636 | 430,564 | 84,928 | 24.6 |
| Total Off-site Releases (Transfers Off-site to Disposal) | 35,221,379 | 43,824,555 | 8,603,176 | 24.4 |
| Total On-site and Off-site Releases | 280,413,169 | 288,002,413 | 7,589,244 | 2.7 |

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

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

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

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

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

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



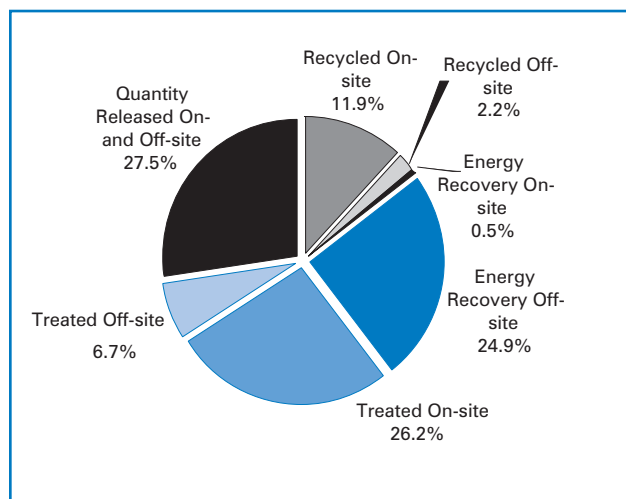
Table 4-62. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| SIC Code | Industry | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| 4953 | RCRA Subtitle C TSD Facilities | 47,405,885 | 11,035,781 | 4,763,092 | 130,817,837 | 251,725,000 | 53,461,130 | 253,003,432 | 752,212,157 | 13,837 |
| 7389 | Solvent Recovery Services | 49,911,178 | 11,290,622 | 0 | 66,305,099 | 14,725,352 | 10,486,301 | 847,182 | 153,565,734 | 1,431 |
| | SIC Code 4953 and SIC Code 7389 | 19,546,476 | 0 | 590,916 | 53,582,660 | 53 | 4,004,584 | 24,099,512 | 101,824,201 | 0 |
| | SIC Code 4953 and SIC Code 34 (Fabricated Metals) | 338,220 | 90,805 | 0 | 128,745 | 0 | 279,495 | 1,255,110 | 2,092,375 | 5 |
| | SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers) | 0 | 0 | 0 | 2,090 | 0 | 6,070 | 1,690 | 9,850 | 0 |
| | SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers) | 3,400,000 | 0 | 0 | 2,214,000 | 3,900 | 238,000 | 5,443 | 5,861,343 | 0 |
| | Total | 120,601,759 | 22,417,208 | 5,354,008 | 253,050,431 | 266,454,305 | 68,475,580 | 279,212,369 | 1,015,565,660 | 15,273 |

Note: Data are from Section 8 of Form R.

ment totaled 266.5 million pounds, or 26.2 percent of the industry's production-related waste (see Figure 4-16). Off-site energy recovery accounted for 253.1 million pounds, or 24.9 percent of the total, and on-site recycling totaled 120.6 million pounds, 11.9 percent of the total.

Figure 4-16. TRI Waste Management, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities



Note: Data are from Section 8 of Form R.

Facilities with only RCRA Subtitle C TSD operations reported 752.2 million pounds of total production-related waste managed, 74.1 percent of the total for this industry. These facilities reported 253.0 million pounds released on- and off-site, 251.7 million pounds treated on-site and 130.8 million pounds sent for energy recovery off-site.

Facilities with only solvent recovery operations reported 153.6 million pounds of total production-related waste managed, or 15.1 percent of the total for the industry. These facilities reported 66.3 million pounds in off-site energy recovery and 49.9 million pounds recycled on-site. Facilities reporting both RCRA Subtitle C TSD and solvent recovery operations managed 101.8 million pounds of total production-related waste, representing 10.0 percent of the total for the industry. These facilities reported 53.6 million pounds in off-site energy recovery and 24.1 million pounds released on- and off-site.



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: RCRA Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and Solvent Recovery Facilities (in SIC Code 7389)

Total production-related waste for RCRA Subtitle C TSD and solvent recovery facilities fell 6.2 percent between 1998 and 1999, a decline of 66.7 million pounds (see Table 4–63). The largest absolute decline was in energy recovery off-site, a decrease of 133.1 million pounds, or 34.5 percent. Off-site treatment decreased by 20.7 percent and on-site recycling decreased by 8.2 percent. The quantity released on- and off-site declined by 1.7 percent, from 284.2 million pounds to 279.2 million pounds. The

largest absolute increase was in on-site treatment, which rose by 55.8 percent, from 171.0 million pounds to 266.5 million pounds.

Transfers Off-site for Further Waste Management/Disposal

RCRA Subtitle C TSD and solvent recovery facilities reported 372.3 million pounds of transfers off-site for further waste management and disposal in 1999, as shown in

Table 4-63. Quantities of TRI Chemicals in Waste, 1998–1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| Waste Management Activity | 1998 | 1999 | Change 1998-1999 | |
|---------------------------------------|----------------------|----------------------|--------------------|-------------|
| | Pounds | Pounds | Pounds | Percent |
| Recycled On-site | 131,315,578 | 120,601,759 | -10,713,819 | -8.2 |
| Recycled Off-site | 20,015,384 | 22,417,208 | 2,401,824 | 12.0 |
| Energy Recovery On-site | 3,287,608 | 5,354,008 | 2,066,400 | 62.9 |
| Energy Recovery Off-site | 386,128,229 | 253,050,431 | -133,077,798 | -34.5 |
| Treated On-site | 171,016,532 | 266,454,305 | 95,437,773 | 55.8 |
| Treated Off-site | 86,345,263 | 68,475,580 | -17,869,683 | -20.7 |
| Quantity Released On- and Off-site | 284,164,671 | 279,212,369 | -4,952,302 | -1.7 |
| Total Production-related Waste | 1,082,273,265 | 1,015,565,660 | -66,707,605 | -6.2 |
| Non-production-related Waste | 122,571 | 15,273 | -107,298 | -87.5 |

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

Table 4-64. TRI Transfers Off-site for Further Waste Management/Disposal by 4-digit SIC Code, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| SIC Code | Industry | Transfers to Recycling Pounds | Transfers to Energy Recovery Pounds | Transfers to Treatment Pounds | Transfers to POTWs | | Other Off-site Transfers* Pounds | Other Transfers Off-site to Disposal** Pounds | Total Transfers for Further Waste Management/Disposal Pounds |
|----------|--|----------------------------------|--|----------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|--|---|
| | | | | | Metals and Metal Compounds Pounds | Non-metal TRI Chemicals Pounds | | | |
| 4953 | RCRA Subtitle C Facilities | 10,169,682 | 131,558,767 | 30,825,909 | 14,358 | 1,682,113 | 0 | 45,162,328 | 219,413,157 |
| 7389 | Solvent Recovery Services | 13,308,224 | 63,011,969 | 12,483,727 | 59 | 270,816 | 553,773 | 981,486 | 90,610,054 |
| | SIC Code 4953 and SIC Code 7389 | 22,835 | 54,419,367 | 3,980,303 | 0 | 45 | 0 | 1,840 | 58,424,390 |
| | SIC Code 4953 and SIC Code 34 (Fabricated Metals) | 90,866 | 193,304 | 352,784 | 0 | 0 | 0 | 717,997 | 1,354,951 |
| | SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers) | 0 | 2,090 | 6,070 | 0 | 0 | 0 | 0 | 8,160 |
| | SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers) | 0 | 2,213,500 | 237,900 | 0 | 170 | 0 | 0 | 2,451,570 |
| | Total | 23,591,607 | 251,398,997 | 47,886,693 | 14,417 | 1,953,144 | 553,773 | 46,863,651 | 372,262,282 |

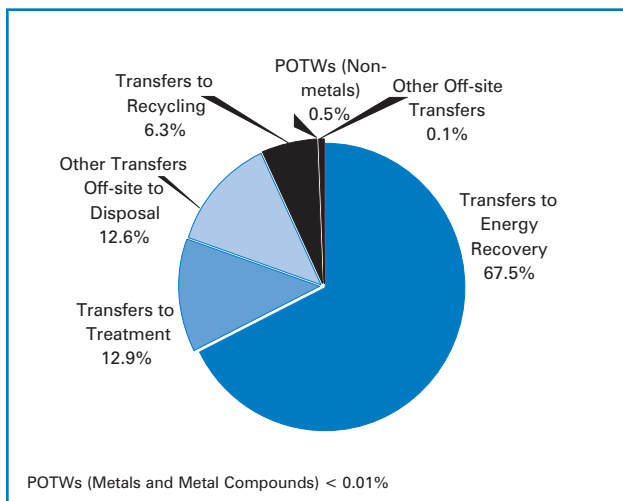
Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.

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

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



Figure 4-17. Distribution of TRI Transfers Off-site for Further Waste Management/Disposal, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities



Note: Data are from Section 6 of Form R.

Table 4-64. Transfers off-site to energy recovery amounted to 251.4 million pounds, or 67.5 percent of all transfers for further waste management and disposal (see Figure 4-17). The industry reported 47.9 million pounds sent off-site to treatment (12.9 percent of the total) and 23.6 million pounds sent off-site to recycling (6.3 percent). The category other transfers off-site to disposal totaled 46.9 million pounds (12.6 percent of total transfers for further waste management and disposal). Transfers of non-metal TRI chemicals to POTWs amounted to 2.0 million pounds (0.5 percent).

Facilities with only RCRA Subtitle C TSD operations reported a total of 219.4 million pounds of transfers off-site for further waste management and disposal, or 58.9 percent of the total for the industry. Most of this was transfers sent off-site for energy recovery (131.6 million pounds). These facilities sent 45.2 million pounds off-site for disposal, accounting for 96.4 percent of the industry total for this category.

Facilities with only solvent recovery operations reported 90.6 million pounds of transfers sent off-site for further waste management and disposal, 24.3 percent of the total. Of this, 63.0 million pounds went to energy recovery, 13.3 million pounds to recycling, and 12.5 million pounds to treatment. Other transfers off-site to disposal accounted for almost a million pounds. Facilities with both RCRA Subtitle C TSD and solvent recovery operations reported 58.4 million pounds, or 15.7 percent of total transfers for further waste management and disposal for the industry. These facilities reported 54.4 million pounds sent off-site for energy recovery and 4.0 million pounds sent off-site for treatment.

Transfers off-site for further waste management and disposal by RCRA Subtitle C TSD and solvent recovery facilities fell 30.3 percent between 1998 and 1999, a drop of 161.9 million pounds (see Table 4-65). The largest absolute decrease was in transfers to energy recovery, from 405.3 million pounds to 251.4 million pounds, or 38.0 percent. Transfers to treatment fell 29.4 percent, from 67.8 million pounds to 47.9 million pounds. Other off-site transfers to disposal rose 16.3 percent, from 40.3 million pounds to 46.9 million pounds. Transfers to recycling rose 24.6 percent, from 18.9 million pounds to 23.6 million pounds, and transfers to POTWs rose 10.6 percent, from 1.8 million pounds to 2.0 million pounds. Within the POTW category, transfers of metals and metal compounds fell 96.5 percent, and transfers of non-metal TRI chemicals rose 42.8 percent.

TRI Data by State

RCRA Subtitle C TSD and solvent recovery facilities in Texas submitted the largest number of TRI forms, 461. The only other



Table 4-65. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| | 1998 | 1999 | Change 1998-1999 | |
|---|--------------------|--------------------|---------------------|--------------|
| | Pounds | Pounds | Pounds | Percent |
| Transfers to Recycling | 18,927,984 | 23,591,607 | 4,663,623 | 24.6 |
| Transfers to Energy Recovery | 405,318,954 | 251,398,997 | -153,919,957 | -38.0 |
| Transfers to Treatment | 67,808,258 | 47,886,693 | -19,921,565 | -29.4 |
| Transfers to POTWs | 1,779,700 | 1,967,561 | 187,861 | 10.6 |
| Metals and Metal Compounds Only | 411,897 | 14,417 | -397,480 | -96.5 |
| Non-metal TRI Chemicals | 1,367,803 | 1,953,144 | 585,341 | 42.8 |
| Other Off-site Transfers* | 0 | 553,773 | 553,773 | — |
| Other Off-site Transfers to Disposal** | 40,279,522 | 46,863,651 | 6,584,129 | 16.3 |
| Total Transfers Off-site for Further Waste Management/Disposal | 534,114,418 | 372,262,282 | -161,852,136 | -30.3 |

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

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

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

state to submit more than 300 forms was Ohio, with 356.

On- and Off-site Releases

RCRA Subtitle C TSD and solvent recovery facilities in Ohio reported the largest total on- and off-site releases in 1999, 60.7 million pounds (see Table 4-66). As shown in Map 4-6, Ohio, Oregon, Idaho, Illinois, California and Michigan reported the largest amounts of total releases in 1999, over 20 million pounds each.

Of Ohio's 60.7 million pounds in total transfers, 38.6 million pounds were released on-site to RCRA Subtitle C landfills, the largest such amount of any state. Ohio facilities also reported the largest amount injected underground in Class I wells, 13.4 million pounds.

Oregon ranked second in total releases, with 45.0 million pounds, of which 35.9 million pounds were released in on-site RCRA Subtitle C landfills. Idaho was third, with 24.0 million pounds of total releases, Illinois ranked fourth, with 22.8 million pounds, and California was fifth, with 21.6 million pounds. Most of those states' releases

went to on-site RCRA Subtitle C landfills. Facilities in Michigan, which ranked sixth overall, with 20.2 million pounds of total releases, reported the largest amount of off-site releases; 13.1 million pounds were transferred off-site to disposal.

The largest absolute increase in total releases by RCRA Subtitle C TSD and solvent recovery facilities between 1998 and 1999, by state, was for Oregon, where total releases jumped 87.9 percent, from 24.0 million pounds to 45.0 million pounds (see Table 4-67). Next was Michigan, where total releases rose from 11.8 million pounds to 20.2 million pounds, an increase of 71.0 percent. Louisiana recorded an increase of almost 6 million pounds (130.0 percent). The largest decreases were for Ohio, from 75.3 million pounds to 60.7 million pounds, a 19.4 percent decline, and Idaho, from 31.7 million pounds to 24.0 million pounds, a 24.1 percent decrease. Indiana also recorded a large decrease, from 12.4 million pounds to 6.3 million pounds, a decline of 49.4 percent. No other state had absolute changes of more than 2 million pounds.



Waste Management Data

Among states, Ohio facilities reported the largest total production-related waste managed in RCRA Subtitle C TSD and solvent recovery facilities, 155.0 million pounds (see Table 4–66). Ohio facilities in this industry reported 61.0 million pounds of on- and off-site releases, the largest amount of any state for this category of waste management. Ohio facilities also reported 53.8 million pounds of on-site treatment, 21.6 million pounds of off-site energy recovery, and 14.9 million pounds of on-site recycling.

Texas ranked second, with total production-related waste managed of 122.6 million pounds. Texas facilities reported the largest

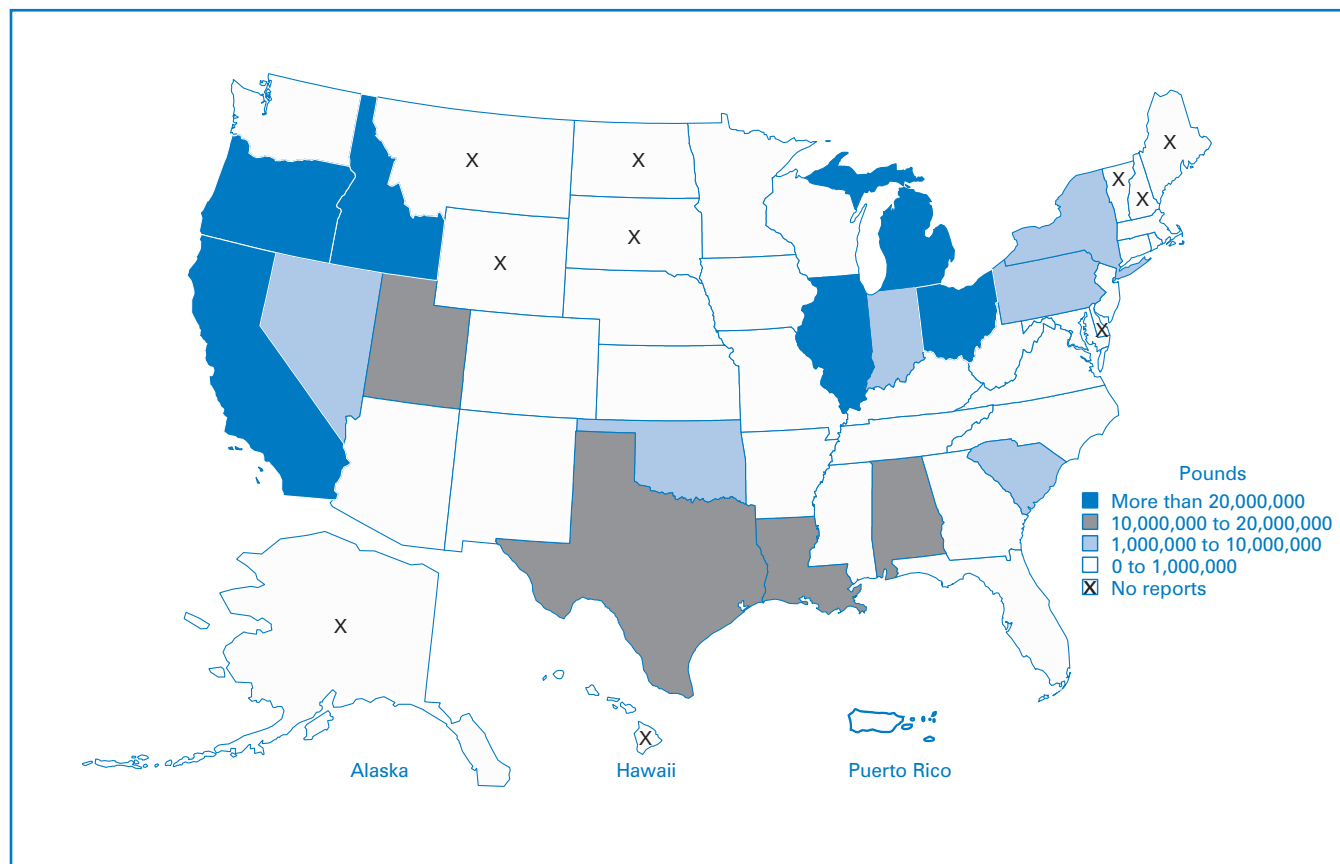
amount of waste treated on-site, 62.8 million pounds. Texas also reported 29.3 million pounds sent to off-site energy recovery, the largest amount of any state in this industry, slightly ahead of Arkansas (27.7 million pounds) and California (27.2 million pounds).

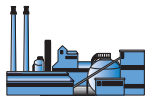
California ranked third, with 116.5 million pounds of total production-related waste managed. The state ranked first in on-site recycling (32.3 million pounds) and off-site treatment (24.0 million pounds).

Top 15 Chemicals for On- and Off-site Releases

Table 4–68 presents data for the 15 chemicals released in the largest amounts by TRI

Map 4-6. Total On-site and Off-site Releases, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities





Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: RCRA Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and Solvent Recovery Facilities (in SIC Code 7389)

Table 4-66. Summary of TRI Information by State, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| State | | On-site Releases | | | | | | | Off-site Releases | Total On- and Off-site Releases |
|----------------|--------|---------------------|--------------------------|-----------------------|------------------|---------------------------|-----------------------------|------------------------|--------------------------------|---------------------------------|
| | | Total Air Emissions | Surface Water Discharges | Underground Injection | | On-site Land Releases | | Total On-site Releases | | |
| | | | | Class I Wells | Class II-V Wells | RCRA Subtitle C Landfills | Other On-site Land Releases | | Transfers Off-site to Disposal | |
| Total Forms | Number | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Alabama | 50 | 3,004 | 0 | 0 | 0 | 13,554,931 | 0 | 13,557,935 | 168,697 | 13,726,632 |
| Arizona | 22 | 4,664 | 0 | 0 | 0 | 0 | 0 | 4,664 | 622,550 | 627,214 |
| Arkansas | 159 | 13,926 | 108 | 0 | 0 | 32,100 | 0 | 46,134 | 104,385 | 150,519 |
| California | 158 | 82,596 | 0 | 0 | 0 | 18,178,901 | 93,562 | 18,355,059 | 3,225,858 | 21,580,917 |
| Colorado | 2 | 251 | 0 | 0 | 0 | 0 | 0 | 251 | 0 | 251 |
| Connecticut | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 685,800 | 685,800 |
| Florida | 8 | 6,622 | 0 | 0 | 0 | 0 | 0 | 6,622 | 180 | 6,802 |
| Georgia | 6 | 12,422 | 0 | 0 | 0 | 0 | 0 | 12,422 | 0 | 12,422 |
| Idaho | 12 | 3,205 | 0 | 0 | 0 | 24,031,000 | 0 | 24,034,205 | 25 | 24,034,230 |
| Illinois | 231 | 73,075 | 21 | 0 | 0 | 18,737,328 | 771,825 | 19,582,249 | 3,191,413 | 22,773,662 |
| Indiana | 33 | 11,497 | 168 | 0 | 0 | 0 | 0 | 11,665 | 6,243,238 | 6,254,903 |
| Iowa | 2 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 9 |
| Kansas | 12 | 17,671 | 1 | 0 | 0 | 0 | 0 | 17,672 | 185 | 17,857 |
| Kentucky | 102 | 17,872 | 15 | 0 | 0 | 0 | 442,442 | 460,329 | 143,322 | 603,651 |
| Louisiana | 63 | 2,930 | 0 | 2,807,375 | 0 | 7,311,500 | 0 | 10,121,805 | 109,781 | 10,231,586 |
| Maryland | 1 | 13 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 |
| Massachusetts | 10 | 3,693 | 5 | 0 | 0 | 0 | 0 | 3,698 | 657,617 | 661,315 |
| Michigan | 140 | 82,787 | 0 | 0 | 0 | 7,008,813 | 0 | 7,091,600 | 13,105,788 | 20,197,388 |
| Minnesota | 7 | 348 | 0 | 0 | 0 | 0 | 0 | 348 | 14,980 | 15,328 |
| Mississippi | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 |
| Missouri | 8 | 24 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 |
| Nebraska | 76 | 18,643 | 0 | 0 | 0 | 0 | 476,841 | 495,484 | 27,493 | 522,977 |
| Nevada | 18 | 260 | 0 | 0 | 0 | 2,054,100 | 0 | 2,054,360 | 128,284 | 2,182,644 |
| New Jersey | 121 | 24,213 | 23 | 0 | 0 | 0 | 0 | 24,236 | 645,202 | 669,438 |
| New Mexico | 3 | 5,321 | 0 | 0 | 0 | 0 | 0 | 5,321 | 0 | 5,321 |
| New York | 18 | 1,072 | 209 | 0 | 0 | 6,184,700 | 0 | 6,185,981 | 30,962 | 6,216,943 |
| North Carolina | 15 | 15,188 | 34 | 0 | 0 | 0 | 0 | 15,222 | 249,760 | 264,982 |
| Ohio | 356 | 299,748 | 1,193 | 13,360,000 | 0 | 38,573,000 | 18 | 52,233,959 | 8,423,352 | 60,657,311 |
| Oklahoma | 22 | 1,205 | 0 | 2,513,899 | 0 | 6,264,394 | 0 | 8,779,498 | 15,351 | 8,794,849 |
| Oregon | 52 | 755 | 0 | 0 | 0 | 35,877,473 | 9,152,811 | 45,031,039 | 9,082 | 45,040,121 |
| Pennsylvania | 47 | 4,372 | 6,730 | 0 | 0 | 1,614,600 | 2,100,900 | 3,726,602 | 2,257,772 | 5,984,374 |
| Puerto Rico | 16 | 9,895 | 0 | 0 | 0 | 0 | 0 | 9,895 | 68,146 | 78,041 |
| Rhode Island | 2 | 510 | 0 | 0 | 0 | 0 | 0 | 510 | 0 | 510 |
| South Carolina | 36 | 4,347 | 0 | 0 | 0 | 5,227,609 | 2 | 5,231,958 | 0 | 5,231,958 |
| Tennessee | 47 | 6,840 | 2,136 | 0 | 0 | 0 | 0 | 8,976 | 38,725 | 47,701 |
| Texas | 461 | 40,731 | 40,033 | 4,179,953 | 0 | 6,281,274 | 0 | 10,541,991 | 3,393,643 | 13,935,634 |
| Utah | 63 | 4,267 | 0 | 0 | 0 | 15,824,327 | 668,613 | 16,497,207 | 35,979 | 16,533,186 |
| Virginia | 6 | 4,844 | 0 | 0 | 0 | 0 | 0 | 4,844 | 184,412 | 189,256 |
| Washington | 16 | 2,150 | 0 | 0 | 0 | 0 | 0 | 2,150 | 31,306 | 33,456 |
| West Virginia | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 |
| Wisconsin | 25 | 21,911 | 0 | 0 | 0 | 0 | 0 | 21,911 | 11,267 | 33,178 |
| Total | 2,448 | 802,891 | 50,676 | 22,861,227 | 0 | 206,756,050 | 13,707,014 | 244,177,858 | 43,824,555 | 288,002,413 |

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

**Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: RCRA
Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and
Solvent Recovery Facilities (in SIC Code 7389)**



Table 4-66. Summary of TRI Information by State, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities (continued)

| State | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | 3,151,674 | 141,710 | 0 | 227,000 | 23 | 330,531 | 10,179,113 | 14,030,051 | 0 |
| Arizona | 2,784,487 | 1,780,516 | 0 | 1,309,185 | 28,132 | 617,310 | 4,689 | 6,524,319 | 1 |
| Arkansas | 2,802,061 | 389,348 | 4,628,714 | 27,714,479 | 19,388,784 | 133,417 | 441,025 | 55,497,828 | 0 |
| California | 32,257,185 | 2,091,966 | 0 | 27,215,059 | 12,543,432 | 24,002,675 | 18,438,452 | 116,548,769 | 386 |
| Colorado | 1,075 | 27,098 | 0 | 0 | 2,398 | 0 | 1 | 30,572 | 0 |
| Connecticut | 0 | 0 | 0 | 0 | 352,400 | 218,687 | 935,020 | 1,506,107 | 8 |
| Florida | 880,501 | 160,832 | 0 | 1,876,021 | 1,447,266 | 181,646 | 6,622 | 4,552,888 | 0 |
| Georgia | 0 | 111,029 | 0 | 0 | 256,909 | 0 | 12,522 | 380,460 | 0 |
| Idaho | 0 | 0 | 0 | 0 | 0 | 0 | 24,031,000 | 24,031,000 | 0 |
| Illinois | 5,989,766 | 382,666 | 0 | 7,797,656 | 20,363,551 | 1,818,266 | 23,365,078 | 59,716,983 | 70 |
| Indiana | 8,358,000 | 835,520 | 0 | 2,235,574 | 1,692,512 | 950 | 6,237,945 | 19,360,501 | 0 |
| Iowa | 0 | 303,642 | 0 | 0 | 0 | 0 | 9 | 303,651 | 0 |
| Kansas | 208,100 | 172,640 | 0 | 0 | 1,050,437 | 4,135 | 20,124 | 1,455,436 | 0 |
| Kentucky | 0 | 240,359 | 0 | 12,806,818 | 10,006,596 | 1,417,282 | 619,485 | 25,090,540 | 0 |
| Louisiana | 0 | 74,082 | 0 | 2,800 | 18,503 | 1,193,537 | 10,257,665 | 11,546,587 | 0 |
| Maryland | 0 | 429,952 | 0 | 0 | 0 | 0 | 13 | 429,965 | 0 |
| Massachusetts | 338,220 | 210,937 | 0 | 130,835 | 0 | 279,942 | 805,404 | 1,765,338 | 6 |
| Michigan | 17,747,516 | 63,700 | 0 | 57,421,708 | 818,721 | 18,257,233 | 20,337,627 | 114,646,505 | 58 |
| Minnesota | 4,305,598 | 1,271,306 | 0 | 0 | 58,000 | 14,596 | 15,381 | 5,664,881 | 0 |
| Mississippi | 0 | 95,538 | 0 | 0 | 0 | 0 | 3 | 95,541 | 0 |
| Missouri | 0 | 542,305 | 0 | 0 | 20,000 | 20,000 | 19 | 582,324 | 0 |
| Nebraska | 0 | 100,011 | 0 | 15,048 | 23,879,414 | 46,658 | 487,136 | 24,528,267 | 0 |
| Nevada | 0 | 1,064,488 | 0 | 0 | 25,029 | 820,339 | 2,054,100 | 3,963,956 | 83 |
| New Jersey | 8,083,574 | 474,983 | 0 | 23,961,922 | 28,811,007 | 1,670,089 | 644,198 | 63,645,773 | 839 |
| New Mexico | 0 | 35,598 | 0 | 0 | 393,000 | 0 | 5,301 | 433,899 | 0 |
| New York | 0 | 308,244 | 0 | 0 | 323,500 | 64,049 | 6,221,767 | 6,917,560 | 0 |
| North Carolina | 0 | 883,707 | 0 | 0 | 378,000 | 460 | 426,677 | 1,688,844 | 520 |
| Ohio | 14,885,370 | 1,621,380 | 0 | 21,600,288 | 53,765,180 | 2,097,451 | 61,023,190 | 154,992,859 | 13,298 |
| Oklahoma | 0 | 0 | 0 | 0 | 2,713,439 | 6,102 | 8,854,083 | 11,573,624 | 0 |
| Oregon | 0 | 97,505 | 0 | 0 | 24,334 | 1,202,564 | 44,572,379 | 45,896,782 | 0 |
| Pennsylvania | 0 | 1,307,009 | 0 | 0 | 2,954,300 | 412,088 | 5,588,706 | 10,262,103 | 0 |
| Puerto Rico | 1,465,156 | 1,099,765 | 0 | 11,401,702 | 1,763,772 | 1,643,119 | 20,260 | 17,393,774 | 1 |
| Rhode Island | 120,974 | 0 | 0 | 0 | 0 | 768,783 | 402 | 890,159 | 0 |
| South Carolina | 3,195,088 | 246,310 | 0 | 14,585,574 | 34,777 | 473,521 | 5,216,491 | 23,751,761 | 0 |
| Tennessee | 0 | 215,260 | 134,378 | 3,574,812 | 171,842 | 51,596 | 45,297 | 4,193,185 | 0 |
| Texas | 5,590,594 | 3,592,225 | 0 | 29,266,230 | 62,822,278 | 9,690,926 | 11,590,400 | 122,552,653 | 0 |
| Utah | 0 | 0 | 0 | 0 | 20,072,066 | 48,163 | 16,710,703 | 36,830,932 | 3 |
| Virginia | 0 | 849,399 | 0 | 0 | 212,420 | 24,210 | 4,844 | 1,090,873 | 0 |
| Washington | 1,310,154 | 537,176 | 0 | 115 | 62,283 | 236,008 | 2,163 | 2,147,899 | 0 |
| West Virginia | 0 | 207,900 | 0 | 0 | 0 | 0 | 7 | 207,907 | 0 |
| Wisconsin | 7,126,666 | 451,102 | 590,916 | 9,907,605 | 0 | 729,247 | 37,068 | 18,842,604 | 0 |
| Total | 120,601,759 | 22,417,208 | 5,354,008 | 253,050,431 | 266,454,305 | 68,475,580 | 279,212,369 | 1,015,565,660 | 15,273 |

Note: Data are from Section 8 of Form R.



Chapter 4 —Toxics Release Inventory Data for New Industries, 1998–1999: RCRA Subtitle C Treatment, Storage and Disposal Facilities (in SIC Code 4953) and Solvent Recovery Facilities (in SIC Code 7389)

Table 4-67. TRI Total Releases by State, 1998-1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| State | Total On-site and Off-site Releases | | | |
|----------------|-------------------------------------|--------------------|------------------|------------|
| | 1998 Pounds | 1999 Pounds | Change 1998-1999 | |
| | | | Pounds | Percent |
| Alabama | 12,309,866 | 13,726,632 | 1,416,766 | 11.5 |
| Arizona | 1,002 | 627,214 | 626,212 | 62,496.2 |
| Arkansas | 261,420 | 150,519 | -110,901 | -42.4 |
| California | 20,405,960 | 21,580,917 | 1,174,957 | 5.8 |
| Colorado | 250 | 251 | 1 | 0.4 |
| Connecticut | 708,015 | 685,800 | -22,215 | -3.1 |
| Florida | 21,001 | 6,802 | -14,199 | -67.6 |
| Georgia | 17,488 | 12,422 | -5,066 | -29.0 |
| Idaho | 31,653,505 | 24,034,230 | -7,619,275 | -24.1 |
| Illinois | 24,729,141 | 22,773,662 | -1,955,479 | -7.9 |
| Indiana | 12,365,925 | 6,254,903 | -6,111,022 | -49.4 |
| Iowa | 10 | 9 | -1 | -10.0 |
| Kansas | 24,677 | 17,857 | -6,820 | -27.6 |
| Kentucky | 1,290,632 | 603,651 | -686,981 | -53.2 |
| Louisiana | 4,449,005 | 10,231,586 | 5,782,581 | 130.0 |
| Maryland | 6 | 13 | 7 | 116.7 |
| Massachusetts | 1,173,299 | 661,315 | -511,984 | -43.6 |
| Michigan | 11,809,095 | 20,197,388 | 8,388,293 | 71.0 |
| Minnesota | 1,345 | 15,328 | 13,983 | 1,039.6 |
| Mississippi | 2 | 3 | 1 | 50.0 |
| Missouri | 28,931 | 24 | -28,907 | -99.9 |
| Nebraska | 209,481 | 522,977 | 313,496 | 149.7 |
| Nevada | 1,385,954 | 2,182,644 | 796,690 | 57.5 |
| New Jersey | 329,135 | 669,438 | 340,303 | 103.4 |
| New Mexico | 5,990 | 5,321 | -669 | -11.2 |
| New York | 6,282,640 | 6,216,943 | -65,697 | -1.0 |
| North Carolina | 546,966 | 264,982 | -281,984 | -51.6 |
| Ohio | 75,286,300 | 60,657,311 | -14,628,989 | -19.4 |
| Oklahoma | 7,884,687 | 8,794,849 | 910,162 | 11.5 |
| Oregon | 23,965,094 | 45,040,121 | 21,075,027 | 87.9 |
| Pennsylvania | 6,395,761 | 5,984,374 | -411,387 | -6.4 |
| Puerto Rico | 324,772 | 78,041 | -246,731 | -76.0 |
| Rhode Island | 1,432 | 510 | -922 | -64.4 |
| South Carolina | 5,373,461 | 5,231,958 | -141,503 | -2.6 |
| Tennessee | 72,855 | 47,701 | -25,154 | -34.5 |
| Texas | 13,201,673 | 13,935,634 | 733,961 | 5.6 |
| Utah | 16,379,483 | 16,533,186 | 153,703 | 0.9 |
| Virginia | 4,937 | 189,256 | 184,319 | 3,733.4 |
| Washington | 1,470,712 | 33,456 | -1,437,256 | -97.7 |
| West Virginia | 6 | 7 | 1 | 16.7 |
| Wisconsin | 41,255 | 33,178 | -8,077 | -19.6 |
| Total | 280,413,169 | 288,002,413 | 7,589,244 | 2.7 |

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



**Table 4-68. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1999: RCRA
Subtitle C TSD and Solvent Recovery Facilities**

| CAS Number Chemical | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection | | On-site Land Releases | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|---|----------------------------------|--|----------------------------|-------------------------------|---|--|--|--|---|
| | | | Class I Wells Pounds | Class II-V Wells Pounds | RCRA Subtitle C Landfills Pounds | Other On- site Land Releases Pounds | | Transfers Off-site to Disposal Pounds | |
| 7440-66-6 Zinc (fume or dust) | 3,228 | 5 | 0 | 0 | 53,107,211 | 586,002 | 53,696,446 | 13,908 | 53,710,354 |
| — Zinc compounds | 7,673 | 367 | 850,750 | 0 | 31,390,534 | 1,027,201 | 33,276,525 | 10,202,181 | 43,478,706 |
| 1344-28-1 Aluminum oxide (fibrous forms) | 338 | 0 | 0 | 0 | 30,469,494 | 258,064 | 30,727,896 | 347,172 | 31,075,068 |
| — Lead compounds | 6,244 | 308 | 0 | 0 | 12,043,875 | 189,232 | 12,239,659 | 6,237,980 | 18,477,639 |
| 1332-21-4 Asbestos (friable) | 43 | 0 | 0 | 0 | 4,742,648 | 8,475,949 | 13,218,640 | 1 | 13,218,641 |
| 7439-92-1 Lead | 3,893 | 30 | 13,250 | 0 | 9,046,156 | 160,054 | 9,223,383 | 1,469,410 | 10,692,793 |
| 1336-36-3 Polychlorinated biphenyls (PCBs) | 531 | 2 | 0 | 0 | 10,316,919 | 313,508 | 10,630,960 | 1,533 | 10,632,493 |
| — Copper compounds | 4,698 | 117 | 68,000 | 0 | 7,263,149 | 408,896 | 7,744,860 | 2,001,955 | 9,746,815 |
| — Chromium compounds | 1,663 | 551 | 720,000 | 0 | 3,711,644 | 114,063 | 4,547,921 | 2,952,455 | 7,500,376 |
| — Nickel compounds | 2,007 | 491 | 140,000 | 0 | 3,248,507 | 162,489 | 3,553,494 | 3,594,078 | 7,147,572 |
| — Barium compounds | 1,286 | 272 | 250 | 0 | 5,034,475 | 66,561 | 5,102,844 | 1,821,748 | 6,924,592 |
| 7697-37-2 Nitric acid | 471 | 0 | 6,328,468 | 0 | 58,238 | 1,780 | 6,388,957 | 206,958 | 6,595,915 |
| — Nitrate compounds | 265 | 8,356 | 4,563,034 | 0 | 0 | 981,000 | 5,552,655 | 539,647 | 6,092,302 |
| — Manganese compounds | 446 | 24 | 36,000 | 0 | 4,564,123 | 19,446 | 4,620,039 | 181,510 | 4,801,549 |
| 7429-90-5 Aluminum (fume or dust) | 1,281 | 0 | 0 | 0 | 4,072,525 | 100,105 | 4,173,911 | 18,368 | 4,192,279 |
| Subtotal (top 15 chemicals) | 34,067 | 10,523 | 12,719,752 | 0 | 179,069,498 | 12,864,350 | 204,698,190 | 29,588,904 | 234,287,094 |
| Total (all chemicals) | 802,891 | 50,676 | 22,861,227 | 0 | 206,756,050 | 13,707,014 | 244,177,858 | 43,824,555 | 288,002,413 |

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

RCRA Subtitle C TSD and solvent recovery facilities. Zinc (fume or dust) and zinc compounds were the two chemicals with the largest on- and off-site releases in the industry: 53.7 million pounds of zinc and 43.5 million pounds of zinc compounds. Over 98 percent of the zinc releases were to RCRA Subtitle C landfills. About 72.2 percent of the releases of zinc compounds (31.4 million pounds) went to RCRA Subtitle C landfills, other on-site releases

accounted for a little over a million pounds, and 10.2 million pounds, or 23.4 percent of the total, were sent off-site to disposal.

Of the 15 top chemicals released by the industry, 9 reported more than 70 percent of their total releases as releases on-site to RCRA Subtitle C landfills. Almost 65 percent of the friable asbestos was in other on-site land releases, and a little more than half of nickel compounds releases were in



Table 4-69. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999-2001: RCRA Subtitle C TSD and Solvent Recovery Facilities

| Waste Management Activity | Current Year 1999 | | Projected 2000 | | Projected 2001 | |
|---------------------------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|
| | Total Pounds | Percent of Total | Total Pounds | Percent of Total | Total Pounds | Percent of Total |
| Recycled On-site | 120,601,759 | 11.9 | 115,058,626 | 12.7 | 114,093,416 | 12.3 |
| Recycled Off-site | 22,417,208 | 2.2 | 20,573,530 | 2.3 | 19,113,105 | 2.1 |
| Energy Recovery On-site | 5,354,008 | 0.5 | 5,118,529 | 0.6 | 5,133,299 | 0.6 |
| Energy Recovery Off-site | 253,050,431 | 24.9 | 205,546,667 | 22.7 | 207,555,660 | 22.4 |
| Treated On-site | 266,454,305 | 26.2 | 234,650,449 | 25.9 | 234,189,867 | 25.3 |
| Treated Off-site | 68,475,580 | 6.7 | 59,675,842 | 6.6 | 74,231,467 | 8.0 |
| Quantity Released On- and Off-site | 279,212,369 | 27.5 | 264,851,809 | 29.3 | 270,462,371 | 29.2 |
| Total Production-related Waste | 1,015,565,660 | 100.0 | 905,475,452 | 100.0 | 924,779,185 | 100.0 |
| Waste Management Activity | Projected Change 1999-2000 | | Projected Change 2000-2001 | | Projected Change 1999-2001 | |
| | Percent | | Percent | | Percent | |
| Recycled On-site | -4.6 | | -0.8 | | -5.4 | |
| Recycled Off-site | -8.2 | | -7.1 | | -14.7 | |
| Energy Recovery On-site | -4.4 | | 0.3 | | -4.1 | |
| Energy Recovery Off-site | -18.8 | | 1.0 | | -18.0 | |
| Treated On-site | -11.9 | | -0.2 | | -12.1 | |
| Treated Off-site | -12.9 | | 24.4 | | 8.4 | |
| Quantity Released On- and Off-site | -5.1 | | 2.1 | | -3.1 | |
| Total Production-related Waste | -10.8 | | 2.1 | | -8.9 | |

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

transfers off-site to disposal. Nitrate compounds and nitric acid were mainly injected underground into Class I wells; the amounts were 6.3 million pounds for nitric acid and 4.6 million pounds for nitrate compounds.

Releases of the 15 chemicals amounted to 234.3 million pounds, 81.3 percent of the industry total of 288.0 million pounds.

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

RCRA Subtitle C TSD and solvent recovery facilities reporting to TRI expected their production-related waste managed to decrease by 8.9 percent between 1999 and 2001, from a total of 1.02 billion pounds to 924.8 million pounds, as shown in Table 4-69. The projected decrease reflects an

expected decrease of 10.8 percent in 2000 followed by a small increase of 2.1 percent in 2001.

The projected decrease between 1999 and 2001 is expected to come primarily from reductions of 5.4 percent in on-site recycling, 14.7 percent in off-site recycling, 18.0 percent in off-site energy recovery, and 12.1 percent in on-site treatment. The quantity released on- and off-site—the least-desirable outcome under the waste management hierarchy described in Waste Management in Chapter 1 (Figure 1-2)—is projected to decrease by 3.1 percent. The reductions are expected to offset an increase in off-site treatment of 8.4 percent.

The projections do not indicate dramatic changes in waste management practices. Off-site energy recovery would fall from



Table 4-70. Number of Forms Reporting Source Reduction Activity, 1999: RCRA Subtitle C TSD and Solvent Recovery Facilities

| SIC Code | Industry | Total Form Rs Number | Forms Reporting Source Reduction Activity | | Category of Source Reduction Activity | | | | | | | |
|----------|--|----------------------|---|------------------------|---------------------------------------|--------------------------|----------------------------------|-----------------------------------|------------------------------|--------------------------------|--|------------------------------|
| | | | Number | Percent of All Form Rs | Good Operating Practices Number | Inventory Control Number | Spill and Leak Prevention Number | Raw Material Modifications Number | Process Modifications Number | Cleaning and Degreasing Number | Surface Preparation and Finishing Number | Product Modifications Number |
| 4953 | RCRA Subtitle C Facilities | 2,022 | 143 | 7.1 | 136 | 0 | 51 | 0 | 25 | 0 | 0 | 0 |
| 7389 | Solvent Recovery Services | 305 | 65 | 21.3 | 64 | 0 | 23 | 0 | 11 | 0 | 0 | 4 |
| | SIC Code 4953 and SIC Code 7389 | 63 | 23 | 36.5 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 |
| | SIC Code 4953 and SIC Code 34 (Fabricated Metals) | 16 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SIC Code 4953 and SIC Code 5169 (Chemical Wholesalers) | 3 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SIC Code 7389 and SIC Code 5169 (Chemical Wholesalers) | 3 | 1 | 33.3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 2,412 | 232 | 9.6 | 201 | 0 | 120 | 0 | 36 | 0 | 0 | 4 |

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

24.9 percent of total production-related waste managed in 1999 to 22.4 percent in 2001. The share of on-site treatment would decline from 26.2 percent to 25.3 percent. The quantity released on- and off-site would increase from 27.5 percent of total production-related waste managed for this industry to 29.2 percent, although the absolute amount in this category would fall from 279.2 million pounds to 270.5 million pounds.

Source Reduction

Of the Form Rs submitted by RCRA Subtitle C TSD and solvent recovery facilities in 1999, 9.6 percent reported source reduction activity undertaken during the year (see Table 4-70). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Facilities with a combination of RCRA Subtitle C TSD and solvent recovery operations had the largest percentage of forms reporting source reduction activities, 36.5 percent. These facilities identified spill and leak prevention as the source reduction activity undertaken, on 46 forms. Facilities with solvent recovery services only reported undertaking source reduction activities on 21.3 percent of their Form Rs. These facilities identified good operating practices (64 forms), spill and leak prevention (23 forms), and process modifications (11 forms) as their main source reduction activities. Facilities with RCRA Subtitle C TSD operations only reported source reduction activity on 7.1 percent of their Form Rs, with good operating practices identified most often, on 136 forms, followed by spill and leak prevention (51 forms) and process modifications (25 forms).

Federal Facilities

Introduction

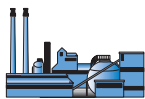
Facilities owned and operated by federal agencies are required to report to TRI. Executive Order 13148 extends reporting to federal facilities regardless of SIC code. As a result, facilities reporting to TRI range from military bases to agricultural testing sites. Federal facilities have been required to report to TRI since the 1994 reporting year, although Department of Energy facilities began reporting a year earlier. In addition to reporting to TRI, federal agencies have been directed by executive order to reduce their on-site releases and off-site transfers to treatment and disposal by 50 percent by the 1999 reporting year, based on the 1994 data. Federal facilities are encouraged to use source reduction wherever practicable to achieve their reductions.

Tables in this section list the federal agencies that have facilities reporting to TRI. Department of Defense (DOD) data are presented for DOD as a whole and for each defense agency.

As stated above, federal facilities should report to TRI regardless of SIC code. Some federal facilities have manufacturing activities similar to the original industries. Other federal facilities have activities similar to the new TRI industries. Still others have activities that are not in either the original industries or in the new industries. This

section divides the federal facilities into two broad groups to show how the federal facilities mirror the activities in the private sector. These two broad groups are “Facilities with Activities Related to Original Industries and Other Industries” (hereafter referred to as original industries) and “Facilities with Activities Related to the New Industries” (hereafter referred to as new industries).

Due to an EPA data entry error, reporting revisions by one federal facility, US Army Letterkenny Depot in Chambersburg, Pennsylvania, were not included in the data used for this 1999 TRI Public Data Release report. Revisions for two chemical compounds (zinc compounds and lead compounds) have been included in the tables in this section, but not included in other tables in this report. The effect of these revisions is to change the facility’s off-site transfers to disposal and treated off-site amounts for zinc compounds from 17,147,839 to zero and lead compounds from 60,123 pounds to zero. In addition, at the time of publication, the facility had notified EPA that it anticipated revising off-site transfers to disposal and treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.



1999 TRI Data for Federal Facilities

In 1999, a total of 127 federal facilities submitted 507 TRI forms, as shown in Table 4–71. Of these, 109 facilities and 328 forms were from original TRI industries, and 18 facilities and 179 forms from new industries.

Facilities owned or operated by Department of Defense agencies submitted 238 forms in the original TRI industries. DOD submissions included 110 reports by Army facilities, 53 reports by Navy facilities and 51 reports by Air Force facilities. The Department of Energy submitted 41 forms.

In the new industries, 14 Tennessee Valley Authority (TVA) facilities submitted 165 forms. (One TVA facility filed 3 forms in the original TRI industries.) Three Department of Energy facilities filed a total of 13 forms in new industry SIC codes. One DOD form, from the Navy, was submitted in a new industry, but it reported zero amounts of releases and waste management.

On- and Off-site Releases

As is also shown in Table 4–71, federal facilities reported on- and off-site releases totaling 87.4 million pounds. The bulk of the releases, 81.1 million pounds, occurred on-site. Off-site releases totaled 6.3 million pounds.

TVA facilities reported 69.7 million pounds of on- and off-site releases in the new industries. This amount represented 66.6 percent of all releases by all federal facilities. It included the largest amounts in all on-site release types by both original and new industries, except for 505 pounds of

underground injection by the Energy Department. TVA's new industry reporting included 52.1 million pounds of air emissions and 15.5 million pounds of other on-site land releases.

Together, the DOD agencies reported 15.7 million pounds of total releases, including 9.7 million pounds of on-site releases, with 7.2 million pounds of that as air emissions. Within the DOD, Army releases of 14.1 million pounds consisted of on-site releases of 8.4 million pounds, of which air emissions were 6.0 million pounds, on-site land releases were 1.7 million pounds and surface water discharges were nearly 687,000 pounds. The Air Force's total of 1.1 million pounds consisted principally of air emissions (about 769,000 pounds) and surface water discharges (nearly 157,000 pounds).

Table 4–72 summarizes changes in on- and off-site releases reported by federal facilities between 1998 and 1999. Total releases rose 35.0 percent, an increase of 22.7 million pounds. Total on-site releases reported rose 27.1, largely because of a 32.9 percent (15.0 million pound) increase in air emissions. On-site land releases were 3.7 million pounds, or 25.6 percent, higher in 1999 than in 1998.

Off-site releases rose from less than 960,000 pounds to 6.3 million pounds. The main component of the increase was the category other off-site management, which increased from 47 pounds in 1998 to 5.6 million pounds in 1999. This was primarily due to reporting by one Army facility that expected to revise its reported amount of off-site releases, as explained above.



Table 4-71. TRI On-site and Off-site Releases, 1999: Federal Facilities

| | | | On-site Releases | | | | | | | Off-site Releases | Total On- and Off-site Releases |
|--|------------------|-------------|------------------|-----------|-----------------------|--------------------------|-----------------------|------------------|------------------------|--------------------------------|---------------------------------|
| | | | | | Underground Injection | | On-site Land Releases | | Total On-site Releases | | |
| | | | | | Total Air Emissions | Surface Water Discharges | Class I Wells | Class II-V Wells | | RCRA Subtitle C Landfills | |
| Federal Agency | Total Facilities | Total Forms | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Transfers Off-site to Disposal | Pounds |
| Federal Facilities with Activities Related to Original Industries and Other Industries | | | | | | | | | | | |
| Department of Defense | 74 | 238 | 7,165,901 | 849,544 | 0 | 0 | 0 | 1,719,257 | 9,734,702 | 5,995,730 | 15,730,432 |
| Air Force | 15 | 51 | 768,715 | 156,629 | 0 | 0 | 0 | 21,930 | 947,274 | 116,777 | 1,064,051 |
| Army | 34 | 110 | 6,045,847 | 686,874 | 0 | 0 | 0 | 1,687,817 | 8,420,538 | 5,717,304 | 14,137,842 |
| Army Corps of Engineers | 2 | 6 | 0 | 44 | 0 | 0 | 0 | 0 | 44 | 16,700 | 16,744 |
| Defense Logistics | 1 | 4 | 5,670 | 0 | 0 | 0 | 0 | 0 | 5,670 | 0 | 5,670 |
| Marines | 8 | 14 | 62,387 | 0 | 0 | 0 | 0 | 0 | 62,387 | 9,319 | 71,706 |
| Navy | 14 | 53 | 283,282 | 5,997 | 0 | 0 | 0 | 9,510 | 298,789 | 135,630 | 434,419 |
| Department of Energy | 12 | 41 | 406,389 | 65,040 | 0 | 505 | 0 | 21,809 | 493,743 | 20,797 | 514,540 |
| Department of Interior | 2 | 2 | 750 | 4,333 | 0 | 0 | 0 | 0 | 5,083 | 0 | 5,083 |
| Department of Treasury | 8 | 14 | 834 | 0 | 0 | 0 | 0 | 138,690 | 139,524 | 13,598 | 153,122 |
| Department of Veterans Affairs | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Protection Agency | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Aeronautics and Space Administration | 6 | 17 | 207,289 | 0 | 0 | 0 | 0 | 0 | 207,289 | 4,138 | 211,427 |
| Tennessee Valley Authority | 1 | 3 | 30 | 765 | 0 | 0 | 0 | 15 | 810 | 10,435 | 11,245 |
| U.S. Department of Agriculture | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 541,563 | 541,563 | 0 | 541,563 |
| U.S. Enrichment Corporation | 1 | 6 | 517,200 | 153 | 0 | 0 | 0 | 0 | 517,353 | 0 | 517,353 |
| Subtotal for Original Industries | 109 | 328 | 8,298,393 | 919,835 | 0 | 505 | 0 | 2,421,334 | 11,640,067 | 6,044,698 | 17,684,765 |
| Federal Facilities with Activities Related to New Industries | | | | | | | | | | | |
| Department of Defense —Navy | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Department of Energy | 3 | 13 | 48,044 | 2,136 | 0 | 0 | 0 | 0 | 50,180 | 1,091 | 51,271 |
| Tennessee Valley Authority | 14 | 165 | 52,085,546 | 1,761,635 | 0 | 0 | 0 | 15,529,475 | 69,376,656 | 287,645 | 69,664,301 |
| Subtotal for New Industries | 18 | 179 | 52,133,590 | 1,763,771 | 0 | 0 | 0 | 15,529,475 | 69,426,836 | 288,736 | 69,715,572 |
| Total for Federal Facilities | 127 | 507 | 60,431,983 | 2,683,606 | 0 | 505 | 0 | 17,950,809 | 81,066,903 | 6,333,434 | 87,400,337 |

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

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.

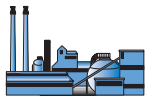


Table 4-72. TRI On-site and Off-site Releases, 1998–1999: Federal Facilities

| | 1998 | 1999 | Change 1998–1999 | |
|--|-------------------|-------------------|-------------------|--------------|
| | Pounds | Pounds | Pounds | Percent |
| On-site Releases | | | | |
| Total Air Emissions | 45,472,233 | 60,431,983 | 14,959,750 | 32.9 |
| Fugitive Air Emissions | 1,097,485 | 6,608,696 | 5,511,211 | 502.2 |
| Point Source Air Emissions | 44,374,748 | 53,823,287 | 9,448,539 | 21.3 |
| Surface Water Discharges | 4,009,631 | 2,683,606 | –1,326,025 | –33.1 |
| Underground Injection | 505 | 505 | 0 | 0.0 |
| Class I Wells | 0 | 0 | 0 | — |
| Class II–V Wells | 505 | 505 | 0 | 0.0 |
| On-site Land Releases | 14,292,558 | 17,950,809 | 3,658,251 | 25.6 |
| RCRA Subtitle C Landfills | 31,563 | 0 | –31,563 | –100.0 |
| Other On-site Landfills | 4,837,419 | 4,519,519 | –317,900 | –6.6 |
| Land Treatment | 582,541 | 552,597 | –29,944 | –5.1 |
| Surface Impoundments | 7,640,076 | 9,909,819 | 2,269,743 | 29.7 |
| Other Disposal | 1,200,959 | 2,968,874 | 1,767,915 | 147.2 |
| Total On-site Releases | 63,774,927 | 81,066,903 | 17,291,976 | 27.1 |
| Off-site Releases | | | | |
| Storage Only ^a | 16,843 | 57,696 | 40,853 | 242.6 |
| Solidification/Stabilization ^b | 11,273 | 3,400 | –7,873 | –69.8 |
| Metals and Metal Compounds Only | | | | |
| Wastewater Treatment (excluding POTWs) ^c | 320 | 1 | –319 | –99.7 |
| Metals and Metal Compounds Only | | | | |
| Transfers to POTWs ^d | 2,746 | 4,326 | 1,580 | 57.5 |
| Metals and Metal Compounds Only | | | | |
| Underground injection | 1,632 | 388 | –1,244 | –76.2 |
| Landfills/Surface Impoundments | 154,956 | 162,686 | 7,730 | 5.0 |
| Land Treatment | 4,190 | 1,356 | –2,834 | –67.6 |
| Other Land Disposal | 632,645 | 287,635 | –345,010 | –54.5 |
| Other Off-site Management | 47 | 5,585,458 | 5,585,411 | 11,883,853.2 |
| Transfers to Waste Broker for Disposal | 74,196 | 135,136 | 60,940 | 82.1 |
| Unknown ^e | 59,579 | 95,352 | 35,773 | 60.0 |
| Total Off-site Releases (Transfers Off-site to Disposal) | 958,427 | 6,333,434 | 5,375,007 | 560.8 |
| Total On-site and Off-site Releases | 64,733,354 | 87,400,337 | 22,666,983 | 35.0 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release. Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising off-site transfers to disposal (other off-site management) for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.

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

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

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

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

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



Waste Management Data

Quantities of TRI Chemicals in Waste

Federal facilities reported managing 192.5 million pounds of TRI chemicals in production-related waste in 1999, as shown in Table 4–73. The largest waste management types reported by federal facilities were quantity released on- and off-site (81.5 million pounds) and on-site treatment (60.6 million pounds).

New industry reporting by TVA facilities accounted for 119.0 million pounds of production-related waste managed, or 56.7 percent of the total for all TRI industries. These TVA facilities reported 69.6 million pounds released on- and off-site and 48.5 million pounds treated on-site, as well as about 900,000 pounds sent off-site to recycling.

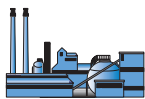
DOD facilities in the original industries reported the second-largest quantity of production-related waste, 39.7 million

Table 4-73. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1999: Federal Facilities

| Federal Agency | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Federal Facilities with Activities Related to Original Industries and Other Industries | | | | | | | | | |
| Department of Defense | 10,767,449 | 2,679,499 | 326 | 134,909 | 10,334,001 | 5,948,556 | 9,824,243 | 39,688,983 | 12,595 |
| Air Force | 27,360 | 152,816 | 0 | 12,260 | 586,615 | 205,182 | 1,080,490 | 2,064,723 | 51 |
| Army | 9,385,849 | 2,142,100 | 0 | 60,168 | 9,432,479 | 5,661,856 | 8,239,276 | 34,921,728 | 8,747 |
| Army Corps of Engineers | 0 | 1,502 | 0 | 0 | 0 | 0 | 16,744 | 18,246 | 0 |
| Defense Logistics | 1,324,948 | 0 | 0 | 0 | 0 | 0 | 5,670 | 1,330,618 | 0 |
| Marines | 21,392 | 134,491 | 326 | 27,100 | 526 | 2,572 | 71,170 | 257,577 | 1,273 |
| Navy | 7,900 | 248,590 | 0 | 35,381 | 314,381 | 78,946 | 410,893 | 1,096,091 | 2,524 |
| Department of Energy | 74,295 | 106,000 | 0 | 830 | 1,676,766 | 11,971 | 610,227 | 2,480,089 | 53 |
| Department of Interior | 0 | 0 | 0 | 0 | 0 | 0 | 5,122 | 5,122 | 0 |
| Department of Treasury | 0 | 29,374,571 | 0 | 0 | 2,467 | 63 | 157,328 | 29,534,429 | 0 |
| Department of Veterans Affairs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Protection Agency | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Aeronautics and Space Administration | 236,406 | 1,800 | 0 | 13,790 | 25,905 | 16,394 | 211,731 | 506,026 | 7,001 |
| Tennessee Valley Authority | 0 | 43,000 | 0 | 0 | 0 | 0 | 11,000 | 54,000 | 0 |
| U.S. Department of Agriculture | 0 | 0 | 0 | 0 | 0 | 0 | 541,349 | 541,349 | 0 |
| U.S. Enrichment Corporation | 0 | 0 | 0 | 0 | 60,300 | 0 | 521,343 | 581,643 | 0 |
| Subtotal for Original Industries | 11,078,150 | 32,204,870 | 326 | 149,529 | 12,099,439 | 5,976,984 | 11,882,343 | 73,391,641 | 19,649 |
| Federal Facilities with Activities Related to New Industries | | | | | | | | | |
| Department of Defense—Navy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Department of Energy | 0 | 100,058 | 0 | 0 | 33,937 | 0 | 52,070 | 186,065 | 1 |
| Tennessee Valley Authority | 0 | 892,320 | 0 | 0 | 48,461,200 | 820 | 69,601,046 | 118,955,386 | 0 |
| Subtotal for New Industries | 0 | 992,378 | 0 | 0 | 48,495,137 | 820 | 69,653,116 | 119,141,451 | 1 |
| Total for Federal Facilities | 11,078,150 | 33,197,248 | 326 | 149,529 | 60,594,576 | 5,977,804 | 81,535,459 | 192,533,092 | 19,650 |

Note: Data are from Section 8 of Form R.

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.



pounds, including the Army's 34.9 million pounds. The Army recycled on-site 9.4 million pounds, treated on-site 9.4 million pounds and released on- or off-site 8.2 million pounds.

The Treasury Department ranked third among federal agencies for total production-related waste, with 29.5 million pounds. Most of this amount was reported as recycled off-site.

Table 4–74 shows changes between 1998 and 1999 in the disposition of production-related waste reported by federal facilities. Total production-related waste rose 23.7 percent. The quantity released on- and off-site increased from 64.7 million pounds to 81.5 million pounds, 26.0 percent higher in 1999 than in 1998. Off-site recycling increased by 60.6 percent, from 20.7 million pounds to 33.2 million pounds. On-site recycling fell by 26.5 percent, from 15.1 million pounds to 11.1 million pounds and off-site energy recovery fell by 43.3 percent, from about 264,000 pounds to about 150,000 pounds.

Transfers Off-site for Further Waste Management/Disposal

Table 4–75 summarizes reporting by federal facilities of transfers off-site for further waste management and disposal. These transfers totaled 40.4 million pounds in 1999. Much of this amount (33.4 million

pounds) was transferred off-site to recycling. The category of other off-site transfers to disposal accounted for 6.5 million pounds. Much of this amount was due to reporting by one Army facility that expected to revise its reported amount of off-site transfers to disposal, as explained above.

Federal facilities in the original TRI industries reported the bulk of the total, with 39.1 million pounds sent off-site for further waste management and disposal. The Treasury Department reported the largest total transfers, 29.4 million pounds, and nearly all of this amount was sent off-site to recycling.

Federal facilities filing forms for new industry SIC codes reported a total of 1.3 million pounds transferred, of which almost a million pounds were sent to recycling, about 290,000 pounds were sent to disposal.

Table 4–76 presents the changes in transfers off-site between 1998 and 1999 reported by federal facilities. Total transfers increased by 82.7 percent, a gain of 18.3 million pounds. Transfers to recycling grew from 20.4 million pounds to 33.4 million pounds, a 63.5 percent increase.



Table 4-74. Quantities of TRI Chemicals in Waste, 1998–1999: Federal Facilities

| Waste Management Activity | 1998 | 1999 | Change 1998-1999 | |
|---------------------------------------|--------------------|--------------------|-------------------|-------------|
| | Pounds | Pounds | Pounds | Percent |
| Recycled On-site | 15,069,474 | 11,078,150 | -3,991,324 | -26.5 |
| Recycled Off-site | 20,671,626 | 33,197,248 | 12,525,622 | 60.6 |
| Energy Recovery On-site | 0 | 326 | 326 | — |
| Energy Recovery Off-site | 263,952 | 149,529 | -114,423 | -43.3 |
| Treated On-site | 54,371,092 | 60,594,576 | 6,223,484 | 11.4 |
| Treated Off-site | 553,513 | 5,977,804 | 5,424,291 | 980.0 |
| Quantity Released On- and Off-site | 64,712,129 | 81,535,459 | 16,823,330 | 26.0 |
| Total Production-related Waste | 155,641,786 | 192,533,092 | 36,891,306 | 23.7 |
| Non-Production-related Waste | 44,847 | 19,650 | -25,197 | -56.2 |

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

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.

Table 4-75. TRI Transfers Off-site for Further Waste Management/Disposal, 1999: Federal Facilities

| Federal Agency | | | | Transfers to POTWs | | Other Off-site Transfers* Pounds | Other Transfers Off-site to Disposal** Pounds | Total Transfers for Further Waste Management/ Disposal Pounds |
|--|----------------------------------|--|----------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|--|--|
| | Transfers to Recycling Pounds | Transfers to Energy Recovery Pounds | Transfers to Treatment Pounds | Metals and Metal Compounds Pounds | Non-metal TRI Chemicals Pounds | | | |
| Federal Facilities with Activities Related to Original Industries and Other Industries | | | | | | | | |
| Department of Defense | 2,868,369 | 134,191 | 242,960 | 114,770 | 2,243 | 0 | 6,047,563 | 9,410,096 |
| Air Force | 141,772 | 11,573 | 94,070 | 112,453 | 686 | 0 | 136,625 | 497,179 |
| Army | 2,326,489 | 60,168 | 67,085 | 1,943 | 459 | 0 | 5,747,641 | 8,203,785 |
| Army Corps of Engineers | 1,502 | 0 | 0 | 0 | 0 | 0 | 16,700 | 18,202 |
| Defense Logistics | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Marines | 134,903 | 27,100 | 2,604 | 320 | 0 | 0 | 9,319 | 174,246 |
| Navy | 263,703 | 35,350 | 79,201 | 54 | 1,098 | 0 | 137,278 | 516,684 |
| Department of Energy | 90,880 | 750 | 3,834 | 5,593 | 73 | 0 | 114,209 | 215,339 |
| Department of Interior | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Department of Treasury | 29,374,572 | 0 | 0 | 0 | 2,010 | 0 | 15,676 | 29,392,258 |
| Department of Veterans Affairs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Protection Agency | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Aeronautics and Space Administration | 0 | 13,690 | 16,025 | 0 | 0 | 0 | 4,138 | 33,853 |
| Tennessee Valley Authority | 43,100 | 0 | 0 | 0 | 0 | 0 | 10,435 | 53,535 |
| U.S. Department of Agriculture | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U.S. Enrichment Corporation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal for Original Industries | 32,376,921 | 148,631 | 262,819 | 120,363 | 4,326 | 0 | 6,192,021 | 39,105,081 |
| Federal Facilities with Activities Related to New Industries | | | | | | | | |
| Department of Defense — Navy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Department of Energy | 100,058 | 0 | 0 | 0 | 0 | 0 | 1,891 | 101,949 |
| Tennessee Valley Authority | 893,600 | 0 | 820 | 0 | 0 | 0 | 287,645 | 1,182,065 |
| Subtotal for New Industries | 993,658 | 0 | 820 | 0 | 0 | 0 | 289,536 | 1,284,014 |
| Total for Federal Facilities | 33,370,579 | 148,631 | 263,639 | 120,363 | 4,326 | 0 | 6,481,557 | 40,389,095 |

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

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising other off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.

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

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



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

As Table 4–77 shows, production-related waste for federal facilities is projected to decrease by 2.2 percent between 1999 and 2001, with the largest decline, 2.2 percent, taking place in 2000. Treated on-site was expected to decrease by 5.2 percent. While off-site treatment was projected to decrease by 93.8 percent, much of this was due to reporting by one Army facility that expected to revise its reported amount of treated off-site for 1999, as explained above.

Off-site recycling was expected to rise by 14.1 percent, from 33.2 million pounds to 37.9 million pounds, and on-site recycling was expected to increase by 5.7 percent. The quantity released on- and off-site was projected to decrease slightly, by 1 percent.

These projected changes would not make much difference to the share of production-related waste handled by the various waste management methods. The share of on-site recycling would rise slightly, to 6.2 percent of the total, and that of off-site recycling

would increase from 15.8 percent of the total to 20.1 percent. The share of on-site treatment would increase from 28.9 percent to 30.5 percent. Despite the decrease in the quantity released on- and off-site, this item was expected to account for 42.9 percent of total production-related waste in 2001, up from 38.9 percent in 1999. On- and off-site releases are the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 1–2).

Source Reduction

In 1999, federal facilities filed 143 forms reporting source reduction activity (see Table 4–78). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Department of Defense facilities reported source reduction activity on 70 forms, 29.4 percent of their total Form Rs. The National Aeronautics and Space Administration facilities submitted 12 forms reporting source reduction activity, representing 70.6 percent

Table 4–76. TRI Transfers Off-site for Further Waste Management/Disposal, 1998–1999: Federal Facilities

| | 1998 | 1999 | Change 1998–1999 | |
|---|-------------------|-------------------|-------------------|-------------|
| | Pounds | Pounds | Pounds | Percent |
| Transfers to Recycling | 20,407,893 | 33,370,579 | 12,962,686 | 63.5 |
| Transfers to Energy Recovery | 238,631 | 148,631 | –90,000 | –37.7 |
| Transfers to Treatment | 359,297 | 263,639 | –95,658 | –26.6 |
| Transfers to POTWs | 121,179 | 124,689 | 3,510 | 2.9 |
| Metals and Metal Compounds Only | 2,746 | 4,326 | 1,580 | 57.5 |
| Non-metal TRI Chemicals | 118,433 | 120,363 | 1,930 | 1.6 |
| Other Off-site Transfers* | 0 | 0 | 0 | — |
| Other Off-site Transfers to Disposal** | 1,047,978 | 6,481,557 | 5,433,579 | 518.5 |
| Total Transfers Off-site for Further Waste Management/Disposal | 22,174,978 | 40,513,784 | 18,338,806 | 82.7 |

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

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising other off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.

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

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



Table 4-77. Current Year and Projected Quantities of TRI Chemicals in Waste, 1999-2001: Federal Facilities

| Waste Management Activity | Current Year 1999 | | Projected 2000 | | Projected 2001 | |
|---------------------------------------|----------------------------|------------------|----------------------------|------------------|----------------------------|------------------|
| | Total Pounds | Percent of Total | Total Pounds | Percent of Total | Total Pounds | Percent of Total |
| Recycled On-site | 11,078,150 | 5.8 | 11,735,313 | 6.2 | 11,714,313 | 6.2 |
| Recycled Off-site | 33,197,248 | 17.2 | 37,864,844 | 20.1 | 37,887,263 | 20.1 |
| Energy Recovery On-site | 326 | 0.0 | 326 | 0.0 | 326 | 0.0 |
| Energy Recovery Off-site | 149,529 | 0.1 | 160,815 | 0.1 | 154,100 | 0.1 |
| Treated On-site | 60,594,576 | 31.5 | 57,297,203 | 30.4 | 57,420,937 | 30.5 |
| Treated Off-site | 5,977,804 | 3.1 | 383,094 | 0.2 | 370,468 | 0.2 |
| Quantity Released On- and Off-site | 81,535,459 | 42.3 | 80,906,904 | 43.0 | 80,682,560 | 42.9 |
| Total Production-related Waste | 192,533,092 | 100.0 | 188,348,499 | 100.0 | 188,229,967 | 100.0 |
| Waste Management Activity | Projected Change 1999-2000 | | Projected Change 2000-2001 | | Projected Change 1999-2001 | |
| | Percent | | Percent | | Percent | |
| Recycled On-site | 5.9 | | -0.2 | | 5.7 | |
| Recycled Off-site | 14.1 | | 0.1 | | 14.1 | |
| Energy Recovery On-site | 0.0 | | 0.0 | | 0.0 | |
| Energy Recovery Off-site | 7.5 | | -4.2 | | 3.1 | |
| Treated On-site | -5.4 | | 0.2 | | -5.2 | |
| Treated Off-site | -93.6 | | -3.3 | | -93.8 | |
| Quantity Released On- and Off-site | -0.8 | | -0.3 | | -1.0 | |
| Total Production-related Waste | -2.2 | | -0.1 | | -2.2 | |

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

Due to an EPA data entry error, one chemical reporting revision for 1999 by a facility, the US Army Letterkenny Depot in Chambersburg, PA, was not included in this table. At the time of publication, the facility had notified EPA that it anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds. Revisions by this facility of two other compounds are included in the federal facility tables but not included in other tables in the 1999 TRI Public Data Release report.

of their total Form Rs. The Tennessee Valley Authority facilities with activities related to the new industry sectors reported source reduction activity on 50 forms, 30.3 percent of their total Form Rs.

The most frequently reported source reduction activity (identified on 65 forms, including 47 filed by the Tennessee Valley Authority facilities with activities related to

the new industry sectors) was raw material modifications. Good operating practices came next, with 44 forms (including 32 by Department of Defense facilities), and surface preparation and finishing was third, with 26 forms (all from Department of Defense facilities).



Chapter 4 —Toxics Release Inventory Data for Federal Facilities, 1998–1999

Table 4-78. Number of Forms Reporting Source Reduction Activity, 1999: Federal Facilities

| | | Forms Reporting Source Reduction Activity | | Category of Source Reduction Activity | | | | | | | |
|--|--------|---|------------------------|---------------------------------------|-------------------|---------------------------|----------------------------|-----------------------|-------------------------|-----------------------------------|-----------------------|
| | | Total Form Rs | Percent of All Form Rs | Good Operating Practices | Inventory Control | Spill and Leak Prevention | Raw Material Modifications | Process Modifications | Cleaning and Degreasing | Surface Preparation and Finishing | Product Modifications |
| Federal Agency | Number | Number | Percent | Number | Number | Number | Number | Number | Number | Number | Number |
| Federal Facilities with Activities Related to Original Industries and Other Industries | | | | | | | | | | | |
| Department of Defense | 238 | 70 | 29.4 | 32 | 15 | 9 | 14 | 13 | 17 | 26 | 2 |
| Air Force | 51 | 19 | 37.3 | 11 | 0 | 1 | 9 | 4 | 16 | 15 | 0 |
| Army | 110 | 21 | 19.1 | 8 | 5 | 8 | 1 | 7 | 0 | 1 | 1 |
| Army Corps of Engineers | 6 | 6 | 100.0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Defense Logistics | 4 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Marines | 14 | 6 | 42.9 | 1 | 2 | 0 | 1 | 0 | 0 | 8 | 1 |
| Navy | 53 | 18 | 34.0 | 6 | 8 | 0 | 3 | 2 | 1 | 2 | 0 |
| Department of Energy | 41 | 6 | 14.6 | 1 | 4 | 1 | 2 | 1 | 1 | 0 | 0 |
| Department of Interior | 2 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Department of Treasury | 14 | 4 | 28.6 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| Department of Veterans Affairs | 1 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Protection Agency | 2 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Aeronautics and Space Administration | 17 | 12 | 70.6 | 9 | 2 | 0 | 0 | 4 | 3 | 0 | 1 |
| Tennessee Valley Authority | 3 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U.S. Department of Agriculture | 4 | 1 | 25.0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| U.S. Enrichment Corporation | 6 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal for Original Industries | 328 | 93 | 28.4 | 43 | 21 | 11 | 18 | 19 | 21 | 26 | 3 |
| Federal Facilities with Activities Related to New Industries | | | | | | | | | | | |
| Department of Defense - Navy | 1 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Department of Energy | 13 | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee Valley Authority | 165 | 50 | 30.3 | 1 | 0 | 0 | 47 | 2 | 0 | 0 | 0 |
| Subtotal for New Industries | 179 | 50 | 27.9 | 1 | 0 | 0 | 47 | 2 | 0 | 0 | 0 |
| Total for Federal Facilities | 507 | 143 | 28.2 | 44 | 21 | 11 | 65 | 21 | 21 | 26 | 3 |

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

Chapter 5

Toxics Release Inventory Data for Original Reporting Industries

Chapter 5



Toxics Release Inventory Data for Original Reporting Industries

This chapter provides an overview of 1999 TRI data by industry sector for the 20 industries that have been required to report to TRI since the program began in 1987. Analyses of TRI reporting by the industries added in 1998 and federal facilities appear in Chapter 4.

The chapter summarizes release and other waste management data by industry for 1999 and for 1995 to 1999. Changes in on- and off-site releases are measured since 1988, and other waste management data are reviewed for 1991 to 1999. The discussion in **Making Year-to-Year Comparisons of TRI Data** in Chapter 1 is important for accurate interpretation of these data because of the significant changes in TRI over time.

Box 5-1 lists the original TRI industries by Standard Industrial Classification (SIC) code. Tables in this chapter also present data submitted on TRI chemical forms that report more than one SIC code in the manufacturing sector. Box 5-2 explains EPA's method for analyzing this "multiple-codes" group, as well as the "no-codes" group.

TRI DATA BY INDUSTRY, 1999

In 1999, a total of 20,698 facilities in the original TRI industries submitted 69,471 forms, as shown in Table 5-1. The chemical manufacturing industry submitted the

largest number of forms, 20,382. The fabricated metals industry ranked second, with 7,459 forms, followed by the primary metals industry, with 6,819 forms. Together, these three industries submitted nearly half (49.9 percent) of the forms for 1999 from the original industries covered by TRI.

On- and Off-site Releases, 1999

On- and off-site releases by the original industries totaled 2.44 billion pounds in 1999, and two industries reported more than half of that total. As shown in Table 5-2, the primary metals industry reported 683.7 million pounds of total releases, and the chemical manufacturing industry reported 670.5 million pounds. These amounts represented 28.0 percent and 27.5 percent, respectively, of all on- and off-site releases reported by the original industries, as illustrated in Figure 5-1. The paper products industry ranked third for total on- and off-site releases, with 225.6 million pounds, or 9.2 percent of the total.

Four other industry groups reported more than 100 million pounds each. The "multiple-codes" group ranked fourth among original industries, with 129.1 million pounds, 5.3 percent of the total. Food industries ranked fifth, with 123.2 million pounds, followed by the transportation equipment industry, with 105.0 million pounds and plastics, with 103.6 million pounds. Each of these four groups account-



Box 5-1. Standard Industrial Classification (SIC) Codes for the Original TRI Industries

- | | |
|----|---|
| 20 | Food and kindred products Manufacture or processing of foods and beverages for human consumption, and related products, such as manufactured ice, chewing gum, vegetable and animal fats and oils, and prepared feeds for animals and fowls. |
| 21 | Tobacco products Manufacture of cigarettes, cigars, smoking and chewing tobacco, snuff, and reconstituted tobacco. Stemming and redrying of tobacco. Manufacture of non-tobacco cigarettes. |
| 22 | Textile mill products Preparation of fiber and subsequent manufacture of yarn, thread, braids, twine, and cordage. Manufacture of broadwoven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn. Dyeing and finishing of fiber, yarn, fabrics, and knit apparel. Coating, waterproofing or otherwise treating fabrics. Integrated manufacture of knit apparel and other finished articles from yarn. Manufacture of felt goods, lace goods, nonwoven fabrics, and miscellaneous textiles. |
| 23 | Apparel and other finished products made from fabrics and similar materials Production of clothing. Fabrication of products by cutting and sewing purchased woven or knit textile fabrics and related materials, such as leather, rubberized fabrics, plastics, and furs. Manufacture of clothing by cutting and joining (e.g., by adhesives) material such as paper and nonwoven textiles. |
| 24 | Lumber and wood products, except furniture Cutting timber and pulpwood. Also, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood mills and veneer mills engaged in producing lumber and wood basic materials. Manufacture of finished articles made entirely or mainly of wood or related materials. |
| 25 | Furniture and fixtures Manufacture of household, office, public building, and restaurant furniture, and office and store fixtures. |
| 26 | Paper and allied products Manufacture of pulps from wood and other cellulose fibers and from rags. Manufacture of paper and paperboard. Manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes. Manufacture of bags from plastics film and sheet. |
| 27 | Printing, publishing, and allied industries Printing by one or more common processes, such as letterpress, lithography (including offset), gravure, or screen. Bookbinding, platemaking, and other services performed for the printing trade. Publishing newspapers, books, and periodicals (whether or not the establishment also prints them). |
| 28 | Chemicals and allied products Production of basic chemicals. Manufacture of products by predominantly chemical processes. (Three general classes of products: 1) basic chemicals, such as acids, alkalis, salts, and organic chemicals; 2) chemical products to be used in further manufacture, such as synthetic fibers, plastics materials, dry colors, and pigments; 3) finished chemical products to be used for ultimate consumption, such as drugs, cosmetics, and soaps, or to be used as materials or supplies in other industries, such as paints, fertilizers, and explosives.) |
| 29 | Petroleum refining and related industries Production of gasoline, kerosene, distillate fuel oils, residual fuel oils, and lubricants, through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. (Establishments also produce aliphatic and aromatic chemicals as byproducts.) |
| 30 | Rubber and miscellaneous plastics products Manufacture of products, not elsewhere classified, from plastics resins and from natural, synthetic, or reclaimed rubber, gutta percha, balata, or gutta siak. Includes manufacture of tires. |

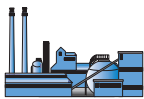
(continued)



Box 5-1. Standard Industrial Classification (SIC) Codes for the Original TRI Industries (continued)

- 31 Leather and leather products**
Tanning, currying, and finishing hides and skins. Converting leather. Manufacture of finished leather and artificial leather products and some similar products made of other materials.
- 32 Stone, clay, glass, and concrete products**
Manufacture of flat glass and other glass products, cement, structural clay products, pottery, concrete and gypsum products, cut stone, abrasive and asbestos products, and other products from materials taken principally from the earth in the form of stone, clay, and sand. (May include mining and quarrying activities operated by manufacturing establishments in this group.)
- 33 Primary metal industries**
Smelting and refining ferrous and nonferrous metals from ore, pig, or scrap. Rolling, drawing, and alloying metals. Manufacture of castings and other basic metal products. Manufacture of nails, spikes, and insulated wire and cable. Includes production of coke.
- 34 Fabricated metal products, except machinery and transportation equipment**
Fabrication of ferrous and nonferrous metal products, such as metal cans, tinware, handtools, cutlery, general hardware, non-electric heating apparatus, fabricated structural metal products, metal forgings metal stampings, ordnance (except vehicles and guided missiles), and a variety of metal and wire products, not elsewhere classified.
- 35 Industrial and commercial machinery and computer equipment**
Manufacture of industrial and commercial machinery and equipment and computers. Manufacture of engines and turbines; farm and garden machinery; construction, mining, and oil field machinery; elevators and conveying equipment; hoists, cranes, monorails, and industrial trucks and tractors; metal working machinery; special industry machinery; general industrial machinery; computer and peripheral equipment and office machinery; and refrigeration and service industry machinery.
- 36 Electronic and other electrical equipment and components, except computer equipment**
Manufacture of machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy. Manufacture of electricity distribution equipment, electrical industrial apparatus, household appliances, electrical lighting and wiring equipment, radio and television receiving equipment, communications equipment, electronic components and accessories, and other electrical equipment and supplies.
- 37 Transportation equipment**
Manufacture of equipment for transportation of passengers and cargo by land, air, and water. Includes motor vehicles, aircraft, guided missiles and space vehicles, ships, boats, railroad equipment, and miscellaneous transportation equipment, such as motorcycles, bicycles, and snowmobiles.
- 38 Measuring, analyzing and controlling instruments, photographic, medical, and optical goods; watches and clocks**
Manufacture of instruments (including professional and scientific) for measuring, testing, analyzing and controlling, and their associated sensors and accessories; optical instruments and lenses; surveying and drafting instruments; hydrological, hydrographic, meteorological, and geophysical equipment; search, detection, navigation, and guidance systems and equipment; surgical, medical, and dental instruments, equipment, and supplies; ophthalmic goods; photographic equipment and supplies; and watches and clocks.
- 39 Miscellaneous manufacturing industries**
Manufacture of products not classified in any other major manufacturing group. Includes jewelry, silverware, and plated ware; musical instruments; dolls, toys, games, and sporting and athletic goods; pens, pencils, and artists' materials; buttons, costume novelties, and miscellaneous notions; brooms and brushes; caskets; and other miscellaneous products.

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



Box 5-2. Multiple SIC Codes and No SIC Codes

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

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

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

Forms that have a SIC code within the manufacturing sector as well as a SIC code within the new industry sectors are included in the manufacturing sector SIC code if the facility reported to TRI before 1998. If the facility reported for the first time for 1998 with both original and new industry SIC codes, it is not included in the analyses in this chapter but is included in the analyses in Chapter 4 under the new industry code

No codes 20-39. Forms that report no SIC code within the manufacturing sector and have no SIC code belonging to a new industry group are included in these tables under the "No codes 20–39" category. Such forms may include, for example, submissions by federal facilities, all of which are required to report regardless of the SIC code covering their operations.

ed for approximately 4 to 5 percent of the total (see Figure 5–1).

Figure 5–2 displays on- and off-site releases for the industries with the largest total releases. Air emissions were the largest release type for all of these industries except primary metals. In the primary metals industry, off-site releases (transfers off-site to disposal) and on-site land releases outweighed other release types. For the food industry, surface water discharges were almost as large as air emissions, accounting for 50.2 million pounds, or

about 40 percent of total releases by that industry.

The primary metals, chemicals, and paper products industries, which reported the largest total on- and off-site releases in 1999, also reported the largest on-site releases, but in a different order.

The chemical manufacturing industry ranked first for on-site releases, with 609.3 million pounds. Chemical industry releases included 288.2 million pounds of air emissions, 77.1 million pounds of surface water discharges, and 195.4 million pounds of


Table 5-1. TRI Facilities and Forms, Original Industries, by Industry, 1999

| SIC Code | Industry | Total Facilities Number | Total Forms Number | Forms Rs Number | Form As Number |
|----------|-----------------------|-------------------------|--------------------|-----------------|----------------|
| 20 | Food | 1,615 | 3,066 | 1,913 | 1,153 |
| 21 | Tobacco | 23 | 67 | 66 | 1 |
| 22 | Textiles | 241 | 485 | 430 | 55 |
| 23 | Apparel | 15 | 33 | 31 | 2 |
| 24 | Lumber | 830 | 2,000 | 1,220 | 780 |
| 25 | Furniture | 352 | 781 | 706 | 75 |
| 26 | Paper | 438 | 2,402 | 2,319 | 83 |
| 27 | Printing | 213 | 447 | 433 | 14 |
| 28 | Chemicals | 3,759 | 20,382 | 16,670 | 3,712 |
| 29 | Petroleum | 410 | 3,441 | 3,069 | 372 |
| 30 | Plastics | 1,831 | 3,731 | 3,122 | 609 |
| 31 | Leather | 72 | 183 | 163 | 20 |
| 32 | Stone/Clay/Glass | 668 | 1,919 | 1,648 | 271 |
| 33 | Primary Metals | 1,912 | 6,819 | 6,078 | 741 |
| 34 | Fabricated Metals | 2,846 | 7,459 | 6,651 | 808 |
| 35 | Machinery | 1,100 | 2,733 | 2,409 | 324 |
| 36 | Electrical Equip. | 1,167 | 2,926 | 2,763 | 163 |
| 37 | Transportation Equip. | 1,295 | 4,502 | 4,166 | 336 |
| 38 | Measure/Photo. | 240 | 588 | 492 | 96 |
| 39 | Miscellaneous | 307 | 686 | 580 | 106 |
| | Multiple codes 20–39 | 1,190 | 4,280 | 3,862 | 418 |
| | No codes 20–39 | 174 | 541 | 474 | 67 |
| | Total | 20,698 | 69,471 | 59,265 | 10,206 |

Note: Facilities/forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the “multiple codes” category. Facilities/forms with no 2-digit SIC code within the range 20–39 are assigned to the “no codes” category.

underground injection—the largest amounts in these categories. The primary metals industry ranked second for on-site releases, with 399.9 million pounds. Primary metals reported 229.6 million pounds of on-site land releases, more than any other industry. Most of the sector’s on-site land releases consisted of other disposal (130.4 million pounds). This sector also reported the largest off-site releases, 283.8 million pounds, 58.3 percent of all off-site releases.

Top 20 Chemicals for On- and Off-site Releases

Table 5-3 lists the 20 TRI chemicals with the largest total releases in 1999 by the original industries. On- and off-site releases of these chemicals totaled 1.85 billion pounds, 76.0 percent of the total 2.44 billion pounds for all chemicals.

Zinc compounds led all TRI chemicals, with releases totaling 330.7 million pounds. Off-site releases (transfers to disposal) contributed almost 60 percent (194.3 million pounds) of this total. As explained in Box



Table 5-2. TRI On-site and Off-site Releases, Original Industries, by Industry, 1999

| SIC Code Industry | Air | | Surface Water Discharges Pounds | Underground Injection | |
|--------------------------|--|--|--|----------------------------|-------------------------------|
| | Fugitive or Nonpoint Air Emissions Pounds | Stack or Point Air Emissions Pounds | | Class I Wells Pounds | Class II-V Wells Pounds |
| 20 Food | 19,887,134 | 39,910,073 | 50,225,853 | 4,514 | 0 |
| 21 Tobacco | 35,725 | 2,728,904 | 162,296 | 0 | 0 |
| 22 Textiles | 1,722,640 | 6,748,425 | 204,073 | 0 | 0 |
| 23 Apparel | 24,590 | 361,953 | 0 | 0 | 0 |
| 24 Lumber | 4,909,048 | 29,236,143 | 109,085 | 0 | 0 |
| 25 Furniture | 2,098,901 | 13,093,100 | 9 | 0 | 0 |
| 26 Paper | 13,663,381 | 172,304,976 | 19,118,393 | 0 | 0 |
| 27 Printing | 9,104,599 | 11,396,535 | 436 | 0 | 0 |
| 28 Chemicals | 75,405,717 | 212,746,746 | 77,097,472 | 195,332,322 | 108,858 |
| 29 Petroleum | 20,653,721 | 27,356,853 | 15,655,884 | 2,805,588 | 40,085 |
| 30 Plastics | 21,589,254 | 69,984,617 | 36,453 | 0 | 0 |
| 31 Leather | 571,380 | 1,639,648 | 65,880 | 0 | 0 |
| 32 Stone/Clay/Glass | 2,226,078 | 30,658,766 | 123,132 | 0 | 0 |
| 33 Primary Metals | 23,932,051 | 82,677,214 | 62,513,740 | 1,186,718 | 15 |
| 34 Fabricated Metals | 19,495,949 | 37,824,949 | 2,429,536 | 48,843 | 0 |
| 35 Machinery | 3,977,903 | 6,776,871 | 140,051 | 0 | 0 |
| 36 Electrical Equip. | 3,957,494 | 12,975,247 | 4,393,066 | 250 | 0 |
| 37 Transportation Equip. | 18,174,725 | 73,554,187 | 177,754 | 0 | 0 |
| 38 Measure/Photo. | 1,009,729 | 7,494,549 | 1,320,125 | 0 | 0 |
| 39 Miscellaneous | 1,816,780 | 7,024,565 | 26,183 | 0 | 0 |
| Multiple codes 20–39 | 19,723,864 | 56,409,142 | 19,559,032 | 20,100 | 5 |
| No codes 20–39 | 6,784,810 | 1,385,996 | 233,363 | 0 | 505 |
| Total | 270,765,473 | 904,289,459 | 253,591,816 | 199,398,335 | 149,468 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the “multiple codes” category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the “no codes” category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the “no codes” 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.



Table 5-2. TRI On-site and Off-site Releases, Original Industries, by Industry, 1999 (continued)

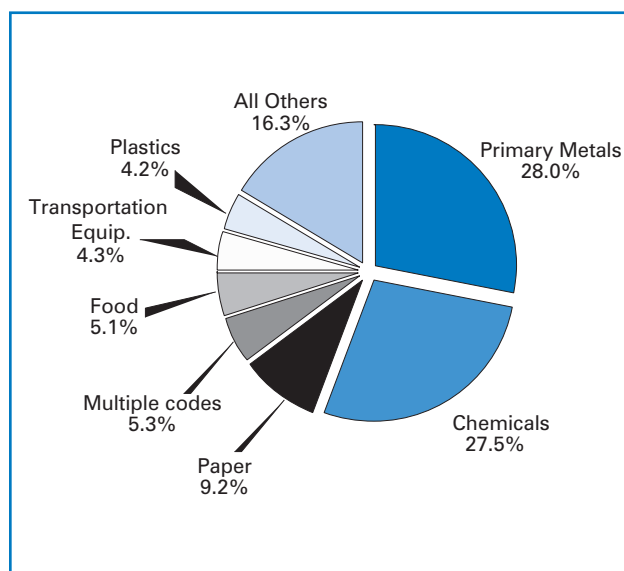
| Industry | On-site Land Releases | | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|-----------------------|---|------------------------------|-----------------------------|-----------------------------------|-----------------------------|----------------------------------|--|---|
| | RCRA Subtitle C Landfills Pounds | Other Landfills Pounds | Land Treatment Pounds | Surface Impoundments Pounds | Other Disposal Pounds | | Transfers Off-site to Disposal Pounds | |
| Food | 525 | 116,028 | 5,708,331 | 311,931 | 119,841 | 116,284,230 | 6,956,919 | 123,241,149 |
| Tobacco | 0 | 0 | 0 | 0 | 0 | 2,926,925 | 770,705 | 3,697,630 |
| Textiles | 0 | 3,650 | 234,799 | 104,438 | 112,700 | 9,130,725 | 682,024 | 9,812,749 |
| Apparel | 0 | 0 | 0 | 0 | 0 | 386,543 | 74,118 | 460,661 |
| Lumber | 31,282 | 68,556 | 37,115 | 32,611 | 7,228 | 34,431,068 | 818,837 | 35,249,905 |
| Furniture | 0 | 2,666 | 0 | 0 | 22,235 | 15,216,911 | 114,491 | 15,331,402 |
| Paper | 235,499 | 11,077,047 | 452,592 | 3,195,138 | 307,994 | 220,355,020 | 5,204,395 | 225,559,415 |
| Printing | 0 | 36,000 | 0 | 0 | 17,559 | 20,555,129 | 122,852 | 20,677,981 |
| Chemicals | 726,299 | 12,987,685 | 1,571,580 | 29,117,374 | 4,169,615 | 609,263,668 | 61,265,769 | 670,529,437 |
| Petroleum | 534 | 44,048 | 79,008 | 311,089 | 51,969 | 66,998,779 | 3,542,150 | 70,540,929 |
| Plastics | 9,195 | 574,092 | 0 | 5,860 | 33,436 | 92,232,907 | 11,394,450 | 103,627,357 |
| Leather | 0 | 0 | 0 | 10,369 | 255 | 2,287,532 | 2,092,878 | 4,380,410 |
| Stone/Clay/Glass | 6,500 | 3,522,389 | 260 | 96,509 | 71,154 | 36,704,788 | 6,274,400 | 42,979,188 |
| Primary Metals | 10,790,474 | 52,486,251 | 21,649 | 35,935,746 | 130,381,446 | 399,925,304 | 283,807,288 | 683,732,592 |
| Fabricated Metals | 125,093 | 173,517 | 8,016 | 3,817 | 341,357 | 60,451,077 | 21,778,616 | 82,229,693 |
| Machinery | 80,915 | 133,446 | 4,309 | 1,376 | 244,740 | 11,359,611 | 4,158,522 | 15,518,133 |
| Electrical Equip. | 150,717 | 830,209 | 255 | 760 | 17,895 | 22,325,893 | 18,799,534 | 41,125,427 |
| Transportation Equip. | 81,822 | 367,898 | 1,500 | 3,662 | 260,310 | 92,621,858 | 12,363,270 | 104,985,128 |
| Measure/Photo. | 5,327 | 16,000 | 380 | 6 | 1,559 | 9,847,675 | 1,051,304 | 10,898,979 |
| Miscellaneous | 27,896 | 1,203 | 0 | 0 | 23,631 | 8,920,258 | 1,308,864 | 10,229,122 |
| Multiple codes 20–39 | 27,504 | 3,561,697 | 290,450 | 4,626,915 | 4,684,660 | 108,903,369 | 20,174,698 | 129,078,067 |
| No codes 20–39 | 140,773 | 395 | 550,978 | 14,277 | 1,622,035 | 10,733,132 | 24,083,918 | 34,817,050 |
| Total | 12,440,355 | 86,002,777 | 8,961,222 | 73,771,878 | 142,491,619 | 1,951,862,402 | 486,840,002 | 2,438,702,404 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the “multiple codes” category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the “no codes” category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the “no codes” 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.



Figure 5-1. TRI On-site and Off-site Releases, Original Industries, by Industry, 1999



Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

1–5 in Chapter 1, off-site releases of metals and their compounds include transfers to solidification/stabilization and to wastewater treatment, including transfers to POTWs. Zinc compounds also had the largest on-site land releases, with 129.7 million pounds. This amount included 81.7 million pounds of other disposal and 32.0 million pounds in landfills other than RCRA subtitle C landfills.

Nitrate compounds ranked second in total releases, with 293.8 million pounds. More nitrate compounds were discharged to surface waters than any other chemical, 229.6 million pounds. TRI facilities in the original industries also injected 42.2 million pounds of nitrate compounds into underground wells on-site, the largest amount for that type of release.

Methanol releases amounted to 205.3 million pounds, the third-largest quantity of on- and off-site releases. Methanol ranked first for air emissions, with 183.9 million pounds, including 163.0 million pounds in stack or point source air emissions.

Ammonia ranked fourth overall, with 184.1 million pounds, and was second highest for air emissions (144.3 million pounds), surface water discharges (7.5 million pounds) and underground injection (25.6 million pounds). Manganese compounds had the second-highest on-site releases to land, 45.0 million pounds, followed closely by copper compounds, with 44.3 million pounds.

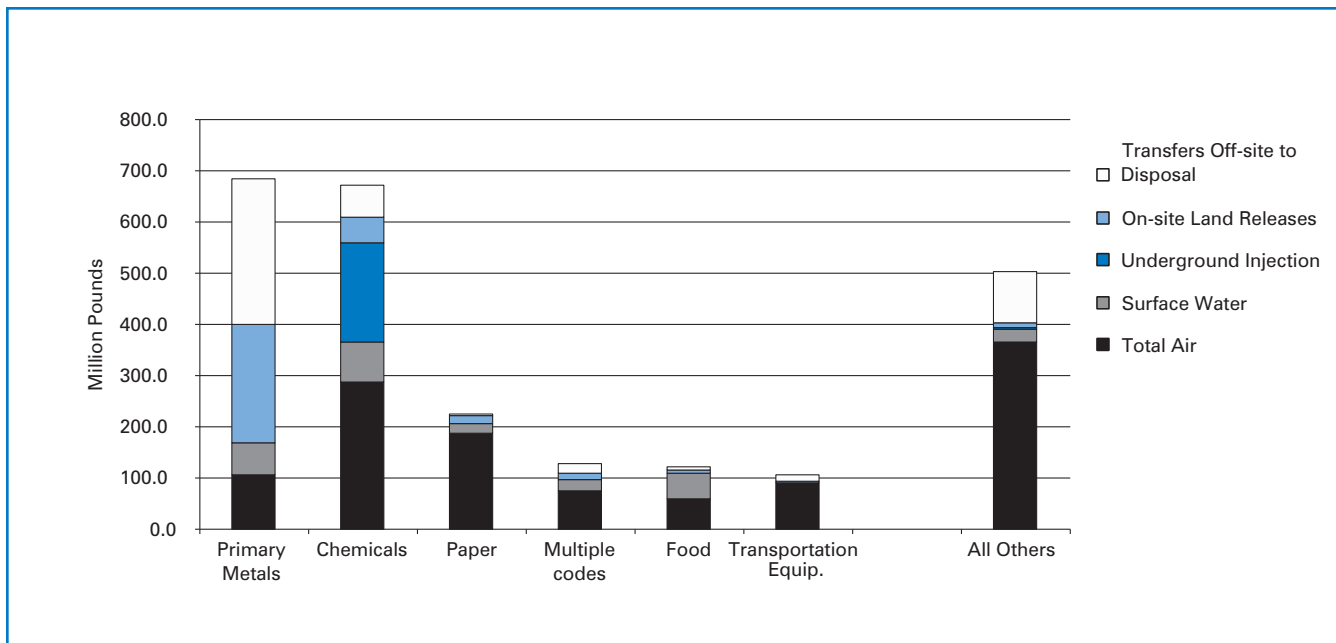
Waste Management Data, 1999

Facilities in the original TRI industries reported managing a total of 23.10 billion pounds of TRI chemicals in production-related waste in 1999, as shown in Table 5–4. Figure 5–3 shows production-related waste reported by the industries with the largest totals. Generally, on-site recycling and on-site treatment were the most common waste management methods for the original industries.

The chemical manufacturing industry reported managing 11.14 billion pounds of total production-related waste in 1999, and it reported the largest quantities in all waste management categories except off-site recycling. Almost 40 percent of the chemical manufacturing industry's production-related waste was recycled on-site (4.29 billion pounds). On-site treatment by this industry amounted to 3.91 billion pounds, and on-site energy recovery totaled 1.38 billion pounds. The chemicals industry reported 662.2 million pounds released on- and off-site. The industry sent



Figure 5-2. Distribution of TRI On-site and Off-site Releases, Original Industries with Largest Totals, 1999



Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

401.9 million pounds to off-site energy recovery and 309.1 million pounds to off-site treatment.

The primary metals industry ranked second among original industries for total production-related waste managed, with 3.52 billion pounds. On-site recycling accounted for the largest portion of this total, 1.55 billion pounds; the primary metals industry ranked second in this category. The industry reported the largest quantity of off-site recycling (754.6 million pounds) and the second-largest quantity released on- and off-site (660.9 million pounds, a little lower than the amount for chemical manufacturing).

The paper products industry reported the third-largest total production-related waste managed, 1.59 billion pounds. More than 62 percent of this amount, 988.2 million

pounds, was treated on-site, the second-largest quantity for on-site treatment.

Production-related waste exceeded 1 billion pounds in two other industry groups. The petroleum industry reported a total of 1.20 billion pounds, of which 530.6 million pounds were treated on-site and 408.8 million pounds went to on-site energy recycling. The petroleum industry ranked third in both on-site treatment (after the chemicals industry and the paper products industry) and on-site energy recovery (after the chemicals industry and the stone, clay, glass, and concrete products group). The "multiple-codes" group reported 1.05 billion pounds. The largest waste management categories for this group were on-site treatment, 362.9 million pounds, and on-site recycling, 277.7 million pounds.



Table 5-3. Top 20 Chemicals with Largest Total On-site and Off-site Releases, Original Industries, 1999

| CAS Number Chemical | Air | | Surface Water Discharges Pounds | Underground Injection | |
|------------------------------------|--|--|--|----------------------------|-------------------------------|
| | Fugitive or Nonpoint Air Emissions Pounds | Stack or Point Air Emissions Pounds | | Class I Wells Pounds | Class II-V Wells Pounds |
| — Zinc compounds | 1,507,464 | 4,014,302 | 1,002,707 | 222,562 | 5,500 |
| — Nitrate compounds | 1,818,184 | 211,738 | 229,551,038 | 42,176,095 | 250 |
| 67-56-1 Methanol | 20,898,502 | 162,975,985 | 3,864,475 | 14,083,936 | 106,103 |
| 7664-41-7 Ammonia | 31,279,310 | 112,955,136 | 7,649,385 | 25,611,167 | 24,618 |
| — Manganese compounds | 939,302 | 941,228 | 4,853,311 | 7,011,377 | 250 |
| 108-88-3 Toluene | 30,282,435 | 58,823,208 | 29,670 | 611,546 | 1,350 |
| 1330-20-7 Xylene (mixed isomers) | 15,070,850 | 51,060,704 | 24,818 | 49,229 | 750 |
| 100-42-5 Styrene | 12,824,242 | 41,906,888 | 3,168 | 191,124 | 0 |
| — Copper compounds | 1,031,390 | 521,204 | 84,642 | 247,755 | 0 |
| 110-54-3 n-Hexane | 19,240,208 | 35,816,968 | 11,114 | 36,501 | 10 |
| 7647-01-0 Hydrochloric acid | 2,486,305 | 48,219,840 | 495 | 36,795 | 0 |
| 7782-50-5 Chlorine | 1,012,814 | 48,151,981 | 328,493 | 62,440 | 0 |
| — Lead compounds | 215,924 | 655,684 | 31,794 | 182,869 | 0 |
| — Chromium compounds | 209,702 | 257,369 | 97,379 | 816,717 | 0 |
| 78-93-3 Methyl ethyl ketone | 15,494,361 | 22,724,308 | 34,304 | 426,247 | 5 |
| — Glycol ethers | 8,656,597 | 27,392,902 | 104,389 | 716 | 0 |
| 75-15-0 Carbon disulfide | 1,147,325 | 34,741,100 | 6,548 | 16,110 | 0 |
| 75-09-2 Dichloromethane | 11,096,910 | 24,459,564 | 12,056 | 107,386 | 0 |
| 7697-37-2 Nitric acid | 556,845 | 1,683,464 | 60,181 | 16,482,141 | 0 |
| 7440-66-6 Zinc (fume or dust) | 750,918 | 476,173 | 15,306 | 1 | 0 |
| Subtotal (top 20 chemicals) | 176,519,588 | 677,989,746 | 247,765,273 | 108,372,714 | 138,836 |
| Total (all chemicals) | 270,765,473 | 904,289,459 | 253,591,816 | 199,398,335 | 149,468 |

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

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

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

Economic Overview, by Industry

Although TRI data present significant information about toxic chemicals that are released on- and off-site, managed in waste

on- and off-site, and transferred off-site for further waste management, certain limitations should be kept in mind, as described in **What Are the Benefits and Limitations of the Data**, in Chapter 1. One such limitation is that TRI data by themselves do not distinguish industry-specific factors that influence the chemicals, the amounts, and the types of releases and waste management reported by facilities. Table 5-5 presents two basic economic measures—employment and dollar value of ship-



Table 5-3. Top 20 Chemicals with Largest Total On-site and Off-site Releases, Original Industries, 1999 (continued)

| Chemical | On-site Land Releases | | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------------------------------|-------------------------------------|---------------------------|--------------------------|--------------------------------|--------------------------|----------------------------------|--|---|
| | RCRA Subtitle C Landfills Pounds | Other Landfills Pounds | Land Treatment Pounds | Surface Impoundments Pounds | Other Disposal Pounds | | Transfers Off-site to Disposal Pounds | |
| Zinc compounds | 6,376,406 | 31,970,479 | 125,988 | 9,442,775 | 81,742,150 | 136,410,333 | 194,251,166 | 330,661,499 |
| Nitrate compounds | 21,702 | 50,493 | 5,317,279 | 1,525,491 | 87,554 | 280,759,824 | 13,075,242 | 293,835,066 |
| Methanol | 46,913 | 510,638 | 18,480 | 469,731 | 165,445 | 203,140,208 | 2,117,503 | 205,257,711 |
| Ammonia | 2,113 | 142,918 | 1,725,147 | 850,384 | 151,167 | 180,391,345 | 3,667,850 | 184,059,195 |
| Manganese compounds | 1,591,285 | 23,363,307 | 360,900 | 14,720,096 | 4,878,129 | 58,659,185 | 48,607,421 | 107,266,606 |
| Toluene | 15,312 | 13,748 | 1,587 | 1,545 | 61,805 | 89,842,206 | 1,448,961 | 91,291,167 |
| Xylene (mixed isomers) | 11,598 | 7,747 | 2,502 | 1,235 | 19,800 | 66,249,233 | 1,090,289 | 67,339,522 |
| Styrene | 6,461 | 360,088 | 3 | 514 | 2,084 | 55,294,572 | 2,100,121 | 57,394,693 |
| Copper compounds | 213,715 | 2,853,728 | 2,209 | 6,528,824 | 34,674,623 | 46,158,090 | 10,981,320 | 57,139,410 |
| n-Hexane | 952 | 1,471 | 730 | 255 | 4,016 | 55,112,225 | 47,900 | 55,160,125 |
| Hydrochloric acid | 36,558 | 0 | 0 | 0 | 28,876 | 50,808,869 | 2,399,296 | 53,208,165 |
| Chlorine | 0 | 0 | 44,684 | 25 | 10,611 | 49,611,048 | 7,745 | 49,618,793 |
| Lead compounds | 463,850 | 3,024,417 | 3,857 | 3,522,735 | 9,293,502 | 17,394,632 | 31,961,514 | 49,356,146 |
| Chromium compounds | 306,008 | 1,407,348 | 36,250 | 24,450,480 | 3,391,292 | 30,972,545 | 14,203,028 | 45,175,573 |
| Methyl ethyl ketone | 25,815 | 3,856 | 130 | 1,176 | 50,544 | 38,760,746 | 779,384 | 39,540,130 |
| Glycol ethers | 19,642 | 13,207 | 10,552 | 0 | 5,780 | 36,203,785 | 848,254 | 37,052,039 |
| Carbon disulfide | 5 | 251 | 0 | 0 | 0 | 35,911,339 | 2,730 | 35,914,069 |
| Dichloromethane | 1,157 | 1,898 | 10 | 0 | 5,279 | 35,684,260 | 154,374 | 35,838,634 |
| Nitric acid | 56,463 | 64,728 | 187,451 | 31,548 | 7,421 | 19,130,242 | 10,530,338 | 29,660,580 |
| Zinc (fume or dust) | 1,458,342 | 812,802 | 0 | 2,012 | 49,754 | 3,565,308 | 26,013,507 | 29,578,815 |
| Subtotal (top 20 chemicals) | 10,654,297 | 64,603,124 | 7,837,759 | 61,548,826 | 134,629,832 | 1,490,059,995 | 364,287,943 | 1,854,347,938 |
| Total (all chemicals) | 12,440,355 | 86,002,777 | 8,961,222 | 73,771,878 | 142,491,619 | 1,951,862,402 | 486,840,002 | 2,438,702,404 |

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

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

ments—that suggest the relative size of the original industries that report to TRI. Economic analyses make use of data on the value of production (shipments) as one way of indicating the size of industrial sectors because no direct comparison can be drawn among the products of the sectors. The economic data in Table 5-5 are from the 2000 *Statistical Abstract of the United States*, the latest consistent data available across all TRI industries, original and new.

Table 5-5 also shows total production-related waste managed by TRI facilities in 1999 and provides approximate comparisons with the economic activity of the facilities. The percentages shown in the table indicate the relative contribution of each industry to total employment and production and to the total quantity of TRI chemicals in production-related waste managed. The ratio of total production-related waste managed to production value (value of shipments), in the last column, provides a com-



Table 5-4. Quantities of TRI Chemicals in Waste Managed, Original Industries, by Industry, 1999

| SIC Code Industry | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site Treated 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 | | | |
| 20 Food | 669,579,214 | 4,021,384 | 368,624 | 186,154 | 117,194,970 | 28,379,792 | 125,728,606 | 945,458,744 | 339,615 |
| 21 Tobacco | 2,877 | 4,692 | 0 | 0 | 1,265,197 | 569,356 | 3,201,944 | 5,044,066 | 0 |
| 22 Textiles | 13,131,341 | 1,193,970 | 5,328,483 | 1,923,938 | 8,766,593 | 1,778,044 | 9,198,301 | 41,320,670 | 350 |
| 23 Apparel | 120,180 | 58,091 | 0 | 32,084 | 970,870 | 72,574 | 458,224 | 1,712,023 | 0 |
| 24 Lumber | 8,168,812 | 493,445 | 2,763,496 | 2,115,995 | 9,619,148 | 1,627,693 | 34,853,373 | 59,641,962 | 539,833 |
| 25 Furniture | 3,759,675 | 4,777,220 | 48,755 | 3,877,812 | 561,325 | 435,753 | 14,250,477 | 27,711,017 | 1,403 |
| 26 Paper | 106,155,787 | 11,846,205 | 206,443,672 | 6,790,097 | 988,175,002 | 44,280,317 | 227,005,796 | 1,590,696,876 | 10,373 |
| 27 Printing | 187,531,609 | 5,943,127 | 263,870 | 3,941,316 | 97,744,655 | 2,037,158 | 20,653,150 | 318,114,885 | 121,037 |
| 28 Chemicals | 4,288,776,638 | 182,418,051 | 1,378,302,403 | 401,877,053 | 3,914,655,653 | 309,149,616 | 662,235,528 | 11,137,414,942 | 6,933,002 |
| 29 Petroleum | 135,610,463 | 22,259,684 | 408,782,307 | 19,580,516 | 530,572,806 | 12,559,640 | 70,761,293 | 1,200,126,709 | 520,425 |
| 30 Plastics | 47,915,834 | 18,907,706 | 14,502,896 | 7,925,098 | 40,366,020 | 8,985,212 | 107,483,282 | 246,086,048 | 37,698 |
| 31 Leather | 464,526 | 226,469 | 0 | 72,698 | 8,860,855 | 439,888 | 4,412,697 | 14,477,133 | 15 |
| 32 Stone/Clay/ Glass | 164,059,360 | 3,773,127 | 651,242,324 | 909,680 | 23,345,061 | 3,100,571 | 42,753,637 | 889,183,760 | 270,396 |
| 33 Primary Metals | 1,552,531,491 | 754,626,615 | 37,661,422 | 3,655,699 | 475,675,781 | 30,818,969 | 660,931,823 | 3,515,901,800 | 293,814,961 |
| 34 Fabricated Metals | 142,101,576 | 351,691,695 | 26,003,219 | 12,919,918 | 100,324,024 | 20,705,710 | 81,423,271 | 735,169,413 | 296,165 |
| 35 Machinery | 13,944,720 | 75,086,526 | 310,093 | 2,443,766 | 7,350,148 | 6,285,050 | 15,638,658 | 121,058,961 | 74,380 |
| 36 Electrical Equip. | 191,059,754 | 370,996,008 | 11,002,472 | 7,699,478 | 70,082,258 | 23,811,046 | 36,763,938 | 711,414,954 | 268,390 |
| 37 Transportation Equip. | 20,905,454 | 127,096,625 | 644,190 | 12,550,137 | 29,902,730 | 13,193,003 | 102,506,313 | 306,798,452 | 14,183 |
| 38 Measure/Photo. | 2,594,636 | 10,836,621 | 561,088 | 2,247,956 | 41,471,165 | 2,356,146 | 10,602,534 | 70,670,146 | 760,347 |
| 39 Miscellaneous | 9,065,566 | 13,711,079 | 4,342,249 | 3,371,693 | 5,538,753 | 2,695,392 | 10,307,530 | 49,032,262 | 702,014 |
| Multiple codes 20–39 | 277,735,580 | 171,186,302 | 56,977,187 | 16,657,952 | 362,947,066 | 34,077,657 | 130,786,592 | 1,050,368,336 | 1,016,887 |
| No codes 20–39 | 4,637,755 | 3,742,825 | 550,243 | 852,366 | 14,936,039 | 24,310,969 | 12,346,509 | 61,376,706 | 5,653 |
| Total | 7,839,852,848 | 2,134,897,467 | 2,806,098,993 | 511,631,406 | 6,850,326,119 | 571,669,556 | 2,384,303,476 | 23,098,779,865 | 305,727,127 |

Note: Data are from Section 8 of Form R. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the “multiple codes” category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the “no codes” category.

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

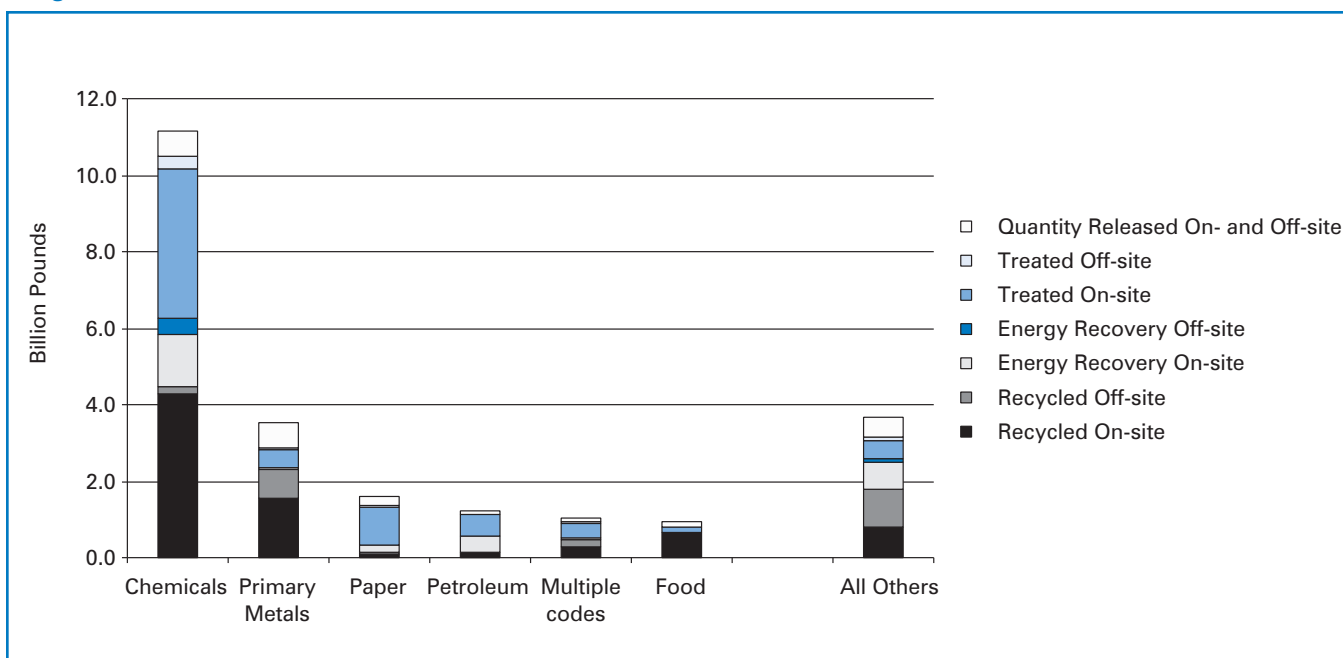
parison of the 1999 TRI quantities reported by each industry with that industry’s production level for 1999. Many factors influence the differences in TRI reporting among industries. Relating TRI quantities to the dollar value of each industry’s products creates a measure of waste managed

that takes into account differences in size among industries.

As shown in Table 5–5, the chemical manufacturing industry accounted for 5.5 percent of manufacturing employment in 1998, 9.7 percent of the value of manufacturing production (value of shipments) in 1999,



Figure 5-3. Distribution of Quantities of TRI Chemicals in Waste Managed, Original Industries with Largest Totals, 1999



Note: Data are from Section 8 of Form R. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category.

and 50.7 percent of TRI total production-related waste managed in 1999. The chemical manufacturing industry managed 26,949 pounds of total production-related waste for each \$1 million value of shipments. This was the largest ratio among the original TRI industries. The primary metals industry ranked second, with 19,701 pounds per \$1 million value, and the paper products industry ranked third, with 9,666 pounds per \$1 million value. These three industries had the largest total production-related waste managed in 1999.

YEAR-BY-YEAR COMPARISONS, BY INDUSTRY

Comparisons of TRI data across reporting years are made on the basis of chemicals that were reportable in all years with the same reporting definitions. This ensures that apparent increases or decreases from

one year to another are not the result of changes in the list of TRI chemicals.

Making Year-to-Year Comparisons of TRI Data, in Chapter 1, explains these multi-year analyses; an understanding of these issues is essential for accurate interpretation of the multiyear data presented in this chapter.

Progress in reducing releases and other quantities of TRI chemicals in wastes in recent years is measured from 1995. Waste management data authorized under the federal Pollution Prevention Act of 1990 have been collected since 1991 and can be compared using that baseline. Comparisons of on-site and off-site releases can also be made for chemicals that were reportable in all years from 1988 to 1999.



Table 5-5. Employees (1998), Shipments (1999) and Total Production-related Waste Managed (1999), by Industry

| SIC Code | Industry | Paid Employees, 1998 | | Value of Shipments, 1999 | | Total Production-related Waste Managed, 1999 | | Production-related Waste Managed per Value of Shipments Pounds per \$1,000,000 |
|--------------|-----------------------|----------------------|--------------|--------------------------|--------------|--|--------------|---|
| | | Number (000) | Percent | \$1,000,000 | Percent | Pounds | Percent | |
| 20 | Food | 1,648 | 8.9 | 500,901 | 11.8 | 945,458,744 | 4.3 | 1,888 |
| 21 | Tobacco | 39 | 0.2 | 50,551 | 1.2 | 5,044,066 | 0.0 | 100 |
| 22 | Textiles | 593 | 3.2 | 78,357 | 1.8 | 41,320,670 | 0.2 | 527 |
| 23 | Apparel | 745 | 4.0 | <500 | <0.01 | 1,712,023 | 0.0 | — |
| 24 | Lumber | 817 | 4.4 | <500 | <0.01 | 59,641,962 | 0.3 | — |
| 25 | Furniture | 523 | 2.8 | <500 | <0.01 | 27,711,017 | 0.1 | — |
| 26 | Paper | 671 | 3.6 | 164,558 | 3.9 | 1,590,696,876 | 7.2 | 9,666 |
| 27 | Printing | 1,478 | 8.0 | <500 | <0.01 | 318,114,885 | 1.4 | — |
| 28 | Chemicals | 1,023 | 5.5 | 413,277 | 9.7 | 11,137,414,942 | 50.7 | 26,949 |
| 29 | Petroleum | 135 | 0.7 | 171,149 | 4.0 | 1,200,126,709 | 5.5 | 7,012 |
| 30 | Plastics | 997 | 5.4 | 164,654 | 3.9 | 246,086,048 | 1.1 | 1,495 |
| 31 | Leather | 84 | 0.5 | <500 | <0.01 | 14,477,133 | 0.1 | — |
| 32 | Stone/Clay/Glass | 558 | 3.0 | 103,773 | 2.4 | 889,183,760 | 4.0 | 8,569 |
| 33 | Primary Metals | 709 | 3.8 | 178,466 | 4.2 | 3,515,901,800 | 16.0 | 19,701 |
| 34 | Fabricated Metals | 1,493 | 8.1 | 245,517 | 5.8 | 735,169,413 | 3.3 | 2,994 |
| 35 | Machinery | 2,181 | 11.8 | 455,140 | 10.7 | 121,058,961 | 0.6 | 266 |
| 36 | Electrical Equip. | 1,689 | 9.1 | 413,204 | 9.7 | 711,414,954 | 3.2 | 1,722 |
| 37 | Transportation Equip. | 1,881 | 10.2 | 583,559 | 13.7 | 306,798,452 | 1.4 | 526 |
| 38 | Measure/Photo. | 858 | 4.6 | 174,661 | 4.1 | 70,670,146 | 0.3 | 405 |
| 39 | Miscellaneous | 391 | 2.1 | <500 | <0.01 | 49,032,262 | 0.2 | — |
| Total | | 18,513 | 100.0 | 4,259,532 | 100.0 | 21,987,034,823 | 100.0 | 5,162 |

Note: Paid Employees is from Table No. 1233 and Value of Shipments is from Table No. 1235 of 2000 Statistical Abstract of the United States (<http://www.census.gov/prod/www/statistical-abstract-us.html>). Total Production-related Waste Managed is from Section 8 (total of 8.1 through 8.7, Column B) for TRI Form R for 1999. Total Production-related Waste Managed in this table does not include forms reporting more than one 2-digit SIC code within SIC codes 20–39 and forms reporting SIC codes outside the 20–39 range.

On- and Off-site Releases, 1995–1999

Table 5–6 summarizes on- and off-site releases by the original TRI industries for 1995 through 1999. During this period, total on- and off-site releases decreased from 2.64 billion pounds to 2.44 billion pounds, a reduction of 7.5 percent.

The two industries with the largest total releases in 1999, the chemical manufacturing and primary metals industries, have exhibited contrasting trends since 1995. The

chemical manufacturing industry's total has decreased steadily, from 828.3 million pounds in 1995 to 670.5 million pounds in 1999, and the industry has fallen from first to second place in total releases. The amount of the reduction was the largest for any original industry, a decrease of 157.8 million pounds, or 19.9 percent, over the five-year period.

Releases from the primary metals industry, by contrast, increased, from 567.5 million pounds in 1995 to 719.0 million pounds in 1998, when primary metals displaced



chemical manufacturing as the industry with the largest total releases. Although total releases for primary metals fell to 683.7 million pounds in 1999, the industry retained its top rank and recorded a total increase of 116.2 million pounds over the period 1995–1999, the largest of any industry. The increase amounted to a 20.5 percent rise in total releases for 1995–1999.

No other original TRI industry reported a reduction or an increase of comparable size between 1995 and 1999. The next largest absolute reductions were in the “multiple-codes” group, from 157.7 million pounds to 129.1 million pounds, a decline of 28.6 million pounds, and in the furniture industry, from 42.7 million pounds to 15.3 million pounds, a difference of 27.3 million pounds. Over the 1995–1999 period, the decrease for the “multiple-codes” group

Table 5-6. TRI On-site and Off-site Releases, Original Industries, by Industry, 1995 and 1998–1999

| SIC Code Industry | Total On-site and Off-site Releases | | | | | | |
|--------------------------|-------------------------------------|----------------------|----------------------|--------------------|-------------|---------------------|-------------|
| | 1995 | 1998 | 1999 | Change 1998–1999 | | Change 1995–1999 | |
| | Pounds | Pounds | Pounds | Pounds | Percent | Pounds | Percent |
| 20 Food | 122,826,570 | 134,685,697 | 123,241,149 | –11,444,548 | –8.5 | 414,579 | 0.3 |
| 21 Tobacco | 2,142,358 | 3,618,629 | 3,697,630 | 79,001 | 2.2 | 1,555,272 | 72.6 |
| 22 Textiles | 18,793,736 | 12,100,340 | 9,812,749 | –2,287,591 | –18.9 | –8,980,987 | –47.8 |
| 23 Apparel | 1,287,784 | 502,558 | 460,661 | –41,897 | –8.3 | –827,123 | –64.2 |
| 24 Lumber | 35,993,438 | 35,018,765 | 35,249,905 | 231,140 | 0.7 | –743,533 | –2.1 |
| 25 Furniture | 42,672,922 | 17,261,004 | 15,331,402 | –1,929,602 | –11.2 | –27,341,520 | –64.1 |
| 26 Paper | 241,130,582 | 234,255,457 | 225,559,415 | –8,696,042 | –3.7 | –15,571,167 | –6.5 |
| 27 Printing | 31,316,321 | 22,518,392 | 20,677,981 | –1,840,411 | –8.2 | –10,638,340 | –34.0 |
| 28 Chemicals | 828,289,631 | 686,777,949 | 670,529,437 | –16,248,512 | –2.4 | –157,760,194 | –19.0 |
| 29 Petroleum | 66,655,532 | 75,718,581 | 70,540,929 | –5,177,652 | –6.8 | 3,885,397 | 5.8 |
| 30 Plastics | 128,215,794 | 112,004,623 | 103,627,357 | –8,377,266 | –7.5 | –24,588,437 | –19.2 |
| 31 Leather | 4,851,489 | 4,835,113 | 4,380,410 | –454,703 | –9.4 | –471,079 | –9.7 |
| 32 Stone/Clay/Glass | 37,117,116 | 45,143,632 | 42,979,188 | –2,164,444 | –4.8 | 5,862,072 | 15.8 |
| 33 Primary Metals | 567,531,674 | 718,987,188 | 683,732,592 | –35,254,596 | –4.9 | 116,200,918 | 20.5 |
| 34 Fabricated Metals | 106,935,535 | 88,486,037 | 82,229,693 | –6,256,344 | –7.1 | –24,705,842 | –23.1 |
| 35 Machinery | 27,925,318 | 20,144,071 | 15,518,133 | –4,625,938 | –23.0 | –12,407,185 | –44.4 |
| 36 Electrical Equip. | 44,286,449 | 32,558,396 | 41,125,427 | 8,567,031 | 26.3 | –3,161,022 | –7.1 |
| 37 Transportation Equip. | 123,402,295 | 102,625,207 | 104,985,128 | 2,359,921 | 2.3 | –18,417,167 | –14.9 |
| 38 Measure/Photo. | 17,702,014 | 12,423,576 | 10,898,979 | –1,524,597 | –12.3 | –6,803,035 | –38.4 |
| 39 Miscellaneous | 13,974,408 | 10,399,631 | 10,229,122 | –170,509 | –1.6 | –3,745,286 | –26.8 |
| Multiple codes 20–39 | 157,717,666 | 127,497,594 | 129,078,067 | 1,580,473 | 1.2 | –28,639,599 | –18.2 |
| No codes 20–39 | 15,650,750 | 6,575,879 | 34,817,050 | 28,241,171 | 429.5 | 19,166,300 | 122.5 |
| Total | 2,636,419,382 | 2,504,138,319 | 2,438,702,404 | –65,435,915 | –2.6 | –497,716,978 | –7.5 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the “multiple codes” category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the “no codes” category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the “no codes” 20–39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total release amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total releases for manganese compounds from 5,584,900 pounds to below 500 pounds.



amounted to 18.2 percent and that for the furniture industry, to 64.1 percent.

Four industries, in addition to the primary metals industry, showed increases between 1995 and 1999: stone, clay, glass, and concrete products, from 37.1 million pounds to 43.0 million pounds (an increase of 5.9 million pounds, or 15.8 percent); petroleum refining, from 66.7 million pounds to 70.5 million pounds (3.9 million pounds, or 5.8 percent); tobacco products, from 2.1 million pounds to 3.7 million pounds (1.6 million pounds, or 72.6 percent); and the food industry, from 122.8 million pounds to 123.2 million pounds, an increase of about 415,000 pounds, or 0.3 percent.

In two of the five groups that reported increases between 1995 and 1999, the general upward trend was broken in 1998–1999. Total releases by the petroleum refining industry fell from 75.7 million pounds in 1998 to 70.5 million pounds in 1999, a decline of 6.8 percent. Releases from the food industry dropped by 8.5 percent, from 134.7 million pounds in 1998 to 123.2 million pounds in 1999.

On- and Off-site Releases, 1988 and 1995–1999

Table 5–7 summarizes original-industry data for the chemicals that have been reportable since 1988. Between 1988 and 1999, total on- and off-site releases decreased from 3.21 billion pounds to 1.75 billion pounds, a decline of 1.46 billion pounds, or 45.5 percent. The chemical manufacturing industry showed the largest absolute reduction, from 879.2 million pounds in 1988 to 384.5 million pounds in 1999, a decrease of 494.7 million pounds.

This amounted to a reduction of 56.3 percent over the period. Only two other industry groups reported reductions of more than 100 million pounds each between 1988 and 1999. Releases from the “multiple-codes” group fell from 303.2 million pounds to 87.4 million pounds, a decrease of 215.7 million pounds, or 71.2 percent. For transportation equipment, the decrease was from 213.7 million pounds to 98.4 million pounds, a drop of 115.3 million pounds, or 54.0 percent.

Only one industry, food products, recorded an increase over the period 1988–1999 period. Reported releases from the industry declined slightly between 1988 and 1995, from 7.0 million pounds to 6.8 million pounds. They then rose to 21.5 million pounds in 1998 before falling to 11.3 million pounds in 1999. The reduction between 1998 and 1999 was 10.2 million pounds, or 47.5 percent, but over the whole 11-year period, releases rose 4.3 million pounds, or 62.0 percent.

TRI Chemicals Managed in Waste, 2000–2001 Projected, 1995–1998, and 1991–1998

Projected Quantities of TRI Chemicals Managed in Waste, 2000–2001

As described in **Waste Management** in Chapter 1, on each Form R that it submits, a facility reports actual waste management quantities for the current and prior years and projected quantities for the next two years. TRI facilities projected a 1.4 percent increase between 1999 and 2001 in production-related waste managed, from 23.10 billion pounds to 23.42 billion pounds in 2001, as shown in Table 5–8. The amount was expected to decrease by 2.6 percent in 2000,



Table 5-7. TRI On-site and Off-site Releases, Original Industries, by Industry, 1988, 1995 and 1998-1999

| SIC Code | Industry | Total On-site and Off-site Releases | | | | | | | |
|----------|-----------------------|-------------------------------------|----------------------|----------------------|----------------------|--------------------|-------------|-----------------------|--------------|
| | | 1988 | 1995 | 1998 | 1999 | Change 1998-1999 | | Change 1988-1999 | |
| | | Pounds | Pounds | Pounds | Pounds | Pounds | Percent | Pounds | Percent |
| 20 | Food | 6,960,051 | 6,754,069 | 21,466,772 | 11,273,723 | -10,193,049 | -47.5 | 4,313,672 | 62.0 |
| 21 | Tobacco | 214,464 | 142,916 | 185,062 | 184,056 | -1,006 | -0.5 | -30,408 | -14.2 |
| 22 | Textiles | 36,798,254 | 15,917,509 | 10,256,849 | 7,917,290 | -2,339,559 | -22.8 | -28,880,964 | -78.5 |
| 23 | Apparel | 951,662 | 1,260,746 | 385,716 | 253,708 | -132,008 | -34.2 | -697,954 | -73.3 |
| 24 | Lumber | 32,846,967 | 31,372,956 | 31,907,744 | 32,719,762 | 812,018 | 2.5 | -127,205 | -0.4 |
| 25 | Furniture | 62,179,772 | 42,412,333 | 16,959,377 | 15,142,464 | -1,816,913 | -10.7 | -47,037,308 | -75.6 |
| 26 | Paper | 205,183,152 | 181,146,959 | 177,493,380 | 171,397,840 | -6,095,540 | -3.4 | -33,785,312 | -16.5 |
| 27 | Printing | 56,534,465 | 31,055,847 | 22,305,321 | 20,470,554 | -1,834,767 | -8.2 | -36,063,911 | -63.8 |
| 28 | Chemicals | 879,178,871 | 519,013,264 | 398,204,669 | 384,494,232 | -13,710,437 | -3.4 | -494,684,639 | -56.3 |
| 29 | Petroleum | 73,910,911 | 42,426,955 | 41,861,646 | 36,645,595 | -5,216,051 | -12.5 | -37,265,316 | -50.4 |
| 30 | Plastics | 160,548,761 | 114,713,683 | 99,360,082 | 93,220,822 | -6,139,260 | -6.2 | -67,327,939 | -41.9 |
| 31 | Leather | 10,089,020 | 4,418,337 | 4,266,247 | 3,797,296 | -468,951 | -11.0 | -6,291,724 | -62.4 |
| 32 | Stone/Clay/Glass | 37,871,123 | 21,906,899 | 29,118,229 | 27,357,696 | -1,760,533 | -6.0 | -10,513,427 | -27.8 |
| 33 | Primary Metals | 645,267,231 | 495,104,404 | 632,926,129 | 592,574,218 | -40,351,911 | -6.4 | -52,693,013 | -8.2 |
| 34 | Fabricated Metals | 159,981,808 | 95,153,392 | 80,075,950 | 74,904,189 | -5,171,761 | -6.5 | -85,077,619 | -53.2 |
| 35 | Machinery | 70,769,700 | 23,874,525 | 16,730,015 | 12,920,306 | -3,809,709 | -22.8 | -57,849,394 | -81.7 |
| 36 | Electrical Equip. | 128,704,186 | 31,699,285 | 23,260,595 | 29,980,664 | 6,720,069 | 28.9 | -98,723,522 | -76.7 |
| 37 | Transportation Equip. | 213,723,723 | 116,972,513 | 96,258,909 | 98,375,540 | 2,116,631 | 2.2 | -115,348,183 | -54.0 |
| 38 | Measure/Photo. | 56,725,985 | 12,564,459 | 6,939,168 | 5,861,067 | -1,078,101 | -15.5 | -50,864,918 | -89.7 |
| 39 | Miscellaneous | 31,785,682 | 13,390,926 | 9,968,642 | 9,607,043 | -361,599 | -3.6 | -22,178,639 | -69.8 |
| | Multiple codes 20-39 | 303,164,914 | 123,464,135 | 88,752,495 | 87,446,724 | -1,305,771 | -1.5 | -215,718,190 | -71.2 |
| | No codes 20-39 | 39,707,366 | 12,870,367 | 4,515,968 | 33,186,396 | 28,670,428 | 634.9 | -6,520,970 | -16.4 |
| | Total | 3,213,098,068 | 1,937,636,479 | 1,813,198,965 | 1,749,731,185 | -63,467,780 | -3.5 | -1,463,366,883 | -45.5 |

Note: Does not include delisted chemicals, chemicals added in 1990, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid and sulfuric acid. **On-site Releases** are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20-39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total release amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total releases for manganese compounds from 5,584,900 pounds to below 500 pounds.

to 22.50 billion pounds, before rising again. Of the five industry groups that had total releases exceeding 1 billion pounds in 1999, reductions were projected for chemical manufacturing, paper products, and petroleum refining, and increases were projected for the primary metals industry and the "multiple-codes" group.

Primary metals was the industry with the largest projected absolute increase, from 3.52 billion pounds in 1999 to 3.68 billion pounds in 2001, a rise of 167.8 million pounds. Although the amount of production-related waste for this industry was expected to dip in 2000, to 3.50 billion pounds, overall growth for the 1999-2001 period was expected to be 4.8 percent. The next-largest absolute increase projected was



for the food industry, which reported 945.5 million pounds of production-related waste in 1999. The amount was projected to grow by 1.2 percent by 2000, to 956.5 million pounds, but then to jump to 1.37 billion pounds by 2001. The increase of 421.8 million pounds over the 1999–2001 period would represent a rise of 44.6 percent.

The printing industry would experience the third-largest increase in production-related waste, nearly 57 million pounds. The growth from 318.1 million pounds in 1999 to 374.9 million pounds in 2001 would amount to an increase of 17.8 percent. The “multiple-codes” group was expected to see a rise of almost 34 million pounds in production-related waste, from 1.05 billion pounds to 1.08 billion pounds, an increase of 3.2 percent. The increase for electrical equipment industry was projected to be nearly 34 million pounds, from 711.4 million pounds to 745.3 million pounds, a rise of 4.8 percent. For transportation equipment, an increase of almost 12 million pounds was projected, from 306.8 million pounds to 318.7 million pounds, or 3.9 percent. Smaller increases, of less than 10 million pounds, were expected for four other industries.

Other industry groups expected to reduce their production-related waste between 1999 and 2001. The projected declines were more than 10 million pounds for several industries including paper manufacturing, plastics, and fabricated metals.

Production-related waste managed by the paper manufacturing industry was projected to fall from 1.59 billion pounds in 1999 to 1.53 billion pounds in 2001, a difference of 58.6 million pounds, or 3.7 percent. For plastics, the decrease was expected to be

20.6 million pounds, from 246.1 million pounds in 1999 to 225.5 million pounds in 2001, a decline of 8.4 percent.

Quantities of TRI Chemicals in Waste, 1995–1999

As shown in Table 5–9, facilities in the original TRI industries reported managing 22.54 billion pounds of production-related waste in 1995 and 23.10 billion pounds in 1999. The chemical manufacturing industry reported the largest absolute increase during the 1995–1999 period, from 9.53 billion pounds to 11.14 billion pounds, a rise of 1.61 billion pounds, or 16.9 percent. Second was the food products industry, which reported an increase of 808.7 million pounds, from 136.8 million pounds in 1995 to 945.5 million pounds in 1999. The increase amounted to 591.1 percent, the largest percentage change for any of the industries listed. A distant third was the petroleum industry, which reported an increase of 252.8 million pounds, from 947.3 million pounds in 1995 to 1.20 billion pounds in 1999, or 26.7 percent. No other industry reported an increase of more than 30 million pounds for the period.

The “multiple-codes” group (forms reporting more than one two-digit SIC code) recorded the largest absolute reduction in total production-related waste between 1995 and 1999. This group’s forms reported 1.83 billion pounds in 1995 and 1.05 billion pounds in 1999, a decrease of 781.9 million pounds, or 42.7 percent. The primary metals industry had the second largest decrease, 591.9 million pounds, from 4.11 billion pounds in 1995 to 3.52 billion pounds in 1999. This represented a decline of 14.4 percent. Third in absolute reductions was the plastics industry, with a decrease of 296.5 million pounds. The drop



Table 5-8. Current Year and Projected Quantities of TRI Chemicals in Waste, Original Industries, by Industry, 1999-2001

| SIC Code | Industry | Total Production-related Waste Managed | | | | |
|----------|-----------------------|--|-----------------------|-----------------------|-----------------------------|-----------------------------|
| | | Current Year 1999 Pounds | Projected | | | Change 1999-2001 Percent |
| | | | 2000 Pounds | 2001 Pounds | Change 1999-2000 Percent | |
| 20 | Food | 945,458,744 | 956,515,862 | 1,367,304,781 | 1.2 | 44.6 |
| 21 | Tobacco | 5,044,066 | 4,807,872 | 4,827,989 | -4.7 | -4.3 |
| 22 | Textiles | 41,320,670 | 41,149,755 | 40,589,771 | -0.4 | -1.8 |
| 23 | Apparel | 1,712,023 | 1,727,507 | 1,737,624 | 0.9 | 1.5 |
| 24 | Lumber | 59,641,962 | 58,202,427 | 60,615,351 | -2.4 | 1.6 |
| 25 | Furniture | 27,711,017 | 23,275,568 | 22,799,387 | -16.0 | -17.7 |
| 26 | Paper | 1,590,696,876 | 1,538,649,164 | 1,532,075,751 | -3.3 | -3.7 |
| 27 | Printing | 318,114,885 | 346,667,189 | 374,877,662 | 9.0 | 17.8 |
| 28 | Chemicals | 11,137,414,942 | 10,788,253,237 | 10,925,205,928 | -3.1 | -1.9 |
| 29 | Petroleum | 1,200,126,709 | 1,039,457,214 | 1,124,560,749 | -13.4 | -6.3 |
| 30 | Plastics | 246,086,048 | 230,182,484 | 225,454,098 | -6.5 | -8.4 |
| 31 | Leather | 14,477,133 | 14,211,729 | 13,918,647 | -1.8 | -3.9 |
| 32 | Stone/Clay/Glass | 889,183,760 | 885,032,733 | 893,848,610 | -0.5 | 0.5 |
| 33 | Primary Metals | 3,515,901,800 | 3,496,898,737 | 3,683,729,325 | -0.5 | 4.8 |
| 34 | Fabricated Metals | 735,169,413 | 729,182,579 | 722,185,557 | -0.8 | -1.8 |
| 35 | Machinery | 121,058,961 | 116,168,073 | 119,756,792 | -4.0 | -1.1 |
| 36 | Electrical Equip. | 711,414,954 | 716,988,656 | 745,284,087 | 0.8 | 4.8 |
| 37 | Transportation Equip. | 306,798,452 | 313,721,088 | 318,679,702 | 2.3 | 3.9 |
| 38 | Measure/Photo. | 70,670,146 | 70,506,601 | 70,856,667 | -0.2 | 0.3 |
| 39 | Miscellaneous | 49,032,262 | 47,209,916 | 46,433,310 | -3.7 | -5.3 |
| | Multiple codes 20-39 | 1,050,368,336 | 1,041,428,186 | 1,084,287,153 | -0.9 | 3.2 |
| | No codes 20-39 | 61,376,706 | 43,852,910 | 44,164,047 | -28.6 | -28.0 |
| | Total | 23,098,779,865 | 22,504,089,487 | 23,423,192,988 | -2.6 | 1.4 |

Note: Data are from Section 8 (Total of 8.1 through 8.7) of Form R for 1999. Current Year is Column B, 2000 is Column C and 2001 is Column D. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20-39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total production-related waste amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total production-related waste for manganese compounds from 5,584,900 pounds to below 500 pounds.

from 542.6 million pounds in 1995 to 246.1 million pounds in 1999 amounted to a decline of 54.6 percent, the highest percentage decrease among the original industries.

Quantities of TRI Chemicals in Waste, 1991 and 1995-1998

As shown in Table 5-10, total production-related waste managed rose from 17.91 billion pounds in 1991 to 18.83 billion pounds

in 1999, a 5.1 percent increase. This analysis addresses only the chemicals that were reportable in all years, 1991 to 1999.

The "multiple-codes" group reported the largest absolute reduction in total production-related waste managed. This group's forms totaled 1.91 billion pounds of production-related waste in 1991 and 877.0 million pounds in 1999. The reduction of



about 1.04 billion pounds represented a decrease of more than half, 54.2 percent. The plastics industry also reduced its production-related waste by more than half, 53.5 percent. With a drop of 252.3 million pounds between 1991 and 1999—from 471.4 million pounds in 1991 to 219.0 million pounds in 1999—the plastics industry ranked second in absolute reductions.

The petroleum industry ranked third in reductions; its production-related waste decreased from 1.17 billion pounds in 1991 to 989.8 million pounds in 1999. The total decrease of 177.2 million pounds over the period amounted to a 15.2 percent reduction. Between 1995 and 1999, however, the industry's production-related waste rose from 815.0 million pounds to 989.8 million

Table 5-9. Total Production-related Waste Managed, Original Industries, by Industry, 1995 and 1998-1999

| SIC Code | Industry | Total Production-related Waste Managed | | | | | |
|----------|-----------------------|--|-----------------------|-----------------------|--------------------|------------|------------------------|
| | | 1995 | 1998 | 1999 | Change 1998-1999 | | Change 1995-1999 |
| | | Pounds | Pounds | Pounds | Pounds | Percent | Pounds Percent |
| 20 | Food | 136,806,075 | 1,304,299,754 | 945,458,744 | -358,841,010 | -27.5 | 808,652,669 591.1 |
| 21 | Tobacco | 3,061,366 | 5,897,772 | 5,044,066 | -853,706 | -14.5 | 1,982,700 64.8 |
| 22 | Textiles | 55,150,811 | 49,340,819 | 41,320,670 | -8,020,149 | -16.3 | -13,830,141 -25.1 |
| 23 | Apparel | 2,161,558 | 1,820,495 | 1,712,023 | -108,472 | -6.0 | -449,535 -20.8 |
| 24 | Lumber | 112,361,152 | 62,637,123 | 59,641,962 | -2,995,161 | -4.8 | -52,719,190 -46.9 |
| 25 | Furniture | 60,757,162 | 32,459,439 | 27,711,017 | -4,748,422 | -14.6 | -33,046,145 -54.4 |
| 26 | Paper | 1,758,412,836 | 1,479,054,323 | 1,590,696,876 | 111,642,553 | 7.5 | -167,715,960 -9.5 |
| 27 | Printing | 294,766,213 | 300,492,121 | 318,114,885 | 17,622,764 | 5.9 | 23,348,672 7.9 |
| 28 | Chemicals | 9,531,248,520 | 10,658,457,726 | 11,137,414,942 | 478,957,216 | 4.5 | 1,606,166,422 16.9 |
| 29 | Petroleum | 947,285,622 | 1,038,746,885 | 1,200,126,709 | 161,379,824 | 15.5 | 252,841,087 26.7 |
| 30 | Plastics | 542,626,137 | 262,371,142 | 246,086,048 | -16,285,094 | -6.2 | -296,540,089 -54.6 |
| 31 | Leather | 10,331,453 | 10,755,703 | 14,477,133 | 3,721,430 | 34.6 | 4,145,680 40.1 |
| 32 | Stone/Clay/Glass | 863,902,116 | 796,266,984 | 889,183,760 | 92,916,776 | 11.7 | 25,281,644 2.9 |
| 33 | Primary Metals | 4,107,828,450 | 3,599,576,930 | 3,515,901,800 | -83,675,130 | -2.3 | -591,926,650 -14.4 |
| 34 | Fabricated Metals | 764,447,335 | 713,661,894 | 735,169,413 | 21,507,519 | 3.0 | -29,277,922 -3.8 |
| 35 | Machinery | 170,690,285 | 146,965,583 | 121,058,961 | -25,906,622 | -17.6 | -49,631,324 -29.1 |
| 36 | Electrical Equip. | 695,872,529 | 781,666,242 | 711,414,954 | -70,251,288 | -9.0 | 15,542,425 2.2 |
| 37 | Transportation Equip. | 399,130,504 | 297,514,311 | 306,798,452 | 9,284,141 | 3.1 | -92,332,052 -23.1 |
| 38 | Measure/Photo. | 79,445,972 | 74,842,678 | 70,670,146 | -4,172,532 | -5.6 | -8,775,826 -11.0 |
| 39 | Miscellaneous | 52,389,911 | 50,947,108 | 49,032,262 | -1,914,846 | -3.8 | -3,357,649 -6.4 |
| | Multiple codes 20-39 | 1,832,303,176 | 1,076,773,946 | 1,050,368,336 | -26,405,610 | -2.5 | -781,934,840 -42.7 |
| | No codes 20-39 | 115,180,667 | 30,876,676 | 61,376,706 | 30,500,030 | 98.8 | -53,803,961 -46.7 |
| | Total | 22,536,159,850 | 22,775,425,654 | 23,098,779,865 | 323,354,211 | 1.4 | 562,620,015 2.5 |

Note: Data are from Section 8 (total of 8.1 through 8.7) of Form R of year indicated. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category. Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20-39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change total production-related waste amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total production-related waste for manganese compounds from 5,584,900 pounds to below 500 pounds. Seven facilities in the food processing industry (SIC code 20) reported from 150 million pounds to 1 billion pounds each in on-site recycling of n-hexane in 1995, for a total of 4.0 billion pounds. In 1996 these facilities reported no on-site recycling of n-hexane. On their 1996 Form Rs, these facilities also reported zero for on-site recycling of n-hexane for the prior year (1995). However, they have not revised their 1995 form. These amounts of on-site recycling in 1995 have been omitted from this table.



pounds, increasing 16.1 percent in the last year.

Between 1991 and 1999, other industries reported decreases of more than 100 million pounds including machinery (a decline of 152.3 million pounds, or 58.1 percent) and the stone, clay, glass, and concrete group (a decrease of 126.0 million pounds, or 12.9 percent).

The largest absolute increase in production-related waste between 1991 and 1999—about 2.10 billion pounds—was reported by the chemical manufacturing industry. Its total rose from 6.86 billion pounds to 8.95 billion pounds, an increase of 30.3 percent. The primary metals industry had the second-largest increase, about 838.3 million pounds. Its production-related waste rose from 2.32 billion pounds in 1991 to 3.16 billion pounds in 1999, a 36.2 percent

Table 5-10. Total Production-related Waste Managed, Original Industries, by Industry, 1991, 1995 and 1998-1999

| SIC Code | Industry | Total Production-related Waste Managed | | | | | | | |
|----------|-----------------------|--|-----------------------|-----------------------|-----------------------|--------------------|------------|--------------------|------------|
| | | 1991 | 1995 | 1998 | 1999 | Change 1998-1999 | | Change 1991-1999 | |
| | | Pounds | Pounds | Pounds | Pounds | Pounds | Percent | Pounds | Percent |
| 20 | Food | 34,030,866 | 54,870,869 | 85,307,686 | 66,123,801 | -19,183,885 | -22.5 | 32,092,935 | 94.3 |
| 21 | Tobacco | 51,388,971 | 169,261 | 193,470 | 185,491 | -7,979 | -4.1 | -51,203,480 | -99.6 |
| 22 | Textiles | 46,542,986 | 44,062,387 | 42,525,705 | 35,426,982 | -7,098,723 | -16.7 | -11,116,004 | -23.9 |
| 23 | Apparel | 2,284,692 | 2,106,759 | 1,632,105 | 1,398,157 | -233,948 | -14.3 | -886,535 | -38.8 |
| 24 | Lumber | 59,992,495 | 108,841,005 | 60,012,518 | 56,835,760 | -3,176,758 | -5.3 | -3,156,735 | -5.3 |
| 25 | Furniture | 61,297,883 | 60,041,328 | 31,977,087 | 27,350,378 | -4,626,709 | -14.5 | -33,947,505 | -55.4 |
| 26 | Paper | 1,381,526,976 | 1,309,311,403 | 1,282,125,764 | 1,392,598,205 | 110,472,441 | 8.6 | 11,071,229 | 0.8 |
| 27 | Printing | 258,847,784 | 291,431,644 | 299,229,547 | 316,166,258 | 16,936,711 | 5.7 | 57,318,474 | 22.1 |
| 28 | Chemicals | 6,864,419,809 | 7,308,331,935 | 8,494,597,668 | 8,946,237,562 | 451,639,894 | 5.3 | 2,081,817,753 | 30.3 |
| 29 | Petroleum | 1,166,992,745 | 814,951,500 | 852,228,535 | 989,803,680 | 137,575,145 | 16.1 | -177,189,065 | -15.2 |
| 30 | Plastics | 471,361,440 | 498,338,513 | 233,487,822 | 219,020,288 | -14,467,534 | -6.2 | -252,341,152 | -53.5 |
| 31 | Leather | 17,878,399 | 7,025,037 | 6,357,174 | 10,884,687 | 4,527,513 | 71.2 | -6,993,712 | -39.1 |
| 32 | Stone/Clay/Glass | 973,517,811 | 839,829,747 | 758,453,750 | 847,543,492 | 89,089,742 | 11.7 | -125,974,319 | -12.9 |
| 33 | Primary Metals | 2,318,461,645 | 3,174,533,241 | 3,248,311,739 | 3,156,767,694 | -91,544,045 | -2.8 | 838,306,049 | 36.2 |
| 34 | Fabricated Metals | 577,710,938 | 674,521,043 | 669,846,491 | 692,674,442 | 22,827,951 | 3.4 | 114,963,504 | 19.9 |
| 35 | Machinery | 261,885,615 | 156,608,789 | 134,952,542 | 109,627,942 | -25,324,600 | -18.8 | -152,257,673 | -58.1 |
| 36 | Electrical Equip. | 672,688,221 | 584,251,230 | 674,122,398 | 630,274,036 | -43,848,362 | -6.5 | -42,414,185 | -6.3 |
| 37 | Transportation Equip. | 378,444,124 | 374,408,086 | 278,070,502 | 289,166,623 | 11,096,121 | 4.0 | -89,277,501 | -23.6 |
| 38 | Measure/Photo. | 116,365,141 | 69,734,482 | 62,842,869 | 59,143,750 | -3,699,119 | -5.9 | -57,221,391 | -49.2 |
| 39 | Miscellaneous | 67,562,403 | 49,482,747 | 48,058,590 | 46,359,139 | -1,699,451 | -3.5 | -21,203,264 | -31.4 |
| | Multiple codes 20-39 | 1,914,546,773 | 1,271,967,092 | 869,100,658 | 876,956,089 | 7,855,431 | 0.9 | -1,037,590,684 | -54.2 |
| | No codes 20-39 | 208,496,326 | 107,152,545 | 25,629,796 | 55,558,337 | 29,928,541 | 116.8 | -152,937,989 | -73.4 |
| | Total | 17,906,244,043 | 17,801,970,643 | 18,159,064,416 | 18,826,102,793 | 667,038,377 | 3.7 | 919,858,750 | 5.1 |

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid and sulfuric acid. Data are from Section 8 (total of 8.1 through 8.7) of Form R of year indicated. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Forms with no 2-digit SIC code within the range 20 to 39 are assigned to the "no codes" category.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the "no codes" 20-39 category were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's total production-related waste amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising total production-related waste for manganese compounds from 5,584,900 pounds to below 500 pounds.



increase. In the last year, however, the total decreased by 2.8 percent. The fabricated metals industry had the third largest absolute increase, reporting 577.7 million pounds in 1991 and 692.7 million pounds in 1999. The rise of 115.0 million pounds amounted to a 19.9 percent increase in production-related waste. No other original industry reported an increase of more than 100 million pounds.

Economic Overview, by Industry, Multi-Year Comparisons

U.S. economic expansion continued in 1999, with 4.2 percent real growth (adjusted for inflation) in gross domestic product (*Economic Report of the President*, January 2001). As shown in Table 5–11, manufacturing production also continued to increase, for all industry groups except tobacco, leather, printing, fabricated metals, and textiles.

Table 5–11 presents production indexes for each industrial sector from 1991 to 1999.

During this period, production increased 47.9 percent for U.S. manufacturing overall. Table 5–12 compares the change in manufacturing production since 1991 with the change in TRI quantities released on- and off-site and in TRI total production-related waste managed. As shown in Table 5–12, the quantity released on- and off-site steadily decreased (except for a very small increase between 1996 and 1997), even as manufacturing production expanded. Overall, while production rose 47.9 percent, TRI facilities reported a decrease of 28.3 percent in quantity released on- and off-site since 1991. Although the total quantity of production-related waste that facilities managed rose, by 5.1 percent, the overall increase was considerably smaller than the nation's increase in manufacturing production. While manufacturing production steadily increased from 1991 to 1999, for a gain of 47.9 percent over the period, TRI production-related waste decreased in about half of the years. Increases in 1994, 1997, 1998 and 1999, however, led to an overall increase for the period.



Table 5-11. Industrial Production Indexes by Industry, 1991-1999

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total Index | 100.0 | 103.1 | 106.6 | 112.5 | 117.9 | 123.1 | 131.0 | 136.5 | 141.3 |
| Manufacturing | 100.0 | 104.0 | 107.8 | 114.3 | 120.4 | 126.1 | 135.2 | 141.8 | 147.9 |
| SIC Code Industry | | | | | | | | | |
| 20 Food | 100.0 | 101.6 | 103.7 | 105.4 | 107.5 | 107.1 | 109.6 | 111.1 | 111.9 |
| 21 Tobacco | 100.0 | 101.1 | 85.0 | 105.6 | 113.0 | 114.8 | 114.2 | 107.4 | 95.3 |
| 22 Textiles | 100.0 | 107.9 | 113.6 | 119.3 | 118.9 | 117.3 | 120.7 | 119.6 | 119.6 |
| 23 Apparel | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 24 Lumber | 100.0 | 105.8 | 106.7 | 112.1 | 114.2 | 116.5 | 121.7 | 125.4 | 128.7 |
| 25 Furniture | 100.0 | 105.5 | 110.7 | 114.0 | 117.5 | 119.3 | 124.5 | 128.7 | 132.4 |
| 26 Paper | 100.0 | 103.3 | 107.4 | 112.0 | 113.2 | 112.4 | 118.1 | 118.7 | 120.0 |
| 27 Printing | 100.0 | 100.9 | 101.6 | 101.6 | 102.2 | 102.2 | 106.2 | 106.1 | 105.3 |
| 28 Chemicals | 100.0 | 103.7 | 105.4 | 108.7 | 111.4 | 113.9 | 118.9 | 119.4 | 121.9 |
| 29 Petroleum | 100.0 | 100.9 | 103.8 | 103.6 | 105.4 | 107.8 | 111.8 | 114.3 | 115.7 |
| 30 Plastics | 100.0 | 110.3 | 117.9 | 128.4 | 132.0 | 135.9 | 141.6 | 146.9 | 151.8 |
| 31 Leather | 100.0 | 101.6 | 102.6 | 95.1 | 88.3 | 88.9 | 85.0 | 78.4 | 70.9 |
| 32 Stone/clay/glass | 100.0 | 102.9 | 105.0 | 111.0 | 114.3 | 117.9 | 124.0 | NA | NA |
| 33 Primary metals | 100.0 | 103.4 | 108.7 | 117.7 | 120.2 | 123.7 | 131.0 | 129.9 | 130.9 |
| 34 Fabricated metals | 100.0 | 104.0 | 108.5 | 116.6 | 121.0 | 124.9 | 131.1 | 133.9 | 133.8 |
| 35 Machinery | 100.0 | 104.8 | 115.4 | 131.7 | 150.6 | 167.3 | 186.9 | 216.4 | 241.2 |
| 36 Electrical Equip. | 100.0 | 111.6 | 122.1 | 145.6 | 184.9 | 230.6 | 290.2 | 351.7 | 435.5 |
| 37 Transportation Equip. | 100.0 | 103.6 | 107.3 | 111.4 | 110.6 | 111.5 | 121.3 | 126.0 | 126.8 |
| 38 Measure/Photo. | 100.0 | 100.2 | 101.0 | 100.0 | 103.8 | 107.8 | 109.8 | 112.8 | 116.7 |
| 39 Miscellaneous | 100.0 | 101.6 | 107.4 | 111.8 | 115.5 | 120.7 | 127.9 | NA | NA |

Note: From 2000 Statistical Abstract of the United States, No. 1238. *Industrial Production Indexes, by Industry: 1990 to 1999* (<<http://www.census.gov/prod/www/statistical-abstract-us.html>>, accessed February 24, 2001).

NA—data not provided.

Table 5-12. Cumulative Change in Manufacturing Production and in TRI Quantities in Waste Managed, 1991-1999

| | 1991-1992 | 1992-1993 | 1993-1994 | 1994-1995 | 1995-1996 | 1996-1997 | 1997-1998 | 1998-1999 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Manufacturing Production | 4.0 | 3.8 | 6.5 | 6.0 | 5.7 | 9.1 | 6.5 | 6.1 |
| TRI Quantity Released On- and Off-site | -8.5 | -7.6 | -1.1 | -3.3 | -3.4 | 0.3 | -3.0 | -5.5 |
| TRI Total Production-related Waste Managed | -2.4 | -0.6 | 6.6 | -3.8 | -1.7 | 2.8 | 0.9 | 3.7 |

Note: From 2000 Statistical Abstract of the United States, No. 1238. *Industrial Production Indexes, by Industry: 1990 to 1999* (<<http://www.census.gov/prod/www/statistical-abstract-us.html>>, accessed February 24, 2001).

Appendix A

**Chemical-specific TRI
Release and Waste
Management Data, 1988, 1995,
1998, and 1999**



Appendix A –Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|-----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 71751-41-2 * | Abamectin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 1 | 250 | 0 | 0 | 251 | 0 | 251 |
| | | 98o | 3 | 1 | 250 | 0 | 0 | 251 | 0 | 251 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 1 | 250 | 0 | 0 | 251 | 0 | 251 |
| | | 99n | No reports | | | | | | | |
| 30560-19-1 * | Acephate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 2,250 | 0 | 0 | 0 | 2,250 | 1,000 | 3,250 |
| | | 98o | 7 | 1,775 | 0 | 0 | 0 | 1,775 | 0 | 1,775 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 7 | 645 | 0 | 0 | 0 | 645 | 0 | 645 |
| | | 99n | No reports | | | | | | | |
| 75-07-0 **,* | Acetaldehyde | 88 | 67 | 6,951,807 | 98,236 | 2,219,105 | 194,958 | 9,464,106 | 24,930 | 9,489,036 |
| | | 95 | 238 | 13,435,389 | 227,200 | 605,886 | 155,320 | 14,423,795 | 1,099 | 14,424,894 |
| | | 98o | 272 | 12,657,793 | 192,606 | 412,152 | 21,557 | 13,284,108 | 5,901 | 13,290,009 |
| | | 98n | 5 | 2,233 | 0 | 0 | 0 | 2,233 | 7 | 2,240 |
| | | 99o | 278 | 11,943,416 | 228,291 | 754,277 | 11,745 | 12,937,729 | 4,215 | 12,941,944 |
| | | 99n | 5 | 697 | 1 | 0 | 0 | 698 | 179 | 877 |
| 60-35-5 ** | Acetamide | 88 | 1 | 0 | 0 | 0 | 0 | 0 | 250 | 250 |
| | | 95 | 5 | 8 | 0 | 920,000 | 0 | 920,008 | 0 | 920,008 |
| | | 98o | 9 | 106 | 1 | 2,157,694 | 0 | 2,157,801 | 0 | 2,157,801 |
| | | 98n | 3 | 63 | 0 | 0 | 25,474 | 25,537 | 10 | 25,547 |
| | | 99o | 10 | 107 | 1 | 2,452,733 | 0 | 2,452,841 | 0 | 2,452,841 |
| | | 99n | 2 | 51 | 0 | 0 | 0 | 51 | 2 | 53 |
| 75-05-8 | Acetonitrile | 88 | 67 | 2,194,739 | 42,223 | 16,739,010 | 1,790 | 18,977,762 | 416,333 | 19,394,095 |
| | | 95 | 89 | 1,038,942 | 7,324 | 30,336,181 | 12 | 31,382,459 | 10,971 | 31,393,430 |
| | | 98o | 110 | 1,029,234 | 28,862 | 20,733,190 | 33 | 21,791,319 | 35,073 | 21,826,392 |
| | | 98n | 22 | 4,406 | 0 | 1,240,903 | 0 | 1,245,309 | 29,981 | 1,275,290 |
| | | 99o | 111 | 877,756 | 14,031 | 19,487,584 | 223 | 20,379,594 | 658,202 | 21,037,796 |
| | | 99n | 23 | 4,907 | 1 | 49,874 | 0 | 54,782 | 53,815 | 108,597 |
| 98-86-2 * | Acetophenone | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 39 | 205,888 | 971 | 629,201 | 3,369 | 839,429 | 19,427 | 858,856 |
| | | 98o | 46 | 138,515 | 655 | 732,358 | 0 | 871,528 | 49,744 | 921,272 |
| | | 98n | 6 | 33,106 | 0 | 1,649 | 0 | 34,755 | 0 | 34,755 |
| | | 99o | 43 | 178,003 | 699 | 627,563 | 0 | 806,265 | 35,156 | 841,421 |
| | | 99n | 5 | 5 | 1 | 62,265 | 0 | 62,271 | 4 | 62,275 |
| 53-96-3 | 2-Acetylaminofluorene | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 110 | 0 | 0 | 8,500 | 8,610 | 1,205 | 9,815 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 4 | 139 | 1 | 0 | 38,197 | 38,337 | 20,648 | 58,985 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Abamectin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 6,425 | 10,152 | 29 | 16,606 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 6,230 | 4,165 | 28 | 10,423 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 4,918 | 3,589 | 23 | 8,530 | 0 |
| | 99n | No reports | | | | | | | | |
| * Acephate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 10 | 0 | 0 | 0 | 183,000 | 15,728 | 1,409 | 200,147 | 0 |
| | 98o | 90 | 0 | 0 | 0 | 9,800 | 12,683 | 2,186 | 24,759 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 70 | 0 | 0 | 0 | 7,500 | 17,922 | 426 | 25,918 | 1 |
| | 99n | No reports | | | | | | | | |
| *,** Acetaldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 10,000 | 32,190 | 9,239,285 | 358,459 | 14,510,964 | 1,755,026 | 14,441,699 | 40,347,623 | 1,691 |
| | 98o | 14,000 | 694 | 10,275,584 | 266,784 | 17,029,181 | 1,672,903 | 13,358,695 | 42,617,841 | 1,174 |
| | 98n | 0 | 0 | 0 | 12,964,868 | 166,000 | 45 | 2,281 | 13,133,194 | 1 |
| | 99o | 17,183 | 1,460 | 14,573,471 | 245,738 | 23,464,460 | 1,431,358 | 13,055,672 | 52,789,342 | 139 |
| | 99n | 0 | 0 | 130 | 0 | 256,700 | 0 | 875 | 257,705 | 1 |
| ** Acetamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 1,000 | 0 | 0 | 130 | 920,000 | 921,130 | 0 |
| | 98o | 0 | 0 | 81,220 | 40,954 | 2 | 362 | 2,157,761 | 2,280,299 | 0 |
| | 98n | 0 | 0 | 0 | 21,133 | 90,561 | 0 | 25,547 | 137,241 | 1 |
| | 99o | 0 | 0 | 80,637 | 44,923 | 2 | 575 | 2,452,836 | 2,578,973 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 166,642 | 0 | 53 | 166,695 | 0 |
| Acetonitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,309,962 | 2,071,150 | 23,162,787 | 4,704,330 | 11,104,608 | 5,742,679 | 31,934,516 | 82,030,032 | 1,076 |
| | 98o | 12,941,704 | 1,880,831 | 20,414,930 | 7,032,353 | 19,270,706 | 7,630,788 | 22,923,308 | 92,094,620 | 1,030 |
| | 98n | 196,874 | 0 | 5,904 | 4,526,522 | 1,973,227 | 371,049 | 1,275,755 | 8,349,331 | 1 |
| | 99o | 12,141,069 | 2,000,134 | 41,499,091 | 7,788,191 | 20,402,846 | 8,480,280 | 21,189,784 | 113,501,395 | 66 |
| | 99n | 515,017 | 0 | 34,700 | 5,257,192 | 2,844,093 | 93,449 | 59,490 | 8,803,941 | 11 |
| * Acetophenone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 920,000 | 9,710 | 24,949,642 | 1,171,212 | 1,313,510 | 185,062 | 886,541 | 29,435,677 | 519 |
| | 98o | 0 | 3,448 | 32,071,882 | 1,355,425 | 719,096 | 161,672 | 929,213 | 35,240,736 | 0 |
| | 98n | 0 | 0 | 0 | 59,772 | 137,644 | 0 | 34,752 | 232,168 | 1 |
| | 99o | 0 | 3,683 | 33,367,740 | 1,435,519 | 866,050 | 178,690 | 858,798 | 36,710,480 | 8 |
| | 99n | 0 | 0 | 0 | 0 | 95,167 | 0 | 62,048 | 157,215 | 0 |
| 2-Acetylaminofluorene | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 310 | 41 | 9,800 | 10,151 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 99,902 | 0 | 58,981 | 158,883 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 62476-59-9 * | Acifluorfen, sodium salt | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 60 | 5 | 0 | 5 | 70 | 0 | 70 |
| | | 98o | 4 | 476 | 2,193 | 0 | 17 | 2,686 | 421,514 | 424,200 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 315 | 4,757 | 0 | 0 | 5,072 | 222,680 | 227,752 |
| | | 99n | No reports | | | | | | | |
| 107-02-8 * | Acrolein | 88 | 12 | 33,652 | 0 | 68,950 | 500 | 103,102 | 0 | 103,102 |
| | | 95 | 21 | 71,302 | 4 | 83,465 | 0 | 154,771 | 0 | 154,771 |
| | | 98o | 29 | 184,134 | 270 | 95,900 | 1,351 | 281,655 | 665 | 282,320 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 30 | 204,777 | 255 | 170,950 | 429 | 376,411 | 139 | 376,550 |
| | | 98n | No reports | | | | | | | |
| 79-06-1 *,** | Acrylamide | 88 | 59 | 26,019 | 3,124 | 2,198,000 | 756 | 2,227,899 | 97,582 | 2,325,481 |
| | | 95 | 82 | 19,083 | 1,801 | 6,279,626 | 235 | 6,300,745 | 3,083 | 6,303,828 |
| | | 98o | 78 | 23,349 | 2,272 | 6,333,564 | 0 | 6,359,185 | 6,789 | 6,365,974 |
| | | 98n | 7 | 129 | 0 | 0 | 0 | 129 | 172 | 301 |
| | | 99o | 80 | 22,458 | 369 | 7,510,853 | 22 | 7,533,702 | 2,224 | 7,535,926 |
| | | 99n | 10 | 2,416 | 1 | 0 | 6,267 | 8,684 | 3,920 | 12,604 |
| 79-10-7 | Acrylic acid | 88 | 158 | 800,046 | 16,646 | 22,262,010 | 15,950 | 23,094,652 | 134,139 | 23,228,791 |
| | | 95 | 189 | 528,058 | 2,648 | 7,840,000 | 47 | 8,370,753 | 45,395 | 8,416,148 |
| | | 98o | 195 | 322,224 | 6,973 | 4,499,600 | 79 | 4,828,876 | 81,666 | 4,910,542 |
| | | 98n | 14 | 368 | 0 | 44 | 48,617 | 49,029 | 5,995 | 55,024 |
| | | 99o | 199 | 366,380 | 6,734 | 2,630,949 | 1,030 | 3,005,093 | 219,423 | 3,224,516 |
| | | 99n | 11 | 158 | 1 | 0 | 0 | 159 | 688 | 847 |
| 107-13-1 *,** | Acrylonitrile | 88 | 113 | 4,796,161 | 6,531 | 4,562,713 | 2,150 | 9,367,555 | 151,450 | 9,519,005 |
| | | 95 | 105 | 1,532,128 | 7,137 | 5,193,028 | 618 | 6,732,911 | 4,917 | 6,737,828 |
| | | 98o | 105 | 1,152,724 | 1,100 | 4,005,290 | 321 | 5,159,435 | 8,156 | 5,167,591 |
| | | 98n | 11 | 1,264 | 0 | 0 | 0 | 1,264 | 917 | 2,181 |
| | | 99o | 104 | 978,026 | 1,172 | 4,462,492 | 560 | 5,442,250 | 84,849 | 5,527,099 |
| | | 99n | 13 | 1,015 | 1 | 0 | 23,244 | 24,260 | 13,570 | 37,830 |
| 15972-60-8 * | Alachlor | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 756 | 280 | 0 | 0 | 1,036 | 2,940 | 3,976 |
| | | 98o | 2 | 1,510 | 220 | 0 | 0 | 1,730 | 9,100 | 10,830 |
| | | 98n | 3 | 54 | 0 | 0 | 0 | 54 | 613 | 667 |
| | | 99o | 2 | 755 | 390 | 0 | 0 | 1,145 | 1,270 | 2,415 |
| | | 99n | 3 | 42 | 0 | 0 | 0 | 42 | 655 | 697 |
| 116-06-3 * | Aldicarb | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 3,477 | 0 | 0 | 6 | 3,483 | 0 | 3,483 |
| | | 98o | 3 | 154 | 0 | 0 | 15 | 169 | 0 | 169 |
| | | 98n | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99o | 3 | 171 | 0 | 0 | 256 | 427 | 0 | 427 |
| | | 99n | 3 | 6 | 0 | 0 | 0 | 6 | 156 | 162 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Acifluorfen, sodium salt | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 600 | 1,272 | 65 | 1,937 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 13,105 | 3,237 | 423,965 | 440,307 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 45,498 | 1,891 | 227,507 | 274,896 | 0 |
| | 99n | No reports | | | | | | | | |
| * Acrolein | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,800 | 0 | 3,752,847 | 43,323 | 5,168,260 | 11,361 | 154,579 | 9,135,170 | 86 |
| | 98o | 0 | 0 | 3,712,551 | 38,933 | 16,430,612 | 12 | 278,469 | 20,460,577 | 194 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 4,878,507 | 176,954 | 8,581,456 | 211 | 365,014 | 14,002,142 | 16 |
| | 98n | No reports | | | | | | | | |
| *** Acrylamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,037 | 0 | 820 | 43,304 | 187,170 | 210,284 | 6,305,564 | 6,751,179 | 3,985 |
| | 98o | 162 | 144 | 90,200 | 6,627 | 160,009 | 311,267 | 6,363,850 | 6,932,259 | 49,724 |
| | 98n | 0 | 0 | 0 | 228,142 | 62,489 | 0 | 291 | 290,922 | 1 |
| | 99o | 3 | 0 | 94,233 | 9,777 | 134,468 | 234,039 | 7,536,297 | 8,008,817 | 2 |
| | 99n | 0 | 0 | 0 | 51,885 | 148,301 | 45,117 | 10,310 | 255,613 | 0 |
| Acrylic acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,339,863 | 34,800 | 26,544,419 | 5,033,613 | 26,801,813 | 471,136 | 8,407,802 | 70,633,446 | 3,411 |
| | 98o | 4,863,156 | 0 | 31,350,455 | 5,916,104 | 24,168,363 | 2,077,125 | 4,895,656 | 73,270,859 | 6,994 |
| | 98n | 0 | 101,540 | 1,605 | 659,051 | 452,945 | 9,417 | 63,584 | 1,288,142 | 1 |
| | 99o | 4,680,911 | 120 | 20,851,955 | 6,323,120 | 32,320,082 | 1,201,617 | 3,235,863 | 68,613,668 | 111,055 |
| | 99n | 0 | 52,100 | 1,323 | 37,623 | 1,082,263 | 89 | 697 | 1,174,095 | 1 |
| *** Acrylonitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 12,408,043 | 69,716 | 3,326,652 | 666,245 | 10,647,695 | 1,131,550 | 6,769,787 | 35,019,688 | 8,110 |
| | 98o | 12,827,695 | 190 | 4,841,082 | 158,067 | 10,880,197 | 872,541 | 5,135,764 | 34,715,536 | 1,573 |
| | 98n | 0 | 0 | 0 | 24,762 | 433,873 | 1,519,681 | 2,043 | 1,980,359 | 0 |
| | 99o | 12,435,645 | 0 | 3,909,625 | 211,021 | 11,415,674 | 1,743,040 | 8,476,594 | 38,191,599 | 81,964 |
| | 99n | 0 | 0 | 0 | 52,049 | 766,904 | 16,283 | 36,383 | 871,619 | 0 |
| * Alachlor | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 5,481 | 120,000 | 217,179 | 3,930 | 346,590 | 30,000 |
| | 98o | 0 | 0 | 0 | 0 | 17,300 | 181,800 | 10,830 | 209,930 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 64,944 | 0 | 183 | 65,127 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 11,000 | 139,100 | 2,401 | 152,501 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 261,537 | 0 | 197 | 261,734 | 0 |
| * Aldicarb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 580 | 20,011 | 3,472 | 24,063 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 502 | 40,611 | 149 | 41,262 | 10 |
| | 98n | 0 | 0 | 0 | 0 | 16,633 | 0 | 1 | 16,634 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 376 | 19,953 | 166 | 20,495 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 170,879 | 0 | 162 | 171,041 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|-------------|--------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 309-00-2 * | Aldrin | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 3 | 307 | 7 | 0 | 22,000 | 22,314 | 3,308 | 25,622 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28057-48-9 | d-trans-Allethrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 107-18-6 * | Allyl alcohol | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 31 | 168,141 | 6,519 | 298,801 | 1,100 | 474,561 | 11,296 | 485,857 |
| | | 98o | 32 | 262,353 | 9,688 | 424,120 | 0 | 696,161 | 16 | 696,177 |
| | | 98n | 4 | 111 | 0 | 39,734 | 0 | 39,845 | 0 | 39,845 |
| | | 99o | 29 | 263,169 | 5,041 | 595,114 | 755 | 864,079 | 28 | 864,107 |
| | | 99n | 5 | 520 | 0 | 4,832 | 0 | 5,352 | 16,195 | 21,547 |
| 107-11-9 | Allylamine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 2 | 951 | 40 | 0 | 0 | 991 | 0 | 991 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 1,040 | 450 | 0 | 0 | 1,490 | 0 | 1,490 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 107-05-1 | Allyl chloride | 88 | 20 | 149,369 | 430 | 250 | 200 | 150,249 | 747 | 150,996 |
| | | 95 | 21 | 52,698 | 95 | 0 | 481 | 53,274 | 13 | 53,287 |
| | | 98o | 24 | 70,809 | 5 | 0 | 2 | 70,816 | 860 | 71,676 |
| | | 98n | 2 | 91 | 0 | 0 | 0 | 91 | 864 | 955 |
| | | 99o | 27 | 79,237 | 25 | 0 | 0 | 79,262 | 1,586 | 80,848 |
| | | 99n | 3 | 253 | 1 | 0 | 8,189 | 8,443 | 4,526 | 12,969 |
| 7429-90-5 * | Aluminum (fume or dust) | 88 | 357 | 3,681,998 | 91,518 | 250 | 3,177,625 | 6,951,391 | 14,482,254 | 21,433,645 |
| | | 95 | 330 | 1,976,660 | 36,979 | 250 | 1,872,773 | 3,886,662 | 6,293,022 | 10,179,684 |
| | | 98o | 321 | 1,302,266 | 3,618 | 0 | 1,907,917 | 3,213,801 | 6,802,860 | 10,016,661 |
| | | 98n | 17 | 109,949 | 0 | 5 | 3,752,538 | 3,862,492 | 41,326 | 3,903,818 |
| | | 99o | 333 | 5,634,715 | 4,753 | 0 | 1,346,058 | 6,985,526 | 13,809,568 | 20,795,094 |
| | | 99n | 12 | 1,144,097 | 0 | 0 | 4,283,907 | 5,428,004 | 18,368 | 5,446,372 |
| 1344-28-1 | Aluminum oxide (fibrous forms) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 60 | 133,416 | 2,805 | 0 | 593,000 | 729,221 | 4,499,941 | 5,229,162 |
| | | 98o | 54 | 26,665 | 750 | 0 | 46,575 | 73,990 | 2,936,026 | 3,010,016 |
| | | 98n | 12 | 285 | 0 | 0 | 15,572,355 | 15,572,640 | 141,030 | 15,713,670 |
| | | 99o | 50 | 112,241 | 756 | 0 | 55,341 | 168,338 | 2,879,680 | 3,048,018 |
| | | 99n | 12 | 338 | 0 | 0 | 30,727,558 | 30,727,896 | 347,172 | 31,075,068 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Aldrin | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 1 | 77,986 | 110 | 26,045 | 104,142 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 53,598 | 0 | 0 | 53,598 | 0 |
| d-trans-Allethrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Allyl alcohol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 189,517 | 0 | 1,531,138 | 363,377 | 1,414,321 | 422,499 | 486,288 | 4,407,140 | 133 |
| | 98o | 248,764 | 0 | 1,413,165 | 1,168,713 | 1,157,533 | 173,575 | 653,664 | 4,815,414 | 2 |
| | 98n | 0 | 0 | 0 | 61,206 | 76,299 | 0 | 39,841 | 177,346 | 0 |
| | 99o | 340,364 | 0 | 1,844,591 | 1,028,462 | 924,753 | 133,150 | 814,620 | 5,085,940 | 751 |
| | 99n | 0 | 0 | 0 | 46,358 | 3,239,971 | 61,976 | 21,540 | 3,369,845 | 0 |
| Allylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 360 | 0 | 991 | 1,351 | 0 |
| | 98n | 0 | 0 | 0 | 5 | 20 | 0 | 0 | 25 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 4,000 | 0 | 1,274 | 5,274 | 0 |
| | 99n | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Allyl chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 520,000 | 0 | 186,000 | 1,756 | 750,979 | 412,357 | 52,568 | 1,923,660 | 65 |
| | 98o | 780,000 | 68,000 | 5,349,016 | 321,228 | 243,860 | 194,934 | 70,054 | 7,027,092 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 127,076 | 282 | 955 | 128,313 | 0 |
| | 99o | 23,000 | 44,000 | 157,078 | 236,934 | 301,187 | 648,363 | 78,649 | 1,489,211 | 1,001 |
| | 99n | 0 | 0 | 0 | 0 | 192,972 | 1,090 | 12,967 | 207,029 | 0 |
| * Aluminum (fume or dust) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 15,378,165 | 24,327,521 | 0 | 164,604 | 15,628,491 | 332,192 | 8,051,958 | 63,882,931 | 714 |
| | 98o | 15,726,178 | 29,635,638 | 0 | 4,267 | 18,287,637 | 176,034 | 9,868,341 | 73,698,095 | 29,317 |
| | 98n | 0 | 210,000 | 0 | 0 | 226,635 | 550 | 3,781,933 | 4,219,118 | 10,984 |
| | 99o | 15,508,535 | 28,604,288 | 0 | 5,058 | 21,798,263 | 425,726 | 19,199,937 | 85,541,807 | 25 |
| | 99n | 1,013,539 | 0 | 0 | 0 | 289,500 | 127,156 | 4,320,550 | 5,750,745 | 1 |
| Aluminum oxide (fibrous forms) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 25,100 | 15,627 | 0 | 9,991 | 21,448 | 2,986,600 | 2,315,726 | 5,374,492 | 7 |
| | 98o | 7,716,545 | 254,780 | 0 | 0 | 0 | 1,147,081 | 2,000,733 | 11,119,139 | 3 |
| | 98n | 102,013 | 12,691 | 0 | 13,033 | 46,453 | 552,561 | 15,725,611 | 16,452,362 | 0 |
| | 99o | 12,612,150 | 496,257 | 0 | 1,111 | 217 | 845,798 | 1,910,982 | 15,866,515 | 1 |
| | 99n | 4 | 1,731 | 0 | 0 | 909,390 | 1,205,831 | 30,944,181 | 33,061,137 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|--------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 20859-73-8 * | Aluminum phosphide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 153 | 157 |
| 834-12-8 * | Ametryn | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 836 | 83 | 0 | 5 | 924 | 250 | 1,174 |
| | | 98o | 5 | 1,168 | 51 | 0 | 0 | 1,219 | 0 | 1,219 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 1,460 | 16 | 0 | 0 | 1,476 | 0 | 1,476 |
| | | 99n | No reports | | | | | | | |
| 60-09-3 ** | 4-Aminoazobenzene | 88 | 1 | 0 | 0 | 537 | 0 | 537 | 0 | 537 |
| | | 95 | 1 | 0 | 0 | 64 | 0 | 64 | 0 | 64 |
| | | 98o | 2 | 0 | 0 | 124 | 0 | 124 | 0 | 124 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 287 | 0 | 287 | 0 | 287 |
| | | 99n | No reports | | | | | | | |
| 92-67-1 ** | 4-Aminobiphenyl | 88 | 1 | 10 | 0 | 4 | 0 | 14 | 0 | 14 |
| | | 95 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 2 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 13 | 0 | 13 | 0 | 13 |
| | | 99n | No reports | | | | | | | |
| 33089-61-1 * | Amitraz | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 61-82-5 **,* | Amitrole | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 168 | 176 |
| 7664-41-7 * | Ammonia | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2,940 | 159,200,954 | 9,320,538 | 23,959,031 | 5,588,138 | 198,068,661 | 1,600,225 | 199,668,886 |
| | | 98o | 2,726 | 153,291,641 | 7,383,797 | 25,647,620 | 3,268,821 | 189,591,879 | 2,017,531 | 191,609,410 |
| | | 98n | 262 | 5,756,672 | 364,668 | 502,580 | 1,339,588 | 7,963,508 | 29,639 | 7,993,147 |
| | | 99o | 2,610 | 144,234,446 | 7,649,385 | 25,635,785 | 2,871,729 | 180,391,345 | 3,106,589 | 183,497,934 |
| | | 99n | 249 | 6,666,922 | 268,326 | 610,000 | 3,781,015 | 11,326,263 | 221,689 | 11,547,952 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site Pounds | Total Production-related Waste Managed Pounds | Non-production-related Waste Managed Pounds |
|----------------------|------|----------------|-----------------|-----------------|-----------------|----------------|-----------------|---|---|---|
| | | On-site Pounds | Off-site Pounds | On-site Pounds | Off-site Pounds | On-site Pounds | Off-site Pounds | | | |
| * Aluminum phosphide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 66,262 | 0 | 28,100 | 94,362 | 0 |
| * Ametryn | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 108,500 | 12,502 | 256 | 121,258 | 1 |
| | 98o | 25 | 0 | 0 | 0 | 120,083 | 85,000 | 592 | 205,700 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 25 | 0 | 0 | 0 | 46,079 | 12,000 | 801 | 58,905 | 0 |
| | 99n | No reports | | | | | | | | |
| ** 4-Aminoazobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3 | 0 | 64 | 67 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 74 | 124 | 198 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 67 | 287 | 354 | 0 |
| | 99n | No reports | | | | | | | | |
| ** 4-Aminobiphenyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 91,000 | 0 | 2 | 91,002 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 98,000 | 810 | 0 | 98,810 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 124,926 | 48 | 13 | 124,987 | 0 |
| | 99n | No reports | | | | | | | | |
| * Amitraz | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| *** Amitrole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 22,788 | 0 | 1 | 22,789 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 205,239 | 0 | 170 | 205,409 | 0 |
| * Ammonia | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 190,464,294 | 12,036,036 | 43,263,891 | 112,865 | 308,699,468 | 18,737,292 | 198,317,491 | 771,631,337 | 1,096,464 |
| | 98o | 342,121,789 | 10,214,289 | 103,213,049 | 150,020 | 271,591,316 | 17,260,247 | 196,040,261 | 940,590,971 | 515,621 |
| | 98n | 7,858,375 | 1,883 | 0 | 97,656 | 5,093,107 | 91,284 | 7,900,197 | 21,042,502 | 61,159 |
| | 99o | 208,384,055 | 7,750,820 | 89,129,210 | 134,609 | 306,220,697 | 16,191,460 | 185,216,055 | 813,026,906 | 517,454 |
| | 99n | 7,480,382 | 368 | 0 | 9,769 | 6,261,581 | 173,273 | 11,526,954 | 25,452,327 | 1,639 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|--------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 62-53-3 * | Aniline | 88 | 68 | 712,769 | 16,105 | 3,582,975 | 12,822 | 4,324,671 | 346,206 | 4,670,877 |
| | | 95 | 67 | 200,799 | 8,943 | 1,221,381 | 4,193 | 1,435,316 | 21,600 | 1,456,916 |
| | | 98o | 69 | 216,517 | 19,549 | 1,076,445 | 252 | 1,312,763 | 25,401 | 1,338,164 |
| | | 98n | 12 | 696 | 0 | 85,466 | 0 | 86,162 | 1,479 | 87,641 |
| | | 99o | 70 | 176,497 | 15,782 | 533,803 | 1,013 | 727,095 | 55,479 | 782,574 |
| | | 99n | 10 | 302 | 1 | 0 | 0 | 303 | 344 | 647 |
| 90-04-0 ** | o-Anisidine | 88 | 6 | 2,293 | 285 | 0 | 250 | 2,828 | 3 | 2,831 |
| | | 95 | 7 | 1,031 | 74 | 0 | 0 | 1,105 | 3 | 1,108 |
| | | 98o | 7 | 1,373 | 39 | 0 | 0 | 1,412 | 2 | 1,414 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 7 | 1,587 | 14 | 0 | 0 | 1,601 | 1 | 1,602 |
| | | 99n | No reports | | | | | | | |
| 104-94-9 | p-Anisidine | 88 | 2 | 10 | 250 | 0 | 250 | 510 | 0 | 510 |
| | | 95 | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 1 | 45 | 0 | 0 | 0 | 45 | 0 | 45 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 120-12-7 | Anthracene | 88 | 139 | 199,823 | 4,382 | 0 | 10,905 | 215,110 | 204,665 | 419,775 |
| | | 95 | 70 | 81,471 | 4,943 | 0 | 939 | 87,353 | 48,140 | 135,493 |
| | | 98o | 69 | 56,059 | 580 | 0 | 3,564 | 60,203 | 69,966 | 130,169 |
| | | 98n | 3 | 15 | 0 | 0 | 0 | 15 | 0 | 15 |
| | | 99o | 67 | 75,827 | 515 | 0 | 3,185 | 79,527 | 65,057 | 144,584 |
| | | 99n | 4 | 303 | 0 | 0 | 166,319 | 166,622 | 7,172 | 173,794 |
| 7440-36-0 | Antimony | 88 | 152 | 69,916 | 11,114 | 2,100 | 903,916 | 987,046 | 625,682 | 1,612,728 |
| | | 95 | 134 | 34,310 | 6,592 | 0 | 18,786 | 59,688 | 122,755 | 182,443 |
| | | 98o | 118 | 7,015 | 14,471 | 0 | 30,542 | 52,028 | 321,459 | 373,487 |
| | | 98n | 11 | 78 | 47 | 18,994 | 1,226,450 | 1,245,569 | 72,946 | 1,318,515 |
| | | 99o | 122 | 9,106 | 13,411 | 0 | 56,885 | 79,402 | 331,101 | 410,503 |
| | | 99n | 6 | 93 | 0 | 0 | 715,803 | 715,896 | 19,118 | 735,014 |
| -- | Antimony compounds | 88 | 272 | 166,290 | 31,178 | 9,200 | 1,935,018 | 2,141,686 | 2,281,080 | 4,422,766 |
| | | 95 | 561 | 105,476 | 33,705 | 11,332 | 1,598,569 | 1,749,082 | 3,425,678 | 5,174,760 |
| | | 98o | 588 | 73,626 | 33,435 | 11,298 | 1,242,642 | 1,361,001 | 3,524,101 | 4,885,102 |
| | | 98n | 57 | 11,794 | 22,136 | 170,062 | 23,472,944 | 23,676,936 | 179,968 | 23,856,904 |
| | | 99o | 581 | 116,799 | 31,374 | 62,911 | 980,943 | 1,192,027 | 3,034,587 | 4,226,614 |
| | | 99n | 62 | 14,064 | 31,354 | 610,086 | 27,110,578 | 27,766,082 | 373,803 | 28,139,885 |
| 7440-38-2 ** | Arsenic | 88 | 78 | 7,687 | 1,282 | 0 | 181,267 | 190,236 | 65,342 | 255,578 |
| | | 95 | 94 | 7,121 | 368 | 0 | 27,356 | 34,845 | 81,878 | 116,723 |
| | | 98o | 50 | 16,672 | 533 | 0 | 5,065 | 22,270 | 117,860 | 140,130 |
| | | 98n | 35 | 40,200 | 1,334 | 269,393 | 76,489,637 | 76,800,564 | 194,051 | 76,994,615 |
| | | 99o | 54 | 1,257 | 547 | 0 | 76,294 | 78,098 | 99,163 | 177,261 |
| | | 99n | 24 | 5,547 | 505 | 250 | 35,645,402 | 35,651,704 | 393,702 | 36,045,406 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Aniline | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 7,243,251 | 0 | 7,419,516 | 354,598 | 3,749,706 | 1,258,936 | 1,455,266 | 21,481,273 | 1,148 |
| | 98o | 7,549,987 | 2 | 8,579,301 | 2,940,299 | 3,611,723 | 3,537,666 | 1,358,868 | 27,577,846 | 6,698 |
| | 98n | 0 | 0 | 0 | 17,825 | 837,519 | 305,538 | 86,786 | 1,247,668 | 0 |
| | 99o | 9,876,710 | 0 | 7,785,942 | 2,307,087 | 3,248,988 | 3,625,271 | 769,364 | 27,613,362 | 8,993 |
| | 99n | 0 | 0 | 0 | 57,303 | 638,618 | 0 | 136 | 696,057 | 0 |
| ** o-Anisidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 143 | 0 | 14,704 | 5,100 | 1,061 | 21,008 | 0 |
| | 98o | 0 | 0 | 2,756 | 0 | 991 | 5,176 | 1,413 | 10,336 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 2,398 | 0 | 376 | 7,083 | 1,602 | 11,459 | 0 |
| | 99n | No reports | | | | | | | | |
| p-Anisidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 18 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 61 | 0 | 45 | 106 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| Anthracene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 176,705 | 20,744 | 183,121 | 200,541 | 1,693,357 | 5,084 | 115,722 | 2,395,274 | 34,354 |
| | 98o | 244,557 | 33,782 | 333,554 | 97,248 | 100,138 | 63,167 | 130,316 | 1,002,762 | 2 |
| | 98n | 0 | 0 | 0 | 0 | 4,354 | 37 | 8 | 4,399 | 1 |
| | 99o | 599,528 | 30,256 | 237,242 | 162,322 | 78,457 | 25,067 | 148,881 | 1,281,753 | 3 |
| | 99n | 0 | 0 | 0 | 0 | 228,324 | 215 | 173,562 | 402,101 | 0 |
| Antimony | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,831,021 | 5,483,416 | 0 | 1,730 | 818,680 | 95,864 | 127,061 | 10,357,772 | 463 |
| | 98o | 4,625,143 | 727,639 | 30,405 | 66,692 | 308,925 | 52,241 | 340,759 | 6,151,804 | 12 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 38,018 | 1,284,899 | 1,322,917 | 1 |
| | 99o | 5,276,182 | 1,167,889 | 0 | 0 | 351,900 | 108,459 | 289,408 | 7,193,838 | 13 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 734,829 | 734,829 | 0 |
| Antimony compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,373,201 | 3,311,424 | 0 | 50,997 | 79,188 | 939,909 | 4,047,038 | 13,801,757 | 27,841 |
| | 98o | 4,885,114 | 3,998,003 | 6,820 | 16,879 | 566,509 | 503,989 | 4,533,424 | 14,510,738 | 142,994 |
| | 98n | 10,441 | 0 | 0 | 0 | 16,484 | 8 | 23,852,433 | 23,879,366 | 159 |
| | 99o | 5,050,525 | 3,858,336 | 0 | 53,103 | 470,311 | 521,640 | 3,679,812 | 13,633,727 | 213,256 |
| | 99n | 11,713 | 14,752 | 0 | 0 | 0 | 470 | 27,836,527 | 27,863,462 | 300,004 |
| ** Arsenic | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,072,279 | 162,386 | 7,700 | 496 | 13,030 | 45,969 | 66,757 | 1,368,617 | 749 |
| | 98o | 3,403,468 | 205,974 | 0 | 0 | 64,685 | 3,058 | 223,391 | 3,900,576 | 2,534 |
| | 98n | 542,954 | 0 | 0 | 0 | 60,800 | 17,033 | 76,970,133 | 77,590,920 | 6 |
| | 99o | 1,502,341 | 567,744 | 0 | 0 | 74,034 | 3,652 | 183,470 | 2,331,241 | 1,172 |
| | 99n | 0 | 142,814 | 0 | 0 | 0 | 111,931 | 36,300,636 | 36,555,381 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|------------------------|------|--------------------|---------------------|--------------------------|-----------------------|------------------|------------------------|--------------------------------|--|
| | | | | Total Air Emissions | Surface Water Discharges | Underground Injection | Releases to Land | Total On-site Releases | Transfers Off-site to Disposal | |
| | | | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | |
| — | Arsenic compounds | 88 | 274 | 268,528 | 6,243 | 27,400 | 4,946,184 | 5,248,355 | 1,407,110 | 6,655,465 |
| | | 95 | 305 | 83,604 | 4,825 | 55,000 | 1,723,347 | 1,866,776 | 1,556,589 | 3,423,365 |
| | | 98o | 347 | 106,913 | 5,628 | 173,100 | 7,126,553 | 7,412,194 | 681,955 | 8,094,149 |
| | | 98n | 205 | 200,500 | 159,881 | 760,075 | 549,575,334 | 550,695,790 | 1,458,492 | 552,154,282 |
| | | 99o | 324 | 91,617 | 15,584 | 198,310 | 9,278,202 | 9,583,713 | 1,974,759 | 11,558,472 |
| | | 99n | 197 | 199,876 | 168,073 | 880,034 | 555,749,965 | 556,997,948 | 1,593,746 | 558,591,694 |
| 1332-21-4 | *** Asbestos (friable) | 88 | 146 | 48,496 | 10,699 | 0 | 2,111,880 | 2,171,075 | 12,135,707 | 14,306,782 |
| | | 95 | 74 | 5,950 | 1 | 0 | 131,404 | 137,355 | 4,860,165 | 4,997,520 |
| | | 98o | 66 | 2,563 | 1 | 0 | 610,368 | 612,932 | 8,319,951 | 8,932,883 |
| | | 98n | 15 | 138 | 0 | 0 | 13,527,501 | 13,527,639 | 155,028 | 13,682,667 |
| | | 99o | 74 | 3,389 | 0 | 0 | 326,186 | 329,575 | 4,843,382 | 5,172,957 |
| | | 99n | 13 | 43 | 0 | 0 | 13,247,597 | 13,247,640 | 1 | 13,247,641 |
| 1912-24-9 | * Atrazine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 20 | 22,689 | 1,656 | 0 | 637,036 | 661,381 | 101,631 | 763,012 |
| | | 98o | 23 | 30,971 | 2,756 | 336 | 554,456 | 588,519 | 15,780 | 604,299 |
| | | 98n | 5 | 12 | 0 | 0 | 73,687 | 73,699 | 3,690 | 77,389 |
| | | 99o | 23 | 20,915 | 1,212 | 172 | 599,739 | 622,038 | 22,795 | 644,833 |
| | | 99n | 5 | 31 | 0 | 0 | 44,173 | 44,204 | 133 | 44,337 |
| 7440-39-3 | Barium | 88 | 142 | 266,811 | 18,650 | 0 | 6,721,686 | 7,007,147 | 1,883,903 | 8,891,050 |
| | | 95 | 77 | 175,350 | 6,279 | 0 | 227,523 | 409,152 | 492,999 | 902,151 |
| | | 98o | 70 | 54,419 | 7,807 | 0 | 285,353 | 347,579 | 447,682 | 795,261 |
| | | 98n | 58 | 198,123 | 141,206 | 25,000 | 9,299,213 | 9,663,542 | 1,358,670 | 11,022,212 |
| | | 99o | 68 | 79,390 | 2,157 | 0 | 501,295 | 582,842 | 820,282 | 1,403,124 |
| | | 99n | 44 | 181,781 | 55,281 | 24,153 | 5,459,880 | 5,721,095 | 1,831,394 | 7,552,489 |
| — | Barium compounds | 88 | 629 | 1,027,722 | 104,302 | 2,773 | 5,791,655 | 6,926,452 | 17,532,268 | 24,458,720 |
| | | 95 | 592 | 373,750 | 108,121 | 83,000 | 1,707,447 | 2,272,318 | 6,544,688 | 8,817,006 |
| | | 98o | 699 | 803,592 | 1,096,433 | 35,400 | 6,913,852 | 8,849,277 | 6,089,036 | 14,938,313 |
| | | 98n | 443 | 2,218,734 | 1,003,832 | 1,286,250 | 169,589,111 | 174,097,927 | 37,843,055 | 211,940,982 |
| | | 99o | 679 | 850,760 | 1,120,204 | 268 | 6,070,833 | 8,042,065 | 6,867,428 | 14,909,493 |
| | | 99n | 438 | 2,223,524 | 1,062,123 | 1,982,650 | 245,824,805 | 251,093,102 | 35,831,029 | 286,924,131 |
| 22781-23-3 | * Bendiocarb | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 555 | 0 | 0 | 0 | 555 | 0 | 555 |
| | | 98o | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| | | 98n | 1 | 3 | 0 | 0 | 0 | 3 | 10 | 13 |
| | | 99o | 3 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99n | 1 | 11 | 0 | 0 | 0 | 11 | 10 | 21 |
| 1861-40-1 | * Benfluralin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 8 | 2,977 | 0 | 0 | 0 | 2,977 | 14,000 | 16,977 |
| | | 98o | 8 | 1,564 | 0 | 0 | 0 | 1,564 | 3 | 1,567 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 9 | 1,231 | 0 | 0 | 0 | 1,231 | 5 | 1,236 |
| | | 98n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Arsenic compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,446,334 | 300,321 | 0 | 231 | 227,628 | 1,302,233 | 2,883,568 | 7,160,315 | 93,392 |
| | 98o | 2,534,030 | 858,825 | 0 | 0 | 68,912 | 121,938 | 7,033,868 | 10,617,573 | 2,154,034 |
| | 98n | 58,677 | 12 | 0 | 1 | 43,270 | 7,039 | 552,256,545 | 552,365,544 | 43 |
| | 99o | 3,529,653 | 1,087,793 | 300 | 0 | 78,979 | 202,247 | 7,917,170 | 12,816,142 | 2,438,639 |
| | 99n | 65,746 | 351 | 0 | 0 | 0 | 474 | 559,062,571 | 559,129,142 | 5,200,019 |
| *,** Asbestos (friable) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 398,800 | 0 | 0 | 0 | 1,548,870 | 1,102 | 4,280,979 | 6,229,751 | 176,200 |
| | 98o | 375,107 | 150 | 0 | 0 | 1,207,292 | 362 | 6,740,866 | 8,323,777 | 2,206,599 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 13,527,516 | 13,527,516 | 3 |
| | 99o | 251,379 | 145 | 0 | 0 | 606,068 | 29,132 | 3,437,254 | 4,323,978 | 389,333 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 13,300,010 | 13,300,010 | 0 |
| * Atrazine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 73 | 0 | 0 | 0 | 556,057 | 180,643 | 685,144 | 1,421,917 | 17,002 |
| | 98o | 250 | 0 | 0 | 0 | 654,669 | 213,479 | 612,381 | 1,480,779 | 254 |
| | 98n | 0 | 0 | 0 | 0 | 268,583 | 10 | 77,389 | 345,982 | 0 |
| | 99o | 2,250 | 0 | 0 | 0 | 510,071 | 190,895 | 679,522 | 1,382,738 | 252 |
| | 99n | 0 | 0 | 0 | 0 | 146,907 | 10 | 44,337 | 191,254 | 0 |
| Barium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 14,719 | 448,944 | 0 | 102 | 43,195 | 37,552 | 774,572 | 1,319,084 | 5 |
| | 98o | 159,389 | 413,535 | 601,788 | 418 | 399,046 | 120,846 | 1,012,348 | 2,707,370 | 652 |
| | 98n | 4,992 | 437,318 | 0 | 0 | 376,908 | 289,982 | 10,731,478 | 11,840,678 | 10 |
| | 99o | 164,889 | 70,441 | 0 | 0 | 34,104 | 105,417 | 1,614,604 | 1,989,455 | 6 |
| | 99n | 28,292 | 819,285 | 0 | 0 | 1,177,015 | 167,327 | 6,778,677 | 8,970,596 | 17 |
| Barium compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 26,521,724 | 2,173,955 | 200 | 66,358 | 6,364,467 | 3,498,239 | 8,131,099 | 46,756,042 | 33,069 |
| | 98o | 35,285,575 | 6,231,998 | 19,138 | 90,616 | 5,780,159 | 809,953 | 15,024,115 | 63,241,554 | 540 |
| | 98n | 569,437 | 794,202 | 0 | 34,332 | 435,153 | 199,747 | 211,215,186 | 213,248,057 | 24,198 |
| | 99o | 52,052,240 | 2,646,444 | 6,000 | 139,668 | 5,021,774 | 693,028 | 16,717,428 | 77,276,582 | 14,167 |
| | 99n | 553,901 | 2,212,564 | 0 | 0 | 37,315 | 219,843 | 288,206,503 | 291,230,126 | 11,304 |
| * Bendiocarb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 560 | 0 | 0 | 0 | 0 | 0 | 560 | 1,120 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 580 | 0 | 580 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 581 | 0 | 581 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 56,392 | 0 | 11 | 56,403 | 0 |
| * Benfluralin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,205 | 0 | 0 | 0 | 6,200 | 175 | 16,910 | 27,490 | 4 |
| | 98o | 79,000 | 0 | 0 | 0 | 31 | 897 | 1,347 | 81,275 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 87,000 | 0 | 0 | 0 | 0 | 335 | 1,223 | 88,558 | 0 |
| | 98n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|---------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 17804-35-2 * | Benomyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | 1 | 10 | 0 | 0 | 0 | 10 | 5 | 15 |
| | | 99o | 3 | 7 | 0 | 0 | 0 | 7 | 0 | 7 |
| | | 99n | 2 | 0 | 0 | 0 | 0 | 0 | 254 | 254 |
| 98-87-3 | Benzal chloride | 88 | 3 | 5,258 | 0 | 0 | 0 | 5,258 | 7,308 | 12,566 |
| | | 95 | 4 | 1,112 | 0 | 0 | 0 | 1,112 | 0 | 1,112 |
| | | 98o | 3 | 398 | 0 | 0 | 0 | 398 | 0 | 398 |
| | | 98n | 3 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 99o | 3 | 387 | 0 | 0 | 0 | 387 | 0 | 387 |
| | | 99n | 1 | 23 | 0 | 0 | 0 | 23 | 22 | 45 |
| 55-21-0 | Benzamide | 88 | 1 | 500 | 250 | 250 | 0 | 1,000 | 750 | 1,750 |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 71-43-2 ** | Benzene | 88 | 484 | 32,341,184 | 46,732 | 825,035 | 126,728 | 33,339,679 | 396,880 | 33,736,559 |
| | | 95 | 476 | 9,410,086 | 21,290 | 282,642 | 18,583 | 9,732,601 | 71,391 | 9,803,992 |
| | | 98o | 484 | 7,239,578 | 15,070 | 504,109 | 237,544 | 7,996,301 | 130,443 | 8,126,744 |
| | | 98n | 523 | 362,733 | 3,943 | 71,697 | 2,727 | 441,100 | 67,440 | 508,540 |
| | | 99o | 487 | 7,287,778 | 13,647 | 617,825 | 18,732 | 7,937,982 | 71,349 | 8,009,331 |
| | | 99n | 490 | 353,408 | 14,291 | 222,803 | 555,127 | 1,145,629 | 71,868 | 1,217,497 |
| 92-87-5 | Benzidine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 4 | 38 | 0 | 0 | 0 | 38 | 0 | 38 |
| | | 99o | 2 | 7 | 0 | 0 | 0 | 7 | 0 | 7 |
| | | 99n | 4 | 6 | 0 | 0 | 0 | 6 | 165 | 171 |
| 98-07-7 ** | Benzoic trichloride | 88 | 4 | 24,963 | 0 | 0 | 0 | 24,963 | 9,777 | 34,740 |
| | | 95 | 7 | 6,496 | 0 | 0 | 0 | 6,496 | 250 | 6,746 |
| | | 98o | 6 | 2,253 | 0 | 0 | 0 | 2,253 | 330 | 2,583 |
| | | 98n | 2 | 2 | 0 | 0 | 0 | 2 | 110 | 112 |
| | | 99o | 6 | 2,175 | 0 | 0 | 0 | 2,175 | 400 | 2,575 |
| | | 99n | 4 | 9 | 0 | 0 | 0 | 9 | 172 | 181 |
| 98-88-4 | Benzoyl chloride | 88 | 22 | 33,014 | 0 | 130,000 | 250 | 163,264 | 2,399 | 165,663 |
| | | 95 | 22 | 16,749 | 0 | 0 | 0 | 16,749 | 1,460 | 18,209 |
| | | 98o | 25 | 11,905 | 0 | 0 | 0 | 11,905 | 0 | 11,905 |
| | | 98n | 1 | 88 | 0 | 0 | 0 | 88 | 3,980 | 4,068 |
| | | 99o | 22 | 10,351 | 0 | 0 | 0 | 10,351 | 0 | 10,351 |
| | | 99n | 2 | 74 | 0 | 0 | 0 | 74 | 2,393 | 2,467 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Benomyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 482,000 | 122,000 | 0 | 604,000 | 0 |
| | 98o | 0 | 0 | 45,000 | 65,600 | 20,200 | 20,263 | 1 | 151,064 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 95,374 | 0 | 20 | 95,394 | 0 |
| | 99o | 0 | 0 | 0 | 107,108 | 13,757 | 16,128 | 7 | 137,000 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 31,995 | 0 | 16 | 32,011 | 0 |
| Benzal chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 260,000 | 2,800 | 0 | 1,105 | 263,905 | 0 |
| | 98o | 0 | 0 | 0 | 120,000 | 84,000 | 200 | 400 | 204,600 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 235,247 | 0 | 20 | 235,267 | 0 |
| | 99o | 0 | 0 | 0 | 550,000 | 83,000 | 74 | 388 | 633,462 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 676,990 | 0 | 45 | 677,035 | 0 |
| Benzamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| *,** Benzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 47,987,022 | 420,034 | 20,222,877 | 1,579,955 | 54,065,446 | 1,974,430 | 9,795,515 | 136,045,279 | 65,962 |
| | 98o | 36,113,609 | 640,449 | 16,882,843 | 1,086,608 | 47,608,948 | 3,810,819 | 8,133,354 | 114,276,630 | 51,769 |
| | 98n | 962,014 | 502,057 | 569,513 | 8,432,613 | 3,913,360 | 304,222 | 912,873 | 15,596,652 | 35,039 |
| | 99o | 36,876,512 | 616,713 | 24,765,316 | 1,124,480 | 48,417,541 | 3,247,161 | 8,021,586 | 123,069,309 | 67,208 |
| | 99n | 2,304,682 | 56,328 | 619,481 | 1,494,490 | 5,573,726 | 971,250 | 698,228 | 11,718,185 | 23,414 |
| Benzidine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 101,123 | 58 | 34 | 101,215 | 1 |
| | 99o | 0 | 0 | 89,000 | 0 | 5,538 | 60 | 2 | 94,600 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 311,452 | 0 | 169 | 311,621 | 0 |
| ** Benzoic trichloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 3,001 | 150,000 | 32 | 6,242 | 159,275 | 0 |
| | 98o | 0 | 0 | 0 | 20,000 | 160,000 | 34,870 | 2,557 | 217,427 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 15,768 | 0 | 112 | 15,880 | 0 |
| | 99o | 0 | 0 | 0 | 20,000 | 110,000 | 1,608 | 2,572 | 134,180 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 176,025 | 0 | 178 | 176,203 | 0 |
| Benzoyl chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 80 | 1,676,545 | 615,127 | 18,213 | 2,309,965 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 2,011,461 | 498,362 | 11,903 | 2,521,726 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 570,508 | 0 | 4,068 | 574,576 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 2,370,374 | 336,441 | 10,370 | 2,717,185 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 504,005 | 0 | 2,469 | 506,474 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|-----------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 94-36-0 * | Benzoyl peroxide | 88 | 50 | 6,294 | 0 | 5,350 | 36,050 | 47,694 | 23,954 | 71,648 |
| | | 95 | 64 | 2,043 | 255 | 0 | 10,345 | 12,643 | 4,760 | 17,403 |
| | | 98o | 59 | 803 | 250 | 0 | 736 | 1,789 | 6,046 | 7,835 |
| | | 98n | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 58 | 251 | 250 | 0 | 117 | 618 | 5,423 | 6,041 |
| | | 99n | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 100-44-7 | Benzyl chloride | 88 | 51 | 43,329 | 640 | 0 | 500 | 44,469 | 9,687 | 54,156 |
| | | 95 | 48 | 19,664 | 40 | 0 | 247 | 19,951 | 3,870 | 23,821 |
| | | 98o | 45 | 26,888 | 347 | 150 | 261 | 27,646 | 4,506 | 32,152 |
| | | 98n | 3 | 41 | 250 | 0 | 0 | 291 | 1 | 292 |
| | | 99o | 38 | 26,278 | 1,207 | 270 | 214 | 27,969 | 1,260 | 29,229 |
| | | 99n | 6 | 23 | 1 | 0 | 0 | 24 | 177 | 201 |
| 7440-41-7 ** | Beryllium | 88 | 12 | 2,763 | 74 | 0 | 37,000 | 39,837 | 3,160 | 42,997 |
| | | 95 | 10 | 1,087 | 31 | 0 | 21,255 | 22,373 | 7,595 | 29,968 |
| | | 98o | 14 | 799 | 26 | 0 | 57,818 | 58,643 | 20,404 | 79,047 |
| | | 98n | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 15 | 769 | 57 | 0 | 53,271 | 54,097 | 20,081 | 74,178 |
| | | 99n | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| — | ** Beryllium compounds | 88 | 5 | 862 | 17 | 0 | 12,000 | 12,879 | 8,261 | 21,140 |
| | | 95 | 7 | 360 | 2 | 0 | 23,000 | 23,362 | 2,391 | 25,753 |
| | | 98o | 8 | 383 | 6 | 0 | 0 | 389 | 6,754 | 7,143 |
| | | 98n | 53 | 20,999 | 1,859 | 0 | 733,229 | 756,087 | 91,333 | 847,420 |
| | | 99o | 16 | 473 | 27 | 4,100 | 19 | 4,619 | 5,028 | 9,647 |
| | | 99n | 57 | 7,343 | 3,483 | 0 | 822,928 | 833,754 | 49,840 | 883,594 |
| 82657-04-3 * | Bifenthrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 10 | 0 | 0 | 5 | 15 | 0 | 15 |
| | | 98o | 5 | 760 | 5 | 0 | 0 | 765 | 0 | 765 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 19 | 19 |
| | | 99o | 5 | 546 | 0 | 0 | 0 | 546 | 0 | 546 |
| | | 99n | No reports | | | | | | | |
| 92-52-4 * | Biphenyl | 88 | 181 | 1,211,292 | 88,197 | 82,760 | 222,297 | 1,604,546 | 227,492 | 1,832,038 |
| | | 95 | 136 | 744,993 | 6,242 | 30,337 | 71,864 | 853,436 | 38,088 | 891,524 |
| | | 98o | 122 | 536,524 | 4,105 | 29,574 | 1,159 | 571,362 | 49,880 | 621,242 |
| | | 98n | 10 | 36 | 0 | 0 | 0 | 36 | 55 | 91 |
| | | 99o | 124 | 675,326 | 8,949 | 4,177 | 24 | 688,476 | 56,857 | 745,333 |
| | | 99n | 10 | 3,348 | 0 | 0 | 2 | 3,350 | 2,615 | 5,965 |
| 111-91-1 | Bis(2-chloroethoxy)-methane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 12,510 | 0 | 250 | 0 | 12,760 | 0 | 12,760 |
| | | 98o | 1 | 1,434 | 0 | 930 | 1,024 | 3,388 | 0 | 3,388 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 1 | 1,312 | 0 | 3,697 | 0 | 5,009 | 0 | 5,009 |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 4 | 7 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Benzoyl peroxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,600 | 10,800 | 863 | 1,520 | 57,214 | 42,461 | 16,769 | 134,227 | 1 |
| | 98o | 10,364 | 0 | 0 | 1,191 | 86,629 | 49,139 | 8,972 | 156,295 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 12,360 | 0 | 0 | 12,360 | 0 |
| | 99o | 6,935 | 0 | 0 | 1,885 | 124,112 | 91,458 | 6,476 | 230,866 | 3 |
| | 99n | 0 | 0 | 0 | 0 | 15,291 | 0 | 2 | 15,293 | 0 |
| Benzyl chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,000 | 0 | 25,481 | 430,300 | 256,947 | 11,027 | 21,421 | 746,176 | 81 |
| | 98o | 4,800 | 0 | 17,000 | 420,878 | 250,910 | 76,610 | 31,360 | 801,558 | 2 |
| | 98n | 0 | 0 | 0 | 0 | 483,947 | 0 | 66 | 484,013 | 0 |
| | 99o | 0 | 0 | 0 | 392,457 | 169,516 | 37,127 | 28,550 | 627,650 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 678,251 | 0 | 198 | 678,449 | 0 |
| ** Beryllium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 39,689 | 19,263 | 0 | 0 | 780 | 423 | 27,369 | 87,524 | 0 |
| | 98o | 160,399 | 84,146 | 0 | 0 | 10 | 8 | 63,356 | 307,919 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 101,065 | 24,154 | 0 | 0 | 0 | 966 | 66,436 | 192,621 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ** | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 7 | 23,880 | 0 | 0 | 0 | 1,011 | 24,661 | 49,559 | 0 |
| | 98o | 0 | 26,450 | 0 | 0 | 0 | 1,090 | 1,833 | 29,373 | 1 |
| | 98n | 9,700 | 0 | 0 | 0 | 194 | 0 | 846,933 | 856,827 | 308 |
| | 99o | 0 | 38,384 | 0 | 0 | 0 | 1,349 | 8,089 | 47,822 | 2 |
| | 99n | 9,700 | 0 | 0 | 0 | 0 | 0 | 898,112 | 907,812 | 9 |
| * Bifenthrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 20 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 402 | 230 | 632 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 11,275 | 0 | 19 | 11,294 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 1 | 2,069 | 71 | 2,141 | 0 |
| | 99n | No reports | | | | | | | | |
| * Biphenyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 268,053 | 156,081 | 1,088,381 | 346,055 | 963,993 | 615,716 | 904,745 | 4,343,024 | 11,639 |
| | 98o | 306,564 | 260,334 | 1,209,699 | 131,946 | 495,349 | 764,962 | 626,662 | 3,795,516 | 3,939 |
| | 98n | 0 | 0 | 0 | 12,840 | 279,525 | 263 | 89 | 292,717 | 0 |
| | 99o | 446,648 | 245,973 | 2,098,273 | 150,054 | 663,883 | 610,722 | 764,610 | 4,980,163 | 4,190 |
| | 99n | 0 | 0 | 0 | 42,583 | 711,018 | 2,824 | 3,152 | 759,577 | 5 |
| Bis(2-chloroethoxy)-methane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 12,796 | 12,796 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 15 | 3,388 | 3,403 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 5,009 | 5,009 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 28,000 | 0 | 2 | 28,002 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|---------------------------------------|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On- site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 111-44-4 * | Bis(2-chloroethyl) ether | 88 | 8 | 4,922 | 1,351 | 0 | 0 | 6,273 | 0 | 6,273 |
| | | 95 | 11 | 564 | 3 | 0 | 0 | 567 | 0 | 567 |
| | | 98o | 11 | 844 | 4 | 0 | 0 | 848 | 1 | 849 |
| | | 98n | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 12 | 353 | 23 | 0 | 0 | 376 | 296 | 672 |
| | | 99n | 3 | 11 | 1 | 0 | 0 | 12 | 17 | 29 |
| 542-88-1 ** | Bis(chloromethyl) ether | 88 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 153 | 157 |
| 108-60-1 | Bis(2-chloro-1- methylethyl) ether | 88 | 2 | 7,959 | 30,000 | 0 | 0 | 37,959 | 0 | 37,959 |
| | | 95 | 2 | 6,130 | 0 | 0 | 0 | 6,130 | 0 | 6,130 |
| | | 98o | 2 | 3,360 | 46 | 0 | 2 | 3,408 | 0 | 3,408 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 4,110 | 2 | 0 | 2 | 4,114 | 0 | 4,114 |
| | | 99n | No reports | | | | | | | |
| 56-35-9 * | Bis(tributyltin) oxide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 32 | 0 | 0 | 32 | 13,873 | 13,905 |
| | | 98o | 3 | 0 | 6 | 0 | 2 | 8 | 3,372 | 3,380 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 10 | 6 | 0 | 1 | 17 | 3,923 | 3,940 |
| | | 99n | No reports | | | | | | | |
| 10294-34-5 | Boron trichloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 5 | 750 | 0 | 0 | 0 | 750 | 0 | 750 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 7 | 350 | 0 | 0 | 0 | 350 | 0 | 350 |
| | | 99n | No reports | | | | | | | |
| 7637-07-2 | Boron trifluoride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 24 | 25,019 | 0 | 0 | 0 | 25,019 | 929 | 25,948 |
| | | 98o | 23 | 38,142 | 5 | 0 | 0 | 38,147 | 0 | 38,147 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 23 | 16,722 | 0 | 0 | 0 | 16,722 | 0 | 16,722 |
| | | 99n | No reports | | | | | | | |
| 314-40-9 * | Bromacil | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 500 | 27,897 | 0 | 0 | 28,397 | 0 | 28,397 |
| | | 98o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | 1 | 25 | 0 | 0 | 0 | 25 | 0 | 25 |
| | | 99o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Bis(2-chloroethyl) ether | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 146,118 | 302,700 | 203,775 | 0 | 88,893 | 570 | 742,056 | 0 |
| | 98o | 0 | 159,909 | 426,404 | 9,541 | 540,375 | 349,619 | 853 | 1,486,701 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 10,234 | 0 | 0 | 10,234 | 0 |
| | 99o | 0 | 142,932 | 1,280,773 | 6,127 | 1,627,378 | 455,565 | 384 | 3,513,159 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 215,220 | 0 | 26 | 215,246 | 0 |
| ** Bis(chloromethyl) ether | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 13,000 | 0 | 0 | 13,000 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 36,500 | 0 | 0 | 36,500 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 34,000 | 0 | 0 | 34,000 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 111,933 | 0 | 157 | 112,090 | 0 |
| Bis(2-chloro-1-methylethyl) ether | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,200,000 | 0 | 8,540,000 | 0 | 10,840,000 | 0 | 6,100 | 24,586,100 | 1 |
| | 98o | 8,900,000 | 0 | 6,000,000 | 0 | 1,410,000 | 0 | 3,500 | 16,313,500 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 2,800,000 | 0 | 7,210,000 | 0 | 5,149,000 | 0 | 4,100 | 15,163,100 | 0 |
| | 99n | No reports | | | | | | | | |
| * Bis(tributyltin) oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 39,840 | 0 | 0 | 336 | 0 | 13,903 | 54,079 | 0 |
| | 98o | 0 | 58,478 | 0 | 0 | 336 | 0 | 3,380 | 62,194 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 35,864 | 0 | 0 | 346 | 530 | 4,367 | 41,107 | 1 |
| | 99n | No reports | | | | | | | | |
| Boron trichloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,000 | 0 | 0 | 0 | 200 | 0 | 1 | 5,201 | 0 |
| | 98o | 6,700 | 0 | 0 | 0 | 53,000 | 0 | 335 | 60,035 | 2 |
| | 98n | No reports | | | | | | | | |
| | 99o | 9,100 | 0 | 0 | 0 | 16,000 | 10,000 | 145 | 35,245 | 0 |
| | 99n | No reports | | | | | | | | |
| Boron trifluoride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 425,701 | 1,027 | 24,369 | 451,097 | 191 |
| | 98o | 0 | 0 | 0 | 35 | 462,635 | 15,255 | 35,396 | 513,321 | 449 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 509,864 | 1,130 | 16,452 | 527,446 | 181 |
| | 99n | No reports | | | | | | | | |
| * Bromacil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5 | 0 | 0 | 0 | 30,687 | 27,829 | 27,947 | 86,468 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 1,192 | 1,192 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 32,434 | 0 | 25 | 32,459 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 850 | 850 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 17,343 | 0 | 0 | 17,343 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|---|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 7726-95-6 | * Bromine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 46 | 112,466 | 880 | 7 | 10 | 113,363 | 250 | 113,613 |
| | | 98o | 52 | 104,083 | 7,110 | 7 | 7,705 | 118,905 | 3 | 118,908 |
| | | 98n | 4 | 84 | 0 | 0 | 0 | 84 | 2 | 86 |
| | | 99o | 48 | 235,390 | 15 | 0 | 7,705 | 243,110 | 30,508 | 273,618 |
| | | 99n | 2 | 33 | 0 | 0 | 0 | 33 | 7,360 | 7,393 |
| 35691-65-7 | * 1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 353-59-3 | Bromochlorodifluoromethane (Halon 1211) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 4,811 | 0 | 0 | 0 | 4,811 | 0 | 4,811 |
| | | 98o | 4 | 3,673 | 0 | 0 | 0 | 3,673 | 0 | 3,673 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 3,979 | 0 | 0 | 0 | 3,979 | 0 | 3,979 |
| | | 99n | No reports | | | | | | | |
| 75-25-2 | Bromoform | 88 | 2 | 0 | 8,600 | 0 | 0 | 8,600 | 0 | 8,600 |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 3 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 99o | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 4 | 7 |
| 74-83-9 | * Bromomethane | 88 | 36 | 2,784,795 | 0 | 1,546 | 0 | 2,786,341 | 0 | 2,786,341 |
| | | 95 | 43 | 2,601,734 | 14 | 3,817 | 0 | 2,605,565 | 0 | 2,605,565 |
| | | 98o | 45 | 1,565,087 | 30 | 230 | 11 | 1,565,358 | 0 | 1,565,358 |
| | | 98n | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 43 | 1,428,722 | 29 | 0 | 4 | 1,428,755 | 1,603 | 1,430,358 |
| | | 99n | 3 | 186 | 0 | 0 | 0 | 186 | 0 | 186 |
| 75-63-8 | Bromotrifluoromethane (Halon 1301) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 8 | 33,632 | 0 | 0 | 0 | 33,632 | 0 | 33,632 |
| | | 98o | 6 | 26,842 | 0 | 0 | 0 | 26,842 | 0 | 26,842 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 6 | 30,825 | 0 | 0 | 0 | 30,825 | 0 | 30,825 |
| | | 99n | No reports | | | | | | | |
| 1689-84-5 | * Bromoxynil | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 6 | 0 | 0 | 0 | 6 | 990 | 996 |
| | | 98o | 2 | 506 | 0 | 0 | 0 | 506 | 1,483 | 1,989 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 3 | 0 | 0 | 0 | 3 | 790 | 793 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Bromine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,960,000 | 740 | 0 | 0 | 14,808,669 | 283,435 | 112,386 | 20,165,230 | 29 |
| | 98o | 5,670,000 | 230 | 0 | 0 | 18,611,926 | 20,781 | 121,933 | 24,424,870 | 196 |
| | 98n | 0 | 0 | 0 | 162,356 | 12,791 | 0 | 86 | 175,233 | 1 |
| | 99o | 130,800 | 430 | 0 | 0 | 850,764 | 483,028 | 241,997 | 1,707,019 | 800 |
| | 99n | 0 | 2,991 | 0 | 0 | 11,373 | 0 | 7,393 | 21,757 | 0 |
| * 1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 10,957 | 0 | 10,957 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 11,000 | 9,824 | 0 | 20,824 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 9,595 | 0 | 9,595 | 0 |
| | 99n | No reports | | | | | | | | |
| Bromochlorodifluoromethane (Halon 1211) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 282,800 | 0 | 0 | 0 | 0 | 0 | 4,832 | 287,632 | 2 |
| | 98o | 501,947 | 0 | 0 | 0 | 0 | 0 | 3,673 | 505,620 | 175 |
| | 98n | No reports | | | | | | | | |
| | 99o | 485,900 | 0 | 0 | 0 | 0 | 0 | 3,827 | 489,727 | 152 |
| | 99n | No reports | | | | | | | | |
| Bromoform | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 10,594 | 2 | 3 | 10,599 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 216 | 2 | 1 | 219 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 18,000 | 0 | 1 | 18,001 | 0 |
| * Bromomethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 165,182 | 0 | 101,000 | 380 | 4,876,073 | 0 | 2,578,001 | 7,720,636 | 5 |
| | 98o | 12,780 | 0 | 222,300 | 280 | 488,585 | 0 | 1,561,574 | 2,285,519 | 14,071 |
| | 98n | 0 | 0 | 0 | 0 | 3,007 | 30 | 1 | 3,038 | 1 |
| | 99o | 295,500 | 0 | 273,800 | 160 | 947,126 | 2,455 | 1,343,242 | 2,862,283 | 15,333 |
| | 99n | 0 | 0 | 0 | 0 | 178,475 | 0 | 187 | 178,662 | 0 |
| Bromotrifluoromethane (Halon 1301) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 200,661 | 0 | 0 | 0 | 0 | 0 | 36,155 | 236,816 | 806 |
| | 98o | 583,803 | 0 | 0 | 0 | 0 | 0 | 26,592 | 610,395 | 6,468 |
| | 98n | No reports | | | | | | | | |
| | 99o | 647,796 | 0 | 0 | 0 | 0 | 0 | 29,446 | 677,242 | 1,630 |
| | 99n | No reports | | | | | | | | |
| * Bromoxynil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 996 | 996 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 1,244 | 1,244 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 790 | 790 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|-------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Transfers Off-site to Disposal Pounds | |
| 1689-99-2 * | Bromoxynil octanoate | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 500 | 0 | 0 | 0 | 500 | 14,069 |
| | | 98o | 5 | 1,566 | 0 | 0 | 0 | 1,566 | 15,986 |
| | | 98n | No reports | | | | | | |
| | | 99o | 6 | 519 | 0 | 0 | 0 | 519 | 9,445 |
| | | 99n | No reports | | | | | | |
| 357-57-3 | Brucine | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | |
| | | 99o | No reports | | | | | | |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 153 | 157 |
| 106-99-0 ** | 1,3-Butadiene | 88 | 157 | 7,004,622 | 522,504 | 1,500 | 7,817 | 7,536,443 | 7,721,841 |
| | | 95 | 186 | 3,050,945 | 5,393 | 0 | 277 | 3,056,615 | 3,061,507 |
| | | 98o | 189 | 2,741,685 | 8,834 | 732 | 7,998 | 2,759,249 | 2,761,316 |
| | | 98n | 6 | 1,035 | 0 | 0 | 0 | 1,035 | 1,535 |
| | | 99o | 190 | 1,909,518 | 1,900 | 720 | 127 | 1,912,265 | 1,914,331 |
| | | 99n | 4 | 2,178 | 0 | 0 | 0 | 2,178 | 2,683 |
| 141-32-2 | Butyl acrylate | 88 | 166 | 411,862 | 3,528 | 0 | 602 | 415,992 | 434,758 |
| | | 95 | 164 | 230,275 | 2,919 | 0 | 559 | 233,753 | 307,344 |
| | | 98o | 158 | 206,776 | 7,790 | 0 | 546 | 215,112 | 240,585 |
| | | 98n | 12 | 6,009 | 0 | 0 | 0 | 6,009 | 28,590 |
| | | 99o | 157 | 241,981 | 8,747 | 156 | 546 | 251,430 | 283,193 |
| | | 99n | 12 | 3,031 | 0 | 0 | 0 | 3,031 | 3,476 |
| 71-36-3 | n-Butyl alcohol | 88 | 1,109 | 37,715,221 | 128,130 | 3,006,660 | 175,819 | 41,025,830 | 41,950,349 |
| | | 95 | 1,125 | 26,124,368 | 115,353 | 2,263,357 | 4,631 | 28,507,709 | 28,798,595 |
| | | 98o | 1,027 | 21,606,870 | 94,523 | 3,169,538 | 5,209 | 24,876,140 | 25,258,983 |
| | | 98n | 180 | 27,573 | 0 | 61,068 | 370 | 89,011 | 105,086 |
| | | 99o | 971 | 21,015,396 | 56,286 | 3,097,813 | 3,226 | 24,172,721 | 24,819,972 |
| | | 99n | 171 | 31,534 | 1 | 91,230 | 1,400 | 124,165 | 200,880 |
| 78-92-2 * | sec-Butyl alcohol | 88 | 92 | 1,097,163 | 122,291 | 0 | 2,600 | 1,222,054 | 1,243,405 |
| | | 95 | 115 | 908,143 | 6,782 | 136,172 | 2,805 | 1,053,902 | 1,072,278 |
| | | 98o | 116 | 971,834 | 3,950 | 169,243 | 7 | 1,145,034 | 1,161,569 |
| | | 98n | 36 | 2,531 | 0 | 0 | 13,000 | 15,531 | 15,581 |
| | | 99o | 108 | 864,240 | 11,020 | 145,995 | 5 | 1,021,260 | 1,038,191 |
| | | 99n | 38 | 2,976 | 0 | 0 | 13,000 | 15,976 | 16,481 |
| 75-65-0 * | tert-Butyl alcohol | 88 | 54 | 1,574,137 | 14,989 | 674,798 | 818 | 2,264,742 | 2,321,244 |
| | | 95 | 91 | 657,818 | 20,183 | 1,082,071 | 751 | 1,760,823 | 1,791,606 |
| | | 98o | 84 | 420,564 | 30,330 | 861,956 | 7,352 | 1,320,202 | 1,498,419 |
| | | 98n | 26 | 25,804 | 21 | 0 | 1,092 | 26,917 | 30,946 |
| | | 99o | 82 | 366,121 | 15,354 | 770,634 | 751 | 1,152,860 | 1,229,328 |
| | | 99n | 33 | 31,061 | 260 | 0 | 5 | 31,326 | 33,139 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Bromoxynil octanoate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 173 | 13,689 | 13,862 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 40 | 21,215 | 21,255 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 397 | 13,525 | 13,922 | 0 |
| | 99n | No reports | | | | | | | | |
| Brucine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 94,553 | 0 | 157 | 94,710 | 0 |
| ** 1,3-Butadiene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,513,939 | 13,652,736 | 31,663,920 | 34,519 | 58,474,775 | 96,310 | 2,879,808 | 112,316,007 | 200,548 |
| | 98o | 5,428,029 | 15,574,853 | 15,171,040 | 260,947 | 53,274,984 | 3,918,622 | 2,724,665 | 96,353,140 | 776,818 |
| | 98n | 0 | 0 | 0 | 218,662 | 130,866 | 9,120 | 1,035 | 359,683 | 1 |
| | 99o | 5,566,810 | 11,539,016 | 15,618,413 | 433,581 | 62,997,080 | 307,699 | 1,912,694 | 98,375,293 | 59,754 |
| | 99n | 0 | 0 | 0 | 27,320 | 232,521 | 1,620 | 2,068 | 263,529 | 0 |
| Butyl acrylate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 173,995 | 207,325 | 4,059,471 | 1,143,139 | 4,174,080 | 228,382 | 301,235 | 10,287,627 | 5,271 |
| | 98o | 270,060 | 950 | 3,912,299 | 932,014 | 11,726,284 | 87,681 | 225,309 | 17,154,597 | 6,129 |
| | 98n | 0 | 0 | 0 | 91,548 | 178,664 | 261 | 7,554 | 278,027 | 2 |
| | 99o | 330,066 | 1,466 | 3,045,794 | 600,039 | 2,691,295 | 178,128 | 265,758 | 7,112,546 | 1,408 |
| | 99n | 0 | 0 | 12,753 | 61,497 | 237,812 | 3,797 | 3,218 | 319,077 | 16 |
| n-Butyl alcohol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 8,438,990 | 3,351,225 | 24,665,663 | 8,572,532 | 38,018,327 | 3,346,692 | 28,870,500 | 115,263,929 | 52,341 |
| | 98o | 8,306,964 | 2,608,611 | 29,189,033 | 8,360,639 | 42,906,842 | 5,218,604 | 25,588,497 | 122,179,190 | 58,888 |
| | 98n | 1,704,649 | 8,376 | 32,154 | 9,817,765 | 1,739,894 | 963,207 | 94,668 | 14,360,713 | 23 |
| | 99o | 9,132,073 | 2,250,267 | 33,288,202 | 8,396,622 | 32,557,149 | 4,666,674 | 24,995,850 | 115,286,837 | 11,269 |
| | 99n | 2,619,863 | 7,646 | 37,137 | 4,621,141 | 2,708,082 | 1,192,341 | 127,721 | 11,313,931 | 10,357 |
| * sec-Butyl alcohol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 748,440 | 24,774 | 13,041,102 | 6,275,927 | 2,249,797 | 125,101 | 1,089,469 | 23,554,610 | 2,810 |
| | 98o | 171,903 | 9,319 | 10,701,253 | 1,012,818 | 1,532,676 | 253,034 | 1,171,838 | 14,852,841 | 7 |
| | 98n | 220 | 0 | 0 | 246,002 | 49 | 236,962 | 15,367 | 498,600 | 2 |
| | 99o | 380,567 | 76,228 | 12,708,755 | 1,475,673 | 1,394,860 | 140,513 | 1,046,198 | 17,222,794 | 4 |
| | 99n | 14 | 0 | 0 | 416,452 | 51,604 | 35,246 | 15,198 | 518,514 | 2 |
| * tert-Butyl alcohol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 466,023 | 2,256 | 64,310,733 | 27,469,833 | 2,447,778 | 1,794,551 | 2,230,055 | 98,721,229 | 2,091 |
| | 98o | 662,776 | 231,209 | 37,637,302 | 7,506,442 | 2,331,750 | 1,841,732 | 1,494,042 | 51,705,253 | 61 |
| | 98n | 31,188 | 200 | 0 | 3,841,737 | 129,572 | 11,110 | 23,110 | 4,036,917 | 16 |
| | 99o | 658,568 | 19,879 | 38,801,127 | 8,108,339 | 1,673,758 | 1,754,071 | 1,567,501 | 52,583,243 | 21,102 |
| | 99n | 50,563 | 122 | 0 | 898,535 | 258,975 | 35,514 | 29,903 | 1,273,612 | 24 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 106-88-7 | 1,2-Butylene oxide | 88 | 18 | 99,931 | 3,500 | 0 | 250 | 103,681 | 898 | 104,579 |
| | | 95 | 15 | 11,083 | 1 | 0 | 0 | 11,084 | 5 | 11,089 |
| | | 98o | 13 | 10,581 | 8,401 | 0 | 0 | 18,982 | 0 | 18,982 |
| | | 98n | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99o | 13 | 11,619 | 2,402 | 0 | 0 | 14,021 | 0 | 14,021 |
| | | 99n | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| 123-72-8 | * Butyraldehyde | 88 | 26 | 2,218,692 | 3,812 | 1,997 | 31 | 2,224,532 | 117,741 | 2,342,273 |
| | | 95 | 29 | 291,440 | 821 | 149,783 | 10 | 442,054 | 41 | 442,095 |
| | | 98o | 32 | 289,834 | 618 | 29,000 | 1,478 | 320,930 | 1,663 | 322,593 |
| | | 98n | 1 | 122 | 0 | 0 | 0 | 122 | 3 | 125 |
| | | 99o | 34 | 295,543 | 466 | 29,003 | 149,000 | 474,012 | 6,827 | 480,839 |
| | | 99n | No reports | | | | | | | |
| 7440-43-9 | ** Cadmium | 88 | 90 | 22,430 | 2,598 | 0 | 94,602 | 119,630 | 155,313 | 274,943 |
| | | 95 | 48 | 12,196 | 463 | 0 | 19,861 | 32,520 | 90,519 | 123,039 |
| | | 98o | 50 | 2,109 | 542 | 0 | 158,670 | 161,321 | 100,921 | 262,242 |
| | | 98n | 20 | 1,318 | 0 | 166,607 | 2,282,416 | 2,450,341 | 60,410 | 2,510,751 |
| | | 99o | 46 | 2,377 | 691 | 0 | 31,889 | 34,957 | 45,656 | 80,613 |
| | | 99n | 19 | 1,920 | 0 | 61,000 | 1,628,788 | 1,691,708 | 319,554 | 2,011,262 |
| — | ** Cadmium compounds | 88 | 117 | 118,978 | 1,549 | 2,409 | 294,877 | 417,813 | 1,067,942 | 1,485,755 |
| | | 95 | 120 | 54,853 | 948 | 34,109 | 797,776 | 887,686 | 1,743,893 | 2,631,579 |
| | | 98o | 94 | 68,890 | 923 | 130,033 | 778,483 | 978,329 | 1,307,328 | 2,285,657 |
| | | 98n | 39 | 16,431 | 1,218 | 96,875 | 7,910,629 | 8,025,153 | 291,393 | 8,316,546 |
| | | 99o | 93 | 29,838 | 1,501 | 23 | 656,007 | 687,369 | 701,113 | 1,388,482 |
| | | 99n | 36 | 18,768 | 765 | 100,000 | 9,933,779 | 10,053,312 | 152,773 | 10,206,085 |
| 156-62-7 | * Calcium cyanamide | 88 | 3 | 12,600 | 0 | 0 | 66,000 | 78,600 | 0 | 78,600 |
| | | 95 | 5 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 4 | 134 | 0 | 0 | 0 | 134 | 0 | 134 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 98n | No reports | | | | | | | |
| 133-06-2 | * Captan | 88 | 18 | 14,869 | 750 | 5,100 | 1,000 | 21,719 | 12,434 | 34,153 |
| | | 95 | 15 | 7,280 | 5 | 0 | 5 | 7,290 | 3,868 | 11,158 |
| | | 98o | 11 | 9,211 | 5 | 0 | 0 | 9,216 | 1,761 | 10,977 |
| | | 98n | 3 | 2 | 0 | 0 | 0 | 2 | 138 | 140 |
| | | 99o | 13 | 5,111 | 5 | 0 | 0 | 5,116 | 1,070 | 6,186 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 27 | 27 |
| 63-25-2 | * Carbaryl | 88 | 23 | 7,923 | 877 | 0 | 500 | 9,300 | 6,198 | 15,498 |
| | | 95 | 21 | 7,824 | 10 | 0 | 1,060 | 8,894 | 26,861 | 35,755 |
| | | 98o | 22 | 7,824 | 10 | 0 | 100 | 7,934 | 9,156 | 17,090 |
| | | 98n | 3 | 7 | 0 | 0 | 0 | 7 | 132 | 139 |
| | | 99o | 15 | 5,276 | 5 | 0 | 8,405 | 13,686 | 41,376 | 55,062 |
| | | 99n | 3 | 4 | 0 | 0 | 11,743 | 11,747 | 27 | 11,774 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| 1,2-Butylene oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 990 | 0 | 330,194 | 329,270 | 93 | 10,804 | 671,351 | 0 |
| | 98o | 1 | 0 | 0 | 275,443 | 498,660 | 307 | 18,815 | 793,226 | 0 |
| | 98n | 0 | 0 | 0 | 50 | 0 | 35 | 1 | 86 | 0 |
| | 99o | 2 | 0 | 0 | 282,059 | 382,495 | 620 | 14,294 | 679,470 | 0 |
| | 99n | 0 | 0 | 0 | 150 | 6 | 0 | 1 | 157 | 0 |
| * Butyraldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 1,300 | 2,545,861 | 22,000 | 1,982,004 | 169,714 | 440,778 | 5,161,657 | 10 |
| | 98o | 1,500 | 31,000 | 2,136,982 | 20,760 | 1,928,392 | 651,126 | 317,716 | 5,087,476 | 5,208 |
| | 98n | 0 | 0 | 0 | 19,950 | 392 | 409 | 122 | 20,873 | 0 |
| | 99o | 1,500 | 1,200 | 4,909,209 | 40,812 | 7,983,588 | 176,272 | 409,140 | 13,521,721 | 81,118 |
| | 99n | No reports | | | | | | | | |
| ** Cadmium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,471,697 | 545,490 | 29,191 | 633 | 91,725 | 53,384 | 74,415 | 2,266,535 | 3,918 |
| | 98o | 1,101,823 | 320,139 | 0 | 0 | 27,779 | 52,294 | 276,672 | 1,778,707 | 9,411 |
| | 98n | 0 | 8,110 | 0 | 0 | 0 | 10,742 | 2,462,721 | 2,481,573 | 1 |
| | 99o | 88,054 | 202,689 | 0 | 0 | 29,363 | 11,102 | 119,767 | 450,975 | 3 |
| | 99n | 143,393 | 139,104 | 0 | 0 | 0 | 471 | 1,699,147 | 1,982,115 | 10 |
| ** Cadmium compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 8,221,097 | 1,482,852 | 0 | 1,082 | 86,561 | 138,528 | 2,509,561 | 12,439,681 | 11,698 |
| | 98o | 2,561,776 | 643,605 | 0 | 5,236 | 3,225 | 47,340 | 3,218,632 | 6,479,814 | 59,621 |
| | 98n | 1,900 | 71,989 | 0 | 0 | 3,000 | 4,772 | 8,315,149 | 8,396,810 | 94 |
| | 99o | 3,003,967 | 636,397 | 0 | 212 | 4,654 | 19,971 | 1,824,458 | 5,489,659 | 39,151 |
| | 99n | 77,444 | 27,995 | 0 | 0 | 0 | 1,050 | 6,733,862 | 6,840,351 | 120,009 |
| * Calcium cyanamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 130 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 | 0 |
| | 98n | No reports | | | | | | | | |
| * Captan | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,070 | 0 | 0 | 0 | 9,834 | 1,072 | 7,479 | 23,455 | 2 |
| | 98o | 2,697 | 0 | 0 | 0 | 9,000 | 3,944 | 11,297 | 26,938 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 68,416 | 0 | 140 | 68,556 | 0 |
| | 99o | 2,314 | 0 | 0 | 0 | 9,000 | 17,910 | 9,922 | 39,146 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 66,081 | 0 | 27 | 66,108 | 0 |
| * Carbaryl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 36,618 | 0 | 0 | 0 | 467,593 | 7,885 | 32,697 | 544,793 | 1 |
| | 98o | 80,456 | 0 | 79,931 | 0 | 365,862 | 24,121 | 14,478 | 564,848 | 101 |
| | 98n | 0 | 0 | 0 | 0 | 77,947 | 0 | 139 | 78,086 | 0 |
| | 99o | 71,825 | 0 | 64 | 0 | 373,282 | 11,446 | 7,907 | 464,524 | 0 |
| | 99n | 0 | 97 | 0 | 0 | 133,259 | 0 | 11,774 | 145,130 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|-------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 1563-66-2 * | Carbofuran | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 7 | 4,187 | 2 | 0 | 250 | 4,439 | 250 | 4,689 |
| | | 98o | 4 | 2,921 | 1 | 0 | 0 | 2,922 | 0 | 2,922 |
| | | 98n | 3 | 16 | 0 | 0 | 0 | 16 | 2 | 18 |
| | | 99o | 4 | 13,999 | 112 | 0 | 0 | 14,111 | 0 | 14,111 |
| | | 99n | 2 | 10 | 0 | 0 | 0 | 10 | 23 | 33 |
| 75-15-0 * | Carbon disulfide | 88 | 88 | 124,109,904 | 39,501 | 13,400 | 43,436 | 124,206,241 | 58,473 | 124,264,714 |
| | | 95 | 92 | 84,120,300 | 39,864 | 33,644 | 265 | 84,194,073 | 2,949 | 84,197,022 |
| | | 98o | 95 | 43,432,877 | 4,687 | 16,599 | 1,651 | 43,455,814 | 5,801 | 43,461,615 |
| | | 98n | 6 | 924 | 1 | 0 | 0 | 925 | 24 | 949 |
| | | 99o | 105 | 35,888,425 | 6,548 | 16,110 | 256 | 35,911,339 | 2,730 | 35,914,069 |
| | | 99n | 6 | 262 | 1 | 0 | 0 | 263 | 33 | 296 |
| 56-23-5 ** | Carbon tetrachloride | 88 | 95 | 3,795,248 | 15,627 | 98,050 | 14,759 | 3,923,684 | 49,703 | 3,973,387 |
| | | 95 | 71 | 420,754 | 717 | 53,966 | 0 | 475,437 | 7,735 | 483,172 |
| | | 98o | 55 | 274,291 | 2,586 | 23,163 | 1,679 | 301,719 | 9,956 | 311,675 |
| | | 98n | 15 | 954 | 250 | 5 | 0 | 1,209 | 10,295 | 11,504 |
| | | 99o | 57 | 237,235 | 84 | 27,548 | 938 | 265,805 | 7,307 | 273,112 |
| | | 99n | 13 | 2,334 | 1 | 0 | 0 | 2,335 | 9,259 | 11,594 |
| 463-58-1 | Carbonyl sulfide | 88 | 38 | 25,954,103 | 0 | 0 | 0 | 25,954,103 | 0 | 25,954,103 |
| | | 95 | 64 | 17,934,454 | 0 | 0 | 0 | 17,934,454 | 0 | 17,934,454 |
| | | 98o | 82 | 19,843,628 | 0 | 0 | 0 | 19,843,628 | 0 | 19,843,628 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 101 | 21,344,436 | 0 | 0 | 0 | 21,344,436 | 0 | 21,344,436 |
| | | 99n | No reports | | | | | | | |
| 5234-68-4 * | Carboxin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 8 | 0 | 0 | 0 | 8 | 428 | 436 |
| | | 98o | 3 | 5 | 0 | 0 | 0 | 5 | 17 | 22 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 5 | 0 | 0 | 0 | 5 | 154 | 159 |
| | | 99n | No reports | | | | | | | |
| 120-80-9 | Catechol | 88 | 113 | 3,789 | 320,546 | 0 | 84,332 | 408,667 | 89,474 | 498,141 |
| | | 95 | 127 | 3,457 | 24,747 | 0 | 3,479 | 31,683 | 563 | 32,246 |
| | | 98o | 139 | 5,345 | 24,122 | 0 | 1,029 | 30,496 | 914 | 31,410 |
| | | 98n | 4 | 3 | 0 | 0 | 0 | 3 | 24 | 27 |
| | | 99o | 136 | 6,801 | 28,696 | 0 | 878 | 36,375 | 2,996 | 39,371 |
| | | 99n | 2 | 235 | 0 | 0 | 0 | 235 | 46 | 281 |
| 133-90-4 * | Chloramben | 88 | 1 | 1,418 | 250 | 0 | 0 | 1,668 | 1,159 | 2,827 |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Carbofuran | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 1 | 3 | 47,158 | 5,422 | 52,584 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 3 | 35,601 | 2,922 | 38,526 | 275 |
| | 98n | 0 | 0 | 0 | 0 | 243,290 | 0 | 15 | 243,305 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 19,615 | 14,111 | 33,726 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 162,525 | 0 | 25 | 162,550 | 0 |
| * Carbon disulfide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 20,874,450 | 18 | 5,775,132 | 368,509 | 18,092,770 | 361,938 | 84,767,924 | 130,240,741 | 154,892 |
| | 98o | 30,024,800 | 1,985 | 10,070,374 | 216,999 | 32,269,421 | 239,776 | 43,245,898 | 116,069,253 | 24,336 |
| | 98n | 0 | 0 | 0 | 25,038 | 779,188 | 11,922 | 849 | 816,997 | 0 |
| | 99o | 25,913,004 | 1,067 | 9,352,618 | 99,958 | 34,307,856 | 3,954,153 | 28,187,942 | 101,816,598 | 22,518 |
| | 99n | 0 | 0 | 0 | 0 | 530,976 | 0 | 290 | 531,266 | 0 |
| ** Carbon tetrachloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,837,422 | 365,067 | 317,149 | 50,068 | 52,608,819 | 733,254 | 463,274 | 56,375,053 | 34,525 |
| | 98o | 2,218,866 | 2,075,495 | 808,627 | 43,116 | 13,865,412 | 462,232 | 299,092 | 19,772,840 | 4,829 |
| | 98n | 4,399 | 0 | 468,751 | 277,751 | 985,513 | 2,580,491 | 4,735 | 4,321,640 | 1 |
| | 99o | 7,066,850 | 3,197,654 | 369,334 | 24,319 | 16,308,400 | 688,463 | 231,108 | 27,886,128 | 28,183 |
| | 99n | 0 | 0 | 500,408 | 67,656 | 1,818,361 | 37,175 | 6,228 | 2,429,828 | 0 |
| | Carbonyl sulfide | 88 | NA | NA | NA | NA | NA | NA | NA | NA |
| | | 95 | 0 | 0 | 1,508,252 | 14,572,854 | 16,000 | 18,778,809 | 34,875,915 | 1 |
| | | 98o | 0 | 0 | 2,403,251 | 17,913,061 | 0 | 19,995,133 | 40,311,445 | 5 |
| | | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 0 | 0 | 3,422,194 | 76,837,634 | 0 | 21,523,038 | 101,782,866 | 5,714 |
| | 99n | No reports | | | | | | | | |
| * Carboxin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,817 | 0 | 0 | 0 | 0 | 402 | 436 | 3,655 | 0 |
| | 98o | 1,110 | 0 | 0 | 0 | 0 | 218 | 22 | 1,350 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 1,538 | 0 | 0 | 0 | 0 | 60 | 159 | 1,757 | 0 |
| | 99n | No reports | | | | | | | | |
| Catechol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 7,145,990 | 94,995 | 1,481,057 | 54,221 | 68,220 | 8,844,483 | 2,774 |
| | 98o | 0 | 0 | 9,717,608 | 105,959 | 4,435,187 | 50,634 | 35,007 | 14,344,395 | 2 |
| | 98n | 0 | 0 | 3,384 | 0 | 9,997 | 0 | 27 | 13,408 | 0 |
| | 99o | 0 | 4,594 | 10,920,474 | 97,721 | 3,845,892 | 79,487 | 82,363 | 15,030,531 | 5 |
| | 99n | 0 | 0 | 0 | 25,880 | 867 | 21,036 | 236 | 48,019 | 0 |
| * Chloramben | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|---|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 57-74-9 | *** Chlordane | 88 | 2 | 2,698 | 4 | 4,262 | 0 | 6,964 | 0 | 6,964 |
| | | 95 | 1 | 823 | 22 | 0 | 0 | 845 | 0 | 845 |
| | | 98o | No reports | | | | | | | |
| | | 98n | 7 | 45 | 0 | 20,106 | 25,548 | 45,699 | 22 | 45,721 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 4 | 8 | 1 | 0 | 0 | 9 | 40 | 49 |
| 115-28-6 | ** Chlorendic acid | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 6 | 0 | 0 | 0 | 6 | 0 | 6 |
| | | 98o | 2 | 30 | 0 | 0 | 0 | 30 | 0 | 30 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 32 | 0 | 0 | 0 | 32 | 0 | 32 |
| | | 99n | No reports | | | | | | | |
| 90982-32-4 | * Chlorimuron ethyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98o | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 27 | 0 | 0 | 0 | 27 | 0 | 27 |
| | | 99n | No reports | | | | | | | |
| 7782-50-5 | * Chlorine | 88 | 1,800 | 133,085,601 | 6,622,187 | 107,624 | 439,547 | 140,254,959 | 1,003,531 | 141,258,490 |
| | | 95 | 1,380 | 65,761,772 | 442,215 | 74,124 | 13,095 | 66,291,206 | 12,286 | 66,303,492 |
| | | 98o | 1,191 | 59,757,962 | 252,747 | 81,637 | 56,122 | 60,148,468 | 27,010 | 60,175,478 |
| | | 98n | 149 | 77,026 | 168,797 | 27,639 | 154,480 | 427,942 | 3,000 | 430,942 |
| | | 99o | 1,109 | 49,164,795 | 328,493 | 62,440 | 55,320 | 49,611,048 | 7,745 | 49,618,793 |
| | | 99n | 130 | 206,361 | 63,090 | 0 | 55,359 | 324,810 | 94,167 | 418,977 |
| 10049-04-4 | * Chlorine dioxide | 88 | 122 | 12,251,050 | 2,350 | 0 | 41,000 | 12,294,400 | 41,750 | 12,336,150 |
| | | 95 | 127 | 1,305,279 | 5 | 0 | 0 | 1,305,284 | 0 | 1,305,284 |
| | | 98o | 117 | 1,037,587 | 71 | 0 | 0 | 1,037,658 | 0 | 1,037,658 |
| | | 98n | 4 | 13,000 | 510 | 0 | 0 | 13,510 | 0 | 13,510 |
| | | 99o | 111 | 987,794 | 109 | 0 | 5 | 987,908 | 0 | 987,908 |
| | | 99n | 4 | 5,200 | 764 | 0 | 0 | 5,964 | 0 | 5,964 |
| 79-11-8 | * Chloroacetic acid | 88 | 37 | 26,819 | 850 | 10 | 0 | 27,679 | 2,506 | 30,185 |
| | | 95 | 31 | 6,474 | 16 | 0 | 0 | 6,490 | 600 | 7,090 |
| | | 98o | 25 | 3,585 | 16 | 0 | 0 | 3,601 | 500 | 4,101 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 21 | 4,565 | 17 | 0 | 0 | 4,582 | 328 | 4,910 |
| | | 99n | No reports | | | | | | | |
| 4080-31-3 | * 1-(3-Chloroallyl)-3,5,7-triaza-1-azonia-adamantane chloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 7 | 93 | 10 | 0 | 521 | 624 | 2,514 | 3,138 |
| | | 98o | 16 | 437 | 11 | 0 | 653 | 1,101 | 5,138 | 6,239 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 12 | 217 | 11 | 0 | 509 | 737 | 5,769 | 6,506 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *,** Chlordane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 5,150 | 95 | 845 | 6,090 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 25,778 | 187,264 | 35 | 45,721 | 258,798 | 1 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 470,719 | 114 | 46 | 470,879 | 0 |
| ** Chlorendic acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 488 | 6 | 494 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 567 | 30 | 597 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 157 | 32 | 189 | 0 |
| | 99n | No reports | | | | | | | | |
| * Chlorimuron ethyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 5,838 | 1 | 5,839 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 33,861 | 3 | 33,864 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 11,885 | 27 | 11,912 | 0 |
| | 99n | No reports | | | | | | | | |
| * Chlorine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 84,986,469 | 1,791,968 | 499 | 1,467 | 219,882,098 | 1,180,909 | 66,282,619 | 374,126,029 | 13,375 |
| | 98o | 71,150,772 | 88,349 | 0 | 50,291 | 249,199,167 | 945,823 | 60,182,930 | 381,617,332 | 9,292 |
| | 98n | 760,238 | 0 | 0 | 0 | 4,557,933 | 26,089 | 408,279 | 5,752,539 | 583 |
| | 99o | 68,617,968 | 83,925 | 2 | 60,545 | 205,389,521 | 732,495 | 49,575,274 | 324,459,730 | 20,587 |
| | 99n | 2,802,661 | 0 | 0 | 0 | 3,730,585 | 87,594 | 340,384 | 6,961,224 | 43 |
| * Chlorine dioxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,484,920 | 0 | 0 | 0 | 40,571,008 | 0 | 1,326,713 | 44,382,641 | 3,933 |
| | 98o | 2,858,988 | 0 | 0 | 0 | 48,480,626 | 6,000 | 1,081,876 | 52,427,490 | 862 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 13,510 | 13,510 | 0 |
| | 99o | 722,759 | 0 | 0 | 0 | 48,022,541 | 0 | 1,011,489 | 49,756,789 | 263 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 5,964 | 5,964 | 0 |
| * Chloroacetic acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 25,013 | 0 | 0 | 0 | 1,342,493 | 2,726 | 6,607 | 1,376,839 | 0 |
| | 98o | 85,721 | 0 | 0 | 0 | 1,209,175 | 568 | 3,250 | 1,298,714 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 10,132 | 0 | 0 | 10,132 | 0 |
| | 99o | 83,319 | 0 | 0 | 0 | 867,368 | 1,419 | 4,768 | 956,874 | 1 |
| | 99n | No reports | | | | | | | | |
| * 1-(3-Chloroallyl)-3,5,7-triaza-1-azonia-adamantane chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,700 | 0 | 0 | 0 | 720 | 4,700 | 3,570 | 11,690 | 0 |
| | 98o | 78,111 | 0 | 0 | 0 | 2,310 | 12,150 | 6,753 | 99,324 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 31,211 | 0 | 0 | 0 | 1,834 | 331,049 | 6,541 | 370,635 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|---|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 106-47-8 | *** p-Chloroaniline | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 267 | 827 | 0 | 0 | 1,094 | 11 | 1,105 |
| | | 98o | 4 | 6,181 | 12 | 0 | 0 | 6,193 | 0 | 6,193 |
| | | 98n | 1 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 99o | 4 | 131 | 337 | 0 | 0 | 468 | 0 | 468 |
| | | 99n | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 108-90-7 | * Chlorobenzene | 88 | 66 | 4,375,887 | 98,354 | 84,457 | 4,127 | 4,562,825 | 117,624 | 4,680,449 |
| | | 95 | 62 | 1,132,073 | 1,850 | 27,405 | 5 | 1,161,333 | 92,582 | 1,253,915 |
| | | 98o | 75 | 774,102 | 662 | 184,106 | 16 | 958,886 | 19,763 | 978,649 |
| | | 98n | 18 | 1,130 | 250 | 250 | 0 | 1,630 | 1,870 | 3,500 |
| | | 99o | 75 | 675,741 | 1,433 | 113,526 | 214 | 790,914 | 16,217 | 807,131 |
| | | 99n | 17 | 2,149 | 1 | 62,018 | 0 | 64,168 | 15,448 | 79,616 |
| 510-15-6 | Chlorobenzilate | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 10 | 13 |
| 75-68-3 | 1-Chloro-1,1-difluoroethane (HCFC-142b) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 25 | 6,954,443 | 771 | 6 | 0 | 6,955,220 | 21,600 | 6,976,820 |
| | | 98o | 28 | 5,529,844 | 40 | 0 | 0 | 5,529,884 | 4,979 | 5,534,863 |
| | | 98n | 3 | 11 | 0 | 0 | 0 | 11 | 614 | 625 |
| | | 99o | 29 | 5,644,136 | 44 | 0 | 0 | 5,644,180 | 4,989 | 5,649,169 |
| | | 99n | 6 | 24 | 0 | 0 | 0 | 24 | 119 | 143 |
| 75-45-6 | * Chlorodifluoromethane (HCFC-22) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 244 | 12,585,061 | 2,279 | 22 | 1 | 12,587,363 | 55,084 | 12,642,447 |
| | | 98o | 242 | 8,942,117 | 3,652 | 0 | 1 | 8,945,770 | 50,648 | 8,996,418 |
| | | 98n | 1 | 64,602 | 0 | 0 | 0 | 64,602 | 0 | 64,602 |
| | | 99o | 250 | 8,376,930 | 3,652 | 0 | 1 | 8,380,583 | 67,799 | 8,448,382 |
| | | 99n | 5 | 108,930 | 0 | 0 | 0 | 108,930 | 0 | 108,930 |
| 75-00-3 | Chloroethane | 88 | 50 | 4,907,292 | 27,448 | 1,510 | 1 | 4,936,251 | 32,260 | 4,968,511 |
| | | 95 | 55 | 2,890,354 | 2,320 | 0 | 116 | 2,892,790 | 4,400 | 2,897,190 |
| | | 98o | 59 | 2,198,423 | 1,024 | 67 | 50 | 2,199,564 | 3,900 | 2,203,464 |
| | | 98n | 2 | 16 | 0 | 0 | 0 | 16 | 3 | 19 |
| | | 99o | 56 | 2,127,670 | 261 | 130 | 0 | 2,128,061 | 2,309 | 2,130,370 |
| | | 99n | No reports | | | | | | | |
| 67-66-3 | *** Chloroform | 88 | 169 | 25,988,609 | 1,114,965 | 36,000 | 68,647 | 27,208,221 | 143,124 | 27,351,345 |
| | | 95 | 163 | 10,496,501 | 332,473 | 33,276 | 4,297 | 10,866,547 | 6,647 | 10,873,194 |
| | | 98o | 140 | 6,506,538 | 135,414 | 44,102 | 12,344 | 6,698,398 | 42,857 | 6,741,255 |
| | | 98n | 21 | 2,226 | 6 | 5 | 0 | 2,237 | 3,471 | 5,708 |
| | | 99o | 132 | 5,335,138 | 86,305 | 59,399 | 11,771 | 5,492,613 | 32,282 | 5,524,895 |
| | | 99n | 22 | 3,231 | 1 | 64,297 | 0 | 67,529 | 59,348 | 126,877 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *** p-Chloroaniline | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 540 | 0 | 120,301 | 940 | 121,781 | 0 |
| | 98o | 0 | 0 | 46,000 | 520 | 0 | 6,424 | 16,097 | 69,041 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 25,861 | 0 | 20 | 25,881 | 0 |
| | 99o | 0 | 0 | 570,000 | 1,372 | 1,112 | 7,396 | 471 | 580,351 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 17,936 | 0 | 1 | 17,937 | 0 |
| * Chlorobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 9,123,869 | 1,016,982 | 2,099,757 | 1,366,145 | 11,231,684 | 1,503,368 | 1,242,678 | 27,584,483 | 20,613 |
| | 98o | 1,107,325 | 976,071 | 5,490,480 | 3,476,264 | 10,333,365 | 4,804,121 | 983,806 | 27,171,432 | 831 |
| | 98n | 260,432 | 0 | 20,907 | 81,425 | 1,819,899 | 1,302 | 2,040 | 2,186,005 | 3 |
| | 99o | 4,394,439 | 6,186,066 | 4,355,424 | 1,518,569 | 6,283,038 | 1,640,671 | 784,133 | 25,162,340 | 16,458 |
| | 99n | 443,673 | 0 | 8,156 | 287,236 | 2,576,220 | 1,174 | 64,394 | 3,380,853 | 11 |
| Chlorobenzilate | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 41,000 | 0 | 9 | 41,009 | 0 |
| 1-Chloro-1,1-difluoroethane (HCFC-142b) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 52,560 | 0 | 0 | 320 | 304,070 | 26,330 | 6,933,797 | 7,317,077 | 459 |
| | 98o | 67 | 0 | 0 | 5,400 | 534,586 | 165,589 | 5,537,482 | 6,243,124 | 103 |
| | 98n | 0 | 0 | 0 | 0 | 136,697 | 0 | 625 | 137,322 | 0 |
| | 99o | 12,089,067 | 0 | 0 | 142,321 | 537,217 | 190,798 | 5,577,057 | 18,536,460 | 13 |
| | 99n | 0 | 0 | 0 | 0 | 591,193 | 0 | 124 | 591,317 | 0 |
| * Chlorodifluoromethane (HCFC-22) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,374,126 | 242,386 | 0 | 27,002 | 401,771 | 258,992 | 12,473,833 | 15,778,110 | 196,364 |
| | 98o | 698,765 | 168,042 | 0 | 237 | 505,214 | 291,198 | 9,092,224 | 10,755,680 | 125,566 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 63,090 | 63,090 | 1,512 |
| | 99o | 867,732 | 472,424 | 0 | 2,422 | 346,748 | 203,402 | 8,524,280 | 10,417,008 | 28,185 |
| | 99n | 3 | 0 | 0 | 0 | 12,715 | 1,114 | 108,966 | 122,798 | 1 |
| Chloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,321,094 | 155,726 | 13,500,359 | 45,855 | 28,074,197 | 492,722 | 2,896,879 | 47,486,832 | 8,570 |
| | 98o | 5,135,802 | 175,104 | 11,263,574 | 17,934 | 35,499,891 | 332,191 | 2,206,187 | 54,630,683 | 135 |
| | 98n | 0 | 0 | 0 | 0 | 48,025 | 14 | 15 | 48,054 | 1 |
| | 99o | 535,427 | 431,321 | 22,516,043 | 119,801 | 28,690,272 | 504,450 | 2,129,345 | 54,926,659 | 1,402 |
| | 99n | No reports | | | | | | | | |
| *** Chloroform | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,138,816 | 175,713 | 17,199,219 | 103,558 | 17,286,695 | 2,062,169 | 10,831,218 | 52,797,388 | 27,208 |
| | 98o | 6,749,489 | 1,871,565 | 5,133,726 | 164,858 | 16,253,651 | 1,722,202 | 6,714,471 | 38,609,962 | 21,625 |
| | 98n | 53,314 | 0 | 1,650 | 326,742 | 1,473,283 | 2,409,085 | 3,716 | 4,267,790 | 6 |
| | 99o | 8,936,153 | 2,756,665 | 1,606,655 | 89,563 | 25,578,063 | 2,025,057 | 5,489,112 | 46,481,268 | 51,614 |
| | 99n | 222,080 | 0 | 18,133 | 468,149 | 2,136,199 | 187,350 | 70,520 | 3,102,431 | 53 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Off-site Releases | Total On- and Off-site Releases |
|-------------|-----------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | |
| 74-87-3 * | Chloromethane | 88 | 81 | 11,567,647 | 115,985 | 165,250 | 0 | 11,848,882 | 11,908,022 |
| | | 95 | 111 | 4,394,877 | 57,430 | 50,198 | 35 | 4,502,540 | 4,504,097 |
| | | 98o | 101 | 2,650,625 | 1,742 | 323,201 | 57 | 2,975,625 | 2,976,577 |
| | | 98n | 9 | 2,812 | 0 | 0 | 0 | 2,812 | 2,819 |
| | | 99o | 98 | 2,776,733 | 2,159 | 158,680 | 53 | 2,937,625 | 2,939,819 |
| | | 99n | 11 | 1,150 | 0 | 0 | 8,228 | 9,378 | 13,834 |
| 107-30-2 ** | Chloromethyl methyl ether | 88 | 4 | 3,033 | 0 | 0 | 0 | 3,033 | 3,033 |
| | | 95 | 3 | 2,865 | 10 | 0 | 0 | 2,875 | 2,945 |
| | | 98o | 2 | 1,000 | 0 | 0 | 0 | 1,000 | 1,000 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 1,300 | 0 | 0 | 0 | 1,300 | 1,300 |
| | | 99n | 3 | 70 | 1 | 0 | 0 | 71 | 240 |
| 563-47-3 ** | 3-Chloro-2-methyl-1-propene | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 19,859 | 0 | 0 | 0 | 19,859 | 19,859 |
| | | 98o | 3 | 7,353 | 0 | 0 | 0 | 7,353 | 7,353 |
| | | 98n | No reports | | | | | | |
| | | 99o | 4 | 8,716 | 0 | 0 | 0 | 8,716 | 8,716 |
| | | 99n | No reports | | | | | | |
| — | Chlorophenols | 88 | 9 | 2,573 | 272 | 71,554 | 0 | 74,399 | 74,401 |
| | | 95 | 9 | 4,997 | 30 | 105,687 | 0 | 110,714 | 111,672 |
| | | 98o | 6 | 4,864 | 36 | 73,548 | 0 | 78,448 | 86,461 |
| | | 98n | 5 | 16 | 0 | 0 | 0 | 16 | 4,191 |
| | | 99o | 8 | 3,519 | 75 | 59,159 | 2 | 62,755 | 66,094 |
| | | 99n | 3 | 1 | 0 | 0 | 0 | 1 | 286 |
| 76-06-2 * | Chloropicrin | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 15 | 11,472 | 0 | 0 | 0 | 11,472 | 11,508 |
| | | 98o | 16 | 7,560 | 0 | 0 | 0 | 7,560 | 7,830 |
| | | 98n | 1 | 4 | 0 | 0 | 0 | 4 | 4 |
| | | 99o | 15 | 6,647 | 0 | 0 | 0 | 6,647 | 6,648 |
| | | 99n | 1 | 4 | 0 | 0 | 0 | 4 | 4 |
| 126-99-8 ** | Chloroprene | 88 | 13 | 1,948,008 | 287 | 68,792 | 0 | 2,017,087 | 2,017,087 |
| | | 95 | 15 | 983,932 | 0 | 60,000 | 5,104 | 1,049,036 | 1,056,138 |
| | | 98o | 12 | 977,628 | 0 | 100,000 | 0 | 1,077,628 | 1,077,628 |
| | | 98n | 2 | 528 | 0 | 0 | 0 | 528 | 529 |
| | | 99o | 10 | 906,891 | 0 | 29,000 | 0 | 935,891 | 935,891 |
| | | 99n | 1 | 255 | 0 | 0 | 0 | 255 | 255 |
| 542-76-7 | 3-Chloropropionitrile | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | |
| | | 98o | No reports | | | | | | |
| | | 98n | No reports | | | | | | |
| | | 99o | No reports | | | | | | |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 157 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Chloromethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,803,788 | 650 | 4,517,896 | 4,505 | 14,364,776 | 240,406 | 4,522,298 | 26,454,319 | 7,918 |
| | 98o | 3,447,064 | 23,740 | 4,341,426 | 17,950 | 8,368,825 | 292,447 | 2,931,738 | 19,423,190 | 12,003 |
| | 98n | 0 | 0 | 0 | 0 | 342,535 | 1,997,213 | 2,861 | 2,342,609 | 1 |
| | 99o | 3,323,869 | 1 | 5,274,618 | 2,063 | 13,727,873 | 234,597 | 2,935,887 | 25,498,908 | 2,699 |
| | 99n | 0 | 0 | 0 | 0 | 363,375 | 0 | 13,928 | 377,303 | 33,696 |
| ** Chloromethyl methyl ether | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 15,900 | 0 | 2,909 | 18,809 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 280 | 0 | 1,000 | 1,280 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 1,600 | 0 | 1,300 | 2,900 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 163,369 | 0 | 235 | 163,604 | 0 |
| ** 3-Chloro-2-methyl-1-propene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 544,134 | 14,819 | 19,859 | 578,812 | 10 |
| | 98o | 0 | 0 | 0 | 0 | 637,973 | 344 | 7,353 | 645,670 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 550,770 | 16,664 | 8,525 | 575,959 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Chlorophenols | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,919,075 | 0 | 0 | 6,400 | 237,484 | 26,212 | 109,865 | 3,299,036 | 1,776 |
| | 98o | 2,737,000 | 0 | 0 | 0 | 297,377 | 7,807 | 85,733 | 3,127,917 | 725 |
| | 98n | 0 | 0 | 1,009 | 62,967 | 281,511 | 9,645 | 3,940 | 359,072 | 0 |
| | 99o | 2,148,700 | 0 | 0 | 0 | 1,740,690 | 3,639 | 65,024 | 3,958,053 | 1,070 |
| | 99n | 0 | 0 | 2,837 | 78,708 | 188,731 | 71 | 286 | 270,633 | 0 |
| * Chloropicrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 9,981 | 632 | 0 | 54 | 441 | 34,524 | 10,677 | 56,309 | 0 |
| | 98o | 2,250 | 1,064 | 0 | 0 | 1,110 | 483 | 7,544 | 12,451 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 |
| | 99o | 2,206 | 914 | 0 | 0 | 4,233 | 412 | 6,647 | 14,412 | 10 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 |
| ** Chloroprene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 480,972 | 466,280 | 9,105 | 4,233,572 | 138,421 | 1,051,019 | 6,379,369 | 518 |
| | 98o | 0 | 306,514 | 1,200,000 | 66,206 | 8,860,286 | 209,184 | 1,077,632 | 11,719,822 | 10 |
| | 98n | 0 | 0 | 0 | 13,385 | 102,414 | 173 | 299 | 116,271 | 0 |
| | 99o | 0 | 584,238 | 1,945,200 | 798 | 8,671,014 | 115,522 | 935,889 | 12,252,661 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 102,743 | 0 | 15 | 102,758 | 0 |
| 3-Chloropropionitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 106,854 | 0 | 157 | 107,011 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|--|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 63938-10-3 | Chlorotetrafluoroethane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 1 | 129,800 | 0 | 0 | 0 | 129,800 | 0 | 129,800 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 354-25-6 | 1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 504,553 | 0 | 0 | 0 | 504,553 | 0 | 504,553 |
| | | 98o | 3 | 23,336 | 0 | 0 | 0 | 23,336 | 0 | 23,336 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 59,525 | 0 | 0 | 0 | 59,525 | 0 | 59,525 |
| | | 99n | No reports | | | | | | | |
| 2837-89-0 | 2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 752,215 | 1,255 | 0 | 0 | 753,470 | 0 | 753,470 |
| | | 98o | 23 | 750,474 | 5 | 0 | 0 | 750,479 | 0 | 750,479 |
| | | 98n | 1 | 852 | 0 | 0 | 0 | 852 | 0 | 852 |
| | | 99o | 22 | 599,721 | 5 | 0 | 0 | 599,726 | 0 | 599,726 |
| | | 99n | 1 | 4,651 | 0 | 0 | 0 | 4,651 | 0 | 4,651 |
| 1897-45-6 | * Chlorothalonil | 88 | 10 | 28,476 | 250 | 0 | 0 | 28,726 | 396,274 | 425,000 |
| | | 95 | 25 | 7,440 | 35 | 0 | 750 | 8,225 | 97,420 | 105,645 |
| | | 98o | 25 | 9,236 | 35 | 0 | 0 | 9,271 | 301,801 | 311,072 |
| | | 98n | 1 | 0 | 0 | 5 | 32,000 | 32,005 | 5 | 32,010 |
| | | 99o | 19 | 5,106 | 7 | 0 | 0 | 5,113 | 280,116 | 285,229 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75-88-7 | 2-Chloro-1,1,1-trifluoroethane (HCFC-133a) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 35,523 | 0 | 0 | 0 | 35,523 | 0 | 35,523 |
| | | 98o | 4 | 162,775 | 52 | 0 | 0 | 162,827 | 0 | 162,827 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 23,950 | 30 | 0 | 0 | 23,980 | 0 | 23,980 |
| | | 99n | No reports | | | | | | | |
| 75-72-9 | Chlorotrifluoromethane (CFC-13) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 98o | 1 | 14,700 | 5 | 0 | 0 | 14,705 | 0 | 14,705 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 10,790 | 5 | 0 | 0 | 10,795 | 0 | 10,795 |
| | | 99n | No reports | | | | | | | |
| 5598-13-0 | * Chlorpyrifos methyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 510 | 0 | 0 | 6,000 | 6,510 | 0 | 6,510 |
| | | 98o | 5 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 10 | 0 | 0 | 0 | 10 | 24,197 | 24,207 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Chlorotetrafluoroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 29,571 | 0 | 0 | 29,571 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 129,800 | 129,800 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 47,355 | 0 | 0 | 47,355 | 0 |
| 1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,725 | 0 | 504,011 | 505,736 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 165,890 | 0 | 23,136 | 189,026 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 457,049 | 474,629 | 59,325 | 991,003 | 0 |
| | 99n | No reports | | | | | | | | |
| 2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 239,200 | 0 | 0 | 193,194 | 35,816 | 753,296 | 1,221,506 | 401 |
| | 98o | 44,530 | 282,345 | 0 | 0 | 501,437 | 0 | 749,963 | 1,578,275 | 32 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 852 | 852 | 0 |
| | 99o | 110,249 | 246,089 | 0 | 0 | 263,090 | 1,085 | 599,669 | 1,220,182 | 41 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 4,651 | 4,651 | 0 |
| * Chlorothalonil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,339 | 0 | 0 | 2,294 | 24,716 | 139,966 | 102,279 | 274,594 | 5 |
| | 98o | 4,726 | 0 | 0 | 0 | 65,406 | 195,241 | 311,120 | 576,493 | 419 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 32,000 | 32,000 | 0 |
| | 99o | 25,082 | 0 | 0 | 0 | 63,840 | 149,720 | 285,866 | 524,508 | 1,614 |
| | 99n | 0 | 0 | 0 | 0 | 14,075 | 0 | 0 | 14,075 | 0 |
| 2-Chloro-1,1,1-trifluoroethane (HCFC-133a) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 35,608 | 35,608 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 33,000 | 0 | 162,925 | 195,925 | 4 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 250,000 | 0 | 23,700 | 273,700 | 1 |
| | 99n | No reports | | | | | | | | |
| Chlorotrifluoromethane (CFC-13) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 30 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 14,705 | 14,705 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 33,339 | 0 | 0 | 0 | 0 | 10,795 | 44,134 | 0 |
| | 99n | No reports | | | | | | | | |
| * Chlorpyrifos methyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 400 | 0 | 0 | 0 | 0 | 6,095 | 6,402 | 12,897 | 0 |
| | 98o | 2,000 | 0 | 0 | 0 | 0 | 4,990 | 285 | 7,275 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 4,000 | 0 | 0 | 0 | 0 | 0 | 8 | 4,008 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 64902-72-3 * | Chlorsulfuron | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | No reports | | | | | | | |
| 7440-47-3 | Chromium | 88 | 1,257 | 566,498 | 75,442 | 2,249 | 9,282,766 | 9,926,955 | 11,710,612 | 21,637,567 |
| | | 95 | 1,995 | 418,408 | 17,266 | 33 | 1,109,958 | 1,545,665 | 5,771,254 | 7,316,919 |
| | | 98o | 1,954 | 478,733 | 13,112 | 9 | 685,766 | 1,177,620 | 12,286,701 | 13,464,321 |
| | | 98n | 58 | 7,409 | 25,220 | 260,448 | 14,863,233 | 15,156,310 | 1,684,877 | 16,841,187 |
| | | 99o | 1,971 | 300,814 | 11,236 | 56 | 715,100 | 1,027,206 | 15,226,590 | 16,253,796 |
| | | 99n | 55 | 3,879 | 20,333 | 38,250 | 10,484,695 | 10,547,157 | 1,582,791 | 12,129,948 |
| — | Chromium compounds | 88 | 1,214 | 764,851 | 326,027 | 52,653 | 30,938,106 | 32,081,637 | 14,898,699 | 46,980,336 |
| | | 95 | 1,478 | 650,311 | 138,551 | 1,084,747 | 22,090,165 | 23,963,774 | 20,389,031 | 44,352,805 |
| | | 98o | 1,501 | 347,629 | 112,520 | 874,795 | 30,241,083 | 31,576,027 | 14,258,085 | 45,834,112 |
| | | 98n | 325 | 305,563 | 114,397 | 667,755 | 58,501,745 | 59,589,460 | 5,859,141 | 65,448,601 |
| | | 99o | 1,471 | 467,071 | 97,379 | 816,717 | 29,591,378 | 30,972,545 | 11,704,628 | 42,677,173 |
| | | 99n | 311 | 281,396 | 97,202 | 720,000 | 122,827,111 | 123,925,709 | 5,140,315 | 129,066,024 |
| 6459-94-5 ** | C.I. Acid Red 114 | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 569-64-2 * | C.I. Basic Green 4 | 88 | 6 | 750 | 0 | 0 | 0 | 750 | 250 | 1,000 |
| | | 95 | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 3 | 5 | 0 | 0 | 0 | 5 | 750 | 755 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 989-38-8 | C.I. Basic Red 1 | 88 | No reports | | | | | | | |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 668 | 668 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 28407-37-6 | C.I. Direct Blue 218 | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 6 | 10 | 6 | 0 | 0 | 16 | 1,400 | 1,416 |
| | | 98o | 6 | 0 | 10 | 0 | 5 | 15 | 2,142 | 2,157 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 8 | 0 | 10 | 0 | 0 | 10 | 2,259 | 2,269 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Chlorsulfuron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 3,444 | 1 | 3,445 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 10,508 | 1 | 10,509 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 2,221 | 1 | 2,222 | 0 |
| | 99n | No reports | | | | | | | | |
| Chromium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 29,383,000 | 102,620,653 | 9,781,278 | 51,737 | 407,059 | 1,625,216 | 8,196,383 | 152,065,326 | 41,531 |
| | 98o | 86,941,979 | 85,701,571 | 86,318 | 17,198 | 815,469 | 1,198,804 | 13,503,531 | 188,264,870 | 55,236 |
| | 98n | 1 | 141,529 | 0 | 0 | 59,920 | 48,806 | 16,443,437 | 16,693,693 | 9 |
| | 99o | 27,015,081 | 86,204,633 | 0 | 1,555 | 506,478 | 774,300 | 12,439,973 | 126,942,020 | 3,887,557 |
| | 99n | 1,524 | 383,454 | 0 | 0 | 1,977 | 187,876 | 11,309,149 | 11,883,980 | 15 |
| Chromium compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 36,402,729 | 45,926,897 | 44,280 | 66,691 | 94,217,654 | 3,498,201 | 40,262,731 | 220,419,183 | 1,658,998 |
| | 98o | 38,004,484 | 33,563,950 | 10,015 | 33,545 | 1,225,288 | 2,591,138 | 44,564,125 | 119,992,545 | 175,639 |
| | 98n | 64,201 | 903,937 | 0 | 57,374 | 133,506 | 449,066 | 65,248,633 | 66,856,717 | 2,871 |
| | 99o | 27,604,292 | 34,962,321 | 2,000 | 64,839 | 8,936,864 | 1,354,628 | 43,372,240 | 116,297,184 | 1,444,247 |
| | 99n | 14,417 | 1,765,370 | 0 | 0 | 91,982 | 207,012 | 85,760,261 | 87,839,042 | 43,000,521 |
| ** C.I. Acid Red 114 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * C.I. Basic Green 4 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 110 | 499 | 10 | 619 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 998 | 20 | 1,018 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| C.I. Basic Red 1 | 88 | No reports | | | | | | | | |
| | 95 | 0 | 0 | 0 | 54 | 0 | 289 | 668 | 1,011 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| C.I. Direct Blue 218 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5 | 0 | 0 | 0 | 619 | 5,151 | 1,411 | 7,186 | 0 |
| | 98o | 0 | 260 | 0 | 0 | 312 | 1,417 | 2,144 | 4,133 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 450 | 0 | 0 | 53 | 1,622 | 2,262 | 4,387 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|-----------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 16071-86-6 | C.I. Direct Brown 95 | 88 | No reports | | | | | | | |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 2832-40-8 | C.I. Disperse Yellow 3 | 88 | 1 | 398 | 302 | 0 | 0 | 700 | 899 | 1,599 |
| | | 95 | 3 | 450 | 27 | 0 | 0 | 477 | 1,061 | 1,538 |
| | | 98o | 3 | 205 | 25 | 0 | 0 | 230 | 876 | 1,106 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 50 | 25 | 0 | 0 | 75 | 900 | 975 |
| | | 99n | No reports | | | | | | | |
| 81-88-9 | C.I. Food Red 15 | 88 | 2 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 3118-97-6 | C.I. Solvent Orange 7 | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 97-56-3 | C.I. Solvent Yellow 3 | 88 | 1 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 842-07-9 | C.I. Solvent Yellow 14 | 88 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 95 | No reports | | | | | | | |
| 492-80-8 | *,** C.I. Solvent Yellow 34 | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 2 | 5 | 0 | 0 | 0 | 5 | 157 | 162 |
| 7440-48-4 | ** Cobalt | 88 | 178 | 44,038 | 16,744 | 0 | 213,204 | 273,986 | 248,089 | 522,075 |
| | | 95 | 260 | 35,521 | 17,070 | 0 | 46,487 | 99,078 | 223,081 | 322,159 |
| | | 98o | 268 | 40,630 | 3,597 | 0 | 85,063 | 129,290 | 414,253 | 543,543 |
| | | 98n | 6 | 280 | 7 | 0 | 133,731 | 134,018 | 17,870 | 151,888 |
| | | 99o | 250 | 24,325 | 5,600 | 0 | 5,803 | 35,728 | 330,771 | 366,499 |
| | | 99n | 5 | 27 | 0 | 0 | 83,115 | 83,142 | 5 | 83,147 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year. C.I. Solvent Yellow 14 has no reports for 1998 or 1999 and C.I. Solvent Yellow 34 has no reports for 1988 and 1995.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| C.I. Direct Brown 95 | 88 | No reports | | | | | | | | |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| C.I. Disperse Yellow 3 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,061 | 5,189 | 1,410 | 7,660 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 1,882 | 1,106 | 2,988 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 950 | 950 | 0 |
| | 99n | No reports | | | | | | | | |
| C.I. Food Red 15 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| C.I. Solvent Orange 7 | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| C.I. Solvent Yellow 3 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| C.I. Solvent Yellow 14 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| *,** C.I. Solvent Yellow 34 | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 129,504 | 0 | 162 | 129,666 | 0 |
| ** Cobalt | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,583,408 | 12,062,557 | 0 | 1 | 379,265 | 85,327 | 250,979 | 16,361,537 | 19 |
| | 98o | 4,249,702 | 7,607,336 | 0 | 10,000 | 14,107 | 32,813 | 326,390 | 12,240,348 | 311 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 151,859 | 151,859 | 1 |
| | 99o | 4,421,707 | 7,424,436 | 0 | 0 | 5,886 | 14,387 | 250,501 | 12,116,917 | 38 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 83,124 | 83,124 | 0 |

Note: Data from Section 8 (Current Year) of Form R. C.I. Solvent Yellow 14 has no reports for 1998 or 1999 and C.I. Solvent Yellow 34 has no reports for 1988 and 1995. 98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|---------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| — | ** Cobalt compounds | 88 | 150 | 56,410 | 63,662 | 18,500 | 38,960 | 177,532 | 300,641 | 478,173 |
| | | 95 | 233 | 29,756 | 70,646 | 51,657 | 505,634 | 657,693 | 352,486 | 1,010,179 |
| | | 98o | 287 | 32,098 | 35,350 | 32,950 | 500,101 | 600,499 | 353,801 | 954,300 |
| | | 98n | 157 | 55,229 | 24,069 | 12,006 | 12,610,937 | 12,702,241 | 461,156 | 13,163,397 |
| | | 99o | 288 | 33,861 | 58,826 | 30,421 | 494,601 | 617,709 | 501,159 | 1,118,868 |
| | | 99n | 155 | 45,019 | 24,948 | 17,001 | 14,769,746 | 14,856,714 | 401,282 | 15,257,996 |
| 7440-50-8 | * Copper | 88 | 1,976 | 1,525,312 | 117,147 | 15,646 | 10,466,155 | 12,124,260 | 17,233,013 | 29,357,273 |
| | | 95 | 2,797 | 1,270,554 | 44,746 | 29,787 | 1,658,490 | 3,003,577 | 14,995,886 | 17,999,463 |
| | | 98o | 2,794 | 783,514 | 37,959 | 56,634 | 1,535,810 | 2,413,917 | 9,189,922 | 11,603,839 |
| | | 98n | 58 | 117,699 | 17,196 | 23,211 | 278,545,097 | 278,703,203 | 2,423,176 | 281,126,379 |
| | | 99o | 2,726 | 2,147,555 | 33,835 | 62,367 | 1,356,172 | 3,599,929 | 9,389,644 | 12,989,573 |
| | | 99n | 45 | 83,855 | 2,985 | 5 | 12,843,001 | 12,929,846 | 1,593,575 | 14,523,421 |
| — | Copper compounds | 88 | 1,045 | 3,158,742 | 185,292 | 165,957 | 29,683,607 | 33,193,598 | 14,135,121 | 47,328,719 |
| | | 95 | 1,470 | 2,026,261 | 93,463 | 284,852 | 40,773,223 | 43,177,799 | 10,135,478 | 53,313,277 |
| | | 98o | 1,578 | 3,537,103 | 95,291 | 187,400 | 51,931,154 | 55,750,948 | 8,689,722 | 64,440,670 |
| | | 98n | 385 | 608,782 | 369,878 | 1,374,646 | 1,233,639,938 | 1,235,993,244 | 4,574,527 | 1,240,567,771 |
| | | 99o | 1,592 | 1,552,594 | 84,642 | 247,755 | 44,273,099 | 46,158,090 | 9,377,458 | 55,535,548 |
| | | 99n | 362 | 657,441 | 276,825 | 1,273,581 | 1,731,744,734 | 1,733,952,581 | 4,289,275 | 1,738,241,856 |
| 8001-58-9 | *** Creosote | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 85 | 928,376 | 8,427 | 0 | 500 | 937,303 | 2,595,570 | 3,532,873 |
| | | 98o | 78 | 869,799 | 24,842 | 0 | 12,275 | 906,916 | 1,204,515 | 2,111,431 |
| | | 98n | 14 | 1,142 | 0 | 0 | 2,176,468 | 2,177,610 | 1,996 | 2,179,606 |
| | | 99o | 75 | 742,018 | 22,318 | 0 | 34,237 | 798,573 | 607,485 | 1,406,058 |
| | | 99n | 15 | 1,059 | 1 | 0 | 1,174,746 | 1,175,806 | 636 | 1,176,442 |
| 120-71-8 | ** p-Cresidine | 88 | 6 | 7,080 | 250 | 0 | 750 | 8,080 | 4,700 | 12,780 |
| | | 95 | 6 | 4,606 | 0 | 0 | 0 | 4,606 | 2,200 | 6,806 |
| | | 98o | 4 | 2,400 | 0 | 0 | 0 | 2,400 | 0 | 2,400 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 1,730 | 410 | 0 | 0 | 2,140 | 0 | 2,140 |
| | | 99n | No reports | | | | | | | |
| 108-39-4 | * m-Cresol | 88 | 15 | 18,432 | 283 | 0 | 455 | 19,170 | 13,503 | 32,673 |
| | | 95 | 29 | 48,000 | 1,675 | 680,000 | 0 | 729,675 | 3,316 | 732,991 |
| | | 98o | 26 | 44,999 | 141 | 502,670 | 4,655 | 552,465 | 632 | 553,097 |
| | | 98n | 4 | 9 | 0 | 0 | 0 | 9 | 0 | 9 |
| | | 99o | 24 | 41,392 | 670 | 401,011 | 3,096 | 446,169 | 755 | 446,924 |
| | | 99n | 6 | 116 | 1 | 250 | 0 | 367 | 279 | 646 |
| 95-48-7 | o-Cresol | 88 | 28 | 89,793 | 448 | 0 | 1,667 | 91,908 | 12,458 | 104,366 |
| | | 95 | 23 | 12,425 | 82 | 590,000 | 0 | 602,507 | 5,257 | 607,764 |
| | | 98o | 21 | 9,270 | 16 | 466,578 | 20 | 475,884 | 39,525 | 515,409 |
| | | 98n | 6 | 12 | 0 | 0 | 0 | 12 | 0 | 12 |
| | | 99o | 25 | 11,059 | 19 | 381,376 | 20 | 392,474 | 2,674 | 395,148 |
| | | 99n | 7 | 717 | 1 | 250 | 11,770 | 12,738 | 743 | 13,481 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Cobalt compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 222,882 | 1,987,024 | 0 | 847 | 1,394,924 | 98,451 | 958,210 | 4,662,338 | 4,241 |
| | 98o | 151,421 | 1,678,717 | 0 | 7,985 | 1,459,617 | 37,257 | 955,881 | 4,290,878 | 1,602 |
| | 98n | 39,737 | 18,567 | 0 | 0 | 46,417 | 15 | 13,158,477 | 13,263,213 | 4,021 |
| | 99o | 314,090 | 1,460,920 | 117 | 14,204 | 1,157,119 | 65,427 | 1,093,446 | 4,105,323 | 3,773 |
| | 99n | 164,666 | 11,144 | 0 | 0 | 0 | 10 | 15,256,539 | 15,432,359 | 30 |
| * Copper | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 497,597,679 | 568,944,460 | 506 | 43,341 | 41,198,550 | 1,758,270 | 11,536,321 | 1,121,079,127 | 92,197 |
| | 98o | 538,829,326 | 569,858,783 | 189,372 | 499,061 | 45,072,502 | 1,422,645 | 8,791,428 | 1,164,663,117 | 952,172 |
| | 98n | 2,708,008 | 817,145 | 0 | 0 | 1,370 | 27,294 | 281,065,001 | 284,618,818 | 5 |
| | 99o | 467,406,131 | 597,997,865 | 0 | 332 | 742,770 | 1,671,710 | 8,440,789 | 1,076,259,597 | 165,014 |
| | 99n | 3,363,123 | 1,633,389 | 0 | 0 | 51,153 | 42,171 | 14,495,146 | 19,584,982 | 2 |
| Copper compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 215,002,488 | 181,627,923 | 0 | 30,802 | 60,465,252 | 2,278,683 | 50,020,457 | 509,425,605 | 1,323,186 |
| | 98o | 186,532,474 | 150,451,923 | 0 | 23,292 | 2,735,305 | 1,819,514 | 61,391,920 | 402,954,428 | 4,149,261 |
| | 98n | 5,677,807 | 1,786,645 | 0 | 15,858 | 483,340 | 168,564 | 1,349,748,709 | 1,357,880,923 | 297,963 |
| | 99o | 220,044,782 | 148,611,331 | 1,200 | 324,339 | 3,100,191 | 1,429,907 | 52,719,419 | 426,231,169 | 4,476,230 |
| | 99n | 2,005,320 | 2,249,900 | 0 | 0 | 7,214,180 | 491,128 | 1,476,246,887 | 1,488,207,415 | 330,001,090 |
| *** Creosote | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 64,447,471 | 2,180 | 6,100 | 94,871 | 163,131 | 298,027 | 3,208,184 | 68,219,964 | 322,992 |
| | 98o | 11,514,469 | 717,808 | 2,626,352 | 81,103 | 842,960 | 902,470 | 1,907,684 | 18,592,846 | 541,707 |
| | 98n | 0 | 0 | 10 | 49,454 | 523,727 | 41,936 | 2,177,407 | 2,792,534 | 3 |
| | 99o | 6,427,378 | 696,540 | 2,143,805 | 163,252 | 432,906 | 1,051,318 | 1,345,805 | 12,261,004 | 519,891 |
| | 99n | 0 | 0 | 471 | 225 | 1,490,119 | 22,639 | 1,179,126 | 2,692,580 | 0 |
| ** p-Cresidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 51,611 | 6,806 | 58,417 | 3,400 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 29,000 | 2,400 | 31,400 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 1,106 | 5,700 | 1,387 | 8,193 | 0 |
| | 99n | No reports | | | | | | | | |
| * m-Cresol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,309,373 | 1,500,001 | 615,425 | 17,910 | 329,024 | 91,159 | 737,708 | 5,600,600 | 151 |
| | 98o | 1,769,226 | 1,064,540 | 649,489 | 18,878 | 240,659 | 8,216 | 554,568 | 4,305,576 | 719 |
| | 98n | 0 | 0 | 0 | 45,524 | 40,473 | 0 | 9 | 86,006 | 0 |
| | 99o | 32,821 | 943,956 | 631,926 | 19,426 | 264,730 | 7,763 | 450,744 | 2,351,366 | 667 |
| | 99n | 0 | 0 | 0 | 44,270 | 531,957 | 0 | 436 | 576,663 | 0 |
| o-Cresol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 171,098 | 76 | 304,801 | 321 | 184,032 | 125,072 | 606,682 | 1,392,082 | 117 |
| | 98o | 95,701 | 0 | 339,395 | 1,218 | 206,884 | 17,724 | 516,766 | 1,177,688 | 376 |
| | 98n | 0 | 0 | 0 | 45,524 | 58,649 | 0 | 12 | 104,185 | 0 |
| | 99o | 29,734 | 75 | 250,748 | 24,837 | 206,544 | 16,996 | 394,795 | 923,729 | 89 |
| | 99n | 0 | 0 | 0 | 44,270 | 521,460 | 1,500 | 14,240 | 581,470 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 106-44-5 | p-Cresol | 88 | 18 | 640,703 | 1,143 | 152,000 | 62,291 | 856,137 | 643 | 856,780 |
| | | 95 | 30 | 44,901 | 1,066 | 342,500 | 0 | 388,467 | 3,168 | 391,635 |
| | | 98o | 30 | 57,003 | 43 | 299,485 | 0 | 356,531 | 50,556 | 407,087 |
| | | 98n | 5 | 13 | 0 | 0 | 0 | 13 | 0 | 13 |
| | | 99o | 28 | 44,318 | 422 | 244,834 | 68 | 289,642 | 32,884 | 322,526 |
| | | 99n | 7 | 148 | 1 | 250 | 0 | 399 | 222 | 621 |
| 1319-77-3 * | Cresol (mixed isomers) | 88 | 111 | 787,305 | 6,811 | 1,804,060 | 4,516 | 2,602,692 | 483,488 | 3,086,180 |
| | | 95 | 155 | 1,606,566 | 15,011 | 648,882 | 2,345 | 2,272,804 | 47,654 | 2,320,458 |
| | | 98o | 147 | 1,563,222 | 8,374 | 489,033 | 11,839 | 2,072,468 | 18,781 | 2,091,249 |
| | | 98n | 21 | 2,449 | 251 | 750 | 12,984 | 16,434 | 1,032 | 17,466 |
| | | 99o | 151 | 1,410,156 | 5,025 | 899,887 | 9,317 | 2,324,385 | 117,260 | 2,441,645 |
| | | 99n | 18 | 3,500 | 252 | 0 | 63,963 | 67,715 | 17,134 | 84,849 |
| 4170-30-3 * | Crotonaldehyde | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 7 | 101,579 | 680 | 391,500 | 0 | 493,759 | 0 | 493,759 |
| | | 98o | 6 | 29,584 | 3,800 | 1,300 | 0 | 34,684 | 0 | 34,684 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 8 | 28,867 | 37,297 | 1,350 | 0 | 67,514 | 0 | 67,514 |
| | | 99n | 3 | 16 | 1 | 0 | 0 | 17 | 176 | 193 |
| 98-82-8 | Cumene | 88 | 118 | 5,239,958 | 3,201 | 30,165 | 8,591 | 5,281,915 | 83,287 | 5,365,202 |
| | | 95 | 241 | 1,876,436 | 1,490 | 9,403 | 1,102 | 1,888,431 | 70,457 | 1,958,888 |
| | | 98o | 245 | 1,326,837 | 660 | 1,040 | 9,537 | 1,338,074 | 32,676 | 1,370,750 |
| | | 98n | 159 | 10,482 | 5 | 0 | 926 | 11,413 | 861 | 12,274 |
| | | 99o | 242 | 1,393,731 | 3,133 | 1,271 | 9,196 | 1,407,331 | 16,670 | 1,424,001 |
| | | 99n | 145 | 11,274 | 19 | 0 | 12 | 11,305 | 1,188 | 12,493 |
| 80-15-9 | Cumene hydroperoxide | 88 | 40 | 192,523 | 1,784 | 371,000 | 250 | 565,557 | 22,944 | 588,501 |
| | | 95 | 44 | 72,898 | 68 | 280,000 | 3,400 | 356,366 | 9,725 | 366,091 |
| | | 98o | 45 | 75,036 | 79 | 210,000 | 11,000 | 296,115 | 10,747 | 306,862 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 49 | 63,230 | 120 | 330,000 | 10,400 | 403,750 | 10,428 | 414,178 |
| | | 99n | 3 | 173 | 0 | 0 | 0 | 173 | 14,690 | 14,863 |
| 135-20-6 ** | Cupferron | 88 | 4 | 920 | 0 | 0 | 0 | 920 | 0 | 920 |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 21725-46-2 * | Cyanazine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 991 | 492 | 0 | 0 | 1,483 | 2,527 | 4,010 |
| | | 98o | 6 | 193 | 0 | 0 | 0 | 193 | 0 | 193 |
| | | 98n | 1 | 9 | 0 | 0 | 12,000 | 12,009 | 0 | 12,009 |
| | | 99o | 2 | 77 | 0 | 0 | 0 | 77 | 0 | 77 |
| | | 99n | 1 | 67 | 0 | 0 | 81,464 | 81,531 | 0 | 81,531 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| p-Cresol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 137,136 | 900,001 | 454,288 | 58,641 | 239,766 | 989,315 | 392,942 | 3,172,089 | 100 |
| | 98o | 83,138 | 654,268 | 449,080 | 76,711 | 1,156,104 | 54,263 | 387,019 | 2,860,583 | 280 |
| | 98n | 0 | 0 | 0 | 45,524 | 58,586 | 0 | 13 | 104,123 | 0 |
| | 99o | 21,521 | 471,978 | 368,924 | 105,385 | 1,393,414 | 45,727 | 321,096 | 2,728,045 | 230 |
| | 99n | 0 | 0 | 0 | 44,270 | 511,244 | 0 | 416 | 555,930 | 0 |
| * Cresol (mixed isomers) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,052,270 | 187,427 | 5,077,170 | 637,169 | 8,558,967 | 1,143,472 | 2,204,126 | 18,860,601 | 6,814 |
| | 98o | 125,717 | 645,573 | 7,298,232 | 434,321 | 11,306,167 | 313,764 | 2,097,628 | 22,221,402 | 8 |
| | 98n | 0 | 0 | 0 | 2,688,010 | 1,748,792 | 105,015 | 17,166 | 4,558,983 | 2 |
| | 99o | 117,186 | 816,127 | 5,452,294 | 400,508 | 10,422,770 | 324,550 | 2,497,295 | 20,030,730 | 1,704 |
| | 99n | 167,180 | 0 | 0 | 2,894,302 | 1,561,752 | 13,363 | 68,371 | 4,704,968 | 10 |
| * Crotonaldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 202,400 | 0 | 498,820 | 701,220 | 0 |
| | 98o | 0 | 0 | 1,837,500 | 0 | 569,220 | 16 | 34,884 | 2,441,620 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 1,823,660 | 7,492 | 1,255,658 | 1,552 | 66,911 | 3,155,273 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 252,503 | 0 | 188 | 252,691 | 0 |
| Cumene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 17,285,493 | 60,160 | 7,052,013 | 1,626,798 | 6,412,021 | 169,307 | 2,048,017 | 34,653,809 | 2,276 |
| | 98o | 19,166,077 | 147,270 | 9,222,203 | 855,853 | 16,050,082 | 187,647 | 1,482,966 | 47,112,098 | 917 |
| | 98n | 161,872 | 500 | 14,642 | 614,478 | 74,840 | 17,918 | 6,080 | 890,330 | 878 |
| | 99o | 20,953,597 | 58,642 | 5,571,585 | 1,043,530 | 12,802,582 | 114,628 | 1,492,979 | 42,037,543 | 523 |
| | 99n | 417,429 | 308 | 21,094 | 711,535 | 389,237 | 3,104 | 9,153 | 1,551,860 | 23 |
| | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 6 | 482,755 | 21,434 | 375,758 | 879,953 | 1 |
| | 98o | 0 | 0 | 0 | 1,066 | 399,343 | 264,990 | 304,800 | 970,199 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 6 | 500 | 476 | 1,095,436 | 435,408 | 424,604 | 1,956,430 | 1 |
| | 99n | 0 | 0 | 0 | 50,683 | 111,872 | 15,702 | 326 | 178,583 | 0 |
| ** Cupferron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 5,648 | 0 | 5,648 | 0 |
| | 98o | 0 | 0 | 13,228 | 659 | 0 | 0 | 0 | 13,887 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 3,750 | 9,623 | 0 | 0 | 0 | 13,373 | 0 |
| | 99n | No reports | | | | | | | | |
| * Cyanazine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 545,000 | 8,100 | 3,887 | 556,987 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 43,000 | 27,576 | 453 | 71,029 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 12,000 | 12,000 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 75,400 | 75,500 | 150,900 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 81,531 | 81,531 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|---------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| — | Cyanide compounds | 88 | 393 | 1,248,012 | 195,244 | 3,707,326 | 107,208 | 5,257,790 | 581,408 | 5,839,198 |
| | | 95 | 247 | 1,074,734 | 89,753 | 4,429,640 | 18,581 | 5,612,708 | 149,457 | 5,762,165 |
| | | 98o | 242 | 703,161 | 54,613 | 3,762,384 | 16,821 | 4,536,979 | 109,484 | 4,646,463 |
| | | 98n | 86 | 62,250 | 2,996 | 18,750 | 3,882,176 | 3,966,172 | 45,428 | 4,011,600 |
| | | 99o | 240 | 944,249 | 68,306 | 3,459,749 | 10,989 | 4,483,293 | 76,107 | 4,559,400 |
| | | 99n | 67 | 13,934 | 2,157 | 19,000 | 2,302,994 | 2,338,085 | 8,873 | 2,346,958 |
| 1134-23-2 * | Cycloate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 26 | 1,108 | 16 | 0 | 1,150 | 242 | 1,392 |
| | | 98o | 3 | 97 | 113 | 77 | 0 | 287 | 4 | 291 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 625 | 113 | 89 | 0 | 827 | 684 | 1,511 |
| | | 99n | No reports | | | | | | | |
| 110-82-7 * | Cyclohexane | 88 | 304 | 13,984,542 | 20,071 | 334,471 | 38,190 | 14,377,274 | 211,575 | 14,588,849 |
| | | 95 | 366 | 8,098,877 | 18,908 | 238,200 | 10,809 | 8,366,794 | 105,702 | 8,472,496 |
| | | 98o | 378 | 5,947,982 | 13,718 | 348,428 | 1,357 | 6,311,485 | 56,057 | 6,367,542 |
| | | 98n | 197 | 84,998 | 28 | 8,430 | 262 | 93,718 | 12,027 | 105,745 |
| | | 99o | 369 | 4,763,575 | 13,055 | 272,426 | 1,051 | 5,050,107 | 100,931 | 5,151,038 |
| | | 99n | 193 | 72,799 | 26 | 61,998 | 6,422 | 141,245 | 13,156 | 154,401 |
| 108-93-0 * | Cyclohexanol | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 25 | 167,959 | 154 | 3,623,000 | 0 | 3,791,113 | 70 | 3,791,183 |
| | | 98o | 27 | 300,624 | 298 | 4,307,800 | 0 | 4,608,722 | 1,490 | 4,610,212 |
| | | 98n | 3 | 43 | 0 | 0 | 0 | 43 | 13 | 56 |
| | | 99o | 24 | 161,524 | 41 | 3,730,307 | 0 | 3,891,872 | 881 | 3,892,753 |
| | | 99n | 7 | 9 | 0 | 0 | 0 | 9 | 181 | 190 |
| 68359-37-5 * | Cyfluthrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 2 | 4 | 1 | 0 | 0 | 5 | 0 | 5 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 4 | 16 | 72 | 0 | 0 | 88 | 0 | 88 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68085-85-8 * | Cyhalothrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 94-75-7 *,** | 2,4-D (acetic acid) | 88 | 28 | 7,020 | 549 | 3,789 | 38,000 | 49,358 | 68,422 | 117,780 |
| | | 95 | 27 | 6,888 | 1,083 | 250 | 4,325 | 12,546 | 17,430 | 29,976 |
| | | 98o | 28 | 3,970 | 88 | 1,300 | 1,798 | 7,156 | 2,887 | 10,043 |
| | | 98n | 6 | 18 | 0 | 29,909 | 0 | 29,927 | 269 | 30,196 |
| | | 99o | 28 | 7,879 | 74 | 440 | 1,798 | 10,191 | 11,426 | 21,617 |
| | | 99n | 7 | 34 | 0 | 21,850 | 0 | 21,884 | 480 | 22,364 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Cyanide compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 664,976 | 32,518 | 19,000 | 3,523 | 9,342,137 | 713,508 | 5,685,128 | 16,460,790 | 6,222 |
| | 98o | 1,692,214 | 58,277 | 7,028,885 | 2,185 | 11,964,665 | 718,714 | 4,574,383 | 26,039,323 | 2,497 |
| | 98n | 4,803,744 | 0 | 143 | 195 | 22,269,231 | 55,905 | 3,952,976 | 31,082,194 | 24 |
| | 99o | 463,102 | 24,093 | 5,174,259 | 31 | 12,949,714 | 1,059,035 | 4,531,674 | 24,201,908 | 25,138 |
| | 99n | 1,091,815 | 0 | 92 | 116 | 12,243,449 | 20,585 | 2,427,129 | 15,783,186 | 27,248 |
| * Cycloate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 2,000 | 6,001 | 1,346 | 9,347 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 1,148 | 3,574 | 289 | 5,011 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 1,097 | 2,054 | 600 | 3,751 | 1,652 |
| | 99n | No reports | | | | | | | | |
| * Cyclohexane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 54,644,021 | 1,585,367 | 10,345,060 | 5,145,025 | 23,742,793 | 1,250,210 | 8,426,987 | 105,139,463 | 123,189 |
| | 98o | 67,098,407 | 638,827 | 18,369,452 | 3,402,221 | 21,853,631 | 4,380,775 | 6,176,219 | 121,919,532 | 9,059 |
| | 98n | 457,159 | 1,685 | 3,156 | 4,891,083 | 3,435,597 | 248,265 | 93,750 | 9,130,695 | 357 |
| | 99o | 42,836,316 | 961,401 | 15,660,044 | 1,898,114 | 23,104,408 | 2,183,050 | 5,103,249 | 91,746,582 | 175,033 |
| | 99n | 1,567,007 | 63,963 | 18,735 | 2,573,663 | 3,408,308 | 135,743 | 146,034 | 7,913,453 | 2,164 |
| * Cyclohexanol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 677,199 | 16,473 | 154,921 | 21,584 | 3,836,687 | 4,706,864 | 1 |
| | 98o | 0 | 0 | 3,021,084 | 75,661 | 150,421 | 104,240 | 4,649,061 | 8,000,467 | 0 |
| | 98n | 0 | 0 | 29 | 144 | 12,360 | 0 | 33 | 12,566 | 0 |
| | 99o | 0 | 100 | 1,781,743 | 64,445 | 155,135 | 89,275 | 3,871,747 | 5,962,445 | 0 |
| | 99n | 0 | 0 | 0 | 31 | 82,814 | 0 | 181 | 83,026 | 0 |
| * Cyfluthrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 989 | 890 | 20 | 1,899 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 3,496 | 964 | 5 | 4,465 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 15,916 | 0 | 0 | 15,916 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 3,024 | 1,623 | 83 | 4,730 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 13,783 | 0 | 0 | 13,783 | 0 |
| * Cyhalothrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| *,** 2,4-D (acetic acid) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 29,200 | 0 | 0 | 0 | 23,780 | 24,490 | 27,595 | 105,065 | 6,192 |
| | 98o | 87,757 | 0 | 0 | 11 | 111,450 | 59,436 | 9,964 | 268,618 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 125,425 | 0 | 30,192 | 155,617 | 0 |
| | 99o | 94,815 | 0 | 0 | 0 | 118,130 | 63,548 | 26,173 | 302,666 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 386,422 | 164 | 22,131 | 408,717 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|-------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 533-74-4 * | Dazomet | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 1,042 | 230 | 0 | 0 | 1,272 | 2,578 | 3,850 |
| | | 98o | 14 | 0 | 0 | 0 | 0 | 0 | 1,274 | 1,274 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 15 | 250 | 450 | 0 | 5 | 705 | 250 | 955 |
| | | 98n | No reports | | | | | | | |
| 53404-60-7 * | Dazomet, sodium salt | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 250 | 250 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 94-82-6 * | 2,4-DB | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 750 | 0 | 0 | 0 | 750 | 0 | 750 |
| | | 98o | 2 | 7 | 0 | 0 | 0 | 7 | 0 | 7 |
| | | 98n | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99o | 2 | 17 | 0 | 0 | 0 | 17 | 0 | 17 |
| | | 99n | No reports | | | | | | | |
| 1929-73-3 ** | 2,4-D butoxyethyl ester | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 510 | 0 | 0 | 0 | 510 | 0 | 510 |
| | | 98o | 2 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 99n | No reports | | | | | | | |
| 94-80-4 ** | 2,4-D butyl ester | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 98o | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | No reports | | | | | | | |
| 1163-19-5 | Decabromodiphenyl oxide | 88 | 58 | 29,604 | 500 | 292 | 21,450 | 51,846 | 555,181 | 607,027 |
| | | 95 | 139 | 39,283 | 3,846 | 11 | 204,248 | 247,388 | 716,245 | 963,633 |
| | | 98o | 142 | 31,114 | 3,168 | 0 | 191,253 | 225,535 | 710,069 | 935,604 |
| | | 98n | 1 | 0 | 0 | 0 | 310,000 | 310,000 | 0 | 310,000 |
| | | 99o | 141 | 116,239 | 2,701 | 0 | 396,169 | 515,109 | 838,696 | 1,353,805 |
| | | 99n | 2 | 0 | 0 | 0 | 350,000 | 350,000 | 0 | 350,000 |
| 13684-56-5 * | Desmedipham | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 94 | 0 | 0 | 0 | 94 | 0 | 94 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 62 | 0 | 0 | 0 | 62 | 0 | 62 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Dazomet | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 20,110 | 1,178 | 3,542 | 24,830 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 100 | 2,100 | 1,400 | 3,600 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 13,093 | 9,803 | 602 | 23,498 | 0 |
| | 98n | No reports | | | | | | | | |
| * Dazomet, sodium salt | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 56 | 7,807 | 0 | 7,863 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 73 | 12,620 | 90 | 12,783 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 38 | 12,165 | 4 | 12,207 | 0 |
| | 99n | No reports | | | | | | | | |
| * 2,4-DB | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 217 | 290 | 507 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 14 | 7 | 21 | 0 |
| | 98n | 0 | 0 | 0 | 21,140 | 0 | 0 | 10 | 21,150 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 8 | 17 | 25 | 0 |
| | 99n | No reports | | | | | | | | |
| *,** 2,4-D butoxyethyl ester | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,600 | 318 | 1,918 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 76 | 76 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 | 0 |
| | 99n | No reports | | | | | | | | |
| *,** 2,4-D butyl ester | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 600 | 0 | 3 | 603 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 9,400 | 0 | 1 | 9,401 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 11,000 | 0 | 1 | 11,001 | 0 |
| | 99n | No reports | | | | | | | | |
| Decabromodiphenyl oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 992,673 | 144,205 | 0 | 18,686 | 32,138 | 322,935 | 947,336 | 2,457,973 | 3,805 |
| | 98o | 264,731 | 88,843 | 385 | 3,214 | 43,588 | 257,120 | 905,470 | 1,563,351 | 8 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 310,000 | 310,000 | 0 |
| | 99o | 368,187 | 29,007 | 6,600 | 8,732 | 58,412 | 419,598 | 1,314,803 | 2,205,339 | 11 |
| | 99n | 0 | 0 | 0 | 0 | 29,784 | 29,784 | 350,000 | 409,568 | 0 |
| * Desmedipham | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 1,150 | 94 | 1,244 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 691 | 62 | 753 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|-----------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 1928-43-4 | *** 2,4-D 2-Ethylhexyl ester | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 2,765 | 250 | 0 | 0 | 3,015 | 3,131 | 6,146 |
| | | 98o | 10 | 4,722 | 5 | 0 | 0 | 4,727 | 1,735 | 6,462 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 10 | 4,672 | 5 | 0 | 0 | 4,677 | 927 | 5,604 |
| 2303-16-4 | Diallate | 99n | No reports | | | | | | | |
| | | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 615-05-4 | ** 2,4-Diaminoanisole | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 170 | 178 |
| | | 88 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| 39156-41-7 | ** 2,4-Diaminoanisole sulfate | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| | | 88 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 95 | No reports | | | | | | | |
| 101-80-4 | ** 4,4'-Diaminodiphenyl ether | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 169 | 449 | 0 | 0 | 618 | 41 | 659 |
| | | 99n | No reports | | | | | | | |
| | | 88 | 5 | 216 | 585 | 0 | 0 | 801 | 142 | 943 |
| 95-80-7 | ** 2,4-Diaminotoluene | 95 | 3 | 23 | 359 | 0 | 0 | 382 | 120 | 502 |
| | | 98o | 3 | 22 | 340 | 0 | 0 | 362 | 55 | 417 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 5 | 0 | 0 | 0 | 5 | 54,062 | 54,067 |
| | | 99n | 4 | 35 | 0 | 0 | 0 | 35 | 774 | 809 |
| 25376-45-8 | ** Diaminotoluene (mixed isomers) | 99o | 2 | 629 | 0 | 0 | 0 | 629 | 0 | 629 |
| | | 99n | 6 | 287 | 1 | 0 | 0 | 288 | 1,030 | 1,318 |
| | | 88 | 13 | 21,097 | 3,288 | 174,000 | 295 | 198,680 | 289,591 | 488,271 |
| | | 95 | 11 | 9,594 | 5,522 | 7,050 | 55 | 22,221 | 28,625 | 50,846 |
| | | 98o | 13 | 13,523 | 5,785 | 13,000 | 205 | 32,513 | 12,531 | 45,044 |
| 25376-45-8 | ** Diaminotoluene (mixed isomers) | 98n | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99o | 11 | 10,381 | 28,633 | 6,200 | 14 | 45,228 | 15,912 | 61,140 |
| | | 99n | 6 | 287 | 1 | 0 | 0 | 288 | 1,030 | 1,318 |
| | | 88 | 13 | 21,097 | 3,288 | 174,000 | 295 | 198,680 | 289,591 | 488,271 |
| | | 95 | 11 | 9,594 | 5,522 | 7,050 | 55 | 22,221 | 28,625 | 50,846 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *,** 2,4-D 2-Ethylhexyl ester Diallate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 36,531 | 0 | 0 | 0 | 0 | 10,318 | 5,468 | 52,317 | 0 |
| | 98o | 7,870 | 0 | 0 | 0 | 0 | 14,179 | 6,334 | 28,383 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 13,250 | 0 | 0 | 0 | 0 | 9,898 | 6,150 | 29,298 | 0 |
| | 99n | No reports | | | | | | | | |
| | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 176,396 | 0 | 175 | 176,571 | 0 |
| ** 2,4-Diaminoanisole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| ** 2,4-Diaminoanisole sulfate | 99n | No reports | | | | | | | | |
| | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| ** 4,4'-Diaminodiphenyl ether | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 4,929 | 380,289 | 377 | 385,595 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 140 | 4,483 | 357 | 4,980 | 0 |
| ** 2,4-Diaminotoluene | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 62 | 138 | 613 | 813 | 0 |
| | 99n | No reports | | | | | | | | |
| | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 7,192 | 29,774 | 655 | 37,621 | 0 |
| ** Diaminotoluene (mixed isomers) | 98o | 0 | 0 | 0 | 0 | 67,020 | 360 | 1,953 | 69,333 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 40,920 | 162,187 | 54,065 | 257,172 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 8,987 | 0 | 624 | 9,611 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 778,686 | 0 | 795 | 779,481 | 0 |
| | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ** Diaminotoluene (mixed isomers) | 95 | 0 | 0 | 755,917 | 386,996 | 362,357 | 1,923,183 | 48,109 | 3,476,562 | 3,550 |
| | 98o | 0 | 0 | 2,714,193 | 4,287,968 | 669,862 | 1,072,322 | 44,224 | 8,788,569 | 255 |
| | 98n | 0 | 0 | 0 | 10,092 | 961,202 | 0 | 13 | 971,307 | 0 |
| | 99o | 0 | 82,392 | 2,202,232 | 8,664,291 | 340,504 | 853,564 | 61,864 | 12,204,847 | 9 |
| | 99n | 0 | 0 | 0 | 70,190 | 1,219,290 | 2,922 | 12,470 | 1,304,872 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|--|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On- site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 333-41-5 | * Diazinon | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 31 | 3,245 | 8 | 0 | 0 | 3,253 | 1,560 | 4,813 |
| | | 98o | 29 | 13,564 | 11 | 0 | 0 | 13,575 | 1,955 | 15,530 |
| | | 98n | 5 | 15 | 0 | 0 | 0 | 15 | 157 | 172 |
| | | 99o | 32 | 26,532 | 13 | 0 | 0 | 26,545 | 2,326 | 28,871 |
| | | 99n | 5 | 15 | 0 | 0 | 0 | 15 | 75 | 90 |
| 334-88-3 | Diazomethane | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 4 | 0 | 0 | 0 | 4 | 0 | 4 |
| | | 99n | No reports | | | | | | | |
| 132-64-9 | Dibenzofuran | 88 | 110 | 71,093 | 1,510 | 0 | 9,929 | 82,532 | 181,799 | 264,331 |
| | | 95 | 37 | 18,704 | 2,843 | 0 | 220 | 21,767 | 19,824 | 41,591 |
| | | 98o | 39 | 93,615 | 29 | 0 | 56,670 | 150,314 | 13,304 | 163,618 |
| | | 98n | 3 | 615 | 0 | 0 | 0 | 615 | 0 | 615 |
| | | 99o | 36 | 57,743 | 20 | 0 | 40 | 57,803 | 16,835 | 74,638 |
| | | 99n | 1 | 4 | 0 | 0 | 0 | 4 | 0 | 4 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| 106-93-4 | *,** 1,2-Dibromoethane | 88 | 34 | 63,342 | 1,011 | 6,882 | 259 | 71,494 | 27,924 | 99,418 |
| | | 95 | 19 | 12,372 | 306 | 0 | 256 | 12,934 | 3 | 12,937 |
| | | 98o | 12 | 10,047 | 6 | 0 | 1 | 10,054 | 0 | 10,054 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 13 | 9,103 | 11 | 0 | 7 | 9,121 | 35,529 | 44,650 |
| | | 99n | 2 | 5 | 1 | 0 | 0 | 6 | 5 | 11 |
| 124-73-2 | Dibromotetrafluoroethane (Halon 2402) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 84-74-2 | * Dibutyl phthalate | 88 | 126 | 204,058 | 14,339 | 350,000 | 6,395 | 574,792 | 113,068 | 687,860 |
| | | 95 | 126 | 104,833 | 3,981 | 390,000 | 1,402 | 500,216 | 25,991 | 526,207 |
| | | 98o | 109 | 33,577 | 206 | 210,000 | 5,480 | 249,263 | 25,676 | 274,939 |
| | | 98n | 62 | 834 | 0 | 0 | 0 | 834 | 560 | 1,394 |
| | | 99o | 115 | 35,356 | 273 | 290,000 | 4,224 | 329,853 | 41,342 | 371,195 |
| | | 99n | 68 | 1,121 | 6 | 0 | 9,421 | 10,548 | 9,006 | 19,554 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Diazinon | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 21,330 | 0 | 0 | 1 | 66,150 | 7,596 | 4,355 | 99,432 | 5 |
| | 98o | 53,095 | 0 | 0 | 0 | 37,803 | 33,649 | 15,018 | 139,565 | 3 |
| | 98n | 0 | 0 | 0 | 0 | 180,882 | 4 | 162 | 181,048 | 0 |
| | 99o | 63,631 | 0 | 0 | 0 | 86,025 | 57,255 | 26,738 | 233,649 | 1 |
| | 99n | 0 | 97 | 0 | 0 | 295,239 | 0 | 80 | 295,416 | 0 |
| | Diazomethane | | | | | | | | | |
| | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 232 | 0 | 4 | 236 | 0 |
| | 99n | No reports | | | | | | | | |
| Dibenzofuran | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 70,546 | 25,036 | 113 | 176 | 405,125 | 1,471 | 37,508 | 539,975 | 13,220 |
| | 98o | 131,734 | 4,920 | 230,475 | 92,830 | 26,678 | 5,981 | 119,032 | 611,650 | 1,302 |
| | 98n | 0 | 0 | 0 | 1,352,711 | 32,439 | 0 | 615 | 1,385,765 | 1 |
| | 99o | 109,749 | 1,450 | 210,545 | 96,365 | 31,728 | 1,887 | 77,457 | 529,181 | 3 |
| | 99n | 0 | 0 | 0 | 0 | 77,842 | 0 | 4 | 77,846 | 0 |
| | 1,2-Dibromo-3-chloropropane | | | | | | | | | |
| | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 29,000 | 0 | 3 | 29,003 | 0 |
| *,** 1,2-Dibromoethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,000 | 0 | 60 | 17 | 34,174 | 72,467 | 11,740 | 123,458 | 0 |
| | 98o | 0 | 0 | 0 | 8,701 | 17,054 | 863 | 9,899 | 36,517 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 120,000 | 22,252 | 58,073 | 9,226 | 209,551 | 792 |
| | 99n | 0 | 0 | 0 | 0 | 84,312 | 0 | 7 | 84,319 | 0 |
| | Dibromotetrafluoroethane (Halon 2402) | | | | | | | | | |
| | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 127,308 | 0 | 0 | 0 | 0 | 0 | 10 | 127,318 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 130,692 | 0 | 0 | 0 | 0 | 0 | 0 | 130,692 | 0 |
| | 99n | No reports | | | | | | | | |
| * Dibutyl phthalate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 51,458 | 26,123 | 1,086,538 | 172,397 | 314,761 | 115,699 | 386,156 | 2,153,132 | 173,706 |
| | 98o | 30,100 | 12,207 | 1,028,453 | 215,856 | 177,719 | 95,702 | 280,203 | 1,840,240 | 4 |
| | 98n | 0 | 0 | 0 | 288,896 | 89,847 | 1,697 | 668 | 381,108 | 6 |
| | 99o | 27,111 | 5,499 | 913,586 | 195,636 | 318,148 | 161,391 | 385,306 | 2,006,677 | 85 |
| | 99n | 17,911 | 0 | 0 | 24,730 | 355,078 | 12,444 | 15,094 | 425,257 | 461 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|---------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 1918-00-9 * | Dicamba | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 6 | 12,580 | 250 | 113,600 | 0 | 126,430 | 0 | 126,430 |
| | | 98o | 9 | 1,207 | 59 | 32,000 | 0 | 33,266 | 2,100 | 35,366 |
| | | 98n | 2 | 10 | 0 | 0 | 0 | 10 | 77 | 87 |
| | | 99o | 13 | 1,259 | 37 | 18,600 | 0 | 19,896 | 140 | 20,036 |
| | | 99n | 2 | 2 | 0 | 0 | 0 | 2 | 87 | 89 |
| 99-30-9 * | Dichloran | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 95-50-1 * | 1,2-Dichlorobenzene | 88 | 45 | 530,535 | 11,624 | 20,000 | 13,354 | 575,513 | 38,266 | 613,779 |
| | | 95 | 28 | 271,539 | 3,789 | 26,000 | 11,521 | 312,849 | 28,228 | 341,077 |
| | | 98o | 36 | 208,463 | 2,352 | 3,800 | 1,245 | 215,860 | 6,076 | 221,936 |
| | | 98n | 10 | 1,036 | 5 | 5 | 0 | 1,046 | 610 | 1,656 |
| | | 99o | 35 | 308,537 | 2,069 | 2,500 | 475 | 313,581 | 7,920 | 321,501 |
| | | 99n | 10 | 1,741 | 1 | 0 | 65,593 | 67,335 | 1,566 | 68,901 |
| 541-73-1 | 1,3-Dichlorobenzene | 88 | 6 | 15,282 | 1,281 | 0 | 0 | 16,563 | 290 | 16,853 |
| | | 95 | 6 | 7,528 | 526 | 0 | 0 | 8,054 | 0 | 8,054 |
| | | 98o | 6 | 4,018 | 203 | 0 | 0 | 4,221 | 0 | 4,221 |
| | | 98n | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 8 | 3,640 | 807 | 0 | 0 | 4,447 | 0 | 4,447 |
| | | 99n | 2 | 9 | 1 | 0 | 0 | 10 | 30 | 40 |
| 106-46-7 ** | 1,4-Dichlorobenzene | 88 | 24 | 1,891,419 | 6,153 | 4,000 | 1,300 | 1,902,872 | 750 | 1,903,622 |
| | | 95 | 24 | 242,372 | 1,287 | 0 | 3,100 | 246,759 | 3,328 | 250,087 |
| | | 98o | 19 | 181,899 | 1,706 | 3,100 | 460 | 187,165 | 0 | 187,165 |
| | | 98n | 11 | 417 | 0 | 0 | 0 | 417 | 81 | 498 |
| | | 99o | 23 | 178,210 | 1,880 | 7,300 | 1,370 | 188,760 | 0 | 188,760 |
| | | 99n | 6 | 44 | 1 | 0 | 0 | 45 | 18 | 63 |
| 25321-22-6 ** | Dichlorobenzene (mixed isomers) | 88 | 15 | 163,684 | 40 | 0 | 0 | 163,724 | 19,672 | 183,396 |
| | | 95 | 9 | 5,443 | 0 | 0 | 0 | 5,443 | 9 | 5,452 |
| | | 98o | 6 | 14,218 | 0 | 0 | 0 | 14,218 | 8 | 14,226 |
| | | 98n | 8 | 319 | 250 | 0 | 0 | 569 | 1,498 | 2,067 |
| | | 99o | 5 | 13,796 | 0 | 0 | 0 | 13,796 | 0 | 13,796 |
| | | 99n | 7 | 52 | 0 | 0 | 0 | 52 | 357 | 409 |
| 91-94-1 ** | 3,3'-Dichlorobenzidine | 88 | 14 | 255 | 752 | 0 | 0 | 1,007 | 209,785 | 210,792 |
| | | 95 | 3 | 11 | 0 | 0 | 0 | 11 | 2,400 | 2,411 |
| | | 98o | 1 | 255 | 0 | 0 | 0 | 255 | 41,600 | 41,855 |
| | | 98n | 3 | 6 | 0 | 0 | 0 | 6 | 0 | 6 |
| | | 99o | 2 | 15 | 0 | 0 | 0 | 15 | 44,145 | 44,160 |
| | | 99n | 4 | 5 | 0 | 0 | 0 | 5 | 161 | 166 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Dicamba | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 510 | 0 | 0 | 0 | 0 | 29 | 126,662 | 127,201 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 37,557 | 65,900 | 35,366 | 138,823 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 22,223 | 0 | 87 | 22,310 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 39,143 | 42,080 | 20,039 | 101,262 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 27,830 | 0 | 90 | 27,920 | 0 |
| * Dichloran | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 50 | 25 | 10 | 85 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 39,948 | 0 | 0 | 39,948 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 55,619 | 0 | 0 | 55,619 | 0 |
| * 1,2-Dichlorobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,527,161 | 3,626,496 | 354,610 | 763,438 | 172,717 | 1,999,033 | 340,963 | 12,784,418 | 153 |
| | 98o | 11,995,819 | 2,222,086 | 1,395,535 | 513,369 | 374,719 | 973,511 | 216,633 | 17,691,672 | 62 |
| | 98n | 2,230,878 | 0 | 159 | 42,595 | 653,679 | 4,239,558 | 1,443 | 7,168,312 | 3 |
| | 99o | 11,893,164 | 1,378,067 | 3,964,034 | 546,751 | 713,178 | 1,496,579 | 327,728 | 20,319,501 | 259 |
| | 99n | 1,705,966 | 0 | 412 | 43,256 | 1,303,837 | 314,609 | 67,005 | 3,435,085 | 53 |
| 1,3-Dichlorobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,068 | 1,291 | 0 | 0 | 10 | 3,989 | 8,079 | 18,437 | 36 |
| | 98o | 1,988 | 950 | 0 | 0 | 10 | 2,555 | 4,260 | 9,763 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 20,077 | 202 | 1 | 20,280 | 1 |
| | 99o | 2,129 | 930 | 68,399 | 0 | 20,895 | 3,169 | 4,439 | 99,961 | 6 |
| | 99n | 0 | 0 | 0 | 0 | 247,556 | 0 | 37 | 247,593 | 0 |
| *,** 1,4-Dichlorobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 705,345 | 34,882 | 42,157 | 11,053 | 73,030 | 621,194 | 248,721 | 1,736,382 | 1,609 |
| | 98o | 2,602,061 | 0 | 134,272 | 6,691 | 1,766 | 299,525 | 185,980 | 3,230,295 | 110 |
| | 98n | 36,560 | 0 | 1 | 149,250 | 376,335 | 1,350 | 256 | 563,752 | 2 |
| | 99o | 1,927,605 | 0 | 416,356 | 2,702 | 18,350 | 390,802 | 188,336 | 2,944,151 | 49,306 |
| | 99n | 28,229 | 0 | 0 | 8,306 | 658,480 | 1 | 48 | 695,064 | 5 |
| ** Dichlorobenzene (mixed isomers) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 266,997 | 5,165 | 79,032 | 3,684 | 5,452 | 360,330 | 0 |
| | 98o | 0 | 0 | 191,010 | 611 | 248,100 | 6,720 | 14,226 | 460,667 | 0 |
| | 98n | 0 | 4,724 | 2,147 | 712,291 | 321,134 | 328 | 1,849 | 1,042,473 | 1 |
| | 99o | 0 | 0 | 1,567,000 | 0 | 1 | 13,402 | 13,796 | 1,594,199 | 0 |
| | 99n | 0 | 0 | 613 | 665,533 | 207,957 | 0 | 154 | 874,257 | 11 |
| ** 3,3'-Dichlorobenzidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 22,000 | 14,000 | 1,600 | 2,701 | 40,301 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 10,000 | 45,000 | 42,000 | 97,000 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 65,021 | 63 | 2 | 65,086 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 11,787 | 64,065 | 44,001 | 119,853 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 237,063 | 0 | 163 | 237,226 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|---|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 612-83-9 ** | 3,3'-Dichlorobenzidine dihydrochloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 16 | 250 | 5 | 0 | 0 | 255 | 6,790 | 7,045 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 16 | 7 | 5 | 0 | 0 | 12 | 3,400 | 3,412 |
| | | 99n | No reports | | | | | | | |
| 64969-34-2 ** | 3,3'-Dichlorobenzidine sulfate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 260 | 260 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 75-27-4 | Dichlorobromomethane | 88 | 1 | 13,440 | 0 | 0 | 0 | 13,440 | 0 | 13,440 |
| | | 95 | 1 | 2,300 | 0 | 0 | 50 | 2,350 | 0 | 2,350 |
| | | 98o | 1 | 2,370 | 0 | 0 | 90 | 2,460 | 0 | 2,460 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 3,405 | 0 | 0 | 80 | 3,485 | 0 | 3,485 |
| | | 99n | No reports | | | | | | | |
| 764-41-0 | 1,4-Dichloro-2-butene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 3,950 | 0 | 4,500 | 0 | 8,450 | 0 | 8,450 |
| | | 98o | 3 | 1,713 | 0 | 5,700 | 0 | 7,413 | 0 | 7,413 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 3 | 910 | 0 | 1,200 | 0 | 2,110 | 0 | 2,110 |
| | | 99n | 1 | 26 | 1 | 0 | 0 | 27 | 4 | 31 |
| 110-57-6 | trans-1,4-Dichloro-2-butene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 137 | 0 | 0 | 0 | 137 | 0 | 137 |
| | | 98o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | 2 | 255 | 0 | 0 | 0 | 255 | 158 | 413 |
| 1649-08-7 | 1,2-Dichloro-1,1-difluoroethane (HCFC-132b) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 890 | 20 | 0 | 0 | 910 | 89 | 999 |
| | | 98o | 2 | 837 | 48 | 0 | 0 | 885 | 0 | 885 |
| | | 98n | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 2 | 17,310 | 45 | 0 | 0 | 17,355 | 0 | 17,355 |
| | | 99n | 1 | 10 | 0 | 0 | 0 | 10 | 5 | 15 |
| 75-71-8 * | Dichlorodifluoromethane (CFC-12) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 137 | 3,249,946 | 17,172 | 89 | 0 | 3,267,207 | 320 | 3,267,527 |
| | | 98o | 55 | 722,844 | 13,005 | 0 | 0 | 735,849 | 0 | 735,849 |
| | | 98n | 5 | 24,607 | 0 | 250 | 0 | 24,857 | 107 | 24,964 |
| | | 99o | 45 | 716,249 | 5 | 0 | 0 | 716,254 | 0 | 716,254 |
| | | 99n | 5 | 18,579 | 1 | 0 | 0 | 18,580 | 32 | 18,612 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** 3,3'-Dichlorobenzidine dihydrochloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 12,797 | 22,000 | 0 | 34,797 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 6,716 | 48,000 | 6,801 | 61,517 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 4,644 | 85,002 | 3,402 | 93,048 | 0 |
| | 99n | No reports | | | | | | | | |
| ** 3,3'-Dichlorobenzidine sulfate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,300 | 2,400 | 0 | 3,700 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 6,000 | 260 | 6,260 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 12,000 | 0 | 12,000 | 0 |
| | 99n | No reports | | | | | | | | |
| Dichlorobromomethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 2,300 | 2,300 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 2,400 | 2,400 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 470 | 4 | 3,501 | 3,975 | 1 |
| | 99n | No reports | | | | | | | | |
| 1,4-Dichloro-2-butene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 13,000 | 3,300,000 | 312,500 | 8,450 | 3,633,950 | 0 |
| | 98o | 1,800,000 | 0 | 0 | 0 | 3,753,000 | 124,000 | 7,413 | 5,684,413 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 5,800,000 | 13,390 | 2,110 | 5,815,500 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 60,000 | 0 | 26 | 60,026 | 0 |
| trans-1,4-Dichloro-2-butene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 137 | 137 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 12,000 | 0 | 1 | 12,001 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 13,000 | 0 | 1 | 13,001 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 129,737 | 0 | 205 | 129,942 | 0 |
| 1,2-Dichloro-1,1-difluoroethane (HCFC-132b) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 98,000 | 22,000 | 1,000 | 121,000 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 320,000 | 61,573 | 880 | 382,453 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 39,584 | 0 | 3 | 39,587 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 370,000 | 91,532 | 17,010 | 478,542 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 27,318 | 0 | 2 | 27,320 | 0 |
| * Dichlorodifluoromethane (CFC-12) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 552,377 | 466,714 | 408,747 | 225 | 126,167 | 114,628 | 3,241,865 | 4,910,723 | 18,435 |
| | 98o | 80,253 | 213,260 | 0 | 0 | 38,976 | 67,036 | 738,467 | 1,137,992 | 4 |
| | 98n | 0 | 0 | 0 | 0 | 199,704 | 8 | 24,723 | 224,435 | 0 |
| | 99o | 246,309 | 178,692 | 0 | 0 | 170 | 132,003 | 657,567 | 1,214,741 | 10,654 |
| | 99n | 0 | 0 | 0 | 0 | 292,534 | 135 | 18,607 | 311,276 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|-------------|--|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 107-06-2 | *** 1,2-Dichloroethane | 88 | 110 | 4,615,179 | 40,527 | 1,452,084 | 2,166 | 6,109,956 | 166,131 | 6,276,087 |
| | | 95 | 83 | 1,292,842 | 5,194 | 24,339 | 256 | 1,322,631 | 23,671 | 1,346,302 |
| | | 98o | 71 | 708,117 | 2,337 | 2,178 | 886 | 713,518 | 105,862 | 819,380 |
| | | 98n | 19 | 284 | 271 | 56,816 | 0 | 57,371 | 23,011 | 80,382 |
| | | 99o | 72 | 545,225 | 833 | 1,171 | 2,983 | 550,212 | 666,493 | 1,216,705 |
| | | 99n | 16 | 814 | 71 | 64,294 | 0 | 65,179 | 2,299 | 67,478 |
| 540-59-0 | 1,2-Dichloroethylene | 88 | 10 | 126,478 | 95 | 0 | 1 | 126,574 | 87,614 | 214,188 |
| | | 95 | 10 | 8,527 | 270 | 0 | 0 | 8,797 | 0 | 8,797 |
| | | 98o | 11 | 5,383 | 44 | 0 | 0 | 5,427 | 0 | 5,427 |
| | | 98n | 7 | 533 | 0 | 0 | 0 | 533 | 387 | 920 |
| | | 99o | 9 | 4,901 | 390 | 0 | 0 | 5,291 | 0 | 5,291 |
| | | 99n | 8 | 1,539 | 1 | 0 | 0 | 1,540 | 13,282 | 14,822 |
| 1717-00-6 | 1,1-Dichloro-1-fluoroethane (HCFC-141b) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 296 | 11,677,933 | 580 | 26 | 35,767 | 11,714,306 | 165,777 | 11,880,083 |
| | | 98o | 232 | 8,908,815 | 54 | 0 | 33,556 | 8,942,425 | 230,925 | 9,173,350 |
| | | 98n | 11 | 31,419 | 0 | 0 | 0 | 31,419 | 1,096 | 32,515 |
| | | 99o | 223 | 7,807,666 | 419 | 0 | 20,128 | 7,828,213 | 278,640 | 8,106,853 |
| | | 99n | 11 | 23,516 | 0 | 0 | 0 | 23,516 | 1,662 | 25,178 |
| 75-43-4 | Dichlorofluoromethane (HCFC-21) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 173,117 | 2 | 0 | 0 | 173,119 | 31,000 | 204,119 |
| | | 98o | 3 | 129,467 | 0 | 0 | 0 | 129,467 | 8,975 | 138,442 |
| | | 98n | 4 | 4 | 0 | 0 | 0 | 4 | 9 | 13 |
| | | 99o | 3 | 105,565 | 0 | 0 | 0 | 105,565 | 10,910 | 116,475 |
| | | 99n | 2 | 5 | 0 | 0 | 75,231 | 75,236 | 0 | 75,236 |
| 75-09-2 | *** Dichloromethane | 88 | 1,675 | 129,124,529 | 349,960 | 1,478,833 | 157,156 | 131,110,478 | 7,806,328 | 138,916,806 |
| | | 95 | 1,012 | 58,305,923 | 28,620 | 1,140,335 | 2,064 | 59,476,942 | 180,137 | 59,657,079 |
| | | 98o | 642 | 40,302,462 | 15,492 | 456,962 | 173,592 | 40,948,508 | 262,922 | 41,211,430 |
| | | 98n | 198 | 469,904 | 262 | 33,702 | 10,127 | 513,995 | 99,836 | 613,831 |
| | | 99o | 531 | 35,556,474 | 12,056 | 107,386 | 8,344 | 35,684,260 | 153,884 | 35,838,144 |
| | | 99n | 161 | 220,397 | 16 | 59,473 | 53,605 | 333,491 | 383,828 | 717,319 |
| 127564-92-5 | Dichloropentafluoropropane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 6,520 | 0 | 0 | 0 | 6,520 | 8,900 | 15,420 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 9,890 | 0 | 0 | 0 | 9,890 | 4,600 | 14,490 |
| | | 99n | No reports | | | | | | | |
| 507-55-1 | 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98o | 2 | 34,043 | 0 | 0 | 0 | 34,043 | 0 | 34,043 |
| | | 98n | 1 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 99o | 3 | 77,310 | 0 | 0 | 0 | 77,310 | 0 | 77,310 |
| | | 99n | 1 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *** 1,2-Dichloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 59,314,824 | 16,921,135 | 32,535,232 | 787,622 | 74,650,467 | 1,630,158 | 1,325,188 | 187,164,626 | 23,301 |
| | 98o | 435,903,074 | 11,350,396 | 49,197,699 | 194,842 | 59,612,529 | 1,892,410 | 833,090 | 558,984,040 | 69,871 |
| | 98n | 0 | 0 | 2,617 | 338 | 1,389,729 | 4,384 | 59,112 | 1,456,180 | 8 |
| | 99o | 397,977,917 | 14,982,020 | 35,619,138 | 266,614 | 75,760,698 | 2,137,851 | 1,072,904 | 527,817,142 | 11,341 |
| | 99n | 213 | 0 | 1,707 | 47,058 | 3,251,128 | 144,444 | 68,188 | 3,512,738 | 0 |
| 1,2-Dichloroethylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 310,000 | 6,100 | 2,871,400 | 0 | 4,680,089 | 1,984 | 8,761 | 7,878,334 | 122 |
| | 98o | 1,560,000 | 1,617,199 | 621,000 | 0 | 3,946,600 | 2,803 | 5,304 | 7,752,906 | 143 |
| | 98n | 0 | 0 | 0 | 0 | 1,163,150 | 0 | 631 | 1,163,781 | 0 |
| | 99o | 4,250,000 | 1,463,455 | 313,000 | 0 | 14,301,329 | 7,070 | 7,511 | 20,342,365 | 121 |
| | 99n | 255,988 | 0 | 0 | 411,928 | 1,745,805 | 165 | 1,279 | 2,415,165 | 10 |
| 1,1-Dichloro-1-fluoroethane (HCFC-141b) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,429,772 | 381,393 | 0 | 99,548 | 2,018,829 | 846,290 | 11,819,111 | 20,594,943 | 38,962 |
| | 98o | 155,007 | 147,221 | 0 | 647,826 | 801,429 | 418,974 | 8,960,363 | 11,130,820 | 75,875 |
| | 98n | 357,028 | 3,660 | 0 | 148 | 271,622 | 4,671 | 32,162 | 669,291 | 0 |
| | 99o | 176,231 | 186,250 | 0 | 742,001 | 993,727 | 843,360 | 8,029,685 | 10,971,254 | 9 |
| | 99n | 274,970 | 4,238 | 0 | 1,379 | 238,799 | 31,708 | 22,740 | 573,834 | 0 |
| Dichlorofluoromethane (HCFC-21) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 7,200 | 1,586 | 23,800 | 204,492 | 237,078 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 5,487 | 138,067 | 143,554 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 288,607 | 183 | 13 | 288,803 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 16,463 | 365 | 116,561 | 133,389 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 21,850 | 0 | 75,234 | 97,084 | 0 |
| *** Dichloromethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 84,723,606 | 14,116,539 | 5,240,223 | 3,234,456 | 25,614,610 | 11,966,476 | 59,554,639 | 204,450,549 | 72,752 |
| | 98o | 136,285,791 | 15,127,026 | 8,885,675 | 3,028,379 | 26,836,797 | 14,262,405 | 41,190,460 | 245,616,533 | 102,531 |
| | 98n | 18,334,527 | 2,100,136 | 728 | 5,293,429 | 2,646,686 | 7,338,183 | 555,330 | 36,269,019 | 271 |
| | 99o | 149,782,371 | 11,326,297 | 7,937,093 | 4,696,123 | 455,912,875 | 15,172,393 | 35,464,508 | 680,291,660 | 700,444 |
| | 99n | 10,243,603 | 1,252,643 | 2,351 | 10,060,265 | 5,050,496 | 5,186,404 | 490,264 | 32,286,026 | 5,564 |
| Dichloropentafluoropropane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 8,900 | 6,500 | 15,400 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 4,600 | 9,900 | 14,500 | 0 |
| | 99n | No reports | | | | | | | | |
| 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 100 | 0 | 0 | 0 | 0 | 0 | 400 | 500 | 0 |
| | 98o | 4,337 | 0 | 0 | 0 | 0 | 0 | 34,043 | 38,380 | 0 |
| | 98n | 0 | 500 | 0 | 0 | 0 | 0 | 1,275 | 1,775 | 0 |
| | 99o | 40,085 | 0 | 0 | 390 | 0 | 1,700 | 77,310 | 119,485 | 7,000 |
| | 99n | 0 | 450 | 0 | 0 | 0 | 0 | 850 | 1,300 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|--|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On- site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 422-56-0 | 3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98o | 3 | 56,258 | 0 | 0 | 0 | 56,258 | 0 | 56,258 |
| | | 98n | 1 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 99o | 2 | 35,012 | 0 | 0 | 0 | 35,012 | 0 | 35,012 |
| | | 99n | 1 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| 120-83-2 | 2,4-Dichlorophenol | 88 | 8 | 1,403 | 107 | 17,700 | 2 | 19,212 | 350 | 19,562 |
| | | 95 | 3 | 3,580 | 245 | 15,900 | 0 | 19,725 | 0 | 19,725 |
| | | 98o | 5 | 490 | 0 | 9,000 | 0 | 9,490 | 0 | 9,490 |
| | | 98n | 3 | 108 | 0 | 0 | 0 | 108 | 0 | 108 |
| | | 99o | 4 | 465 | 30 | 9,700 | 1 | 10,196 | 0 | 10,196 |
| | | 99n | 3 | 57 | 1 | 0 | 0 | 58 | 19 | 77 |
| 78-87-5 | * 1,2-Dichloropropane | 88 | 12 | 1,395,304 | 23,785 | 0 | 3,400 | 1,422,489 | 1,131 | 1,423,620 |
| | | 95 | 11 | 616,470 | 4,344 | 0 | 20 | 620,834 | 1,371 | 622,205 |
| | | 98o | 11 | 298,150 | 1,122 | 0 | 32 | 299,304 | 267 | 299,571 |
| | | 98n | 4 | 8 | 0 | 0 | 0 | 8 | 0 | 8 |
| | | 99o | 11 | 249,656 | 9,242 | 0 | 30 | 258,928 | 6,856 | 265,784 |
| | | 99n | 4 | 23 | 1 | 0 | 0 | 24 | 13 | 37 |
| 10061-02-6 | ** trans-1,3-Dichloropropene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 256 | 0 | 0 | 0 | 256 | 0 | 256 |
| | | 98o | 3 | 1,670 | 0 | 0 | 1 | 1,671 | 0 | 1,671 |
| | | 98n | 1 | 70 | 0 | 0 | 0 | 70 | 0 | 70 |
| | | 99o | 6 | 512 | 0 | 0 | 0 | 512 | 0 | 512 |
| | | 99n | 1 | 85 | 0 | 0 | 0 | 85 | 0 | 85 |
| 78-88-6 | * 2,3-Dichloropropene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 4,253 | 0 | 0 | 0 | 4,253 | 0 | 4,253 |
| | | 98o | 5 | 612 | 490 | 0 | 0 | 1,102 | 1,200 | 2,302 |
| | | 98n | 1 | 32 | 0 | 0 | 0 | 32 | 0 | 32 |
| | | 99o | 5 | 357 | 900 | 0 | 0 | 1,257 | 0 | 1,257 |
| | | 99n | No reports | | | | | | | |
| 542-75-6 | *** 1,3-Dichloropropylene | 88 | 8 | 54,590 | 250 | 0 | 0 | 54,840 | 0 | 54,840 |
| | | 95 | 11 | 32,977 | 193 | 0 | 0 | 33,170 | 0 | 33,170 |
| | | 98o | 12 | 11,139 | 61 | 0 | 1 | 11,201 | 0 | 11,201 |
| | | 98n | 6 | 427 | 0 | 0 | 0 | 427 | 0 | 427 |
| | | 99o | 14 | 6,111 | 67 | 0 | 0 | 6,178 | 0 | 6,178 |
| | | 99n | 6 | 489 | 1 | 0 | 0 | 490 | 168 | 658 |
| 76-14-2 | * Dichlorotetrafluoroethane (CFC-114) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 20 | 1,017,652 | 4,936 | 0 | 0 | 1,022,588 | 136 | 1,022,724 |
| | | 98o | 13 | 827,113 | 5 | 0 | 0 | 827,118 | 1 | 827,119 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 12 | 930,592 | 5 | 0 | 0 | 930,597 | 0 | 930,597 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| 3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 60 | 0 | 0 | 0 | 0 | 0 | 300 | 360 | 0 |
| | 98o | 3,851 | 0 | 0 | 0 | 0 | 0 | 56,558 | 60,409 | 5,700 |
| | 98n | 0 | 410 | 0 | 0 | 0 | 0 | 1,040 | 1,450 | 0 |
| | 99o | 32,023 | 0 | 0 | 400 | 0 | 1,400 | 35,013 | 68,836 | 0 |
| | 99n | 0 | 365 | 0 | 0 | 0 | 0 | 1,040 | 1,405 | 0 |
| 2,4-Dichlorophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,460 | 0 | 3 | 0 | 336,936 | 0 | 19,720 | 358,119 | 0 |
| | 98o | 1,400 | 0 | 3 | 0 | 190,400 | 600 | 9,435 | 201,838 | 0 |
| | 98n | 0 | 0 | 0 | 48,026 | 25,817 | 0 | 108 | 73,951 | 0 |
| | 99o | 1,100 | 0 | 0 | 0 | 216,300 | 0 | 10,141 | 227,541 | 0 |
| | 99n | 0 | 0 | 0 | 8,497 | 115,864 | 181 | 74 | 124,616 | 0 |
| * 1,2-Dichloropropane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 56,000,000 | 0 | 28,380,000 | 0 | 11,573,182 | 7,768 | 620,353 | 96,581,303 | 1,200 |
| | 98o | 26,800,000 | 0 | 10,700,000 | 0 | 15,610,350 | 1,161,416 | 301,901 | 54,573,667 | 10 |
| | 98n | 0 | 0 | 0 | 0 | 689,377 | 22 | 4 | 689,403 | 1 |
| | 99o | 9,200,000 | 0 | 5,109,000 | 2 | 22,414,813 | 3,604,795 | 260,892 | 40,589,502 | 11 |
| | 99n | 0 | 0 | 0 | 0 | 347,173 | 0 | 35 | 347,208 | 0 |
| ** trans-1,3-Dichloropropene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 11,000,000 | 0 | 0 | 0 | 250 | 11,000,250 | 1 |
| | 98o | 7,900 | 0 | 5,210,238 | 9 | 20,505 | 430 | 1,640 | 5,240,722 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 70 | 0 |
| | 99o | 50,000 | 0 | 0 | 180 | 6,845,015 | 242 | 510 | 6,895,947 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 85 | 0 |
| * 2,3-Dichloropropene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 6,100,000 | 1 | 4,200,000 | 0 | 1,960,000 | 510,000 | 4,253 | 12,774,254 | 0 |
| | 98o | 960,000 | 0 | 1,100,000 | 0 | 639,000 | 1,086,000 | 1,102 | 3,786,102 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 73,306 | 0 | 32 | 73,338 | 0 |
| | 99o | 2,300,000 | 0 | 0 | 0 | 3,670,000 | 410,000 | 1,290 | 6,381,290 | 0 |
| | 99n | No reports | | | | | | | | |
| *** 1,3-Dichloropropylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,892,986 | 470 | 11,930,000 | 123 | 969,916 | 2,481 | 33,404 | 17,829,380 | 241 |
| | 98o | 1,932,000 | 0 | 6,000,000 | 16,645 | 1,084,262 | 42,734 | 10,800 | 9,086,441 | 1 |
| | 98n | 0 | 0 | 0 | 14,109 | 89,306 | 80 | 427 | 103,922 | 0 |
| | 99o | 870,000 | 0 | 0 | 26,166 | 890,170 | 120,870 | 8,687 | 1,915,893 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 296,500 | 20 | 653 | 297,173 | 0 |
| * Dichlorotetrafluoroethane (CFC-114) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 19,819 | 14,634 | 0 | 0 | 1,608,479 | 38,271 | 1,018,687 | 2,699,890 | 1 |
| | 98o | 231,484 | 17,299 | 0 | 0 | 1,022,895 | 34,717 | 827,120 | 2,133,515 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 195,012 | 13,065 | 0 | 0 | 38,821 | 124,763 | 915,638 | 1,287,299 | 18,960 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|--|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 34077-87-7 | Dichlorotrifluoroethane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 98o | 1 | 1,699 | 0 | 0 | 0 | 1,699 | 0 | 1,699 |
| | | 98n | 1 | 5 | 0 | 0 | 0 | 5 | 2 | 7 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 12 | 0 | 0 | 0 | 12 | 2 | 14 |
| 354-23-4 | 1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 101,118 | 5 | 0 | 0 | 101,123 | 0 | 101,123 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 107,479 | 5 | 0 | 0 | 107,484 | 0 | 107,484 |
| | | 99n | No reports | | | | | | | |
| 306-83-2 | 2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 12 | 155,006 | 251 | 0 | 0 | 155,257 | 0 | 155,257 |
| | | 98o | 13 | 206,073 | 10 | 0 | 0 | 206,083 | 0 | 206,083 |
| | | 98n | 3 | 457 | 0 | 0 | 0 | 457 | 226 | 683 |
| | | 99o | 10 | 86,172 | 5 | 0 | 0 | 86,177 | 0 | 86,177 |
| | | 99n | 2 | 977 | 0 | 0 | 0 | 977 | 0 | 977 |
| 62-73-7 | *,** Dichlorvos | 88 | 7 | 1,050 | 0 | 0 | 0 | 1,050 | 505 | 1,555 |
| | | 95 | 4 | 255 | 5 | 0 | 0 | 260 | 250 | 510 |
| | | 98o | 4 | 255 | 5 | 0 | 0 | 260 | 0 | 260 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| | | 99o | 4 | 255 | 5 | 0 | 0 | 260 | 0 | 260 |
| | | 99n | 2 | 3 | 1 | 0 | 0 | 4 | 5 | 9 |
| 115-32-2 | * Dicofol | 88 | 8 | 1,343 | 0 | 0 | 0 | 1,343 | 15,786 | 17,129 |
| | | 95 | 4 | 750 | 0 | 0 | 0 | 750 | 250 | 1,000 |
| | | 98o | 4 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 1,008 | 0 | 0 | 0 | 1,008 | 0 | 1,008 |
| | | 99n | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| 77-73-6 | Dicyclopentadiene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 71 | 340,455 | 5,464 | 0 | 475 | 346,394 | 6,888 | 353,282 |
| | | 98o | 85 | 350,062 | 14,943 | 0 | 597 | 365,602 | 6,162 | 371,764 |
| | | 98n | 3 | 15 | 0 | 1,081,201 | 0 | 1,081,216 | 0 | 1,081,216 |
| | | 99o | 91 | 350,645 | 11,817 | 0 | 10 | 362,472 | 2,906 | 365,378 |
| | | 99n | 5 | 281 | 1 | 973,928 | 0 | 974,210 | 256 | 974,466 |
| 1464-53-5 | Diepoxybutane | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 70 | 0 | 0 | 0 | 70 | 0 | 70 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Dichlorotrifluoroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 716,409 | 0 | 968 | 717,377 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 35,000 | 0 | 1,699 | 36,699 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 29,974 | 0 | 7 | 29,981 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 47,879 | 0 | 14 | 47,893 | 0 |
| 1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 101,123 | 101,123 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 107,484 | 107,484 | 0 |
| | 99n | No reports | | | | | | | | |
| 2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 253,000 | 1,304 | 0 | 0 | 18,400 | 24,465 | 155,218 | 452,387 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 38,337 | 4,901 | 204,475 | 247,713 | 955 |
| | 98n | 0 | 0 | 0 | 0 | 32,848 | 0 | 683 | 33,531 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 25,641 | 11,761 | 85,822 | 123,224 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 977 | 977 | 0 |
| *,** Dichlorvos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 33 | 0 | 0 | 297 | 10 | 536 | 550 | 1,426 | 24 |
| | 98o | 0 | 0 | 0 | 0 | 11 | 1,130 | 508 | 1,649 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 14,957 | 0 | 9 | 14,966 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 14 | 1,984 | 260 | 2,258 | 0 |
| | 99n | 0 | 97 | 0 | 0 | 26,895 | 0 | 5 | 26,997 | 0 |
| * Dicofol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 150 | 0 | 0 | 0 | 0 | 95 | 282 | 527 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 895 | 229 | 1,124 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 148 | 0 | 0 | 0 | 0 | 1,166 | 131 | 1,445 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 28,375 | 0 | 3 | 28,378 | 0 |
| Dicyclopentadiene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 514,277 | 128,273 | 1,782,272 | 635,023 | 471,016 | 201,368 | 348,234 | 4,080,463 | 309 |
| | 98o | 457,481 | 43,182 | 1,055,862 | 790,262 | 535,711 | 226,565 | 401,577 | 3,510,640 | 7,573 |
| | 98n | 0 | 0 | 0 | 0 | 22,604 | 0 | 1,081,217 | 1,103,821 | 0 |
| | 99o | 341,739 | 20,448 | 4,454,966 | 684,673 | 713,953 | 93,130 | 370,793 | 6,679,702 | 3,509 |
| | 99n | 0 | 0 | 0 | 333,931 | 459,410 | 0 | 974,025 | 1,767,366 | 0 |
| Diepoxybutane | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 148,733 | 0 | 0 | 70 | 148,803 | 1 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 11,634 | 0 | 0 | 11,634 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|---------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 111-42-2 | Diethanolamine | 88 | 333 | 642,418 | 438,213 | 238,317 | 133,456 | 1,452,404 | 376,037 | 1,828,441 |
| | | 95 | 350 | 369,625 | 287,582 | 18,502 | 40,399 | 716,108 | 456,391 | 1,172,499 |
| | | 98o | 331 | 436,529 | 63,158 | 24,000 | 113,340 | 637,027 | 208,501 | 845,528 |
| | | 98n | 99 | 2,761 | 0 | 316,517 | 169,345 | 488,623 | 3,653 | 492,276 |
| | | 99o | 318 | 373,698 | 35,086 | 26,905 | 79,789 | 515,478 | 204,144 | 719,622 |
| | | 99n | 96 | 531 | 0 | 327,701 | 65,000 | 393,232 | 2,694 | 395,926 |
| 117-81-7 | *,** Di(2-ethylhexyl) phthalate | 88 | 304 | 1,217,329 | 2,781 | 3,091 | 20,748 | 1,243,949 | 3,630,612 | 4,874,561 |
| | | 95 | 318 | 504,167 | 921 | 0 | 19,705 | 524,793 | 3,041,389 | 3,566,182 |
| | | 98o | 302 | 215,583 | 669 | 0 | 24,184 | 240,436 | 1,114,867 | 1,355,303 |
| | | 98n | 59 | 1,986 | 0 | 0 | 0 | 1,986 | 1,798 | 3,784 |
| | | 99o | 285 | 226,926 | 2,629 | 0 | 4,685 | 234,240 | 916,774 | 1,151,014 |
| | | 99n | 66 | 960 | 251 | 0 | 27,649 | 28,860 | 9,247 | 38,107 |
| 64-67-5 | ** Diethyl sulfate | 88 | 24 | 10,627 | 0 | 0 | 250 | 10,877 | 0 | 10,877 |
| | | 95 | 31 | 6,978 | 0 | 0 | 0 | 6,978 | 250 | 7,228 |
| | | 98o | 33 | 6,188 | 0 | 0 | 0 | 6,188 | 177 | 6,365 |
| | | 98n | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 29 | 3,727 | 0 | 0 | 0 | 3,727 | 34,518 | 38,245 |
| | | 99n | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| 35367-38-5 | * Diflubenzuron | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 101-90-6 | ** Diglycidyl resorcinol ether | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 2 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 94-58-6 | ** Dihydrosafrole | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98o | 4 | 12,018 | 0 | 0 | 0 | 12,018 | 0 | 12,018 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 3 | 268 | 0 | 0 | 0 | 268 | 0 | 268 |
| | | 99n | 3 | 5 | 0 | 0 | 0 | 5 | 167 | 172 |
| — | Diisocyanates | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1,096 | 502,504 | 1,370 | 0 | 31,977 | 535,851 | 598,995 | 1,134,846 |
| | | 98o | 1,362 | 539,718 | 28 | 0 | 158,920 | 698,666 | 1,266,323 | 1,964,989 |
| | | 98n | 17 | 750 | 0 | 0 | 900,000 | 900,750 | 2,760 | 903,510 |
| | | 99o | 1,361 | 354,597 | 21 | 0 | 198,911 | 553,529 | 1,182,951 | 1,736,480 |
| | | 99n | 19 | 365 | 1 | 0 | 514,005 | 514,371 | 10,687 | 525,058 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Diethanolamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 23,518 | 160,987 | 102,766 | 732,863 | 2,828,593 | 1,617,435 | 1,137,284 | 6,603,446 | 25,357 |
| | 98o | 3 | 289,382 | 280,874 | 119,918 | 2,935,508 | 2,570,010 | 2,592,385 | 8,788,080 | 86 |
| | 98n | 311,138 | 62,678 | 0 | 636,227 | 21,411 | 23,223 | 495,252 | 1,549,929 | 4 |
| | 99o | 0 | 72,617 | 509,443 | 354,310 | 2,798,392 | 1,477,487 | 1,093,650 | 6,305,899 | 55,485 |
| | 99n | 0 | 5 | 0 | 34,183 | 32,523 | 14,749 | 395,455 | 476,915 | 3 |
| *,** Di(2-ethylhexyl) phthalate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,644,796 | 4,057,967 | 116,013 | 258,725 | 557,557 | 357,115 | 3,676,763 | 11,668,936 | 365 |
| | 98o | 4,985,166 | 1,879,565 | 464,843 | 222,093 | 403,536 | 260,191 | 1,090,724 | 9,306,118 | 574 |
| | 98n | 0 | 0 | 0 | 1,452,492 | 0 | 2,318 | 1,614 | 1,456,424 | 1 |
| | 99o | 3,843,690 | 3,106,109 | 344,691 | 193,711 | 244,510 | 180,691 | 1,080,324 | 8,993,726 | 7,050 |
| | 99n | 0 | 0 | 0 | 9,101 | 179,924 | 1,961 | 33,064 | 224,050 | 3,118 |
| ** Diethyl sulfate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 6,400,000 | 0 | 415 | 3,370 | 4,702 | 7,131 | 6,415,618 | 2 |
| | 98o | 0 | 0 | 0 | 6,887,586 | 4,488 | 2,460 | 6,508 | 6,901,042 | 5 |
| | 98n | 0 | 0 | 0 | 50 | 1 | 50 | 1 | 102 | 0 |
| | 99o | 0 | 0 | 0 | 7,659,130 | 3,704 | 459 | 42,667 | 7,705,960 | 0 |
| | 99n | 0 | 0 | 0 | 1,780 | 1 | 0 | 1 | 1,782 | 0 |
| * Diflubenzuron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Diglycidyl resorcinol ether | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 300 | 0 | 0 | 6 | 306 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 1,100 | 0 | 0 | 6 | 1,106 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ** Dihydrosafrole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 10 | 999 | 0 | 1,009 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 10 | 12,028 | 12,038 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 10 | 78 | 88 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 189,324 | 0 | 171 | 189,495 | 0 |
| Diisocyanates | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 816,798 | 343,867 | 143,840 | 343,308 | 710,457 | 1,182,587 | 1,088,763 | 4,629,620 | 4,204 |
| | 98o | 1,352,830 | 493,865 | 573,125 | 608,093 | 1,919,545 | 1,567,728 | 1,575,017 | 8,090,203 | 9,947 |
| | 98n | 0 | 0 | 0 | 1,352,236 | 1,247,948 | 782 | 903,028 | 3,503,994 | 1 |
| | 99o | 112,052 | 511,409 | 125,596 | 549,395 | 2,045,507 | 1,678,188 | 1,650,688 | 6,672,835 | 20,436 |
| | 99n | 0 | 0 | 0 | 0 | 4,229,041 | 970 | 527,146 | 4,757,157 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|--|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On- site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 55290-64-7 * | Dimethipin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 60-51-5 * | Dimethoate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 270 | 5 | 0 | 250 | 525 | 1,500 | 2,025 |
| | | 98o | 6 | 42 | 5 | 0 | 19,975 | 20,022 | 0 | 20,022 |
| | | 98n | 2 | 15 | 0 | 0 | 0 | 15 | 69 | 84 |
| | | 99o | 5 | 27 | 5 | 0 | 0 | 32 | 0 | 32 |
| | | 99n | 4 | 24 | 0 | 0 | 0 | 24 | 177 | 201 |
| 119-90-4 | 3,3'-Dimethoxybenzidine | 88 | No reports | | | | | | | |
| | | 95 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 162 | 170 |
| 20325-40-0 ** | 3,3'-Dimethoxybenzidine dihydrochloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 8 | 12 | 220 | 0 | 0 | 232 | 0 | 232 |
| | | 99n | No reports | | | | | | | |
| 124-40-3 | Dimethylamine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 71 | 453,915 | 26,490 | 45,250 | 3,140 | 528,795 | 38,146 | 566,941 |
| | | 98o | 75 | 443,982 | 35,629 | 11,250 | 3,788 | 494,649 | 119 | 494,768 |
| | | 98n | 5 | 892 | 0 | 0 | 0 | 892 | 8 | 900 |
| | | 99o | 73 | 414,435 | 30,068 | 11,250 | 2,735 | 458,488 | 18 | 458,506 |
| | | 99n | 7 | 567 | 1 | 0 | 0 | 568 | 422 | 990 |
| 2300-66-5 * | Dimethylamine dicamba | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 505 | 0 | 0 | 0 | 505 | 154 | 659 |
| | | 98o | 3 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 99n | No reports | | | | | | | |
| 121-69-7 | N,N-Dimethylaniline | 88 | 20 | 98,905 | 19,967 | 0 | 250 | 119,122 | 772 | 119,894 |
| | | 95 | 21 | 36,932 | 388 | 0 | 0 | 37,320 | 465 | 37,785 |
| | | 98o | 21 | 32,294 | 850 | 0 | 0 | 33,144 | 7,523 | 40,667 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 21 | 27,624 | 349 | 0 | 0 | 27,973 | 2,577 | 30,550 |
| | | 99n | 3 | 5 | 0 | 0 | 0 | 5 | 167 | 172 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Dimethipin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Dimethoate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 200 | 0 | 0 | 0 | 0 | 242 | 1,900 | 2,342 | 0 |
| | 98o | 433 | 0 | 0 | 0 | 0 | 4,105 | 27,957 | 32,495 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 63,138 | 0 | 84 | 63,222 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 8,691 | 4,865 | 13,556 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 210,152 | 0 | 202 | 210,354 | 0 |
| 3,3'-Dimethoxybenzidine | 88 | No reports | | | | | | | | |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 178,511 | 0 | 164 | 178,675 | 0 |
| ** 3,3'-Dimethoxybenzidine dihydrochloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 50 | 1 | 10 | 61 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 15 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 1,115 | 0 | 232 | 1,347 | 0 |
| | 99n | No reports | | | | | | | | |
| Dimethylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,095,202 | 0 | 21,170 | 1,800 | 2,157,170 | 224,513 | 564,664 | 4,064,519 | 4 |
| | 98o | 574,603 | 0 | 28,500 | 1,600 | 3,739,186 | 450,423 | 494,037 | 5,288,349 | 66 |
| | 98n | 0 | 0 | 0 | 149,823 | 231,726 | 50 | 1,199 | 382,798 | 1 |
| | 99o | 716,804 | 0 | 8,510 | 6,127 | 2,885,224 | 537,560 | 461,481 | 4,615,706 | 78 |
| | 99n | 0 | 0 | 0 | 0 | 432,882 | 750 | 1,228 | 434,860 | 0 |
| * Dimethylamine dicamba | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 7,981 | 0 | 0 | 0 | 0 | 0 | 803 | 8,784 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 88 | 88 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 32 | 0 |
| | 99n | No reports | | | | | | | | |
| N,N-Dimethylaniline | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 50,535 | 0 | 0 | 745,242 | 12,768 | 201,372 | 107,732 | 1,117,649 | 2 |
| | 98o | 46,000 | 21,000 | 0 | 807,221 | 19,620 | 166,522 | 31,090 | 1,091,453 | 2 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 52,678 | 19,000 | 33,536 | 703,600 | 23,751 | 167,707 | 27,833 | 1,028,105 | 4 |
| | 99n | 0 | 0 | 0 | 0 | 148,990 | 0 | 172 | 149,162 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 119-93-7 | 3,3'-Dimethylbenzidine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 4 | 17 | 1 | 0 | 0 | 18 | 171 | 189 |
| 79-44-7 | Dimethylcarbamyl chloride | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 98 | 0 | 0 | 0 | 98 | 0 | 98 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 1 | 90 | 0 | 0 | 0 | 90 | 0 | 90 |
| | | 99n | 3 | 9 | 1 | 0 | 0 | 10 | 173 | 183 |
| 2524-03-0 | Dimethyl chlorothiophosphate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 10 | 0 | 51,677 | 20 | 51,707 | 0 | 51,707 |
| | | 98o | 3 | 77 | 0 | 4,300 | 0 | 4,377 | 0 | 4,377 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 4 | 7 |
| 68-12-2 | *** N,N-Dimethylformamide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 143 | 2,352,993 | 73,106 | 1,099,000 | 1,710 | 3,526,809 | 286,326 | 3,813,135 |
| | | 98o | 169 | 987,602 | 43,057 | 272,325 | 14,976 | 1,317,960 | 693,504 | 2,011,464 |
| | | 98n | 46 | 4,480 | 0 | 11,857 | 0 | 16,337 | 720 | 17,057 |
| | | 99o | 169 | 768,838 | 28,303 | 127,125 | 5 | 924,271 | 766,430 | 1,690,701 |
| | | 99n | 41 | 9,977 | 1 | 0 | 0 | 9,978 | 85,371 | 95,349 |
| 57-14-7 | *** 1,1-Dimethyl hydrazine | 88 | 4 | 4,323 | 10 | 0 | 0 | 4,333 | 8,855 | 13,188 |
| | | 95 | 4 | 299 | 0 | 0 | 0 | 299 | 5 | 304 |
| | | 98o | 4 | 496 | 0 | 0 | 0 | 496 | 0 | 496 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 4 | 408 | 0 | 0 | 0 | 408 | 7 | 415 |
| | | 99n | 3 | 25 | 1 | 0 | 0 | 26 | 557 | 583 |
| 105-67-9 | * 2,4-Dimethylphenol | 88 | 13 | 11,588 | 484 | 24,703 | 399 | 37,174 | 1,500 | 38,674 |
| | | 95 | 19 | 52,797 | 33 | 79,000 | 5 | 131,835 | 17 | 131,852 |
| | | 98o | 25 | 36,023 | 56 | 187,076 | 0 | 223,155 | 1,177 | 224,332 |
| | | 98n | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| | | 99o | 26 | 31,402 | 122 | 156,587 | 0 | 188,111 | 2,202 | 190,313 |
| | | 99n | 4 | 37 | 1 | 5 | 0 | 43 | 14 | 57 |
| 131-11-3 | * Dimethyl phthalate | 88 | 57 | 535,056 | 4,335 | 390 | 504 | 540,285 | 93,358 | 633,643 |
| | | 95 | 89 | 375,121 | 275 | 1,000 | 5 | 376,401 | 2,524 | 378,925 |
| | | 98o | 99 | 263,736 | 627 | 2,950 | 825 | 268,138 | 35,211 | 303,349 |
| | | 98n | 24 | 259 | 0 | 0 | 0 | 259 | 2,077 | 2,336 |
| | | 99o | 95 | 432,199 | 805 | 1,900 | 7,356 | 442,260 | 32,484 | 474,744 |
| | | 99n | 19 | 78 | 1 | 0 | 7,658 | 7,737 | 6,384 | 14,121 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| 3,3'-Dimethylbenzidine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 505 | 48,005 | 0 | 5 | 48,515 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 207,475 | 146 | 173 | 207,794 | 0 |
| Dimethylcarbaryl chloride | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 27,113 | 0 | 98 | 27,211 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 42,084 | 0 | 90 | 42,174 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 205,715 | 0 | 181 | 205,896 | 0 |
| Dimethyl chlorothiophosphate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 51,727 | 51,727 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 1,960 | 0 | 4,331 | 6,291 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 16,000 | 0 | 1 | 16,001 | 0 |
| *,** N,N-Dimethylformamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,738,418 | 389,337 | 8,565,430 | 3,642,854 | 14,738,051 | 3,084,481 | 3,689,071 | 38,847,642 | 246 |
| | 98o | 9,700,653 | 260,139 | 9,778,803 | 7,673,464 | 13,669,610 | 5,171,667 | 2,185,829 | 48,440,165 | 1,455 |
| | 98n | 346,389 | 91 | 0 | 688,975 | 345,236 | 36,877 | 21,389 | 1,438,957 | 2 |
| | 99o | 8,526,815 | 190,989 | 11,042,710 | 9,593,945 | 12,205,473 | 5,281,729 | 2,242,239 | 49,083,900 | 2,069 |
| | 99n | 255,227 | 68 | 0 | 3,143,031 | 773,294 | 3,243,649 | 81,767 | 7,497,036 | 3 |
| *,** 1,1-Dimethyl hydrazine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 57 | 0 | 0 | 3,639 | 10 | 302 | 4,008 | 0 |
| | 98o | 0 | 0 | 0 | 300 | 1,218 | 3,913 | 493 | 5,924 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 320 | 670 | 7,687 | 412 | 9,089 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 549,099 | 0 | 578 | 549,677 | 0 |
| * 2,4-Dimethylphenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 37,140 | 30,368 | 1,573,273 | 50,362 | 397,965 | 75,967 | 131,351 | 2,296,426 | 24 |
| | 98o | 6,240 | 93,314 | 1,491,389 | 42,851 | 530,961 | 29,711 | 224,073 | 2,418,539 | 193 |
| | 98n | 0 | 0 | 0 | 0 | 18,158 | 0 | 2 | 18,160 | 0 |
| | 99o | 19,796 | 65,907 | 2,259,859 | 20,085 | 602,600 | 23,241 | 188,116 | 3,179,604 | 183 |
| | 99n | 0 | 0 | 0 | 0 | 140,677 | 0 | 45 | 140,722 | 0 |
| * Dimethyl phthalate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,288 | 800 | 253,605 | 76,579 | 369,897 | 221,729 | 378,344 | 1,305,242 | 3 |
| | 98o | 1,300 | 11 | 401,458 | 89,612 | 1,027,440 | 23,677 | 320,489 | 1,863,987 | 264 |
| | 98n | 0 | 0 | 0 | 152,247 | 104,268 | 1,810 | 267 | 258,592 | 1 |
| | 99o | 22,721 | 274 | 1,514,650 | 187,467 | 1,254,329 | 18,822 | 375,819 | 3,374,082 | 2 |
| | 99n | 0 | 0 | 0 | 2,798 | 456,783 | 2,066 | 11,879 | 473,526 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 77-78-1 | ** Dimethyl sulfate | 88 | 33 | 10,806 | 610 | 0 | 50 | 11,466 | 0 | 11,466 |
| | | 95 | 40 | 6,712 | 1 | 0 | 0 | 6,713 | 0 | 6,713 |
| | | 98o | 35 | 10,831 | 46 | 0 | 0 | 10,877 | 1,010 | 11,887 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 31 | 9,828 | 3 | 0 | 0 | 9,831 | 0 | 9,831 |
| | | 99n | 3 | 45 | 1 | 0 | 0 | 46 | 187 | 233 |
| 99-65-0 | m-Dinitrobenzene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 547 | 849 | 0 | 1,066 | 2,462 | 0 | 2,462 |
| | | 98o | 2 | 383 | 517 | 0 | 516 | 1,416 | 0 | 1,416 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 382 | 442 | 0 | 49 | 873 | 0 | 873 |
| | | 99n | 2 | 3 | 0 | 0 | 0 | 3 | 100 | 103 |
| 528-29-0 | o-Dinitrobenzene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 65 | 109 | 0 | 136 | 310 | 0 | 310 |
| | | 98o | 2 | 49 | 66 | 0 | 66 | 181 | 0 | 181 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 49 | 63 | 0 | 0 | 112 | 0 | 112 |
| | | 99n | No reports | | | | | | | |
| 100-25-4 | p-Dinitrobenzene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 16 | 30 | 0 | 37 | 83 | 0 | 83 |
| | | 98o | 1 | 13 | 18 | 0 | 18 | 49 | 0 | 49 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 14 | 17 | 0 | 0 | 31 | 0 | 31 |
| | | 99n | No reports | | | | | | | |
| 88-85-7 | * Dinitrobutyl phenol | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 879 | 2 | 0 | 0 | 881 | 0 | 881 |
| | | 98o | 5 | 1,051 | 0 | 0 | 0 | 1,051 | 6,843 | 7,894 |
| | | 98n | 2 | 6 | 0 | 0 | 0 | 6 | 45 | 51 |
| | | 99o | 5 | 1,005 | 0 | 0 | 50 | 1,055 | 16,848 | 17,903 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 534-52-1 | * 4,6-Dinitro-o-cresol | 88 | 10 | 274 | 266 | 0 | 2 | 542 | 46,648 | 47,190 |
| | | 95 | 5 | 130 | 0 | 4,649 | 0 | 4,779 | 7,220 | 11,999 |
| | | 98o | 7 | 104 | 0 | 0 | 1,101 | 1,205 | 123,944 | 125,149 |
| | | 98n | 1 | 130 | 0 | 0 | 9,700 | 9,830 | 1,388 | 11,218 |
| | | 99o | 7 | 102 | 0 | 0 | 0 | 102 | 137,066 | 137,168 |
| | | 99n | 3 | 157 | 0 | 0 | 43,655 | 43,812 | 23,599 | 67,411 |
| 51-28-5 | * 2,4-Dinitrophenol | 88 | 11 | 20,825 | 98,692 | 86,200 | 257 | 205,974 | 110,285 | 316,259 |
| | | 95 | 4 | 112 | 2,000 | 0 | 0 | 2,112 | 0 | 2,112 |
| | | 98o | 6 | 183 | 23,617 | 0 | 0 | 23,800 | 0 | 23,800 |
| | | 98n | 2 | 341 | 0 | 0 | 11,000 | 11,341 | 1,632 | 12,973 |
| | | 99o | 6 | 7 | 23,287 | 0 | 0 | 23,294 | 0 | 23,294 |
| | | 99n | 3 | 190 | 0 | 0 | 46,938 | 47,128 | 26,063 | 73,191 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Dimethyl sulfate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 171,230 | 1 | 0 | 402,841 | 3 | 5,815 | 579,890 | 0 |
| | 98o | 0 | 260,865 | 32,693 | 0 | 221,659 | 861 | 10,613 | 526,691 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 131,338 | 0 | 0 | 95,710 | 9,400 | 9,722 | 246,170 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 234,930 | 0 | 230 | 235,160 | 0 |
| m-Dinitrobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 848,213 | 0 | 2,462 | 850,675 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 516,692 | 0 | 1,416 | 518,108 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 490,539 | 0 | 873 | 491,412 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 124,420 | 0 | 102 | 124,522 | 0 |
| o-Dinitrobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 445,133 | 0 | 310 | 445,443 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 66,089 | 0 | 181 | 66,270 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 62,743 | 0 | 112 | 62,855 | 0 |
| | 99n | No reports | | | | | | | | |
| p-Dinitrobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 29,589 | 0 | 83 | 29,672 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 18,024 | 0 | 49 | 18,073 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 17,112 | 0 | 31 | 17,143 | 0 |
| | 99n | No reports | | | | | | | | |
| * Dinitrobutyl phenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 263,629 | 0 | 34,226 | 110 | 881 | 298,846 | 0 |
| | 98o | 0 | 0 | 310,000 | 0 | 12,003 | 0 | 7,891 | 329,894 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 47,850 | 0 | 51 | 47,901 | 0 |
| | 99o | 0 | 0 | 323,000 | 0 | 15,011 | 1,000 | 17,898 | 356,909 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 54,836 | 0 | 0 | 54,836 | 0 |
| * 4,6-Dinitro-o-cresol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 844,907 | 410 | 18,000 | 13,950 | 7,365 | 884,632 | 0 |
| | 98o | 0 | 0 | 1,466,262 | 10,696 | 31,000 | 6,029 | 123,791 | 1,637,778 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 360 | 46 | 11,000 | 11,406 | 0 |
| | 99o | 0 | 0 | 1,664,037 | 165,913 | 29,000 | 18,681 | 124,717 | 2,002,348 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 68,669 | 0 | 67,411 | 136,080 | 0 |
| * 2,4-Dinitrophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 556,712 | 9 | 1,160,000 | 220 | 2,103 | 1,719,044 | 0 |
| | 98o | 0 | 0 | 562,709 | 29,118 | 1,770,236 | 0 | 23,800 | 2,385,863 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 246,877 | 53 | 13,191 | 260,121 | 0 |
| | 99o | 0 | 0 | 301,737 | 317,192 | 1,642,419 | 72 | 23,290 | 2,284,710 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 240,644 | 0 | 73,191 | 313,835 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|--------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | |
| 121-14-2 | ** 2,4-Dinitrotoluene | 88 | 13 | 93,257 | 12,055 | 106,400 | 14,961 | 226,673 | 350,954 |
| | | 95 | 4 | 1,874 | 231 | 0 | 0 | 2,105 | 2,199 |
| | | 98o | 5 | 1,829 | 187 | 0 | 0 | 2,016 | 2,016 |
| | | 98n | 8 | 166 | 0 | 0 | 10,000 | 10,166 | 11,574 |
| | | 99o | 7 | 1,858 | 168 | 0 | 0 | 2,026 | 27,515 |
| | | 99n | 8 | 429 | 1 | 0 | 43,420 | 43,850 | 67,656 |
| 606-20-2 | ** 2,6-Dinitrotoluene | 88 | 7 | 87,597 | 957 | 27,000 | 0 | 115,554 | 146,436 |
| | | 95 | 1 | 469 | 126 | 0 | 0 | 595 | 595 |
| | | 98o | 1 | 467 | 62 | 0 | 0 | 529 | 529 |
| | | 98n | 2 | 5 | 0 | 0 | 0 | 5 | 5 |
| | | 99o | 3 | 593 | 42 | 0 | 0 | 635 | 9,298 |
| | | 99n | 4 | 67 | 1 | 0 | 15,287 | 15,355 | 23,601 |
| 25321-14-6 | Dinitrotoluene (mixed isomers) | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 6 | 14,811 | 284 | 17,000 | 0 | 32,095 | 32,101 |
| | | 98o | 8 | 26,639 | 1 | 36,000 | 0 | 62,640 | 64,042 |
| | | 98n | 4 | 0 | 0 | 5 | 0 | 5 | 6 |
| | | 99o | 12 | 10,571 | 0 | 1,100 | 0 | 11,671 | 11,987 |
| | | 99n | 2 | 2 | 1 | 0 | 0 | 3 | 9 |
| 39300-45-3 | * Dinocap | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 255 | 0 | 0 | 0 | 255 | 255 |
| | | 98n | No reports | | | | | | |
| | | 99o | No reports | | | | | | |
| | | 99n | No reports | | | | | | |
| 123-91-1 | ** 1,4-Dioxane | 88 | 73 | 612,633 | 203,320 | 0 | 11,702 | 827,655 | 838,609 |
| | | 95 | 54 | 223,144 | 216,689 | 0 | 5,736 | 445,569 | 798,567 |
| | | 98o | 47 | 111,761 | 144,534 | 0 | 4,405 | 260,700 | 737,233 |
| | | 98n | 7 | 836 | 0 | 250 | 10,000 | 11,086 | 12,694 |
| | | 99o | 56 | 164,563 | 168,127 | 0 | 4,903 | 337,593 | 977,447 |
| | | 99n | 8 | 320 | 1 | 250 | 48,069 | 48,640 | 74,907 |
| 122-39-4 | * Diphenylamine | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 23 | 50,706 | 200 | 9,060 | 65 | 60,031 | 94,758 |
| | | 98o | 26 | 61,958 | 25 | 9,665 | 250 | 71,898 | 115,407 |
| | | 98n | 4 | 20 | 0 | 0 | 0 | 20 | 110 |
| | | 99o | 32 | 51,013 | 32 | 5,772 | 250 | 57,067 | 103,015 |
| | | 99n | 5 | 13 | 0 | 0 | 10,130 | 10,143 | 10,562 |
| 122-66-7 | 1,2-Diphenylhydrazine | 88 | No reports | | | | | | |
| | | 95 | No reports | | | | | | |
| | | 98o | No reports | | | | | | |
| | | 98n | 2 | 5 | 0 | 0 | 0 | 5 | 5 |
| | | 99o | 1 | 5 | 0 | 0 | 0 | 5 | 5 |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 7 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** 2,4-Dinitrotoluene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 42,345 | 9 | 27,115 | 1,381 | 2,200 | 73,050 | 0 |
| | 98o | 0 | 0 | 41,135 | 9,706 | 53,539 | 1,100 | 2,059 | 107,539 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 107,067 | 685 | 12,031 | 119,783 | 1 |
| | 99o | 0 | 0 | 32,234 | 952 | 40,983 | 21,382 | 22,933 | 118,484 | 2 |
| | 99n | 0 | 0 | 0 | 0 | 1,030,736 | 0 | 67,249 | 1,097,985 | 0 |
| ** 2,6-Dinitrotoluene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 6,160 | 1 | 9,180 | 118 | 595 | 16,054 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 44,509 | 118 | 529 | 45,156 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 3,755 | 37 | 1 | 3,793 | 1 |
| | 99o | 0 | 0 | 3,451 | 0 | 33,205 | 5,200 | 825 | 42,681 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 94,476 | 0 | 23,592 | 118,068 | 0 |
| Dinitrotoluene (mixed isomers) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 9,100 | 181,321 | 882,089 | 32,321 | 1,104,831 | 2,500 |
| | 98o | 0 | 202,569 | 0 | 6 | 114,686 | 587,330 | 63,375 | 967,966 | 8,701 |
| | 98n | 0 | 0 | 0 | 6 | 86,495 | 0 | 4 | 86,505 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 716,160 | 697,028 | 12,224 | 1,425,412 | 3,203 |
| | 99n | 0 | 0 | 0 | 0 | 143,316 | 0 | 3 | 143,319 | 0 |
| * Dinocap | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 109 | 8 | 117 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| ** 1,4-Dioxane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 74,293 | 11,324 | 1,975,960 | 1,196,352 | 1,019,104 | 305,315 | 790,118 | 5,372,466 | 232 |
| | 98o | 1,120,000 | 4,101 | 595,806 | 672,324 | 1,800,876 | 421,792 | 832,719 | 5,447,618 | 20 |
| | 98n | 0 | 0 | 0 | 454,236 | 26,614 | 3,549 | 12,814 | 497,213 | 1 |
| | 99o | 1,519,000 | 13,401 | 1,811,182 | 1,286,086 | 1,995,984 | 368,480 | 1,061,089 | 8,055,222 | 12 |
| | 99n | 30,078 | 0 | 0 | 225,348 | 372,025 | 8,283 | 74,549 | 710,283 | 0 |
| * Diphenylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 976,755 | 11,600 | 1,100,115 | 264,471 | 46,428 | 722,296 | 95,833 | 3,217,498 | 0 |
| | 98o | 199,400 | 35,131 | 4,769,102 | 823,607 | 21,971 | 77,905 | 86,252 | 6,013,368 | 5,700 |
| | 98n | 0 | 0 | 0 | 0 | 224,324 | 0 | 104 | 224,428 | 0 |
| | 99o | 155,450 | 229 | 5,216,863 | 754,400 | 279,900 | 83,588 | 83,710 | 6,574,140 | 4 |
| | 99n | 0 | 0 | 0 | 46,894 | 205,207 | 0 | 10,386 | 262,487 | 0 |
| 1,2-Diphenylhydrazine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 5,485 | 55 | 1 | 5,541 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 5,267 | 53 | 1 | 5,321 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 32,000 | 0 | 1 | 32,001 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|----------------|------------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 2164-07-0 * | Dipotassium endothall | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | No reports | | | | | | | |
| 136-45-8 * | Dipropyl isocinchomerate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 138-93-2 * | Disodium cyanodithioimidocarbonate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 541-53-7 * | 2,4-Dithiobiuret | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 2 | 11 | 0 | 0 | 0 | 11 | 333 | 344 |
| 330-54-1 * | Diuron | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 8 | 2,765 | 10 | 0 | 5 | 2,780 | 1,950 | 4,730 |
| | | 98o | 11 | 3,323 | 260 | 0 | 0 | 3,583 | 14,100 | 17,683 |
| | | 98n | 1 | 0 | 0 | 0 | 35,756 | 35,756 | 0 | 35,756 |
| | | 99o | 8 | 4,919 | 260 | 0 | 0 | 5,179 | 0 | 5,179 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 2439-10-3 * | Dodine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 120-36-5 **, * | 2,4-DP | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 260 | 0 | 0 | 0 | 260 | 17 | 277 |
| | | 98o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 68 | 0 | 0 | 0 | 68 | 0 | 68 |
| | | 99n | 1 | 2 | 0 | 0 | 0 | 2 | 54 | 56 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Dipotassium-endothall | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 1,900 | 5,400 | 201 | 7,501 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 3,400 | 400 | 3,800 | 0 |
| | 99n | No reports | | | | | | | | |
| * Dipropyl isocinchomeronate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Disodium cyanodithioimidocarbonate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * 2,4-Dithiobiuret | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 122,493 | 0 | 342 | 122,835 | 0 |
| * Diuron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 300 | 0 | 0 | 2 | 0 | 5,711 | 6,568 | 12,581 | 0 |
| | 98o | 250 | 0 | 0 | 0 | 0 | 20,767 | 7,292 | 28,309 | 126 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 35,756 | 35,756 | 0 |
| | 99o | 250 | 0 | 0 | 0 | 0 | 4,336 | 26,196 | 30,782 | 5 |
| | 99n | 0 | 0 | 0 | 0 | 18,317 | 0 | 2 | 18,319 | 0 |
| * Dodine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 270 | 5 | 275 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| *,** 2,4-DP | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,633 | 0 | 0 | 0 | 0 | 11 | 536 | 6,180 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 68 | 68 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 9,954 | 0 | 56 | 10,010 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Off-site Releases | Total On- and Off-site Releases Pounds | |
|------------|------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|--|---------------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | | Transfers Off-site to Disposal Pounds |
| | | | | | | | | | | |
| 2702-72-9 | *,** 2,4-D sodium salt | 88 | NR | NR | NR | NR | NR | NR | NR | |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 30 | 0 | 0 | 30 | 0 | 30 |
| 99n | No reports | | | | | | | | | |
| 106-89-8 | *,** Epichlorohydrin | 88 | 78 | 707,107 | 4,917 | 68,750 | 2,524 | 783,298 | 307 | 783,605 |
| | | 95 | 69 | 321,450 | 26,937 | 0 | 19,035 | 367,422 | 893 | 368,315 |
| | | 98o | 75 | 198,155 | 434 | 0 | 2,167 | 200,756 | 7,751 | 208,507 |
| | | 98n | 8 | 45 | 0 | 12,162 | 0 | 12,207 | 8,852 | 21,059 |
| | | 99o | 73 | 146,482 | 305 | 0 | 1,745 | 148,532 | 2,173 | 150,705 |
| | | 99n | 9 | 60 | 1 | 0 | 0 | 61 | 719 | 780 |
| 13194-48-4 | * Ethoprop | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 6 | 506 | 0 | 0 | 174,290 | 174,796 | 0 | 174,796 |
| | | 98o | 6 | 34 | 0 | 0 | 116,444 | 116,478 | 0 | 116,478 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| | | 99o | 7 | 1 | 0 | 0 | 121,886 | 121,887 | 0 | 121,887 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 27 | 27 |
| 110-80-5 | 2-Ethoxyethanol | 88 | 110 | 2,431,310 | 120,164 | 0 | 52 | 2,551,526 | 71,142 | 2,622,668 |
| | | 95 | 40 | 222,940 | 891 | 0 | 0 | 223,831 | 12,595 | 236,426 |
| | | 98o | 26 | 88,954 | 1 | 0 | 0 | 88,955 | 2,013 | 90,968 |
| | | 98n | 15 | 565 | 0 | 0 | 0 | 565 | 976 | 1,541 |
| | | 99o | 25 | 139,412 | 377 | 0 | 17 | 139,806 | 1,000 | 140,806 |
| | | 99n | 21 | 1,138 | 1 | 0 | 0 | 1,139 | 83,634 | 84,773 |
| 140-88-5 | ** Ethyl acrylate | 88 | 105 | 245,982 | 1,211 | 0 | 265 | 247,458 | 7,110 | 254,568 |
| | | 95 | 106 | 221,362 | 542 | 0 | 523 | 222,427 | 10,182 | 232,609 |
| | | 98o | 100 | 123,762 | 110 | 0 | 524 | 124,396 | 12,016 | 136,412 |
| | | 98n | 10 | 3,372 | 0 | 0 | 0 | 3,372 | 267 | 3,639 |
| | | 99o | 97 | 129,276 | 111 | 810 | 516 | 130,713 | 28,772 | 159,485 |
| | | 99n | 12 | 1,844 | 1 | 0 | 14,649 | 16,494 | 880 | 17,374 |
| 100-41-4 | ** Ethylbenzene | 88 | 564 | 7,718,781 | 15,970 | 72,914 | 175,180 | 7,982,845 | 421,334 | 8,404,179 |
| | | 95 | 1,036 | 10,273,428 | 9,343 | 475,234 | 19,174 | 10,777,179 | 165,756 | 10,942,935 |
| | | 98o | 1,025 | 8,466,984 | 7,284 | 763,279 | 200,692 | 9,438,239 | 148,388 | 9,586,627 |
| | | 98n | 618 | 129,343 | 2,746 | 913 | 14,229 | 147,231 | 23,576 | 170,807 |
| | | 99o | 1,033 | 8,590,322 | 7,408 | 868,615 | 7,245 | 9,473,590 | 173,776 | 9,647,366 |
| | | 99n | 586 | 114,904 | 1,805 | 11,684 | 32,615 | 161,008 | 165,740 | 326,748 |
| 541-41-3 | Ethyl chloroformate | 88 | 5 | 13,903 | 0 | 0 | 0 | 13,903 | 0 | 13,903 |
| | | 95 | 3 | 2,020 | 5 | 0 | 5 | 2,030 | 0 | 2,030 |
| | | 98o | 5 | 2,259 | 5 | 0 | 5 | 2,269 | 0 | 2,269 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 2,200 | 5 | 0 | 5 | 2,210 | 0 | 2,210 |
| 99n | No reports | | | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *,** 2,4-D sodium salt | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 5,139 | 0 | 0 | 5,139 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 4,600 | 0 | 0 | 4,600 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 20,000 | 0 | 30 | 20,030 | 0 |
| | 99n | No reports | | | | | | | | |
| *,** Epichlorohydrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 13,263,282 | 0 | 4,331,319 | 171,461 | 4,190,667 | 952,542 | 343,764 | 23,253,035 | 20,516 |
| | 98o | 10,499,178 | 17,715 | 4,809,942 | 77,141 | 24,705,268 | 953,525 | 201,067 | 41,263,836 | 2 |
| | 98n | 0 | 0 | 49,900 | 8,069 | 546,631 | 0 | 23,091 | 627,691 | 0 |
| | 99o | 11,169,456 | 0 | 4,120,790 | 103,015 | 32,646,933 | 489,049 | 151,387 | 48,680,630 | 0 |
| | 99n | 0 | 0 | 303 | 0 | 849,911 | 0 | 811 | 851,025 | 0 |
| * Ethoprop | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 9 | 0 | 0 | 0 | 0 | 9,404 | 174,442 | 183,855 | 2 |
| | 98o | 95 | 0 | 0 | 0 | 0 | 4,943 | 116,478 | 121,516 | 2 |
| | 98n | 0 | 0 | 0 | 0 | 12,176 | 0 | 6 | 12,182 | 0 |
| | 99o | 69 | 0 | 0 | 0 | 0 | 20,347 | 137,041 | 157,457 | 2 |
| | 99n | 0 | 0 | 0 | 0 | 50,057 | 0 | 27 | 50,084 | 0 |
| 2-Ethoxyethanol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,300 | 1,720 | 434,164 | 142,160 | 1,332,131 | 438,878 | 222,188 | 2,573,541 | 36,529 |
| | 98o | 1,400 | 0 | 584,971 | 93,670 | 507,214 | 847,586 | 112,530 | 2,147,371 | 10,517 |
| | 98n | 125,525 | 26,052 | 0 | 2,960,338 | 77,858 | 15,482 | 1,524 | 3,206,779 | 0 |
| | 99o | 1,200 | 0 | 12,992,481 | 93,097 | 882,595 | 906,595 | 150,784 | 15,026,752 | 1 |
| | 99n | 1,245,636 | 87,571 | 0 | 1,956,055 | 1,168,105 | 1,528,555 | 1,906 | 5,987,828 | 10 |
| ** Ethyl acrylate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 79 | 32,449 | 8,159,796 | 1,356,852 | 487,880 | 96,769 | 231,219 | 10,365,044 | 24,065 |
| | 98o | 381,888 | 191 | 8,430,381 | 1,518,284 | 1,178,908 | 353,939 | 138,413 | 12,002,004 | 4,154 |
| | 98n | 0 | 9,269 | 0 | 887,313 | 252,221 | 45 | 3,633 | 1,152,481 | 2 |
| | 99o | 606,528 | 260 | 10,064,209 | 1,717,979 | 887,528 | 368,981 | 168,304 | 13,813,789 | 2,512 |
| | 99n | 0 | 0 | 0 | 8,908 | 454,088 | 33,550 | 17,120 | 513,666 | 1 |
| ** Ethylbenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 25,033,644 | 6,766,192 | 40,932,118 | 11,370,779 | 19,482,390 | 1,784,871 | 10,844,606 | 116,214,600 | 13,446 |
| | 98o | 28,773,321 | 6,330,695 | 36,760,025 | 10,124,853 | 15,975,930 | 2,288,654 | 9,512,291 | 109,765,769 | 53,235 |
| | 98n | 2,613,939 | 382,495 | 42,357 | 18,809,613 | 2,401,346 | 1,389,141 | 575,447 | 26,214,338 | 101,987 |
| | 99o | 24,787,296 | 5,588,009 | 33,364,869 | 8,424,482 | 17,277,117 | 1,697,966 | 9,839,531 | 100,979,270 | 46,343 |
| | 99n | 3,373,608 | 86,497 | 111,775 | 6,079,702 | 2,712,916 | 938,249 | 149,952 | 13,452,699 | 12,911 |
| Ethyl chloroformate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3,300 | 0 | 1,980 | 5,280 | 10 |
| | 98o | 0 | 0 | 0 | 0 | 53,660 | 0 | 2,035 | 55,695 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 21,445 | 0 | 1,998 | 23,443 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|--|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 759-94-4 * | Ethyl dipropylthiocarbamate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 2,363 | 291 | 373 | 0 | 3,027 | 9,366 | 12,393 |
| | | 98o | 5 | 2,008 | 115 | 2,088 | 0 | 4,211 | 4,565 | 8,776 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 4 | 2,574 | 156 | 903 | 0 | 3,633 | 3,570 | 7,203 |
| | | 99n | No reports | | | | | | | |
| 74-85-1 * | Ethylene | 88 | 274 | 50,503,039 | 15,214 | 17,203 | 13,250 | 50,548,706 | 11,432 | 50,560,138 |
| | | 95 | 289 | 35,261,213 | 27,574 | 0 | 16 | 35,288,803 | 1,771 | 35,290,574 |
| | | 98o | 313 | 31,002,313 | 3,059 | 4,217 | 83 | 31,009,672 | 1,815 | 31,011,487 |
| | | 98n | 9 | 46,345 | 0 | 0 | 0 | 46,345 | 0 | 46,345 |
| | | 99o | 302 | 25,487,756 | 918 | 65,158 | 71,624 | 25,625,456 | 361 | 25,625,817 |
| | | 99n | 9 | 42,756 | 0 | 0 | 0 | 42,756 | 0 | 42,756 |
| — | Ethylenebisdithiocarbamic acid, salts and esters | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 1,630 | 0 | 0 | 0 | 1,630 | 0 | 1,630 |
| | | 98o | 4 | 164 | 0 | 0 | 0 | 164 | 513 | 677 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 4 | 256 | 0 | 0 | 0 | 256 | 0 | 256 |
| | | 99n | 2 | 5 | 0 | 0 | 0 | 5 | 159 | 164 |
| 107-21-1 * | Ethylene glycol | 88 | 1,455 | 13,218,339 | 3,747,561 | 7,927,570 | 736,344 | 25,629,814 | 2,595,276 | 28,225,090 |
| | | 95 | 1,313 | 7,224,374 | 869,708 | 12,554,675 | 853,550 | 21,502,307 | 1,480,855 | 22,983,162 |
| | | 98o | 1,274 | 5,992,249 | 828,275 | 327,030 | 426,720 | 7,574,274 | 1,236,029 | 8,810,303 |
| | | 98n | 390 | 31,993 | 1,215 | 215,158 | 473,025 | 721,391 | 658,721 | 1,380,112 |
| | | 99o | 1,231 | 5,904,980 | 542,567 | 732,545 | 343,582 | 7,523,674 | 2,191,347 | 9,715,021 |
| | | 99n | 398 | 25,438 | 1,480 | 492,264 | 643,972 | 1,163,154 | 255,700 | 1,418,854 |
| 151-56-4 ** | Ethyleneimine | 88 | 1 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 95 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 98o | 1 | 21 | 0 | 0 | 0 | 21 | 0 | 21 |
| | | 98n | 1 | 13 | 0 | 0 | 0 | 13 | 0 | 13 |
| | | 99o | 1 | 6 | 0 | 0 | 0 | 6 | 0 | 6 |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 153 | 157 |
| 75-21-8 *,** | Ethylene oxide | 88 | 203 | 4,640,310 | 44,851 | 11,125 | 54,700 | 4,750,986 | 20,663 | 4,771,649 |
| | | 95 | 169 | 939,303 | 5,230 | 130,000 | 2,208 | 1,076,741 | 8,663 | 1,085,404 |
| | | 98o | 136 | 584,924 | 372 | 22,561 | 1,751 | 609,608 | 1,860 | 611,468 |
| | | 98n | 19 | 105,764 | 0 | 0 | 0 | 105,764 | 0 | 105,764 |
| | | 99o | 130 | 446,800 | 1,157 | 10,796 | 1,750 | 460,503 | 60,920 | 521,423 |
| | | 99n | 18 | 37,038 | 1 | 0 | 0 | 37,039 | 4 | 37,043 |
| 96-45-7 *,** | Ethylene thiourea | 88 | 6 | 500 | 0 | 0 | 0 | 500 | 2,250 | 2,750 |
| | | 95 | 11 | 775 | 0 | 0 | 0 | 775 | 19,665 | 20,440 |
| | | 98o | 14 | 299 | 5 | 0 | 0 | 304 | 6,387 | 6,691 |
| | | 98n | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 13 | 269 | 5 | 0 | 0 | 274 | 5,422 | 5,696 |
| | | 99n | 4 | 24 | 0 | 0 | 0 | 24 | 773 | 797 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Ethyl dipropylthiocarbamate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 6,500 | 33,010 | 12,476 | 51,986 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 70,619 | 33,089 | 8,528 | 112,236 | 524 |
| | 98n | 0 | 0 | 0 | 0 | 11,716 | 0 | 0 | 11,716 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 859 | 14,694 | 7,119 | 22,672 | 1,508 |
| | 99n | No reports | | | | | | | | |
| * Ethylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 196,803,539 | 3 | 403,745,755 | 10,615,177 | 495,602,266 | 2,116,568 | 34,809,790 | 1,143,693,098 | 765,804 |
| | 98o | 123,871,793 | 0 | 608,832,745 | 12,978,078 | 509,119,560 | 3,013,379 | 29,288,019 | 1,287,103,574 | 1,428,760 |
| | 98n | 0 | 0 | 0 | 0 | 540 | 0 | 46,087 | 46,627 | 0 |
| | 99o | 146,760,300 | 317 | 411,077,331 | 11,136,191 | 672,311,331 | 4,761,444 | 26,593,836 | 1,272,640,750 | 393,959 |
| | 99n | 0 | 0 | 0 | 0 | 8,080 | 0 | 42,624 | 50,704 | 0 |
| Ethylenebisdithiocarbamic acid, salts and esters | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 7,250 | 1,500 | 8,750 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 3,329 | 672 | 4,001 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 8,070 | 356 | 8,426 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 129,960 | 0 | 164 | 130,124 | 0 |
| * Ethylene glycol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 366,424,640 | 101,902,466 | 5,926,147 | 13,194,374 | 65,597,774 | 34,533,840 | 22,580,362 | 610,159,603 | 305,209 |
| | 98o | 461,217,302 | 49,728,089 | 6,683,532 | 18,937,602 | 64,431,563 | 31,349,445 | 9,756,044 | 642,103,577 | 819,151 |
| | 98n | 10,539,705 | 10,238,097 | 12,386 | 3,186,484 | 1,914,090 | 516,636 | 812,855 | 27,220,253 | 12,633 |
| | 99o | 470,136,680 | 59,418,281 | 7,811,770 | 15,053,619 | 51,158,755 | 27,746,846 | 10,702,215 | 642,028,166 | 931,568 |
| | 99n | 7,186,483 | 12,269,886 | 615,919 | 1,408,570 | 2,157,663 | 1,736,953 | 1,243,185 | 26,618,659 | 846 |
| ** Ethyleneimine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 34,000 | 0 | 3 | 34,003 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 24,000 | 0 | 21 | 24,021 | 0 |
| | 98n | 0 | 0 | 0 | 31,069 | 0 | 0 | 13 | 31,082 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 23,000 | 0 | 6 | 23,006 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 107,040 | 0 | 157 | 107,197 | 0 |
| *,** Ethylene oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 127,110 | 307 | 16,940 | 0 | 9,974,540 | 70,255 | 1,073,275 | 11,262,427 | 15,974 |
| | 98o | 16,698 | 1,140 | 13,121 | 10 | 8,006,017 | 179,253 | 555,898 | 8,772,137 | 54,314 |
| | 98n | 0 | 0 | 0 | 1,043,180 | 2,998,788 | 10,810 | 105,044 | 4,157,822 | 108 |
| | 99o | 33,020 | 7,400 | 148,002 | 16 | 8,220,522 | 154,693 | 514,119 | 9,077,772 | 4,035 |
| | 99n | 0 | 0 | 0 | 0 | 3,154,065 | 11,920 | 37,729 | 3,203,714 | 588 |
| *,** Ethylene thiourea | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1 | 840 | 0 | 0 | 1 | 6,282 | 19,877 | 27,001 | 1 |
| | 98o | 430 | 565 | 0 | 0 | 0 | 8,632 | 6,635 | 16,262 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 2,700 | 800 | 0 | 0 | 0 | 3,650 | 5,726 | 12,876 | 4 |
| | 99n | 0 | 0 | 0 | 0 | 690,152 | 0 | 795 | 690,947 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|-----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 75-34-3 | Ethylidene dichloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 40,471 | 16 | 0 | 0 | 40,487 | 0 | 40,487 |
| | | 98o | 7 | 43,977 | 0 | 0 | 0 | 43,977 | 0 | 43,977 |
| | | 98n | 6 | 393 | 0 | 0 | 0 | 393 | 8 | 401 |
| | | 99o | 9 | 84,205 | 0 | 0 | 3 | 84,208 | 0 | 84,208 |
| | | 99n | 2 | 92 | 1 | 0 | 0 | 93 | 9 | 102 |
| 52-85-7 * | Famphur | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 9,200 | 9,200 |
| | | 98n | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 5,612 | 5,612 |
| | | 99n | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| 60168-88-9 * | Fenarimol | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 13356-08-6 * | Fenbutatin oxide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 664 | 0 | 660 | 0 | 1,324 | 0 | 1,324 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 664 | 0 | 660 | 0 | 1,324 | 0 | 1,324 |
| | | 99n | No reports | | | | | | | |
| 72490-01-8 * | Fenoxycarb | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 39515-41-8 * | Fenpropathrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 55-38-9 * | Fenthion | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Ethylidene dichloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,300,000 | 0 | 92,000 | 0 | 1,532,000 | 19,149 | 40,156 | 2,983,305 | 15,005 |
| | 98o | 1,600,000 | 0 | 1,431,278 | 0 | 2,332,070 | 23,768 | 43,948 | 5,431,064 | 89 |
| | 98n | 0 | 0 | 0 | 10,275 | 35,933 | 4,528,132 | 395 | 4,574,735 | 1 |
| | 99o | 2,190,000 | 0 | 2,712,610 | 456 | 3,522,136 | 10,830 | 84,125 | 8,520,157 | 81 |
| | 99n | 0 | 0 | 0 | 0 | 117,269 | 0 | 99 | 117,368 | 0 |
| * Famphur | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 3,758 | 0 | 3,758 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 46,000 | 0 | 46,000 | 9 |
| | 98n | 0 | 0 | 0 | 0 | 25,761 | 0 | 7 | 25,768 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 2,200 | 0 | 2,200 | 5,612 |
| | 99n | 0 | 0 | 0 | 0 | 25,757 | 0 | 4 | 25,761 | 0 |
| * Fenarimol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 310 | 650 | 960 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Fenbutatin oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 1,324 | 1,324 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 33,822 | 0 | 0 | 1,324 | 35,146 | 0 |
| | 99n | No reports | | | | | | | | |
| * Fenoxycarb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 40,000 | 0 | 1 | 40,001 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 28,000 | 0 | 0 | 28,000 | 0 |
| | 99n | No reports | | | | | | | | |
| * Fenpropathrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Fenthion | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 960 | 1 | 961 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|-------------------|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On- site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 51630-58-1 | * Fenvalerate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 69806-50-4 | * Fluazifop butyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 2164-17-2 | * Fluometuron | 88 | 2 | 500 | 0 | 0 | 0 | 500 | 3,700 | 4,200 |
| | | 95 | 6 | 796 | 0 | 0 | 0 | 796 | 2,355 | 3,151 |
| | | 98o | 5 | 782 | 0 | 0 | 0 | 782 | 745 | 1,527 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 263 | 0 | 0 | 0 | 263 | 0 | 263 |
| | | 99n | No reports | | | | | | | |
| 7782-41-4 | Fluorine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 7 | 18,319 | 15,000 | 0 | 0 | 33,319 | 0 | 33,319 |
| | | 98o | 10 | 81,938 | 49,857 | 0 | 0 | 131,795 | 0 | 131,795 |
| | | 98n | 2 | 39,082 | 0 | 0 | 90,778 | 129,860 | 0 | 129,860 |
| | | 99o | 13 | 86,302 | 54,153 | 0 | 0 | 140,455 | 0 | 140,455 |
| | | 99n | 3 | 427 | 0 | 0 | 105,417 | 105,844 | 0 | 105,844 |
| 51-21-8 | Fluorouracil | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 0 | 0 | 0 | 250 | 250 | 250 | 500 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 250 | 250 | 500 | 750 |
| | | 99n | No reports | | | | | | | |
| 69409-94-5 | * Fluvalinate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 133-07-3 | * Folpet | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 16 | 5 | 0 | 0 | 21 | 1,941 | 1,962 |
| | | 98o | 8 | 56 | 10 | 0 | 0 | 66 | 4,103 | 4,169 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 6 | 36 | 10 | 0 | 0 | 46 | 3,023 | 3,069 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Fenvalerate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| * Fluazifop butyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Fluometuron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 2 | 0 | 16,900 | 5,646 | 22,548 | 13,000 |
| | 98o | 0 | 0 | 0 | 0 | 25,000 | 8,541 | 1,385 | 34,926 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 37,000 | 2,512 | 1,680 | 41,192 | 0 |
| | 99n | No reports | | | | | | | | |
| Fluorine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 15,000 | 0 | 33,300 | 48,300 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 17,450 | 36,510 | 131,795 | 185,755 | 3 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 129,859 | 129,859 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 26,581 | 20,435 | 140,495 | 187,511 | 33 |
| | 99n | 0 | 0 | 0 | 0 | 31,839 | 0 | 105,844 | 137,683 | 0 |
| Fluorouracil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 964 | 0 | 0 | 0 | 0 | 0 | 0 | 964 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 1,188 | 0 | 0 | 0 | 0 | 0 | 0 | 1,188 | 0 |
| | 99n | No reports | | | | | | | | |
| * Fluvalinate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Folpet | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 80 | 0 | 0 | 801 | 290 | 1,962 | 3,133 | 0 |
| | 98o | 2 | 0 | 0 | 0 | 2,100 | 0 | 4,121 | 6,223 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 943 | 0 | 0 | 0 | 2,000 | 627 | 3,069 | 6,639 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|------------------------|------|--------------------|---------------------|--------------------------|-----------------------|------------------|------------------------|--------------------------------|--|
| | | | | Total Air Emissions | Surface Water Discharges | Underground Injection | Releases to Land | Total On-site Releases | Transfers Off-site to Disposal | |
| | | | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | |
| 72178-02-0 | Fomesafen | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 10 | 0 | 0 | 0 | 10 | 750 | 760 |
| | | 98o | 2 | 884 | 1,532 | 0 | 0 | 2,416 | 9,191 | 11,607 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 1,210 | 1,149 | 0 | 0 | 2,359 | 7,976 | 10,335 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50-00-0 | *,** Formaldehyde | 88 | 823 | 12,459,138 | 904,547 | 9,608,524 | 494,111 | 23,466,320 | 1,409,999 | 24,876,319 |
| | | 95 | 799 | 11,741,591 | 279,255 | 7,313,034 | 132,453 | 19,466,333 | 209,916 | 19,676,249 |
| | | 98o | 828 | 11,801,377 | 300,780 | 9,648,556 | 204,227 | 21,954,940 | 355,281 | 22,310,221 |
| | | 98n | 38 | 143,166 | 0 | 76,238 | 83,190 | 302,594 | 6,228 | 308,822 |
| | | 99o | 818 | 12,324,161 | 350,933 | 10,849,428 | 302,910 | 23,827,432 | 191,642 | 24,019,074 |
| | | 99n | 33 | 85,118 | 1 | 31,437 | 0 | 116,556 | 6,264 | 122,820 |
| 64-18-6 | * Formic acid | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 268 | 592,409 | 15,759 | 11,492,418 | 3,210 | 12,103,796 | 26,377 | 12,130,173 |
| | | 98o | 274 | 955,683 | 95,918 | 10,842,580 | 3,299 | 11,897,480 | 47,935 | 11,945,415 |
| | | 98n | 51 | 3,053 | 19 | 326,344 | 65,624 | 395,040 | 3,175 | 398,215 |
| | | 99o | 263 | 763,783 | 175,284 | 11,424,031 | 3,610 | 12,366,708 | 49,940 | 12,416,648 |
| | | 99n | 47 | 1,839 | 11 | 31,000 | 0 | 32,850 | 2,819 | 35,669 |
| 76-13-1 | Freon 113 | 88 | 1,438 | 70,382,591 | 32,894 | 5,965 | 27,799 | 70,449,249 | 1,924,043 | 72,373,292 |
| | | 95 | 138 | 2,608,115 | 3,829 | 6 | 0 | 2,611,950 | 2,560 | 2,614,510 |
| | | 98o | 32 | 941,033 | 1,627 | 0 | 0 | 942,660 | 4,287 | 946,947 |
| | | 98n | 17 | 1,016 | 0 | 0 | 0 | 1,016 | 746 | 1,762 |
| | | 99o | 24 | 744,932 | 1,932 | 0 | 0 | 746,864 | 88 | 746,952 |
| | | 99n | 12 | 1,178 | 1 | 0 | 9,955 | 11,134 | 5,392 | 16,526 |
| — | Glycol ethers | 88 | 1,628 | 48,881,581 | 285,937 | 362,198 | 105,185 | 49,634,901 | 1,547,840 | 51,182,741 |
| | | 95 | 2,188 | 45,285,377 | 188,537 | 132,064 | 27,695 | 45,633,673 | 778,577 | 46,412,250 |
| | | 98o | 2,046 | 38,186,292 | 193,191 | 1,370 | 41,413 | 38,422,266 | 833,968 | 39,256,234 |
| | | 98n | 259 | 31,027 | 0 | 0 | 16,900 | 47,927 | 17,995 | 65,922 |
| | | 99o | 1,960 | 36,049,499 | 104,389 | 716 | 49,181 | 36,203,785 | 845,084 | 37,048,869 |
| | | 99n | 241 | 33,708 | 0 | 0 | 24,398 | 58,106 | 105,135 | 163,241 |
| 76-44-8 | *,** Heptachlor | 88 | 2 | 54,295 | 2 | 0 | 0 | 54,297 | 0 | 54,297 |
| | | 95 | 1 | 203 | 6 | 0 | 0 | 209 | 0 | 209 |
| | | 98o | No reports | | | | | | | |
| | | 98n | 6 | 137 | 0 | 5 | 0 | 142 | 12 | 154 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 4 | 5 | 1 | 0 | 0 | 6 | 14 | 20 |
| 118-74-1 | *,** Hexachlorobenzene | 88 | 9 | 4,045 | 4 | 410 | 0 | 4,459 | 443,541 | 448,000 |
| | | 95 | 9 | 566 | 6,458 | 480 | 0 | 7,504 | 6,975 | 14,479 |
| | | 98o | 12 | 371 | 4 | 0 | 96 | 471 | 13,251 | 13,722 |
| | | 98n | 5 | 15 | 0 | 0 | 0 | 15 | 77 | 92 |
| | | 99o | 14 | 1,524 | 7 | 0 | 23 | 1,554 | 1,497 | 3,051 |
| | | 99n | 6 | 11 | 1 | 0 | 13,000 | 13,012 | 9 | 13,021 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Fomesafen | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 200 | 200 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 56,080 | 8,845 | 12,776 | 77,701 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 12,741 | 0 | 0 | 12,741 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 64,083 | 1,522 | 11,035 | 76,640 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 15,000 | 0 | 0 | 15,000 | 0 |
| *,** Formaldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 75,909,072 | 56,999 | 6,758,262 | 423,718 | 68,740,738 | 2,918,602 | 19,522,873 | 174,330,264 | 268,362 |
| | 98o | 101,303,291 | 591,297 | 14,709,147 | 372,961 | 92,664,308 | 3,670,967 | 21,773,888 | 235,085,859 | 16,039 |
| | 98n | 189 | 0 | 5,866 | 1,582,146 | 531,568 | 14,648 | 306,176 | 2,440,593 | 2 |
| | 99o | 106,756,307 | 466,490 | 15,544,496 | 386,987 | 81,454,127 | 4,319,695 | 23,699,737 | 232,627,839 | 15,243 |
| | 99n | 45,284 | 0 | 2,110 | 114,378 | 1,316,978 | 16,496 | 117,708 | 1,612,954 | 11 |
| * Formic acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 95,200 | 28 | 7,215,445 | 236,018 | 113,989,498 | 1,522,252 | 12,253,648 | 135,312,089 | 14 |
| | 98o | 808,843 | 14 | 5,818,086 | 1,774,563 | 155,384,846 | 3,587,939 | 12,186,094 | 179,560,385 | 6 |
| | 98n | 0 | 0 | 0 | 1,973,764 | 242,133 | 11,082 | 395,995 | 2,622,974 | 4 |
| | 99o | 710,746 | 10 | 6,613,867 | 1,731,510 | 137,622,016 | 1,392,044 | 12,624,529 | 160,694,722 | 110 |
| | 99n | 0 | 0 | 0 | 2 | 507,537 | 485 | 35,102 | 543,126 | 2 |
| Freon 113 | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,355,210 | 913,898 | 0 | 103,937 | 260,926 | 582,454 | 2,612,917 | 6,829,342 | 30,141 |
| | 98o | 407,512 | 73,959 | 39,916 | 12,608 | 3,372 | 139,670 | 936,926 | 1,613,963 | 6,307 |
| | 98n | 75,808 | 67 | 0 | 106,221 | 1,167,895 | 5,166,938 | 1,778 | 6,518,707 | 2 |
| | 99o | 179,917 | 97,641 | 37,035 | 16,184 | 4,064 | 135,979 | 680,569 | 1,151,389 | 65,287 |
| | 99n | 75,298 | 117 | 0 | 11,418 | 858,798 | 17,969 | 16,578 | 980,178 | 0 |
| Glycol ethers | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 191,651,289 | 3,543,301 | 42,789,982 | 13,212,104 | 32,546,584 | 9,163,285 | 47,371,160 | 340,277,705 | 35,391 |
| | 98o | 141,591,008 | 3,987,510 | 32,890,636 | 13,184,421 | 33,149,649 | 9,868,039 | 40,464,138 | 275,135,401 | 377,569 |
| | 98n | 974,147 | 164,569 | 135,664 | 2,034,482 | 837,402 | 101,280 | 75,787 | 4,323,331 | 5,277 |
| | 99o | 165,270,650 | 4,122,030 | 44,173,570 | 12,748,292 | 44,098,174 | 9,737,420 | 38,228,498 | 318,378,634 | 11,200 |
| | 99n | 1,330,939 | 39,774 | 763,444 | 1,936,635 | 671,775 | 462,849 | 74,635 | 5,280,051 | 1,280 |
| *,** Heptachlor | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3,850 | 851 | 209 | 4,910 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 443,474 | 35 | 153 | 443,662 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 217,288 | 114 | 15 | 217,417 | 0 |
| *,** Hexachlorobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 6,200 | 1 | 0 | 0 | 2,865,008 | 428,747 | 18,549 | 3,318,505 | 19 |
| | 98o | 8,100 | 1 | 114,000 | 54,632 | 1,577,157 | 18,214 | 13,636 | 1,785,740 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 86,605 | 38 | 88 | 86,731 | 1 |
| | 99o | 6,601 | 26,253 | 98,000 | 40,950 | 5,231,018 | 22,285 | 15,205 | 5,440,312 | 8 |
| | 99n | 0 | 0 | 0 | 0 | 399,458 | 699 | 13,013 | 413,170 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|-----------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 87-68-3 | Hexachloro-1,3-butadiene | 88 | 9 | 2,508 | 153 | 220 | 0 | 2,881 | 19,640 | 22,521 |
| | | 95 | 7 | 3,310 | 661 | 434 | 0 | 4,405 | 252 | 4,657 |
| | | 98o | 7 | 2,380 | 5 | 0 | 0 | 2,385 | 510 | 2,895 |
| | | 98n | 7 | 280 | 250 | 5 | 0 | 535 | 480 | 1,015 |
| | | 99o | 8 | 5,003 | 1 | 0 | 22 | 5,026 | 4 | 5,030 |
| | | 99n | 4 | 268 | 1 | 0 | 0 | 269 | 96 | 365 |
| 77-47-4 | * Hexachlorocyclopentadiene | 88 | 5 | 78,317 | 6 | 2,131 | 0 | 80,454 | 28,470 | 108,924 |
| | | 95 | 4 | 8,311 | 6 | 250 | 0 | 8,567 | 2,995 | 11,562 |
| | | 98o | 4 | 5,791 | 0 | 250 | 5,520 | 11,561 | 567 | 12,128 |
| | | 98n | 4 | 10 | 0 | 0 | 0 | 10 | 500 | 510 |
| | | 99o | 4 | 1,098 | 1 | 0 | 0 | 1,099 | 903 | 2,002 |
| | | 99n | 3 | 16 | 1 | 0 | 0 | 17 | 293 | 310 |
| 67-72-1 | * Hexachloroethane | 88 | 22 | 19,077 | 11 | 520 | 1 | 19,609 | 128,504 | 148,113 |
| | | 95 | 21 | 14,551 | 3,330 | 1,378 | 0 | 19,259 | 1,208 | 20,467 |
| | | 98o | 15 | 44,950 | 0 | 295 | 0 | 45,245 | 696 | 45,941 |
| | | 98n | 7 | 862 | 0 | 0 | 0 | 862 | 628 | 1,490 |
| | | 99o | 15 | 42,174 | 0 | 320 | 10 | 42,504 | 0 | 42,504 |
| | | 99n | 9 | 1,326 | 1 | 0 | 9,264 | 10,591 | 18,389 | 28,980 |
| 70-30-4 | * Hexachlorophene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 165 | 173 |
| 110-54-3 | n-Hexane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 731 | 82,152,368 | 46,402 | 5,380 | 11,559 | 82,215,709 | 120,420 | 82,336,129 |
| | | 98o | 810 | 67,317,657 | 14,106 | 26,506 | 19,592 | 67,377,861 | 104,309 | 67,482,170 |
| | | 98n | 657 | 958,660 | 1,667 | 0 | 2,491 | 962,818 | 38,702 | 1,001,520 |
| | | 99o | 788 | 55,057,176 | 11,114 | 36,511 | 7,424 | 55,112,225 | 47,692 | 55,159,917 |
| | | 99n | 642 | 1,013,334 | 2,778 | 5,483 | 564 | 1,022,159 | 28,783 | 1,050,942 |
| 51235-04-2 | * Hexazinone | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 760 | 6,322 | 0 | 0 | 7,082 | 2,973 | 10,055 |
| | | 98o | 5 | 266 | 2,215 | 0 | 0 | 2,481 | 750 | 3,231 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 264 | 6,297 | 0 | 0 | 6,561 | 250 | 6,811 |
| | | 99n | No reports | | | | | | | |
| 67485-29-4 | * Hydramethylnon | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 10 | 0 | 0 | 750 | 760 | 0 | 760 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Hexachloro-1,3-butadiene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 13 | 133,000 | 0 | 6,778,662 | 164,970 | 4,444 | 7,081,089 | 660,211 |
| | 98o | 0 | 0 | 15,200 | 0 | 4,289,000 | 162,314 | 2,650 | 4,469,164 | 410 |
| | 98n | 0 | 0 | 0 | 0 | 283,141 | 40 | 363 | 283,544 | 1 |
| | 99o | 280,000 | 0 | 0 | 0 | 8,715,965 | 52,784 | 5,249 | 9,053,998 | 36,001 |
| | 99n | 0 | 0 | 0 | 0 | 554,740 | 0 | 362 | 555,102 | 0 |
| * Hexachlorocyclopentadiene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 272,865 | 24,908 | 11,478 | 309,251 | 76 |
| | 98o | 0 | 0 | 0 | 552 | 882,835 | 100,678 | 6,611 | 990,676 | 4,800 |
| | 98n | 0 | 0 | 0 | 0 | 21,880 | 2,695,206 | 151 | 2,717,237 | 1 |
| | 99o | 0 | 0 | 0 | 388 | 392,082 | 10,812 | 1,980 | 405,262 | 84,001 |
| | 99n | 0 | 0 | 0 | 0 | 145,509 | 1 | 177 | 145,687 | 0 |
| * Hexachloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,800 | 0 | 1,232,400 | 75,132 | 4,875,108 | 109,188 | 30,153 | 6,326,781 | 129,205 |
| | 98o | 1,100,000 | 0 | 1,134,700 | 85,401 | 3,887,000 | 52,877 | 45,206 | 6,305,184 | 36 |
| | 98n | 0 | 0 | 0 | 2,214 | 543,137 | 2 | 1,138 | 546,491 | 0 |
| | 99o | 1,930,000 | 164,072 | 740,000 | 87,890 | 2,756,485 | 44,622 | 42,275 | 5,765,344 | 357 |
| | 99n | 138,553 | 0 | 0 | 123,769 | 576,027 | 162 | 15,427 | 853,938 | 10 |
| * Hexachlorophene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 219,953 | 0 | 168 | 220,121 | 0 |
| n-Hexane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,125,732,524 | 7,008,154 | 25,411,631 | 14,640,456 | 50,038,708 | 8,044,644 | 82,573,862 | 4,313,449,979 | 80,385 |
| | 98o | 985,817,721 | 13,482,100 | 42,461,972 | 19,657,395 | 65,463,658 | 5,169,506 | 66,618,641 | 1,198,670,993 | 73,597 |
| | 98n | 4,957,135 | 392,648 | 79,618 | 11,276,001 | 5,850,748 | 1,111,403 | 1,327,085 | 24,994,638 | 28,210 |
| | 99o | 659,983,814 | 11,483,629 | 54,779,642 | 21,338,150 | 60,988,140 | 4,763,576 | 54,269,832 | 867,606,783 | 330,281 |
| | 99n | 2,754,933 | 152,971 | 132,470 | 6,852,351 | 6,215,513 | 2,609,634 | 1,027,469 | 19,745,341 | 27,680 |
| * Hexazinone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 50 | 0 | 0 | 0 | 6,954 | 216,172 | 9,410 | 232,586 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 110,000 | 201,891 | 8,580 | 320,471 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 71,000 | 164,269 | 13,155 | 248,424 | 0 |
| | 99n | No reports | | | | | | | | |
| * Hydramethylnon | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 3 | 17 | 20 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 24 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 302-01-2 | ** Hydrazine | 88 | 55 | 35,199 | 2,149 | 0 | 29 | 37,377 | 24,522 | 61,899 |
| | | 95 | 47 | 13,940 | 3 | 0 | 5 | 13,948 | 23,504 | 37,452 |
| | | 98o | 46 | 10,908 | 188 | 695 | 251 | 12,042 | 336 | 12,378 |
| | | 98n | 18 | 290 | 0 | 26,116 | 120 | 26,526 | 824 | 27,350 |
| | | 99o | 47 | 10,011 | 641 | 0 | 252 | 10,904 | 46 | 10,950 |
| | | 99n | 15 | 267 | 1 | 88,378 | 120 | 88,766 | 476 | 89,242 |
| 10034-93-2 | ** Hydrazine sulfate | 88 | 4 | 1,172 | 0 | 355,000 | 0 | 356,172 | 0 | 356,172 |
| | | 95 | 3 | 0 | 0 | 260,000 | 0 | 260,000 | 0 | 260,000 |
| | | 98o | 1 | 0 | 0 | 200,000 | 0 | 200,000 | 0 | 200,000 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 190,000 | 0 | 190,000 | 0 | 190,000 |
| | | 99n | No reports | | | | | | | |
| 7647-01-0 | * Hydrochloric acid | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1,960 | 69,969,121 | 6,871 | 788,214 | 24,091 | 70,788,297 | 2,369,337 | 73,157,634 |
| | | 98o | 970 | 54,510,115 | 2,575 | 100,099 | 21,860 | 54,634,649 | 1,226,418 | 55,861,067 |
| | | 98n | 529 | 555,674,688 | 1 | 0 | 406 | 555,675,095 | 510 | 555,675,605 |
| | | 99o | 984 | 50,706,145 | 495 | 36,795 | 65,434 | 50,808,869 | 2,399,208 | 53,208,077 |
| | | 99n | 517 | 615,487,369 | 11 | 0 | 5 | 615,487,385 | 23 | 615,487,408 |
| 74-90-8 | * Hydrogen cyanide | 88 | 35 | 1,109,277 | 2,300 | 1,737,850 | 1,761 | 2,851,188 | 1,001 | 2,852,189 |
| | | 95 | 51 | 2,481,956 | 763 | 683,154 | 3 | 3,165,876 | 326 | 3,166,202 |
| | | 98o | 50 | 1,456,583 | 308 | 590,597 | 18 | 2,047,506 | 2,729 | 2,050,235 |
| | | 98n | 27 | 612,155 | 0 | 0 | 112,505 | 724,660 | 0 | 724,660 |
| | | 99o | 47 | 1,353,897 | 290 | 1,433,776 | 483 | 2,788,446 | 1,371 | 2,789,817 |
| | | 99n | 23 | 279,102 | 0 | 0 | 1,452 | 280,554 | 0 | 280,554 |
| 7664-39-3 | * Hydrogen fluoride | 88 | 536 | 14,732,294 | 189,928 | 250 | 13,002 | 14,935,474 | 3,467,471 | 18,402,945 |
| | | 95 | 575 | 11,616,575 | 8,702 | 3,845 | 24,078 | 11,653,200 | 1,020,034 | 12,673,234 |
| | | 98o | 626 | 15,612,197 | 23,194 | 0 | 12,740 | 15,648,131 | 55,434 | 15,703,565 |
| | | 98n | 403 | 64,074,150 | 6 | 2,900,000 | 151,228 | 67,125,384 | 50,701 | 67,176,085 |
| | | 99o | 626 | 14,434,432 | 16,983 | 0 | 5,353 | 14,456,768 | 31,399 | 14,488,167 |
| | | 99n | 400 | 58,265,750 | 12 | 4,100,000 | 130,120 | 62,495,882 | 60,094 | 62,555,976 |
| 123-31-9 | Hydroquinone | 88 | 61 | 10,334 | 7,211 | 375,400 | 530 | 393,475 | 6,835 | 400,310 |
| | | 95 | 64 | 17,706 | 5,093 | 340,005 | 43 | 362,847 | 4,406 | 367,253 |
| | | 98o | 59 | 13,867 | 1,558 | 332,000 | 0 | 347,425 | 27,893 | 375,318 |
| | | 98n | 3 | 0 | 0 | 15,309 | 0 | 15,309 | 0 | 15,309 |
| | | 99o | 59 | 58,145 | 2,260 | 367,000 | 5 | 427,410 | 14,504 | 441,914 |
| | | 99n | 4 | 505 | 0 | 0 | 0 | 505 | 2,255 | 2,760 |
| 35554-44-0 | * Imazalil | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Hydrazine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 300 | 452 | 0 | 0 | 31,538 | 8,966 | 37,225 | 78,481 | 2 |
| | 98o | 25 | 0 | 0 | 297 | 99,831 | 302,545 | 37,526 | 440,224 | 1 |
| | 98n | 0 | 0 | 0 | 1,762 | 179,583 | 0 | 27,126 | 208,471 | 0 |
| | 99o | 25 | 0 | 5 | 0 | 61,611 | 142,341 | 53,354 | 257,336 | 3 |
| | 99n | 0 | 0 | 0 | 45 | 455,640 | 10 | 88,759 | 544,454 | 0 |
| ** Hydrazine sulfate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,900 | 1,900 | 260,000 | 263,800 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 200,000 | 200,000 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 190,000 | 190,000 | 0 |
| | 99n | No reports | | | | | | | | |
| * Hydrochloric acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 175,235,762 | 15,821,343 | 100,650 | 1,510 | 1,041,628,574 | 26,254,628 | 71,483,581 | 1,330,526,048 | 114,031 |
| | 98o | 85,368,494 | 2,681,128 | 190,000 | 12,782 | 718,724,495 | 6,548,885 | 54,954,361 | 868,480,145 | 53,158 |
| | 98n | 0 | 0 | 0 | 231,145 | 200,833,658 | 1,567 | 556,111,318 | 757,177,688 | 120,530 |
| | 99o | 65,963,382 | 1,283,791 | 190,000 | 16,118 | 802,018,290 | 9,650,266 | 51,015,558 | 930,137,405 | 223,575 |
| | 99n | 0 | 0 | 0 | 1 | 211,816,503 | 41,474 | 627,959,096 | 839,817,074 | 159,083 |
| * Hydrogen cyanide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 72,134 | 0 | 33,141,239 | 70 | 25,143,135 | 10,443 | 3,141,004 | 61,508,025 | 27,155 |
| | 98o | 57,228 | 0 | 24,442,117 | 0 | 21,259,696 | 473 | 2,044,055 | 47,803,569 | 288 |
| | 98n | 53,473 | 0 | 0 | 0 | 42,101 | 0 | 728,335 | 823,909 | 7 |
| | 99o | 117,205 | 0 | 27,900,378 | 0 | 19,447,535 | 2,675 | 2,765,799 | 50,233,592 | 186 |
| | 99n | 29,774 | 0 | 0 | 0 | 98,104 | 0 | 280,102 | 407,980 | 6 |
| * Hydrogen fluoride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 92,491,171 | 222,387 | 0 | 9,201 | 103,217,512 | 2,489,439 | 12,865,119 | 211,294,829 | 11,499 |
| | 98o | 135,034,314 | 147,393 | 0 | 4,910 | 113,576,035 | 2,309,902 | 15,485,434 | 266,557,988 | 11,219 |
| | 98n | 7,522 | 8,852 | 0 | 0 | 33,587,444 | 47,627 | 67,491,164 | 101,142,609 | 56 |
| | 99o | 141,841,605 | 140,373 | 0 | 1,614 | 100,863,244 | 2,380,036 | 14,677,632 | 259,904,504 | 63,502 |
| | 99n | 0 | 5,600 | 0 | 0 | 28,937,660 | 43,274 | 62,064,081 | 91,050,615 | 28 |
| Hydroquinone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 960 | 0 | 986,933 | 37,786 | 417,185 | 86,342 | 363,576 | 1,892,782 | 45 |
| | 98o | 3,200 | 0 | 848,845 | 10,066 | 405,144 | 126,922 | 359,750 | 1,753,927 | 2 |
| | 98n | 0 | 0 | 0 | 0 | 85,610 | 0 | 15,309 | 100,919 | 0 |
| | 99o | 1,300 | 0 | 927,893 | 36,525 | 656,620 | 157,583 | 445,098 | 2,225,019 | 0 |
| | 99n | 30,660 | 0 | 1,563 | 13,050 | 105,812 | 1,624 | 326 | 153,035 | 10 |
| * Imazalil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 15 | 15 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|-----------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | |
| 55406-53-6 * | 3-Iodo-2-propynyl butylcarbamate | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 3,959 | 10 | 0 | 265 | 4,234 | 16,997 |
| | | 98o | 21 | 3,393 | 10 | 0 | 291 | 3,694 | 11,046 |
| | | 98n | No reports | | | | | | |
| | | 99o | 23 | 3,145 | 10 | 0 | 286 | 3,441 | 253,382 |
| | | 99n | 1 | 0 | 0 | 0 | 42,000 | 42,000 | 42,000 |
| 13463-40-6 | Iron pentacarbonyl | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 1,530 | 0 | 0 | 0 | 1,530 | 1,530 |
| | | 98o | 1 | 1,475 | 0 | 0 | 0 | 1,475 | 1,475 |
| | | 98n | No reports | | | | | | |
| | | 99o | 1 | 1,517 | 0 | 0 | 0 | 1,517 | 1,517 |
| | | 99n | No reports | | | | | | |
| 78-84-2 | Isobutyraldehyde | 88 | 15 | 685,918 | 773 | 60 | 1 | 686,752 | 686,752 |
| | | 95 | 24 | 256,279 | 752 | 44,075 | 47 | 301,153 | 301,153 |
| | | 98o | 20 | 254,460 | 1,182 | 0 | 0 | 255,642 | 427,875 |
| | | 98n | 2 | 165 | 0 | 0 | 0 | 165 | 170 |
| | | 99o | 20 | 259,971 | 966 | 0 | 0 | 260,937 | 384,999 |
| | | 99n | No reports | | | | | | |
| 25311-71-1 * | Isufenphos | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 2,907 | 0 | 0 | 9,000 | 11,907 | 23,207 |
| | | 98o | 2 | 10 | 0 | 0 | 0 | 10 | 10 |
| | | 98n | No reports | | | | | | |
| | | 99o | 2 | 205 | 0 | 0 | 0 | 205 | 205 |
| | | 99n | No reports | | | | | | |
| 67-63-0 * | Isopropyl alcohol (manufacturing) | 88 | 91 | 2,001,397 | 1,900 | 0 | 14 | 2,003,311 | 2,250,350 |
| | | 95 | 72 | 937,246 | 0 | 0 | 0 | 937,246 | 939,823 |
| | | 98o | 68 | 586,639 | 250 | 0 | 0 | 586,889 | 602,990 |
| | | 98n | 11 | 2,326 | 0 | 192,117 | 0 | 194,443 | 237,991 |
| | | 99o | 73 | 588,377 | 165 | 0 | 9 | 588,551 | 594,556 |
| | | 99n | 9 | 768 | 0 | 0 | 0 | 768 | 89,238 |
| 80-05-7 | 4,4'-Isopropylidenediphenol | 88 | 80 | 226,986 | 126,385 | 0 | 426,065 | 779,436 | 1,223,996 |
| | | 95 | 114 | 155,659 | 5,809 | 82,000 | 86,697 | 330,165 | 755,836 |
| | | 98o | 122 | 188,260 | 7,658 | 0 | 67,097 | 263,015 | 844,089 |
| | | 98n | 6 | 262 | 0 | 0 | 56,423 | 56,685 | 56,784 |
| | | 99o | 117 | 169,523 | 4,783 | 72 | 3,282 | 177,660 | 742,125 |
| | | 99n | 4 | 255 | 0 | 0 | 36,740 | 36,995 | 37,419 |
| 120-58-1 | Isosafrole | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | |
| | | 98o | No reports | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 41 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * 3-Iodo-2-propynyl-butylcarbamate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,755 | 2 | 0 | 1 | 300 | 62,552 | 5,151 | 69,761 | 2 |
| | 98o | 30,906 | 0 | 400 | 5,561 | 334 | 123,399 | 6,271 | 166,871 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 21,705 | 0 | 0 | 974 | 329 | 340,696 | 11,345 | 375,049 | 2 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 42,000 | 42,000 | 0 |
| Iron pentacarbonyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 1,379 | 1,379 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 1,475 | 1,475 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 1,517 | 1,517 | 0 |
| | 99n | No reports | | | | | | | | |
| Isobutyraldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 9,647 | 1,193,119 | 567,515 | 609,409 | 76,894 | 300,129 | 2,756,713 | 4 |
| | 98o | 0 | 48,000 | 1,509,037 | 550,059 | 1,118,885 | 118,174 | 429,051 | 3,773,206 | 221 |
| | 98n | 0 | 0 | 0 | 32,119 | 15,206 | 659 | 165 | 48,149 | 0 |
| | 99o | 10,188 | 3,800 | 2,902,392 | 539,410 | 1,180,083 | 36,804 | 403,453 | 5,076,130 | 0 |
| | 99n | No reports | | | | | | | | |
| * Isufenphos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 690 | 0 | 0 | 0 | 0 | 20,300 | 11,612 | 32,602 | 1 |
| | 98o | 2,000 | 0 | 0 | 0 | 0 | 114 | 10 | 2,124 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 20,000 | 0 | 0 | 0 | 0 | 0 | 210 | 20,210 | 0 |
| | 99n | No reports | | | | | | | | |
| * Isopropyl alcohol (manufacturing) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 62,894 | 48,179 | 2,684,671 | 93,871 | 178,156 | 232,658 | 743,206 | 4,043,635 | 9 |
| | 98o | 11,355 | 146,022 | 3,681,484 | 123,138 | 148,574 | 63,213 | 627,994 | 4,801,780 | 8 |
| | 98n | 122,891 | 0 | 0 | 925,705 | 174,862 | 56,137 | 193,515 | 1,473,110 | 1 |
| | 99o | 883,141 | 32,237 | 8,862,061 | 172,520 | 200,129 | 15,056 | 594,825 | 10,759,969 | 9 |
| | 99n | 1,076,491 | 0 | 0 | 824,910 | 197,271 | 97,618 | 768 | 2,197,058 | 10 |
| 4,4'-Isopropylidenediphenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 56,348 | 2,377 | 5,024,865 | 28,758 | 824,095 | 127,796 | 647,242 | 6,711,481 | 121,312 |
| | 98o | 104,158 | 71,832 | 9,043,549 | 98,999 | 1,636,775 | 175,248 | 843,692 | 11,974,253 | 3,477 |
| | 98n | 0 | 0 | 0 | 0 | 137,341 | 2,035 | 56,554 | 195,930 | 0 |
| | 99o | 225,885 | 52,709 | 24,844,350 | 421,160 | 576,435 | 748,818 | 697,896 | 27,567,253 | 3,884 |
| | 99n | 0 | 0 | 0 | 0 | 282,439 | 8,222 | 36,755 | 327,416 | 0 |
| Isosafrole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 77,000 | 0 | 37 | 77,037 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|-------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 77501-63-4 * | Lactofen | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 787 | 0 | 0 | 0 | 787 | 250 | 1,037 |
| | | 98o | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 406 | 0 | 0 | 0 | 406 | 9 | 415 |
| | | 99n | No reports | | | | | | | |
| 7439-92-1 ** | Lead | 88 | 865 | 1,128,042 | 61,776 | 0 | 6,648,926 | 7,838,744 | 12,274,686 | 20,113,430 |
| | | 95 | 857 | 729,998 | 10,644 | 0 | 2,361,516 | 3,102,158 | 2,550,311 | 5,652,469 |
| | | 98o | 810 | 339,433 | 13,105 | 8,613 | 3,265,491 | 3,626,642 | 5,379,837 | 9,006,479 |
| | | 98n | 52 | 4,788 | 138 | 23,068 | 12,705,039 | 12,733,033 | 1,030,338 | 13,763,371 |
| | | 99o | 788 | 350,046 | 8,336 | 0 | 1,234,157 | 1,592,539 | 3,123,113 | 4,715,652 |
| | | 99n | 42 | 4,004 | 32 | 13,250 | 9,206,640 | 9,223,926 | 1,509,420 | 10,733,346 |
| — | Lead compounds | 88 | 736 | 1,555,082 | 180,368 | 2,755 | 20,035,359 | 21,773,564 | 15,929,201 | 37,702,765 |
| | | 95 | 862 | 1,228,687 | 54,994 | 183,912 | 13,519,498 | 14,987,091 | 19,362,403 | 34,349,494 |
| | | 98o | 848 | 854,133 | 38,804 | 171,660 | 16,358,443 | 17,423,040 | 16,876,173 | 34,299,213 |
| | | 98n | 258 | 350,359 | 77,080 | 7,280,139 | 240,468,619 | 248,176,197 | 5,115,886 | 253,292,083 |
| | | 99o | 814 | 871,608 | 31,794 | 182,869 | 16,308,361 | 17,394,632 | 22,369,198 | 39,763,830 |
| | | 99n | 234 | 352,456 | 33,806 | 7,959,140 | 295,159,401 | 303,504,803 | 6,900,198 | 310,405,001 |
| 58-89-9 ** | Lindane | 88 | 3 | 258 | 0 | 0 | 0 | 258 | 56 | 314 |
| | | 95 | 10 | 510 | 0 | 0 | 0 | 510 | 20 | 530 |
| | | 98o | 10 | 26 | 5 | 0 | 0 | 31 | 3 | 34 |
| | | 98n | 6 | 53 | 0 | 0 | 25,654 | 25,707 | 126 | 25,833 |
| | | 99o | 9 | 15 | 5 | 0 | 0 | 20 | 18 | 38 |
| | | 99n | 5 | 15 | 1 | 0 | 0 | 16 | 351 | 367 |
| 330-55-2 * | Linuron | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 270 | 5 | 0 | 5 | 280 | 1,250 | 1,530 |
| | | 98o | 2 | 1,010 | 5 | 0 | 0 | 1,015 | 750 | 1,765 |
| | | 98n | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 2 | 1,010 | 5 | 0 | 0 | 1,015 | 750 | 1,765 |
| | | 99n | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| 554-13-2 | Lithium carbonate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 29 | 15,824 | 0 | 0 | 0 | 15,824 | 601,200 | 617,024 |
| | | 98o | 43 | 8,144 | 250 | 114 | 32,284 | 40,792 | 292,407 | 333,199 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 44 | 12,006 | 501 | 0 | 250 | 12,757 | 192,891 | 205,648 |
| | | 99n | 1 | 0 | 0 | 0 | 11,382 | 11,382 | 0 | 11,382 |
| 121-75-5 * | Malathion | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 21 | 2,512 | 0 | 0 | 0 | 2,512 | 31 | 2,543 |
| | | 98o | 17 | 2,017 | 255 | 0 | 0 | 2,272 | 1,004 | 3,276 |
| | | 98n | 6 | 10 | 0 | 0 | 20,222 | 20,232 | 159 | 20,391 |
| | | 99o | 17 | 5,097 | 5 | 0 | 0 | 5,102 | 38 | 5,140 |
| | | 99n | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Lactofen | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 100 | 0 | 0 | 0 | 0 | 1 | 520 | 621 | 1,044 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 89 | 3 | 92 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 156 | 406 | 562 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Lead | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 208,823,623 | 59,492,972 | 49,836 | 5,662 | 1,631,361 | 1,918,683 | 4,462,867 | 276,385,004 | 19,118 |
| | 98o | 249,087,516 | 36,680,738 | 242,740 | 8,259 | 1,620,234 | 747,986 | 7,317,540 | 295,705,013 | 424,985 |
| | 98n | 414 | 32,124 | 0 | 12,582 | 0 | 135,054 | 13,890,898 | 14,071,072 | 71 |
| | 99o | 213,586,064 | 49,825,513 | 0 | 2,724 | 1,703,934 | 561,736 | 5,174,385 | 270,854,356 | 7,737 |
| | 99n | 3,747 | 275,832 | 0 | 0 | 340,717 | 165,312 | 10,228,676 | 11,014,284 | 17 |
| Lead compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 501,647,569 | 297,656,594 | 0 | 62,073 | 28,890,703 | 7,378,330 | 27,393,141 | 863,028,410 | 3,713,960 |
| | 98o | 420,776,967 | 296,081,977 | 0 | 20,817 | 158,767 | 3,049,869 | 42,883,366 | 762,971,763 | 1,494,519 |
| | 98n | 8,472,755 | 1,141,555 | 0 | 31,345 | 149,746 | 82,511 | 255,435,859 | 265,313,771 | 62,562 |
| | 99o | 442,182,690 | 279,831,652 | 700 | 15,768 | 117,175 | 2,546,697 | 38,424,728 | 763,119,410 | 29,089,501 |
| | 99n | 482,650 | 2,860,198 | 0 | 0 | 424,100 | 55,538 | 277,508,918 | 281,331,404 | 39,001,932 |
| *,** Lindane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 326 | 0 | 0 | 0 | 0 | 3,206 | 272 | 3,804 | 0 |
| | 98o | 168 | 0 | 0 | 0 | 0 | 8,164 | 126 | 8,458 | 1 |
| | 98n | 0 | 0 | 0 | 100,903 | 118,134 | 222 | 25,833 | 245,092 | 1 |
| | 99o | 1,131 | 0 | 0 | 0 | 0 | 60 | 44 | 1,235 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 350,078 | 2,659 | 193 | 352,930 | 0 |
| * Linuron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 1 | 0 | 734 | 797 | 1,532 | 0 |
| | 98o | 25 | 0 | 0 | 0 | 0 | 500 | 550 | 1,075 | 0 |
| | 98n | 0 | 0 | 0 | 2,214 | 14,516 | 0 | 4 | 16,734 | 0 |
| | 99o | 25 | 0 | 0 | 0 | 0 | 500 | 550 | 1,075 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 33,900 | 699 | 3 | 34,602 | 0 |
| Lithium carbonate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 18,000 | 0 | 0 | 0 | 2,200 | 690 | 169,247 | 190,137 | 446,000 |
| | 98o | 48,373 | 0 | 0 | 0 | 1,400 | 3,266 | 301,392 | 354,431 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 94,352 | 0 | 0 | 0 | 5,258 | 3,109 | 204,542 | 307,261 | 17 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 11,382 | 11,382 | 0 |
| * Malathion | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 197 | 0 | 0 | 0 | 0 | 819 | 1,073 | 2,089 | 1 |
| | 98o | 1,187 | 0 | 0 | 0 | 0 | 1,841 | 1,649 | 4,677 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 180,176 | 0 | 20,390 | 200,566 | 0 |
| | 99o | 418 | 0 | 0 | 0 | 0 | 4,118 | 4,628 | 9,164 | 1 |
| | 99n | 0 | 97 | 0 | 0 | 240,221 | 0 | 1 | 240,319 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 108-31-6 | Maleic anhydride | 88 | 199 | 676,778 | 12,580 | 240,000 | 250 | 929,608 | 132,148 | 1,061,756 |
| | | 95 | 211 | 347,371 | 18 | 5 | 1,406 | 348,800 | 14,429 | 363,229 |
| | | 98o | 210 | 357,365 | 11 | 0 | 4,430 | 361,806 | 35,131 | 396,937 |
| | | 98n | 8 | 35 | 0 | 0 | 150,000 | 150,035 | 10 | 150,045 |
| | | 99o | 206 | 378,592 | 5 | 0 | 4,449 | 383,046 | 5,555 | 388,601 |
| | | 99n | 9 | 161 | 1 | 0 | 62,000 | 62,162 | 431 | 62,593 |
| 109-77-3 | Malononitrile | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 432,956 | 0 | 432,956 | 0 | 432,956 |
| | | 98o | 4 | 510 | 0 | 111,100 | 0 | 111,610 | 0 | 111,610 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 10 | 5 | 150,985 | 5 | 151,005 | 0 | 151,005 |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 163 | 171 |
| 12427-38-2 * | Maneb | 88 | 6 | 2,265 | 250 | 0 | 0 | 2,515 | 5,285 | 7,800 |
| | | 95 | 6 | 273 | 0 | 0 | 0 | 273 | 2,461 | 2,734 |
| | | 98o | 7 | 5 | 0 | 0 | 0 | 5 | 2,288 | 2,293 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 7439-96-5 | Manganese | 88 | 954 | 1,586,929 | 321,993 | 255 | 20,229,826 | 22,139,003 | 20,087,660 | 42,226,663 |
| | | 95 | 1,605 | 780,503 | 117,291 | 17 | 8,280,318 | 9,178,129 | 13,138,298 | 22,316,427 |
| | | 98o | 1,806 | 977,741 | 260,263 | 3 | 10,038,944 | 11,276,951 | 15,018,024 | 26,294,975 |
| | | 98n | 61 | 24,751 | 147,150 | 0 | 10,771,082 | 10,942,983 | 1,053,019 | 11,996,002 |
| | | 99o | 1,825 | 802,914 | 136,695 | 5 | 9,661,263 | 10,600,877 | 12,832,774 | 23,433,651 |
| | | 99n | 51 | 12,131 | 140,505 | 0 | 8,123,209 | 8,275,845 | 999,489 | 9,275,334 |
| — | Manganese compounds | 88 | 545 | 1,801,453 | 681,469 | 6,816,070 | 84,227,842 | 93,526,834 | 20,670,921 | 114,197,755 |
| | | 95 | 1,062 | 2,925,313 | 1,655,180 | 10,403,590 | 39,732,058 | 54,716,141 | 28,748,657 | 83,464,798 |
| | | 98o | 1,250 | 1,599,063 | 4,538,943 | 7,762,910 | 52,395,059 | 66,295,975 | 42,664,297 | 108,960,272 |
| | | 98n | 376 | 537,761 | 1,015,935 | 858,700 | 446,827,046 | 449,239,442 | 7,779,405 | 457,018,847 |
| | | 99o | 1,283 | 1,880,530 | 4,853,311 | 7,011,627 | 44,913,717 | 58,659,185 | 42,990,491 | 101,649,676 |
| | | 99n | 386 | 578,324 | 544,928 | 1,186,500 | 411,502,060 | 413,811,812 | 8,052,544 | 421,864,356 |
| 93-65-2 ** | Mecoprop | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 9 | 1,816 | 0 | 0 | 0 | 1,816 | 2,304 | 4,120 |
| | | 98o | 10 | 1,150 | 0 | 0 | 250 | 1,400 | 3,968 | 5,368 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 12 | 1,123 | 0 | 0 | 250 | 1,373 | 2,368 | 3,741 |
| | | 99n | 1 | 2 | 0 | 0 | 0 | 2 | 64 | 66 |
| 149-30-4 * | 2-Mercaptoben-zothiazole | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 28 | 34,857 | 5 | 97,000 | 260 | 132,122 | 376,420 | 508,542 |
| | | 98o | 37 | 5,404 | 100,823 | 45,000 | 250 | 151,477 | 131,778 | 283,255 |
| | | 98n | 1 | 0 | 0 | 0 | 250,000 | 250,000 | 0 | 250,000 |
| | | 99o | 34 | 5,211 | 66,893 | 37,000 | 0 | 109,104 | 122,993 | 232,097 |
| | | 99n | 1 | 0 | 0 | 0 | 176,304 | 176,304 | 0 | 176,304 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Maleic anhydride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,940 | 242 | 3,222,121 | 102,238 | 38,356,328 | 1,154,869 | 355,050 | 43,195,788 | 22,344 |
| | 98o | 7,607 | 250 | 3,857,500 | 163,967 | 50,635,701 | 1,404,589 | 387,975 | 56,457,589 | 12,601 |
| | 98n | 0 | 0 | 0 | 55,466 | 79,450 | 0 | 150,041 | 284,957 | 0 |
| | 99o | 4,507 | 272 | 2,724,748 | 101,555 | 43,347,192 | 1,426,535 | 376,491 | 47,981,300 | 1,533 |
| | 99n | 0 | 0 | 0 | 222,133 | 456,582 | 37,000 | 62,368 | 778,083 | 0 |
| Malononitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 432,956 | 432,956 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 336,000 | 0 | 111,214 | 447,214 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 22,000 | 0 | 151,009 | 173,009 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 191,547 | 0 | 166 | 191,713 | 0 |
| * Maneb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 525 | 0 | 0 | 3 | 0 | 8,800 | 7,861 | 17,189 | 0 |
| | 98o | 35 | 0 | 0 | 0 | 0 | 8,521 | 2,058 | 10,614 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 10,113 | 2,853 | 12,966 | 0 |
| | 99n | No reports | | | | | | | | |
| Manganese | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 30,253,675 | 74,115,194 | 0 | 141 | 173,632 | 1,894,554 | 21,471,565 | 127,908,761 | 715 |
| | 98o | 39,006,919 | 49,624,830 | 0 | 543 | 531,918 | 1,054,488 | 23,783,167 | 114,001,865 | 623,874 |
| | 98n | 960 | 171,563 | 0 | 0 | 113,857 | 0 | 11,998,782 | 12,285,162 | 8 |
| | 99o | 42,755,189 | 69,660,944 | 0 | 1 | 152,697 | 691,840 | 22,024,517 | 135,285,188 | 18,810,107 |
| | 99n | 330 | 179,140 | 0 | 0 | 49,506 | 0 | 7,834,732 | 8,063,708 | 10 |
| Manganese compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 145,391,027 | 88,055,551 | 0 | 199,783 | 1,021,862 | 5,903,439 | 78,070,750 | 318,642,412 | 1,350,559 |
| | 98o | 22,746,875 | 47,858,333 | 22,153 | 35,980 | 1,924,058 | 5,367,241 | 113,573,597 | 191,528,237 | 332,380 |
| | 98n | 87,296 | 140,909 | 0 | 0 | 74,724 | 73,171 | 456,349,921 | 456,726,021 | 70,966 |
| | 99o | 18,775,581 | 45,394,140 | 2,876 | 58,511 | 1,536,543 | 7,046,679 | 100,965,013 | 173,779,343 | 158,189 |
| | 99n | 769,091 | 792,731 | 0 | 0 | 16,286 | 83,200 | 374,672,667 | 376,333,975 | 47,000,046 |
| ** Mecoprop | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 15,614 | 0 | 0 | 0 | 940 | 1,037 | 3,659 | 21,250 | 1 |
| | 98o | 872 | 0 | 0 | 1,000 | 500 | 451 | 4,887 | 7,710 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 2,611 | 0 | 0 | 0 | 440 | 632 | 3,587 | 7,270 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 11,879 | 0 | 67 | 11,946 | 0 |
| * 2-Mercaptobenzothiazole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 5,405 | 104,645 | 0 | 931,100 | 128,323 | 136,948 | 516,905 | 1,823,326 | 632 |
| | 98o | 1,780 | 8,475 | 0 | 800,961 | 513,059 | 76,774 | 282,961 | 1,684,010 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 250,000 | 250,000 | 0 |
| | 99o | 207,850 | 50,116 | 0 | 601,890 | 527,221 | 11,170 | 237,876 | 1,636,123 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 176,304 | 176,304 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|-------------|-------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 7439-97-6 * | Mercury | 88 | 37 | 22,905 | 1,397 | 0 | 13,279 | 37,581 | 258,718 | 296,299 |
| | | 95 | 24 | 13,262 | 192 | 0 | 1,016 | 14,470 | 14,228 | 28,698 |
| | | 98o | 24 | 12,591 | 134 | 0 | 3,069 | 15,794 | 14,827 | 30,621 |
| | | 98n | 10 | 9,416 | 0 | 0 | 236,003 | 245,419 | 14,418 | 259,837 |
| | | 99o | 33 | 11,275 | 133 | 0 | 2,419 | 13,827 | 6,575 | 20,402 |
| | | 99n | 14 | 9,426 | 0 | 0 | 98,316 | 107,742 | 14,956 | 122,698 |
| — | Mercury compounds | 88 | 15 | 2,376 | 9 | 27 | 0 | 2,412 | 17,916 | 20,328 |
| | | 95 | 10 | 3,156 | 136 | 6 | 0 | 3,298 | 207,097 | 210,395 |
| | | 98o | 11 | 2,372 | 34 | 0 | 2,550 | 4,956 | 19,848 | 24,804 |
| | | 98n | 11 | 5,277 | 22 | 0 | 8,969,110 | 8,974,409 | 72,802 | 9,047,211 |
| | | 99o | 13 | 2,110 | 36 | 0 | 5,700 | 7,846 | 53,046 | 60,892 |
| | | 99n | 17 | 3,666 | 9 | 0 | 3,059,271 | 3,062,946 | 89,129 | 3,152,075 |
| 150-50-5 * | Merphos | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 186 | 0 | 0 | 0 | 186 | 0 | 186 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 13 | 0 | 0 | 13 | 0 | 13 |
| | | 99n | No reports | | | | | | | |
| 126-98-7 | Methacrylonitrile | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 6 | 945 | 0 | 606,939 | 0 | 607,884 | 0 | 607,884 |
| | | 98o | 6 | 900 | 0 | 107,076 | 0 | 107,976 | 0 | 107,976 |
| | | 98n | 2 | 800 | 0 | 0 | 0 | 800 | 0 | 800 |
| | | 99o | 6 | 950 | 0 | 102,418 | 0 | 103,368 | 0 | 103,368 |
| | | 99n | 3 | 112 | 1 | 0 | 22,932 | 23,045 | 12,387 | 35,432 |
| 137-42-8 * | Metham sodium | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 4,387 | 1 | 0 | 252 | 4,640 | 13,050 | 17,690 |
| | | 98o | 9 | 5,714 | 40 | 0 | 110 | 5,864 | 800 | 6,664 |
| | | 98n | 2 | 824 | 0 | 0 | 22,248 | 23,072 | 0 | 23,072 |
| | | 99o | 9 | 6,357 | 40 | 0 | 110 | 6,507 | 220 | 6,727 |
| | | 99n | 1 | 3,627 | 0 | 0 | 0 | 3,627 | 0 | 3,627 |
| 67-56-1 * | Methanol | 88 | 2,507 | 259,691,589 | 17,139,114 | 26,587,686 | 11,911,136 | 315,329,525 | 15,290,643 | 330,620,168 |
| | | 95 | 2,486 | 217,605,051 | 9,223,362 | 27,738,543 | 1,776,256 | 256,343,212 | 1,956,802 | 258,300,014 |
| | | 98o | 2,238 | 190,456,559 | 5,859,092 | 16,681,250 | 1,800,269 | 214,797,170 | 877,673 | 215,674,843 |
| | | 98n | 371 | 944,235 | 5,144 | 1,125,538 | 605,659 | 2,680,576 | 90,540 | 2,771,116 |
| | | 99o | 2,161 | 183,874,487 | 3,864,475 | 14,190,039 | 1,211,207 | 203,140,208 | 1,366,054 | 204,506,262 |
| | | 99n | 354 | 945,704 | 8,905 | 1,992,807 | 707,037 | 3,654,453 | 116,658 | 3,771,111 |
| 2032-65-7 * | Methiocarb | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Mercury | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 413,832 | 58,151 | 0 | 0 | 6,307 | 11,009 | 17,996 | 507,295 | 2 |
| | 98o | 455,629 | 34,068 | 0 | 0 | 4,315 | 1,165 | 20,609 | 515,786 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 260,436 | 260,436 | 0 |
| | 99o | 471,573 | 37,688 | 0 | 0 | 4,021 | 5,495 | 18,720 | 537,497 | 12 |
| | 99n | 0 | 307 | 0 | 0 | 0 | 0 | 122,294 | 122,601 | 1 |
| Mercury compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 125,287 | 0 | 0 | 61 | 0 | 4,597 | 25,638 | 155,583 | 179,000 |
| | 98o | 573,026 | 5 | 0 | 0 | 0 | 5,411 | 18,413 | 596,855 | 860 |
| | 98n | 65,400 | 114,138 | 0 | 0 | 0 | 236 | 9,046,771 | 9,226,545 | 2 |
| | 99o | 390,415 | 2,789 | 0 | 0 | 0 | 187 | 57,982 | 451,373 | 2,400 |
| | 99n | 43,155 | 87,463 | 0 | 0 | 0 | 550 | 3,133,514 | 3,264,682 | 15,002 |
| * Merphos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 186 | 186 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 155 | 12 | 13 | 180 | 0 |
| | 99n | No reports | | | | | | | | |
| Methacrylonitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3,189 | 0 | 607,884 | 611,073 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 500 | 0 | 107,976 | 108,476 | 0 |
| | 98n | 0 | 0 | 0 | 1,891,340 | 0 | 0 | 800 | 1,892,140 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 320 | 0 | 103,368 | 103,688 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 73,099 | 0 | 35,431 | 108,530 | 0 |
| * Metham sodium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 33,520 | 0 | 0 | 0 | 102 | 362 | 15,378 | 49,362 | 0 |
| | 98o | 100 | 0 | 0 | 0 | 355 | 3,324 | 6,354 | 10,133 | 1,000 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 24,392 | 24,392 | 0 |
| | 99o | 100 | 0 | 0 | 0 | 748 | 10,472 | 6,866 | 18,186 | 100 |
| | 99n | 9,000 | 0 | 0 | 0 | 0 | 5,970 | 3,600 | 18,570 | 0 |
| * Methanol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 441,801,827 | 28,205,153 | 376,980,271 | 94,135,080 | 955,830,551 | 119,880,621 | 262,620,706 | 2,279,454,209 | 295,175 |
| | 98o | 620,419,622 | 13,003,212 | 299,098,472 | 93,547,811 | 1,065,010,404 | 125,152,243 | 216,866,982 | 2,433,098,746 | 110,258 |
| | 98n | 3,746,596 | 130,289 | 8,256,769 | 33,838,262 | 15,712,702 | 2,607,799 | 2,871,641 | 67,164,058 | 1,926 |
| | 99o | 621,790,741 | 23,751,988 | 435,290,112 | 102,913,751 | 1,114,616,616 | 113,217,331 | 206,036,612 | 2,617,617,151 | 189,597 |
| | 99n | 3,882,000 | 32,667 | 5,534,648 | 21,781,897 | 17,730,075 | 2,397,843 | 3,686,694 | 55,045,824 | 5,733 |
| * Methiocarb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|---|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 94-74-6 | *,** Methoxone | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 1,261 | 0 | 0 | 0 | 1,261 | 1,810 | 3,071 |
| | | 98o | 6 | 1,255 | 0 | 0 | 250 | 1,505 | 3,749 | 5,254 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 780 | 0 | 0 | 250 | 1,030 | 2,887 | 3,917 |
| | | 99n | 2 | 2 | 0 | 0 | 0 | 2 | 314 | 316 |
| 72-43-5 | * Methoxychlor | 88 | 12 | 131,031 | 252 | 0 | 258 | 131,541 | 8 | 131,549 |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 4 | 12 | 0 | 0 | 25,474 | 25,486 | 0 | 25,486 |
| | | 99o | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 3 | 29 | 0 | 0 | 0 | 29 | 14 | 43 |
| 109-86-4 | * 2-Methoxyethanol | 88 | 95 | 5,899,669 | 40,520 | 750 | 7 | 5,940,946 | 57,362 | 5,998,308 |
| | | 95 | 48 | 898,128 | 12,407 | 0 | 5 | 910,540 | 536 | 911,076 |
| | | 98o | 52 | 1,019,820 | 16,882 | 0 | 400 | 1,037,102 | 84 | 1,037,186 |
| | | 98n | 14 | 329 | 0 | 51,963 | 0 | 52,292 | 884 | 53,176 |
| | | 99o | 41 | 972,375 | 20,648 | 0 | 17,098 | 1,010,121 | 16,545 | 1,026,666 |
| | | 99n | 14 | 121 | 1 | 0 | 56,000 | 56,122 | 889 | 57,011 |
| 96-33-3 | Methyl acrylate | 88 | 61 | 443,496 | 1,687 | 200 | 30,260 | 475,643 | 4,765 | 480,408 |
| | | 95 | 71 | 335,178 | 5,962 | 159 | 0 | 341,299 | 865 | 342,164 |
| | | 98o | 64 | 246,310 | 761 | 53,244 | 0 | 300,315 | 50,575 | 350,890 |
| | | 98n | 8 | 24,273 | 0 | 0 | 14,000 | 38,273 | 3,680 | 41,953 |
| | | 99o | 63 | 303,175 | 624 | 51,742 | 267 | 355,808 | 28,796 | 384,604 |
| | | 99n | 4 | 2,216 | 0 | 0 | 0 | 2,216 | 498,922 | 501,138 |
| 1634-04-4 | Methyl tert-butyl ether | 88 | 90 | 2,588,247 | 21,499 | 14,400 | 370 | 2,624,516 | 4,602 | 2,629,118 |
| | | 95 | 184 | 3,300,759 | 78,555 | 15,238 | 3,800 | 3,398,352 | 47,841 | 3,446,193 |
| | | 98o | 207 | 2,624,981 | 60,650 | 47,357 | 325 | 2,733,313 | 216,391 | 2,949,704 |
| | | 98n | 328 | 1,554,325 | 7,161 | 250 | 2,884 | 1,564,620 | 46,503 | 1,611,123 |
| | | 99o | 188 | 2,469,175 | 118,824 | 20,477 | 5,586 | 2,614,062 | 235,645 | 2,849,707 |
| | | 99n | 298 | 1,243,847 | 2,286 | 0 | 1,020 | 1,247,153 | 22,627 | 1,269,780 |
| 79-22-1 | Methyl chlorocarbonate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 2,895 | 5 | 0 | 5 | 2,905 | 0 | 2,905 |
| | | 98o | 4 | 2,352 | 5 | 0 | 5 | 2,362 | 0 | 2,362 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 4 | 3,203 | 5 | 0 | 5 | 3,213 | 0 | 3,213 |
| | | 99n | 3 | 31 | 1 | 0 | 0 | 32 | 162 | 194 |
| 101-14-4 | **, 4,4'-Methylenebis (2-chloroaniline) | 88 | 8 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 95 | 23 | 260 | 0 | 0 | 0 | 260 | 5 | 265 |
| | | 98o | 23 | 20 | 0 | 0 | 0 | 20 | 0 | 20 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 17 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | 3 | 30 | 1 | 0 | 8,189 | 8,220 | 4,419 | 12,639 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *** Methoxone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 19,510 | 0 | 0 | 0 | 58 | 27 | 3,144 | 22,739 | 0 |
| | 98o | 6,670 | 0 | 0 | 0 | 0 | 1,301 | 5,417 | 13,388 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 1,092 | 0 | 0 | 0 | 0 | 723 | 4,226 | 6,041 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 110,530 | 0 | 97 | 110,627 | 0 |
| * Methoxychlor | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 30,194 | 0 | 25,486 | 55,680 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 206,422 | 0 | 43 | 206,465 | 0 |
| * 2-Methoxyethanol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,925,200 | 74,000 | 240,658 | 1,885,948 | 3,357,857 | 1,228,013 | 904,103 | 11,615,779 | 728 |
| | 98o | 279,700 | 151,007 | 742,247 | 1,760,218 | 3,343,057 | 466,416 | 1,093,500 | 7,836,145 | 403 |
| | 98n | 137 | 0 | 0 | 1,275,726 | 150,702 | 0 | 53,249 | 1,479,814 | 1 |
| | 99o | 710,480 | 200,000 | 1,236,963 | 507,350 | 3,591,280 | 466,905 | 1,019,215 | 7,732,193 | 0 |
| | 99n | 573 | 0 | 0 | 34,972 | 254,416 | 0 | 57,116 | 347,077 | 0 |
| Methyl acrylate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 910,001 | 40,769 | 736,924 | 249,260 | 2,132,688 | 51,535 | 346,087 | 4,467,264 | 249 |
| | 98o | 1,067,301 | 0 | 702,681 | 458,653 | 3,323,941 | 75,468 | 422,545 | 6,050,589 | 3 |
| | 98n | 0 | 0 | 0 | 291,314 | 88,974 | 163 | 18,343 | 398,794 | 25,189 |
| | 99o | 942,001 | 140 | 545,151 | 648,816 | 2,397,322 | 232,417 | 380,856 | 5,146,703 | 2 |
| | 99n | 0 | 0 | 0 | 6,441 | 43,108 | 38 | 2,201 | 51,788 | 498,922 |
| Methyl tert-butyl ether | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 847,069 | 32,815 | 228,033 | 1,360,313 | 3,020,968 | 522,838 | 3,430,405 | 9,442,441 | 117,520 |
| | 98o | 2,207,480 | 170,245 | 1,798,255 | 3,330,091 | 6,337,891 | 1,233,832 | 2,984,663 | 18,062,457 | 1,771 |
| | 98n | 2,462,506 | 1,800,430 | 0 | 188,044 | 2,628,152 | 193,278 | 3,422,976 | 10,695,386 | 32,739 |
| | 99o | 2,998,495 | 682 | 2,063,051 | 3,391,282 | 17,686,628 | 1,081,736 | 2,580,818 | 29,802,692 | 297,865 |
| | 99n | 5,250,530 | 135,600 | 5,519 | 1,091,655 | 3,183,495 | 208,396 | 1,242,529 | 11,117,724 | 5,594 |
| Methyl chloro-carbonate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3,610 | 0 | 2,897 | 6,507 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 51,910 | 0 | 3,030 | 54,940 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 39,801 | 0 | 3,023 | 42,824 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 173,861 | 0 | 190 | 174,051 | 0 |
| ** 4,4'-Methylenebis (2-chloroaniline) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 720 | 0 | 0 | 1,872 | 36 | 10,345 | 37 | 13,010 | 0 |
| | 98o | 0 | 0 | 0 | 4,169 | 0 | 9,787 | 10 | 13,966 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 2,997 | 0 | 9,305 | 6 | 12,308 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 133,212 | 0 | 12,635 | 145,847 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|-------------|---|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 101-61-1 ** | 4,4'-Methylenebis (N,N-dimethyl) benzeneamine | 88 | 1 | 250 | 0 | 0 | 7,000 | 7,250 | 1,150 | 8,400 |
| | | 95 | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 74-95-3 | Methylene bromide | 88 | 9 | 57,723 | 0 | 0 | 0 | 57,723 | 0 | 57,723 |
| | | 95 | 5 | 63,091 | 0 | 0 | 0 | 63,091 | 0 | 63,091 |
| | | 98o | 5 | 46,153 | 0 | 0 | 0 | 46,153 | 0 | 46,153 |
| | | 98n | 3 | 160 | 0 | 0 | 0 | 160 | 0 | 160 |
| | | 99o | 3 | 12,352 | 0 | 0 | 0 | 12,352 | 29 | 12,381 |
| | | 99n | 1 | 15 | 1 | 0 | 0 | 16 | 7 | 23 |
| 101-77-9 ** | 4,4'-Methylenedianiline | 88 | 31 | 130,265 | 2,599 | 460,250 | 1,140 | 594,254 | 141,538 | 735,792 |
| | | 95 | 25 | 10,337 | 63 | 23,110 | 0 | 33,510 | 9,423 | 42,933 |
| | | 98o | 25 | 9,073 | 5,041 | 51,200 | 0 | 65,314 | 6,867 | 72,181 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 23 | 9,199 | 4,248 | 33,000 | 8 | 46,455 | 31,768 | 78,223 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78-93-3 * | Methyl ethyl ketone | 88 | 2,534 | 141,566,241 | 92,216 | 255,955 | 166,688 | 142,081,100 | 5,014,726 | 147,095,826 |
| | | 95 | 2,322 | 70,270,116 | 65,782 | 581,632 | 172,000 | 71,089,530 | 260,891 | 71,350,421 |
| | | 98o | 1,906 | 46,487,938 | 54,732 | 343,418 | 116,504 | 47,002,592 | 844,925 | 47,847,517 |
| | | 98n | 290 | 220,956 | 7 | 52,251 | 130 | 273,344 | 215,904 | 489,248 |
| | | 99o | 1,738 | 38,218,669 | 34,304 | 426,252 | 81,521 | 38,760,746 | 745,597 | 39,506,343 |
| | | 99n | 276 | 190,677 | 15 | 65,858 | 168,607 | 425,157 | 648,957 | 1,074,114 |
| 60-34-4 | Methyl hydrazine | 88 | 3 | 2,927 | 1 | 0 | 0 | 2,928 | 1,450 | 4,378 |
| | | 95 | 3 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 98o | 3 | 265 | 0 | 0 | 0 | 265 | 0 | 265 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 401 | 0 | 0 | 0 | 401 | 0 | 401 |
| | | 99n | 2 | 6 | 0 | 0 | 0 | 6 | 195 | 201 |
| 74-88-4 | Methyl iodide | 88 | 3 | 8,944 | 5 | 250 | 0 | 9,199 | 250 | 9,449 |
| | | 95 | 6 | 21,618 | 0 | 10,000 | 0 | 31,618 | 8,600 | 40,218 |
| | | 98o | 10 | 65,167 | 45 | 131 | 1,357 | 66,700 | 329 | 67,029 |
| | | 98n | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 10 | 67,682 | 7 | 24 | 742 | 68,455 | 0 | 68,455 |
| | | 99n | 3 | 215 | 1 | 0 | 17,745 | 17,961 | 9,575 | 27,536 |
| 108-10-1 * | Methyl isobutyl ketone | 88 | 1,011 | 32,035,833 | 762,108 | 116,650 | 31,770 | 32,946,361 | 1,966,488 | 34,912,849 |
| | | 95 | 1,025 | 21,962,743 | 51,292 | 158,600 | 7,041 | 22,179,676 | 86,438 | 22,266,114 |
| | | 98o | 834 | 14,933,309 | 17,655 | 75,950 | 13,846 | 15,040,760 | 166,344 | 15,207,104 |
| | | 98n | 208 | 33,691 | 0 | 250 | 45 | 33,986 | 37,568 | 71,554 |
| | | 99o | 783 | 14,233,870 | 19,591 | 79,800 | 21,724 | 14,354,985 | 170,604 | 14,525,589 |
| | | 99n | 208 | 32,070 | 1 | 0 | 26,815 | 58,886 | 66,631 | 125,517 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** 4,4'-Methylenebis (N,N-dimethyl) benzeneamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| Methylene bromide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 677,059 | 0 | 0 | 0 | 51,903 | 979 | 62,284 | 792,225 | 0 |
| | 98o | 1,500,000 | 0 | 0 | 0 | 0 | 0 | 46,135 | 1,546,135 | 0 |
| | 98n | 0 | 0 | 0 | 64,300 | 354,774 | 0 | 160 | 419,234 | 1 |
| | 99o | 40 | 0 | 0 | 0 | 0 | 0 | 12,348 | 12,388 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 37,000 | 0 | 19 | 37,019 | 0 |
| ** 4,4'-Methylenedianiline | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,300 | 0 | 17,801 | 17,405 | 87,919 | 94,872 | 35,337 | 255,634 | 10 |
| | 98o | 2,830 | 0 | 311,271 | 11,793 | 407,691 | 56,581 | 66,591 | 856,757 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 11,263 | 0 | 0 | 11,263 | 0 |
| | 99o | 6,205 | 0 | 45,995 | 4,157 | 263,766 | 99,971 | 48,589 | 468,683 | 8 |
| | 99n | 0 | 0 | 0 | 0 | 12,386 | 0 | 0 | 12,386 | 0 |
| * Methyl ethyl ketone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 67,669,904 | 21,215,191 | 112,592,049 | 43,763,276 | 71,390,260 | 6,395,059 | 70,181,202 | 393,206,941 | 229,659 |
| | 98o | 56,938,489 | 19,736,392 | 80,609,200 | 33,340,694 | 80,552,807 | 7,723,606 | 48,458,539 | 327,359,727 | 169,435 |
| | 98n | 16,578,184 | 1,888,930 | 119,057 | 41,297,790 | 5,164,871 | 5,030,850 | 323,283 | 70,402,965 | 12,267 |
| | 99o | 52,596,106 | 16,568,581 | 96,034,050 | 32,174,014 | 85,279,339 | 9,174,989 | 39,418,158 | 331,245,237 | 436,890 |
| | 99n | 17,623,465 | 6,917 | 140,361 | 32,590,870 | 7,267,122 | 6,720,764 | 481,209 | 64,830,708 | 39,430 |
| Methyl hydrazine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 20 | 5 | 400 | 425 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 6,508 | 192 | 370 | 7,070 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 3,405 | 5,967 | 506 | 9,878 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 127,742 | 0 | 201 | 127,943 | 0 |
| Methyl iodide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 140 | 0 | 19,376 | 760 | 40,187 | 60,463 | 59 |
| | 98o | 0 | 0 | 0 | 0 | 184,842 | 31,143 | 66,328 | 282,313 | 421 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 4,300 | 0 | 24,001 | 358 | 68,906 | 97,565 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 118,249 | 0 | 27,535 | 145,784 | 0 |
| * Methyl isobutyl ketone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 52,705,598 | 16,396,008 | 27,176,665 | 18,129,738 | 17,804,641 | 1,902,661 | 22,220,141 | 156,335,452 | 50,004 |
| | 98o | 58,935,157 | 10,827,382 | 28,641,669 | 10,705,754 | 14,320,793 | 2,734,198 | 15,213,236 | 141,378,189 | 166,714 |
| | 98n | 5,155,390 | 110,732 | 21,764 | 15,671,143 | 1,875,406 | 1,569,508 | 51,396 | 24,455,339 | 1,756 |
| | 99o | 45,929,749 | 11,479,787 | 28,129,923 | 9,939,821 | 14,297,402 | 1,985,317 | 14,591,319 | 126,353,318 | 333,768 |
| | 99n | 5,833,896 | 144,852 | 16,000 | 15,461,505 | 3,538,063 | 2,403,011 | 88,173 | 27,485,500 | 5,146 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|-------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | |
| 624-83-9 | Methyl isocyanate | 88 | 12 | 10,235 | 0 | 0 | 64 | 10,299 | 18,699 |
| | | 95 | 5 | 1,658 | 0 | 0 | 0 | 1,658 | 1,658 |
| | | 98o | 5 | 507 | 0 | 0 | 5 | 512 | 512 |
| | | 98n | No reports | | | | | | |
| | | 99o | 3 | 438 | 0 | 0 | 1 | 439 | 439 |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 157 |
| 556-61-6 | * Methyl isothiocyanate | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 1,586 | 0 | 0 | 0 | 1,586 | 1,586 |
| | | 98o | 3 | 1,359 | 0 | 0 | 0 | 1,359 | 1,359 |
| | | 98n | No reports | | | | | | |
| | | 99o | 3 | 1,091 | 0 | 0 | 0 | 1,091 | 1,091 |
| | | 99n | No reports | | | | | | |
| 75-86-5 | 2-Methylacetonitrile | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 3,852 | 0 | 0 | 0 | 3,852 | 3,852 |
| | | 98o | 7 | 3,973 | 0 | 56,698 | 0 | 60,671 | 60,671 |
| | | 98n | 2 | 10 | 0 | 24,000 | 0 | 24,010 | 24,157 |
| | | 99o | 6 | 3,772 | 0 | 55,487 | 0 | 59,259 | 59,259 |
| | | 99n | 3 | 3 | 0 | 15,000 | 0 | 15,003 | 15,172 |
| 80-62-6 | Methyl methacrylate | 88 | 218 | 3,630,569 | 28,437 | 327,220 | 8,119 | 3,994,345 | 4,270,912 |
| | | 95 | 267 | 2,113,207 | 1,672 | 120,000 | 1,056 | 2,235,935 | 2,360,802 |
| | | 98o | 283 | 2,233,520 | 437,470 | 150,000 | 1,872 | 2,822,862 | 3,155,801 |
| | | 98n | 14 | 11,821 | 0 | 17,206 | 9,700 | 38,727 | 40,145 |
| | | 99o | 290 | 4,360,784 | 3,343 | 62,000 | 7,904 | 4,434,031 | 4,942,296 |
| | | 99n | 19 | 6,086 | 1 | 0 | 43,660 | 49,747 | 74,331 |
| 924-42-5 | N-Methylolacrylamide | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 29 | 2,835 | 1,171 | 0 | 38 | 4,044 | 4,057 |
| | | 98o | 36 | 5,473 | 1,245 | 0 | 45 | 6,763 | 31,750 |
| | | 98n | No reports | | | | | | |
| | | 99o | 35 | 6,178 | 1,259 | 0 | 53 | 7,490 | 11,138 |
| | | 99n | No reports | | | | | | |
| 298-00-0 | * Methyl parathion | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 1,442 | 0 | 0 | 0 | 1,442 | 4,126 |
| | | 98o | 5 | 189 | 0 | 0 | 0 | 189 | 189 |
| | | 98n | No reports | | | | | | |
| | | 99o | 5 | 15 | 0 | 0 | 0 | 15 | 15 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 109-06-8 | 2-Methylpyridine | 88 | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 8 | 89,938 | 0 | 61,720 | 0 | 151,658 | 151,698 |
| | | 98o | 7 | 2,934 | 0 | 38,900 | 0 | 41,834 | 42,647 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 7 | 16,802 | 0 | 50,100 | 0 | 66,902 | 66,908 |
| | | 99n | 3 | 13 | 1 | 0 | 0 | 14 | 272 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Methyl isocyanate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 66,939 | 0 | 1,658 | 68,597 | 0 |
| | 98o | 0 | 0 | 0 | 3,450 | 90,771 | 0 | 497 | 94,718 | 5 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 6,393 | 32 | 2,310 | 8,735 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 111,931 | 0 | 157 | 112,088 | 0 |
| * Methyl isothiocyanate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 62 | 0 | 82 | 1,586 | 1,730 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 120 | 1,359 | 1,479 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 48 | 0 | 72 | 1,091 | 1,211 | 0 |
| | 99n | No reports | | | | | | | | |
| 2-Methylacetonitrile | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 24,052 | 0 | 3,853 | 27,905 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 9,268 | 0 | 61,231 | 70,499 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 6 | 24,010 | 24,016 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 9,280 | 5 | 59,252 | 68,537 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 98,944 | 3 | 15,105 | 114,052 | 0 |
| Methyl methacrylate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,665,497 | 20,746 | 2,049,934 | 1,396,720 | 5,135,771 | 697,747 | 2,258,315 | 16,224,730 | 3,255 |
| | 98o | 1,483,426 | 58,753 | 2,254,439 | 1,793,672 | 4,004,435 | 578,962 | 3,175,808 | 13,349,495 | 8,256 |
| | 98n | 63,000 | 0 | 0 | 942,771 | 962,274 | 9,146 | 34,953 | 2,012,144 | 2 |
| | 99o | 1,766,009 | 47,419 | 1,979,196 | 2,109,271 | 5,487,258 | 786,030 | 3,340,095 | 15,515,278 | 17,410 |
| | 99n | 76,679 | 0 | 0 | 225,772 | 703,641 | 3,836 | 73,830 | 1,083,758 | 2 |
| N-Methylolacrylamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 360 | 0 | 0 | 294 | 14,277 | 4,373 | 3,096 | 22,400 | 4 |
| | 98o | 0 | 113 | 0 | 0 | 12,400 | 7,425 | 31,759 | 51,697 | 99 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 120 | 0 | 0 | 12,607 | 8,373 | 11,151 | 32,251 | 1 |
| | 99n | No reports | | | | | | | | |
| * Methyl parathion | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 29 | 0 | 0 | 0 | 0 | 0 | 3,664 | 3,693 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 47,000 | 8,531 | 55,531 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 23,992 | 6,501 | 30,493 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 21,609 | 0 | 0 | 21,609 | 0 |
| 2-Methylpyridine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 57,000 | 19,000 | 470 | 37,000 | 98,212 | 150,962 | 362,644 | 930 |
| | 98o | 0 | 140,000 | 42,139 | 12 | 3 | 330 | 42,674 | 225,158 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 170,000 | 34,963 | 5,110 | 40,610 | 1,475 | 66,951 | 319,109 | 1,000 |
| | 99n | 0 | 0 | 0 | 0 | 267,046 | 0 | 267 | 267,313 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|--|------|--------------------|-------------------------------|------------------------------------|---------------------------------|----------------------------|----------------------------------|--|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 872-50-4 | N-Methyl-2-pyrrolidone | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 277 | 2,719,267 | 201,221 | 779,477 | 135,050 | 3,835,015 | 367,111 | 4,202,126 |
| | | 98o | 400 | 3,009,700 | 42,961 | 2,865,692 | 99,411 | 6,017,764 | 494,760 | 6,512,524 |
| | | 98n | 79 | 19,299 | 0 | 0 | 0 | 19,299 | 3,165 | 22,464 |
| | | 99o | 400 | 3,324,415 | 35,538 | 2,945,457 | 96,877 | 6,402,287 | 518,208 | 6,920,495 |
| | | 99n | 83 | 18,640 | 0 | 0 | 43,322 | 61,962 | 88,106 | 150,068 |
| 21087-64-9 * | Metribuzin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 1,936 | 9 | 0 | 0 | 1,945 | 0 | 1,945 |
| | | 98o | 8 | 339 | 26 | 0 | 0 | 365 | 255 | 620 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 9 | 397 | 68 | 0 | 1 | 466 | 250 | 716 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7786-34-7 * | Mevinphos | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 90-94-8 ** | Michler's ketone | 88 | 4 | 1,100 | 0 | 0 | 0 | 1,100 | 0 | 1,100 |
| | | 95 | 1 | 1,577 | 0 | 0 | 0 | 1,577 | 0 | 1,577 |
| | | 98o | 1 | 511 | 0 | 0 | 0 | 511 | 0 | 511 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 869 | 0 | 0 | 0 | 869 | 0 | 869 |
| | | 99n | No reports | | | | | | | |
| 2212-67-1 * | Molinate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 695 | 502 | 0 | 0 | 1,197 | 6,363 | 7,560 |
| | | 98o | 3 | 1,063 | 113 | 0 | 0 | 1,176 | 8,305 | 9,481 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 1,698 | 116 | 0 | 0 | 1,814 | 7,997 | 9,811 |
| | | 99n | 1 | 2 | 0 | 0 | 0 | 2 | 60 | 62 |
| 1313-27-5 | Molybdenum trioxide | 88 | 102 | 111,195 | 139,021 | 197,115 | 97,238 | 544,569 | 573,624 | 1,118,193 |
| | | 95 | 162 | 179,060 | 27,305 | 333,730 | 77,604 | 617,699 | 1,029,058 | 1,646,757 |
| | | 98o | 169 | 198,560 | 36,018 | 302,000 | 48,888 | 585,466 | 579,619 | 1,165,085 |
| | | 98n | 20 | 22,062 | 312 | 5 | 899,506 | 921,885 | 148,188 | 1,070,073 |
| | | 99o | 172 | 100,444 | 36,086 | 117,120 | 111,465 | 365,115 | 1,020,663 | 1,385,778 |
| | | 99n | 20 | 14,619 | 758 | 0 | 549,738 | 565,115 | 179,240 | 744,355 |
| 76-15-3 | Monochloropenta-fluoroethane (CFC-115) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 14 | 275,259 | 2,854 | 3 | 0 | 278,116 | 7 | 278,123 |
| | | 98o | 7 | 76,256 | 5 | 0 | 0 | 76,261 | 0 | 76,261 |
| | | 98n | 1 | 6,852 | 0 | 0 | 0 | 6,852 | 0 | 6,852 |
| | | 99o | 5 | 65,485 | 5 | 0 | 0 | 65,490 | 0 | 65,490 |
| | | 99n | 1 | 11,129 | 0 | 0 | 0 | 11,129 | 0 | 11,129 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| N-Methyl-2-pyrrolidone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,477,378 | 6,548,234 | 182,638 | 2,482,544 | 5,116,412 | 3,415,140 | 4,463,576 | 23,685,922 | 994 |
| | 98o | 404,233 | 7,402,797 | 2,802,735 | 3,563,334 | 5,279,633 | 3,758,376 | 6,627,271 | 29,838,379 | 4,499 |
| | 98n | 8,842,325 | 6 | 391 | 2,519,825 | 874,778 | 336,833 | 22,223 | 12,596,381 | 3 |
| | 99o | 674,557 | 6,525,196 | 5,737,630 | 4,322,405 | 4,675,190 | 3,580,302 | 6,928,552 | 32,443,832 | 473 |
| | 99n | 6,486,530 | 970,518 | 1,850 | 3,876,145 | 940,859 | 1,335,324 | 63,131 | 13,674,357 | 12 |
| * Metribuzin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3,502 | 5,423 | 3,519 | 12,444 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 4,596 | 48,209 | 140 | 52,945 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 19,899 | 63,938 | 7,849 | 91,686 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 19,614 | 0 | 0 | 19,614 | 0 |
| * Mevinphos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Michler's ketone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 436 | 0 | 0 | 1,577 | 2,013 | 0 |
| | 98o | 0 | 0 | 0 | 305 | 14,098 | 0 | 511 | 14,914 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 290,000 | 309 | 11,720 | 86 | 632 | 302,747 | 0 |
| | 99n | No reports | | | | | | | | |
| * Molinate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 3,312 | 128,004 | 6,450 | 137,766 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 9,646 | 67,166 | 10,483 | 87,295 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 4,732 | 16,348 | 7,211 | 28,291 | 2,504 |
| | 99n | 0 | 0 | 0 | 0 | 11,125 | 0 | 62 | 11,187 | 0 |
| Molybdenum trioxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 6,201,074 | 2,454,463 | 0 | 3,530 | 51,382 | 346,576 | 1,614,949 | 10,671,974 | 21,640 |
| | 98o | 3,589,437 | 3,019,402 | 0 | 0 | 132,214 | 466,140 | 1,725,386 | 8,932,579 | 110 |
| | 98n | 0 | 0 | 0 | 0 | 42,786 | 0 | 1,557,562 | 1,600,348 | 5 |
| | 99o | 3,286,213 | 1,694,027 | 511 | 46,400 | 36,387 | 329,180 | 1,589,089 | 6,981,807 | 1,898 |
| | 99n | 0 | 0 | 0 | 0 | 63,467 | 0 | 779,849 | 843,316 | 3 |
| Monochloropenta-fluoroethane (CFC-115) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 8,600 | 2,200 | 0 | 0 | 257,501 | 24,651 | 278,151 | 571,103 | 2 |
| | 98o | 2,000 | 36,230 | 0 | 0 | 3,137 | 258 | 76,257 | 117,882 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 5,340 | 5,340 | 1,512 |
| | 99o | 0 | 34,344 | 0 | 0 | 4,683 | 0 | 28,190 | 67,217 | 37,300 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 11,129 | 11,129 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|---------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 88671-89-0 * | Myclobutanil | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 3 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 99n | No reports | | | | | | | |
| 142-59-6 * | Nabam | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 5 | 0 | 4,864 | 0 | 0 | 4,864 | 0 | 4,864 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 300-76-5 * | Naled | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 50 | 0 | 0 | 0 | 50 | 2,200 | 2,250 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 91-20-3 * | Naphthalene | 88 | 420 | 5,165,426 | 22,518 | 50,946 | 123,697 | 5,362,587 | 1,359,184 | 6,721,771 |
| | | 95 | 539 | 2,720,145 | 43,352 | 44,318 | 44,782 | 2,852,597 | 474,106 | 3,326,703 |
| | | 98o | 536 | 3,366,712 | 34,180 | 191,677 | 1,262,478 | 4,855,047 | 824,557 | 5,679,604 |
| | | 98n | 221 | 91,949 | 296 | 5 | 11,028 | 103,278 | 122,188 | 225,466 |
| | | 99o | 539 | 2,584,505 | 38,374 | 166,054 | 51,279 | 2,840,212 | 640,923 | 3,481,135 |
| | | 99n | 199 | 101,346 | 580 | 5 | 93,832 | 195,763 | 100,248 | 296,011 |
| 134-32-7 ** | alpha-Naphthylamine | 88 | 3 | 590 | 101 | 0 | 0 | 691 | 0 | 691 |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 164 | 172 |
| 91-59-8 | beta-Naphthylamine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 5 | 8 |
| 7440-02-0 ** | Nickel | 88 | 1,182 | 452,669 | 90,636 | 14,295 | 1,225,251 | 1,782,851 | 7,661,144 | 9,443,995 |
| | | 95 | 1,993 | 325,693 | 25,512 | 6,370 | 371,521 | 729,096 | 3,977,835 | 4,706,931 |
| | | 98o | 2,184 | 421,504 | 27,123 | 19,654 | 305,710 | 773,991 | 3,273,758 | 4,047,749 |
| | | 98n | 59 | 42,295 | 4,286 | 110,158 | 4,908,158 | 5,064,897 | 4,510,891 | 9,575,788 |
| | | 99o | 2,172 | 270,983 | 25,082 | 16,689 | 268,497 | 581,251 | 3,815,020 | 4,396,271 |
| | | 99n | 45 | 39,761 | 1,496 | 250 | 4,044,509 | 4,086,016 | 3,695,504 | 7,781,520 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Myclobutanol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 794 | 243 | 1,037 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 2,116 | 455 | 2,571 | 0 |
| | 99n | No reports | | | | | | | | |
| * Nabam | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 14,218 | 253 | 0 | 14,471 | 1 |
| | 98o | 0 | 0 | 192 | 0 | 7,352 | 0 | 4,864 | 12,408 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 99n | No reports | | | | | | | | |
| * Naled | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,000 | 2,600 | 0 | 3,600 | 9 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Naphthalene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 10,707,785 | 290,167 | 5,301,914 | 1,882,043 | 8,473,426 | 1,219,590 | 3,089,853 | 30,964,778 | 351,893 |
| | 98o | 5,092,370 | 474,960 | 6,774,298 | 1,682,298 | 4,683,384 | 1,010,148 | 4,790,729 | 24,508,187 | 81,897 |
| | 98n | 1,181,526 | 33,469 | 5,104 | 22,735,868 | 846,984 | 94,138 | 108,993 | 25,006,082 | 57,356 |
| | 99o | 14,439,008 | 528,949 | 71,190,742 | 2,364,095 | 6,298,339 | 671,103 | 3,519,377 | 99,011,613 | 31,400 |
| | 99n | 432,197 | 43,131 | 4,485 | 856,986 | 2,647,239 | 130,326 | 219,729 | 4,334,093 | 11,733 |
| ** alpha-Naphthylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 243,339 | 0 | 165 | 243,504 | 0 |
| beta-Naphthylamine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 118,000 | 0 | 3 | 118,003 | 0 |
| ** Nickel | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 38,218,815 | 80,925,603 | 127 | 767 | 1,537,254 | 1,016,815 | 3,426,329 | 125,125,710 | 19,229 |
| | 98o | 36,514,243 | 78,058,365 | 38,720 | 1,899 | 319,356 | 550,986 | 3,710,365 | 119,193,934 | 10,743 |
| | 98n | 18,430 | 122,923 | 0 | 0 | 20,200 | 3,187 | 10,096,021 | 10,260,761 | 5 |
| | 99o | 27,380,098 | 79,458,074 | 0 | 575 | 849,109 | 544,791 | 4,161,135 | 112,393,782 | 160,779 |
| | 99n | 16,954 | 169,110 | 0 | 0 | 72,021 | 4,325 | 8,092,504 | 8,354,914 | 4 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| — | ** Nickel compounds | 88 | 580 | 274,176 | 132,233 | 224,968 | 2,384,594 | 3,015,971 | 6,210,073 | 9,226,044 |
| | | 95 | 921 | 268,510 | 61,711 | 146,886 | 2,478,360 | 2,955,467 | 6,294,090 | 9,249,557 |
| | | 98o | 1,051 | 380,608 | 131,897 | 146,481 | 5,696,069 | 6,355,055 | 5,109,524 | 11,464,579 |
| | | 98n | 324 | 729,850 | 292,411 | 337,213 | 50,626,213 | 51,985,687 | 6,035,387 | 58,021,074 |
| | | 99o | 1,070 | 465,624 | 83,621 | 209,998 | 2,687,583 | 3,446,826 | 5,256,783 | 8,703,609 |
| | | 99n | 313 | 726,201 | 160,443 | 181,012 | 53,474,317 | 54,541,973 | 5,585,304 | 60,127,277 |
| — | Nicotine and salts | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 22 | 365,639 | 755 | 0 | 135 | 366,529 | 288,712 | 655,241 |
| | | 98o | 31 | 325,882 | 706 | 0 | 0 | 326,588 | 287,471 | 614,059 |
| | | 98n | 2 | 3 | 0 | 0 | 0 | 3 | 250 | 253 |
| | | 99o | 34 | 286,683 | 586 | 0 | 0 | 287,269 | 758,433 | 1,045,702 |
| | | 99n | 3 | 19 | 0 | 0 | 0 | 19 | 889 | 908 |
| 1929-82-4 | * Nitrapyrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 7 | 119,451 | 0 | 0 | 119,458 | 0 | 119,458 |
| | | 98o | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | No reports | | | | | | | |
| — | Nitrate compounds | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1,289 | 424,384 | 163,486,435 | 48,046,406 | 8,240,682 | 220,197,907 | 5,955,429 | 226,153,336 |
| | | 98o | 1,516 | 369,417 | 211,792,053 | 47,186,839 | 6,148,536 | 265,496,845 | 3,875,049 | 269,371,894 |
| | | 98n | 101 | 5,994 | 2,921,416 | 5,936,287 | 5,534,253 | 14,397,950 | 696,696 | 15,094,646 |
| | | 99o | 1,724 | 2,029,922 | 229,551,038 | 42,176,345 | 7,002,519 | 280,759,824 | 10,488,727 | 291,248,551 |
| | | 99n | 92 | 751 | 1,816,127 | 4,565,634 | 6,379,679 | 12,762,191 | 540,798 | 13,302,989 |
| 7697-37-2 | * Nitric acid | 88 | 1,921 | 8,277,993 | 1,380,565 | 25,485,680 | 580,695 | 35,724,933 | 7,929,318 | 43,654,251 |
| | | 95 | 1,845 | 2,595,864 | 46,586 | 18,755,717 | 293,009 | 21,691,176 | 4,348,694 | 26,039,870 |
| | | 98o | 1,839 | 2,384,260 | 47,650 | 18,869,510 | 228,430 | 21,529,850 | 922,139 | 22,451,989 |
| | | 98n | 149 | 369,560 | 13,005 | 5,300,750 | 63,544 | 5,746,859 | 212,902 | 5,959,761 |
| | | 99o | 1,789 | 2,240,309 | 60,181 | 16,482,141 | 347,611 | 19,130,242 | 7,982,894 | 27,113,136 |
| | | 99n | 141 | 594,480 | 0 | 6,328,468 | 60,018 | 6,982,966 | 207,213 | 7,190,179 |
| 139-13-9 | ** Nitritotriacetic acid | 88 | 14 | 2,500 | 5,100 | 0 | 5,100 | 12,700 | 250 | 12,950 |
| | | 95 | 7 | 1 | 34 | 2,900 | 0 | 2,935 | 0 | 2,935 |
| | | 98o | 14 | 1,407 | 10,202 | 2,400 | 0 | 14,009 | 0 | 14,009 |
| | | 98n | 1 | 0 | 0 | 0 | 11,617 | 11,617 | 0 | 11,617 |
| | | 99o | 12 | 600 | 6,320 | 1,600 | 0 | 8,520 | 0 | 8,520 |
| | | 99n | No reports | | | | | | | |
| 100-01-6 | p-Nitroaniline | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 11,205 | 2 | 0 | 0 | 11,207 | 0 | 11,207 |
| | | 98o | 4 | 12,053 | 0 | 0 | 0 | 12,053 | 0 | 12,053 |
| | | 98n | 1 | 5 | 0 | 0 | 0 | 5 | 500 | 505 |
| | | 99o | 4 | 11,950 | 0 | 0 | 0 | 11,950 | 0 | 11,950 |
| | | 99n | 1 | 27 | 0 | 0 | 7,644 | 7,671 | 4,119 | 11,790 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Nickel compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 14,059,034 | 36,140,048 | 0 | 2,120 | 5,609,537 | 1,144,655 | 7,853,299 | 64,808,693 | 332,672 |
| | 98o | 7,709,418 | 29,672,749 | 5,035 | 357 | 651,048 | 764,503 | 11,769,938 | 50,573,048 | 710,361 |
| | 98n | 255,905 | 1,054,608 | 0 | 1,330 | 197,447 | 110,741 | 58,014,875 | 59,634,906 | 4,759 |
| | 99o | 6,666,754 | 31,037,792 | 2,900 | 27,271 | 625,947 | 808,942 | 8,891,601 | 48,061,207 | 416,161 |
| | 99n | 982,507 | 1,274,770 | 0 | 0 | 35,156 | 99,979 | 54,840,209 | 57,232,621 | 5,230,053 |
| Nicotine and salts | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 34,602 | 0 | 0 | 275,790 | 297,376 | 652,796 | 1,260,564 | 0 |
| | 98o | 0 | 7,611 | 0 | 0 | 827,884 | 645,409 | 621,865 | 2,102,769 | 8,449 |
| | 98n | 0 | 0 | 0 | 0 | 148,971 | 0 | 54 | 149,025 | 0 |
| | 99o | 2,877 | 4,692 | 0 | 0 | 797,497 | 541,900 | 547,463 | 1,894,429 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 613,391 | 0 | 717 | 614,108 | 0 |
| * Nitrapyrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 7,100 | 0 | 380 | 128,628 | 136,108 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 140 | 1 | 141 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 140 | 1 | 141 | 0 |
| | 99n | No reports | | | | | | | | |
| Nitrate compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 95,092,956 | 2,841,878 | 0 | 0 | 52,526,430 | 103,042,941 | 246,388,238 | 499,892,443 | 110,098 |
| | 98o | 113,724,099 | 2,184,126 | 0 | 59,241 | 100,734,013 | 131,680,250 | 283,368,903 | 631,750,632 | 132,931 |
| | 98n | 3,653,825 | 8,473 | 0 | 0 | 2,780,478 | 1,019,036 | 16,384,222 | 23,846,034 | 876 |
| | 99o | 95,489,390 | 1,853,837 | 0 | 55,902 | 112,459,069 | 138,992,642 | 318,427,444 | 667,278,284 | 560,708 |
| | 99n | 2,904,592 | 17,342 | 0 | 0 | 3,482,309 | 1,467,961 | 13,711,593 | 21,583,797 | 1,278 |
| * Nitric acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 28,683,640 | 3,881,357 | 250,245 | 255 | 245,373,000 | 17,477,013 | 27,100,441 | 322,765,951 | 119,089 |
| | 98o | 49,798,305 | 3,817,017 | 0 | 148 | 303,790,960 | 17,725,571 | 22,347,015 | 397,479,016 | 27,600 |
| | 98n | 1,907 | 365 | 0 | 14,386 | 9,396,283 | 468,458 | 6,302,073 | 16,183,472 | 11 |
| | 99o | 48,883,250 | 2,808,384 | 14,434 | 0 | 335,720,018 | 15,145,057 | 27,257,843 | 429,828,986 | 4,672 |
| | 99n | 0 | 0 | 0 | 0 | 10,534,260 | 538,110 | 7,181,493 | 18,253,863 | 15 |
| ** Nitrilotriacetic acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,500 | 0 | 0 | 0 | 969,141 | 1,872 | 2,935 | 976,448 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 1,070,287 | 27,440 | 14,009 | 1,111,736 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 11,617 | 11,617 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 727,119 | 142 | 8,520 | 735,781 | 0 |
| | 99n | No reports | | | | | | | | |
| p-Nitroaniline | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 7 | 0 | 266 | 93,016 | 12,007 | 105,296 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 169,426 | 12,253 | 181,679 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 28,500 | 1 | 150 | 28,651 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 86,550 | 12,200 | 98,750 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 1,249 | 0 | 11,790 | 13,039 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 99-59-2 | 5-Nitro-o-anisidine | 88 | No reports | | | | | | | |
| | | 95 | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 1 | 10 | 5 | 0 | 0 | 15 | 0 | 15 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 10 | 5 | 0 | 0 | 15 | 0 | 15 |
| | | 99n | No reports | | | | | | | |
| 98-95-3 | *,** Nitrobenzene | 88 | 19 | 41,279 | 7,283 | 819,000 | 3,538 | 871,100 | 69,570 | 940,670 |
| | | 95 | 17 | 25,529 | 874 | 330,344 | 43 | 356,790 | 961 | 357,751 |
| | | 98o | 17 | 79,943 | 902 | 407,090 | 62 | 487,997 | 11,324 | 499,321 |
| | | 98n | 10 | 504 | 250 | 15,529 | 0 | 16,283 | 1,059 | 17,342 |
| | | 99o | 21 | 76,723 | 372 | 160,441 | 65 | 237,601 | 50,035 | 287,636 |
| | | 99n | 13 | 551 | 0 | 50,906 | 0 | 51,457 | 13,877 | 65,334 |
| 55-63-0 | Nitroglycerin | 88 | 22 | 52,383 | 2,746 | 0 | 11,640 | 66,769 | 2 | 66,771 |
| | | 95 | 20 | 26,087 | 13,300 | 0 | 0 | 39,387 | 0 | 39,387 |
| | | 98o | 22 | 52,414 | 4,713 | 0 | 0 | 57,127 | 266 | 57,393 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 26 | 15,507 | 1 | 0 | 0 | 15,508 | 1,014 | 16,522 |
| | | 99n | 4 | 3 | 0 | 0 | 0 | 3 | 111 | 114 |
| 88-75-5 | 2-Nitrophenol | 88 | 4 | 33,689 | 1 | 0 | 2 | 33,692 | 13,100 | 46,792 |
| | | 95 | 5 | 38 | 50 | 0 | 0 | 88 | 0 | 88 |
| | | 98o | 5 | 45 | 35 | 0 | 0 | 80 | 0 | 80 |
| | | 98n | 1 | 129 | 0 | 0 | 0 | 129 | 0 | 129 |
| | | 99o | 6 | 52 | 48 | 0 | 0 | 100 | 0 | 100 |
| | | 99n | No reports | | | | | | | |
| 100-02-7 | * 4-Nitrophenol | 88 | 7 | 7,855 | 0 | 6,300 | 7 | 14,162 | 70 | 14,232 |
| | | 95 | 6 | 945 | 0 | 0 | 0 | 945 | 0 | 945 |
| | | 98o | 5 | 855 | 0 | 0 | 0 | 855 | 0 | 855 |
| | | 98n | 3 | 35 | 0 | 0 | 0 | 35 | 500 | 535 |
| | | 99o | 6 | 867 | 0 | 0 | 0 | 867 | 0 | 867 |
| | | 99n | 4 | 201 | 1 | 0 | 21,924 | 22,126 | 4,272 | 26,398 |
| 79-46-9 | *,** 2-Nitropropane | 88 | 15 | 389,385 | 4,300 | 257,000 | 0 | 650,685 | 4,785 | 655,470 |
| | | 95 | 5 | 31,265 | 3,000 | 0 | 0 | 34,265 | 0 | 34,265 |
| | | 98o | 3 | 23,479 | 558 | 0 | 0 | 24,037 | 0 | 24,037 |
| | | 98n | 6 | 359 | 0 | 0 | 0 | 359 | 192 | 551 |
| | | 99o | 2 | 20,844 | 285 | 0 | 0 | 21,129 | 0 | 21,129 |
| | | 99n | 4 | 98 | 1 | 0 | 0 | 99 | 1,146 | 1,245 |
| 924-16-3 | N-Nitrosodi-n-butylamine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 4 | 7 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| 5-Nitro-o-anisidine | 88 | No reports | | | | | | | | |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 99n | No reports | | | | | | | | |
| *,** Nitrobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,277,200 | 0 | 1,554,583 | 79,781 | 1,297,305 | 639,061 | 354,552 | 5,202,482 | 649 |
| | 98o | 419,863 | 0 | 1,847,505 | 590,234 | 1,743,632 | 1,056,242 | 497,174 | 6,154,650 | 7,024 |
| | 98n | 0 | 0 | 0 | 663,888 | 778,054 | 0 | 16,670 | 1,458,612 | 1 |
| | 99o | 13,245,570 | 1 | 1,773,033 | 1,431,993 | 3,005,001 | 2,334,493 | 327,531 | 22,117,622 | 9,089 |
| | 99n | 150,901 | 0 | 0 | 250,049 | 1,240,915 | 732 | 51,127 | 1,693,724 | 10 |
| Nitroglycerin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 24,151 | 0 | 0 | 0 | 428,538 | 59,598 | 39,389 | 551,676 | 6 |
| | 98o | 18,000 | 15,198 | 0 | 21,685 | 270,572 | 134,991 | 60,217 | 520,663 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 33,366 | 790 | 0 | 32,958 | 6,630,605 | 59,363 | 15,647 | 6,772,729 | 98 |
| | 99n | 0 | 0 | 0 | 0 | 88,569 | 0 | 114 | 88,683 | 0 |
| 2-Nitrophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 28,000 | 6 | 120,000 | 23,311 | 83 | 171,400 | 0 |
| | 98o | 0 | 0 | 82,000 | 0 | 61,000 | 24,000 | 85 | 167,085 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 352,946 | 0 | 129 | 353,075 | 0 |
| | 99o | 0 | 0 | 65,000 | 0 | 324,516 | 18,545 | 101 | 408,162 | 1 |
| | 99n | No reports | | | | | | | | |
| * 4-Nitrophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 10,469 | 3 | 65,000 | 574,800 | 950 | 651,222 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 139,944 | 633,083 | 860 | 773,887 | 0 |
| | 98n | 0 | 0 | 0 | 591,228 | 31,000 | 1 | 180 | 622,409 | 1 |
| | 99o | 0 | 0 | 10,300 | 0 | 200,296 | 526,451 | 850 | 737,897 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 84,842 | 380 | 26,389 | 111,611 | 0 |
| *,** 2-Nitropropane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 520 | 140,000 | 81 | 63,028 | 0 | 34,023 | 237,652 | 0 |
| | 98o | 0 | 0 | 9,835 | 23 | 10,598 | 31,114 | 24,037 | 75,607 | 1 |
| | 98n | 0 | 0 | 0 | 519,228 | 203,826 | 11,854 | 551 | 735,459 | 1 |
| | 99o | 0 | 0 | 90 | 0 | 5,411 | 65 | 21,099 | 26,665 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 888,259 | 0 | 1,246 | 889,505 | 0 |
| N-Nitrosodi-n-butylamine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 32,000 | 0 | 2 | 32,002 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On- site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|---------------------------|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 55-18-5 | N-Nitrosodiethylamine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 30 | 1 | 0 | 7,640 | 7,671 | 4,123 | 11,794 |
| 62-75-9 | ** N-Nitrosodimethylamine | 88 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 129 | 0 | 0 | 0 | 129 | 0 | 129 |
| | | 99o | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99n | No reports | | | | | | | |
| 86-30-6 | N-Nitrosodiphenylamine | 88 | 2 | 0 | 27 | 34,000 | 0 | 34,027 | 0 | 34,027 |
| | | 95 | 3 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98o | 4 | 12 | 0 | 0 | 0 | 12 | 0 | 12 |
| | | 98n | 1 | 63 | 0 | 0 | 0 | 63 | 0 | 63 |
| | | 99o | 5 | 16 | 0 | 0 | 0 | 16 | 0 | 16 |
| | | 99n | 1 | 17 | 0 | 0 | 0 | 17 | 0 | 17 |
| 156-10-5 | p-Nitrosodiphenylamine | 88 | 2 | 15 | 0 | 2,000 | 0 | 2,015 | 180 | 2,195 |
| | | 95 | 2 | 24 | 0 | 0 | 0 | 24 | 520 | 544 |
| | | 98o | 2 | 24 | 0 | 0 | 0 | 24 | 0 | 24 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 24 | 0 | 0 | 0 | 24 | 0 | 24 |
| | | 99n | No reports | | | | | | | |
| 621-64-7 | N-Nitrosodi-n-propylamine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 750 | 0 | 0 | 0 | 750 | 1,500 | 2,250 |
| | | 98n | 1 | 129 | 0 | 0 | 0 | 129 | 0 | 129 |
| | | 99o | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99n | No reports | | | | | | | |
| 759-73-9 | N-Nitroso-N-ethylurea | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 161 | 169 |
| 684-93-5 | N-Nitroso-N-methylurea | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 162 | 170 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| N-Nitrosodiethylamine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 23,708 | 0 | 2 | 23,710 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 54,242 | 0 | 11,791 | 66,033 | 0 |
| ** N-Nitrosodimethylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 352,946 | 0 | 129 | 353,075 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 3,978 | 40 | 1 | 4,019 | 1 |
| | 99n | No reports | | | | | | | | |
| N-Nitrosodiphenylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 30,815 | 340,005 | 10 | 370,830 | 0 |
| | 98o | 0 | 0 | 0 | 340,000 | 77,702 | 34,298 | 12 | 452,012 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 80,769 | 0 | 63 | 80,832 | 0 |
| | 99o | 0 | 0 | 0 | 410,000 | 66,647 | 35,279 | 11 | 511,937 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 348,042 | 0 | 17 | 348,059 | 0 |
| p-Nitrosodiphenylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 8,600 | 15,000 | 0 | 65 | 544 | 24,209 | 0 |
| | 98o | 0 | 0 | 9,300 | 16,500 | 0 | 0 | 24 | 25,824 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 10,000 | 18,000 | 0 | 0 | 24 | 28,024 | 0 |
| | 99n | No reports | | | | | | | | |
| N-Nitrosodi-n-propylamine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 25,000 | 1,500 | 25,000 | 0 | 600 | 52,100 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 352,946 | 0 | 129 | 353,075 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 3,605 | 36 | 1 | 3,642 | 1 |
| | 99n | No reports | | | | | | | | |
| N-Nitroso-N-ethylurea | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 161,322 | 0 | 164 | 161,486 | 0 |
| N-Nitroso-N-methylurea | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 162,480 | 0 | 165 | 162,645 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|----------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 4549-40-0 | N-Nitrosomethyl-vinylamine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 153 | 157 |
| 59-89-2 | N-Nitrosomorpholine | 88 | No reports | | | | | | | |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 100-75-4 | N-Nitrosopiperidine | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 38 | 1 | 0 | 9,557 | 9,596 | 5,159 | 14,755 |
| 99-55-8 | 5-Nitro-o-toluidine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 5 | 0 | 0 | 0 | 5 | 30 | 35 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 3 | 27 | 0 | 0 | 7,644 | 7,671 | 4,139 | 11,810 |
| 27314-13-2 * | Norflurazon | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 5 | 0 | 0 | 0 | 5 | 54,000 | 54,005 |
| | | 98o | 4 | 15 | 76 | 0 | 229 | 320 | 14,850 | 15,170 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 5 | 2 | 0 | 4 | 11 | 1,850 | 1,861 |
| | | 99n | No reports | | | | | | | |
| 19044-88-3 * | Oryzalin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 3 | 98 | 0 | 0 | 0 | 98 | 0 | 98 |
| | | 98n | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 4 | 48 | 0 | 0 | 0 | 48 | 0 | 48 |
| | | 99n | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| 20816-12-0 | Osmium tetroxide | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| N-Nitrosomethyl-vinylamine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 94,353 | 0 | 157 | 94,510 | 0 |
| N-Nitrosomorpholine | 88 | No reports | | | | | | | | |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| N-Nitrosopiperidine | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 73,025 | 0 | 14,753 | 87,778 | 0 |
| 5-Nitro-o-toluidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 71,394 | 0 | 11,808 | 83,202 | 0 |
| * Norflurazon | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,000 | 54,010 | 55,010 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 12,700 | 59,780 | 340 | 72,820 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 46,850 | 15 | 46,865 | 0 |
| | 99n | No reports | | | | | | | | |
| * Oryzalin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 40,000 | 2 | 40,002 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 3,500 | 42,000 | 93 | 45,593 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 19,472 | 0 | 5 | 19,477 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 46 | 67,000 | 48 | 67,094 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 19,472 | 0 | 0 | 19,472 | 0 |
| Osmium tetroxide | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 37,606 | 0 | 0 | 37,606 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|---------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 301-12-2 * | Oxydemeton methyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 19666-30-9 * | Oxydiazon | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 665 | 0 | 0 | 0 | 665 | 0 | 665 |
| | | 98o | 5 | 1,160 | 0 | 0 | 0 | 1,160 | 750 | 1,910 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 6 | 770 | 0 | 0 | 0 | 770 | 2,207 | 2,977 |
| | | 99n | No reports | | | | | | | |
| 42874-03-3 * | Oxyfluorfen | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 87 | 3 | 0 | 0 | 90 | 0 | 90 |
| | | 98o | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 1,305 | 0 | 0 | 0 | 1,305 | 0 | 1,305 |
| | | 99n | 1 | 0 | 0 | 0 | 17,690 | 17,690 | 0 | 17,690 |
| 10028-15-6 | Ozone | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 29 | 571,182 | 0 | 0 | 0 | 571,182 | 0 | 571,182 |
| | | 98o | 36 | 655,550 | 0 | 0 | 0 | 655,550 | 0 | 655,550 |
| | | 98n | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 99o | 36 | 609,468 | 0 | 0 | 5 | 609,473 | 0 | 609,473 |
| | | 99n | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 123-63-7 | Paraldehyde | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 33 | 0 | 0 | 0 | 33 | 0 | 33 |
| | | 98o | 3 | 26 | 0 | 0 | 0 | 26 | 0 | 26 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 3 | 31 | 71 | 0 | 0 | 102 | 0 | 102 |
| | | 99n | 3 | 23 | 1 | 0 | 0 | 24 | 268 | 292 |
| 1910-42-5 * | Paraquat dichloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 1,000 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| | | 98o | 3 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 56-38-2 * | Parathion | 88 | 13 | 3,265 | 750 | 0 | 250 | 4,265 | 3,959 | 8,224 |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 85 | 85 |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 2 | 0 | 0 | 0 | 0 | 0 | 28 | 28 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Oxydemeton methyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Oxydiazon | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,012 | 0 | 0 | 0 | 2,400 | 100 | 611 | 6,123 | 0 |
| | 98o | 28,500 | 0 | 0 | 0 | 960 | 287 | 900 | 30,647 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 31,000 | 0 | 0 | 0 | 1,000 | 4,092 | 4,641 | 40,733 | 0 |
| | 99n | No reports | | | | | | | | |
| * Oxyfluorfen | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 130 | 15,093 | 90 | 15,313 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 2,800 | 2,900 | 1 | 5,701 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 1,300 | 15,599 | 2 | 16,901 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 17,690 | 17,690 | 0 |
| Ozone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 2,402,564 | 0 | 569,989 | 2,972,553 | 2 |
| | 98o | 0 | 0 | 0 | 0 | 2,940,204 | 0 | 654,453 | 3,594,657 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 2,655,193 | 0 | 640,340 | 3,295,533 | 3 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Paraldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 47,460 | 11 | 250,000 | 0 | 33 | 297,504 | 1 |
| | 98o | 0 | 0 | 18,414 | 7 | 140,002 | 0 | 26 | 158,449 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 43,482 | 0 | 110,445 | 8 | 102 | 154,037 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 299,520 | 0 | 289 | 299,809 | 0 |
| * Paraquat dichloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 68 | 0 | 0 | 0 | 0 | 170 | 206 | 444 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 6 | 112 | 118 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 |
| | 99n | No reports | | | | | | | | |
| * Parathion | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 32,638 | 0 | 85 | 32,723 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 69,806 | 0 | 28 | 69,834 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries) (continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases Transfers Off-site to Disposal Pounds | Total On- and Off-site Releases Pounds |
|--------------|---------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | | |
| 1114-71-2 * | Pebulate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 507 | 122 | 0 | 0 | 629 | 811 | 1,440 |
| | | 98o | 2 | 520 | 98 | 0 | 0 | 618 | 1,501 | 2,119 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 500 | 0 | 0 | 0 | 500 | 500 | 1,000 |
| | | 99n | No reports | | | | | | | |
| 40487-42-1 * | Pendimethalin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 1,250 | 250 | 0 | 500 | 2,000 | 0 | 2,000 |
| | | 98o | 6 | 3,000 | 15 | 0 | 5 | 3,020 | 560 | 3,580 |
| | | 98n | 3 | 3 | 0 | 0 | 0 | 3 | 123 | 126 |
| | | 99o | 9 | 2,465 | 40 | 0 | 5 | 2,510 | 5,651 | 8,161 |
| | | 99n | 2 | 3 | 0 | 0 | 0 | 3 | 111 | 114 |
| 76-01-7 * | Pentachloroethane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 1,534 | 22 | 0 | 0 | 1,556 | 0 | 1,556 |
| | | 98o | 7 | 1,550 | 0 | 0 | 0 | 1,550 | 0 | 1,550 |
| | | 98n | 3 | 60 | 0 | 0 | 0 | 60 | 0 | 60 |
| | | 99o | 7 | 785 | 1 | 0 | 0 | 786 | 2 | 788 |
| | | 99n | 3 | 23 | 1 | 0 | 0 | 24 | 242 | 266 |
| 87-86-5 **,* | Pentachlorophenol | 88 | 55 | 14,029 | 2,465 | 20,000 | 3,717 | 40,211 | 518,105 | 558,316 |
| | | 95 | 37 | 6,256 | 2,896 | 0 | 250 | 9,402 | 23,942 | 33,344 |
| | | 98o | 35 | 4,343 | 1,057 | 0 | 250 | 5,650 | 23,118 | 28,768 |
| | | 98n | 9 | 287 | 250 | 250 | 240,000 | 240,787 | 1,940 | 242,727 |
| | | 99o | 33 | 1,279 | 1,276 | 0 | 250 | 2,805 | 1,918 | 4,723 |
| | | 99n | 14 | 27 | 1 | 5 | 98,587 | 98,620 | 463 | 99,083 |
| 57-33-0 | Pentobarbital sodium | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 79-21-0 * | Peracetic acid | 88 | 8 | 5,453 | 55 | 0 | 0 | 5,508 | 0 | 5,508 |
| | | 95 | 24 | 7,847 | 15 | 0 | 1,144 | 9,006 | 0 | 9,006 |
| | | 98o | 27 | 8,330 | 5 | 0 | 1,150 | 9,485 | 0 | 9,485 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 28 | 13,557 | 755 | 0 | 1,095 | 15,407 | 0 | 15,407 |
| | | 99n | No reports | | | | | | | |
| 594-42-3 * | Perchloromethyl-mercaptan | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 541 | 0 | 0 | 0 | 541 | 0 | 541 |
| | | 98o | 3 | 894 | 0 | 0 | 0 | 894 | 0 | 894 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 899 | 0 | 0 | 0 | 899 | 0 | 899 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Pebutate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 600 | 4,600 | 270 | 5,470 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 89 | 2,809 | 1,523 | 4,421 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 680 | 680 | 0 |
| | 99n | No reports | | | | | | | | |
| * Pendimethalin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 300 | 0 | 0 | 0 | 190,000 | 6,774 | 1,498 | 198,572 | 56 |
| | 98o | 2,000 | 0 | 0 | 0 | 160,000 | 104,946 | 2,532 | 269,478 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 86,483 | 0 | 126 | 86,609 | 0 |
| | 99o | 6,000 | 0 | 0 | 0 | 150,000 | 64,385 | 4,555 | 224,940 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 32,171 | 0 | 115 | 32,286 | 0 |
| * Pentachloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 220,000 | 0 | 5,972,374 | 75,431 | 1,552 | 6,269,357 | 0 |
| | 98o | 620,000 | 0 | 0 | 0 | 5,007,683 | 107,405 | 1,551 | 5,736,639 | 0 |
| | 98n | 0 | 0 | 0 | 134,821 | 47,064 | 0 | 60 | 181,945 | 1 |
| | 99o | 670,000 | 16,407 | 0 | 0 | 5,699,574 | 43,357 | 627 | 6,429,965 | 168 |
| | 99n | 0 | 0 | 0 | 0 | 149,751 | 0 | 353 | 150,104 | 0 |
| *,** Pentachlorophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,888,603 | 334 | 9,151 | 14,606 | 6,780 | 87,462 | 25,551 | 2,032,487 | 9 |
| | 98o | 76,838 | 227,808 | 1,680 | 4,416 | 4,790 | 127,928 | 25,948 | 469,408 | 5,815 |
| | 98n | 0 | 0 | 1,002 | 0 | 105,151 | 5 | 242,089 | 348,247 | 0 |
| | 99o | 148,940 | 4,773 | 39,000 | 2,907 | 7,766 | 154,388 | 16,096 | 373,870 | 1,762 |
| | 99n | 0 | 0 | 2,837 | 21 | 321,684 | 674 | 97,586 | 422,802 | 2,000 |
| Pentobarbital sodium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| * Peracetic acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 13,833 | 0 | 0 | 0 | 12,884 | 12,396 | 8,889 | 48,002 | 3 |
| | 98o | 0 | 0 | 0 | 0 | 47,536 | 17,732 | 9,971 | 75,239 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 20,329 | 5,860 | 27,481 | 53,670 | 0 |
| | 99n | No reports | | | | | | | | |
| * Perchloromethyl mercaptan | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 540 | 0 | 541 | 1,081 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 120,000 | 15 | 891 | 120,906 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 112,000 | 8 | 898 | 112,906 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A—Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 52645-53-1 * | Permethrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 13 | 1,299 | 37 | 0 | 250 | 1,586 | 751 | 2,337 |
| | | 98o | 18 | 4,435 | 7 | 0 | 0 | 4,442 | 17,549 | 21,991 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 19 | 2,593 | 0 | 0 | 0 | 2,593 | 1,004 | 3,597 |
| | | 99n | 3 | 0 | 0 | 0 | 31,000 | 31,000 | 9 | 31,009 |
| 85-01-8 | Phenanthrene | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 36 | 72,633 | 19 | 0 | 4,008 | 76,660 | 74,560 | 151,220 |
| | | 98o | 64 | 238,895 | 214 | 0 | 77,577 | 316,686 | 80,258 | 396,944 |
| | | 98n | 10 | 26,006 | 0 | 0 | 0 | 26,006 | 606 | 26,612 |
| | | 99o | 73 | 253,888 | 172 | 0 | 15,800 | 269,860 | 107,667 | 377,527 |
| | | 99n | 11 | 3,577 | 0 | 0 | 59,013 | 62,590 | 10,682 | 73,272 |
| 108-95-2 * | Phenol | 88 | 635 | 10,712,736 | 259,230 | 4,661,319 | 1,882,485 | 17,515,770 | 2,536,030 | 20,051,800 |
| | | 95 | 759 | 9,369,262 | 70,566 | 3,823,235 | 174,581 | 13,437,644 | 1,327,795 | 14,765,439 |
| | | 98o | 779 | 8,978,452 | 60,884 | 1,648,446 | 436,649 | 11,124,431 | 1,228,494 | 12,352,925 |
| | | 98n | 32 | 1,627 | 1,277 | 432,901 | 67,000 | 502,805 | 6,204 | 509,009 |
| | | 99o | 749 | 7,413,944 | 46,003 | 1,575,395 | 1,419,125 | 10,454,467 | 1,269,972 | 11,724,439 |
| | | 99n | 29 | 12,716 | 1 | 267,782 | 19,587 | 300,086 | 7,891 | 307,977 |
| 26002-80-2 * | Phenothrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 95-54-5 | 1,2-Phenylenediamine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 8 | 977 | 41,100 | 0 | 2,176 | 44,253 | 31 | 44,284 |
| | | 98o | 7 | 528 | 51 | 0 | 0 | 579 | 1,631 | 2,210 |
| | | 98n | 1 | 37 | 0 | 0 | 0 | 37 | 10 | 47 |
| | | 99o | 7 | 518 | 30 | 0 | 4,033 | 4,581 | 7 | 4,588 |
| | | 99n | No reports | | | | | | | |
| 108-45-2 | 1,3-Phenylenediamine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 20 | 6,621 | 43,343 | 0 | 63,153 | 113,117 | 80 | 113,197 |
| | | 98o | 23 | 8,938 | 727 | 0 | 18,668 | 28,333 | 20,559 | 48,892 |
| | | 98n | 2 | 37 | 0 | 0 | 0 | 37 | 10 | 47 |
| | | 99o | 19 | 2,358 | 237 | 0 | 31,534 | 34,129 | 37 | 34,166 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 106-50-3 | p-Phenylenediamine | 88 | 13 | 113,890 | 826 | 4,716 | 0 | 119,432 | 64,452 | 183,884 |
| | | 95 | 10 | 4,440 | 856 | 0 | 653 | 5,949 | 0 | 5,949 |
| | | 98o | 12 | 1,517 | 114 | 0 | 0 | 1,631 | 1,816 | 3,447 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 11 | 1,781 | 184 | 0 | 1,100 | 3,065 | 2,978 | 6,043 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Permethrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 5 | 651 | 665 | 543 | 1,864 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 277 | 22,529 | 5,379 | 28,185 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 10,538 | 0 | 0 | 10,538 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 215 | 17,999 | 4,383 | 22,597 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 26,033 | 0 | 31,235 | 57,268 | 0 |
| Phenanthrene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 162,334 | 1,190 | 35,001 | 197,478 | 1,123,105 | 2,410 | 153,880 | 1,675,398 | 42,530 |
| | 98o | 326,966 | 98,267 | 53,336 | 165,155 | 526,904 | 170,536 | 341,494 | 1,682,658 | 7,313 |
| | 98n | 0 | 0 | 0 | 32,000 | 234,397 | 0 | 27,212 | 293,609 | 2 |
| | 99o | 1,082,986 | 83,544 | 340,620 | 216,420 | 43,339 | 112,080 | 391,635 | 2,270,624 | 12 |
| | 99n | 0 | 0 | 0 | 33,800 | 347,738 | 0 | 73,753 | 455,291 | 1 |
| * Phenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 41,534,425 | 556,968 | 28,742,254 | 3,686,272 | 34,989,078 | 6,364,238 | 14,554,069 | 130,427,304 | 72,199 |
| | 98o | 42,421,572 | 133,242 | 32,544,506 | 4,372,598 | 26,229,489 | 5,249,876 | 11,948,022 | 122,899,305 | 49,213 |
| | 98n | 0 | 0 | 0 | 4,914,898 | 4,715,602 | 1,557 | 571,501 | 10,203,558 | 9 |
| | 99o | 41,857,920 | 593,038 | 29,778,402 | 3,610,043 | 28,108,118 | 6,294,228 | 10,454,395 | 120,696,144 | 7,064 |
| | 99n | 6,895 | 0 | 627 | 405,878 | 2,240,850 | 8,768 | 306,349 | 2,969,367 | 10 |
| * Phenothrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| 1,2-Phenylenediamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 504,896 | 7,316 | 44,052 | 556,264 | 320 |
| | 98o | 0 | 0 | 0 | 0 | 176,437 | 50,690 | 2,208 | 229,335 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 37 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 178,620 | 47,156 | 4,588 | 230,364 | 0 |
| | 99n | No reports | | | | | | | | |
| 1,3-Phenylenediamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 493 | 676,332 | 134,187 | 112,936 | 923,948 | 1 |
| | 98o | 650 | 114,558 | 20 | 2,300 | 674,477 | 1,734,329 | 46,449 | 2,572,783 | 1,520 |
| | 98n | 0 | 0 | 0 | 0 | 12,604 | 0 | 37 | 12,641 | 0 |
| | 99o | 760 | 0 | 0 | 2,901 | 256,562 | 1,730,750 | 35,231 | 2,026,204 | 2 |
| | 99n | 0 | 0 | 0 | 0 | 19,738 | 0 | 0 | 19,738 | 0 |
| p-Phenylenediamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 364,868 | 20,082 | 5,757 | 390,707 | 1 |
| | 98o | 0 | 0 | 0 | 111 | 337,520 | 66,661 | 3,045 | 407,337 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 8 | 413,800 | 104,497 | 4,093 | 522,398 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|--------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 90-43-7 | * 2-Phenylphenol | 88 | 15 | 10,630 | 480 | 0 | 0 | 11,110 | 250 | 11,360 |
| | | 95 | 17 | 27,063 | 10 | 0 | 5 | 27,078 | 5,656 | 32,734 |
| | | 98o | 14 | 23 | 20 | 0 | 250 | 293 | 1,363 | 1,656 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 19 | 14 | 10 | 0 | 253 | 277 | 1,755 | 2,032 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57-41-0 | ** Phenytoin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 19,300 | 19,300 |
| | | 98o | 1 | 1 | 0 | 0 | 0 | 1 | 7,510 | 7,511 |
| | | 98n | 1 | 3 | 0 | 0 | 0 | 3 | 143 | 146 |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 9,400 | 9,401 |
| | | 99n | No reports | | | | | | | |
| 75-44-5 | Phosgene | 88 | 37 | 21,603 | 500 | 250 | 0 | 22,353 | 480 | 22,833 |
| | | 95 | 29 | 15,894 | 0 | 5 | 0 | 15,899 | 0 | 15,899 |
| | | 98o | 34 | 20,247 | 0 | 0 | 3 | 20,250 | 0 | 20,250 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 31 | 16,604 | 0 | 0 | 0 | 16,604 | 0 | 16,604 |
| | | 99n | 2 | 3 | 0 | 0 | 0 | 3 | 93 | 96 |
| 7803-51-2 | * Phosphine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 1,491 | 0 | 0 | 0 | 1,491 | 0 | 1,491 |
| | | 98o | 5 | 38,368 | 0 | 0 | 0 | 38,368 | 0 | 38,368 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 54,385 | 0 | 0 | 0 | 54,385 | 0 | 54,385 |
| | | 99n | 2 | 3 | 0 | 0 | 0 | 3 | 92 | 95 |
| 7723-14-0 | * Phosphorus (yellow or white) | 88 | 73 | 20,608 | 11,322 | 0 | 3,893,674 | 3,925,604 | 195,013 | 4,120,617 |
| | | 95 | 53 | 28,621 | 3,661 | 0 | 1,871,801 | 1,904,083 | 23,650 | 1,927,733 |
| | | 98o | 52 | 23,590 | 3,761 | 0 | 2,273,118 | 2,300,469 | 7,637 | 2,308,106 |
| | | 98n | 3 | 14 | 0 | 0 | 0 | 14 | 568 | 582 |
| | | 99o | 53 | 9,748 | 4,990 | 0 | 2,715,672 | 2,730,410 | 6,739 | 2,737,149 |
| | | 99n | 3 | 75,125 | 0 | 0 | 0 | 75,125 | 108 | 75,233 |
| 85-44-9 | Phthalic anhydride | 88 | 180 | 549,909 | 1,040 | 0 | 1,265 | 552,214 | 3,976,682 | 4,528,896 |
| | | 95 | 184 | 604,993 | 711 | 0 | 674 | 606,378 | 76,916 | 683,294 |
| | | 98o | 162 | 303,603 | 193 | 0 | 0 | 303,796 | 3,827,768 | 4,131,564 |
| | | 98n | 6 | 21 | 0 | 31,039 | 0 | 31,060 | 386 | 31,446 |
| | | 99o | 152 | 276,527 | 67 | 0 | 300 | 276,894 | 2,954,374 | 3,231,268 |
| | | 99n | 7 | 538 | 1 | 0 | 7,640 | 8,179 | 6,099 | 14,278 |
| 1918-02-1 | * Picloram | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 220 | 1 | 0 | 0 | 221 | 0 | 221 |
| | | 98o | 2 | 460 | 380,006 | 0 | 0 | 380,466 | 0 | 380,466 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 2,800 | 10 | 0 | 0 | 2,810 | 0 | 2,810 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998, and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * 2-Phenylphenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 530 | 0 | 1,027,544 | 2,104 | 32,551 | 1,062,729 | 1 |
| | 98o | 197 | 0 | 300 | 0 | 120,000 | 332 | 456 | 121,285 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 1 | 0 | 125,000 | 2,970 | 313 | 128,284 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ** Phenytoin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 19,000 | 19,000 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 140 | 15,000 | 7,500 | 22,640 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 20,629 | 0 | 146 | 20,775 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 152 | 17,500 | 9,400 | 27,052 | 0 |
| | 99n | No reports | | | | | | | | |
| Phosgene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 430,034 | 0 | 15,138,316 | 2,414 | 15,867 | 15,586,631 | 7 |
| | 98o | 3,173,304 | 0 | 0 | 330 | 7,417,424 | 735 | 20,288 | 10,612,081 | 43 |
| | 98n | No reports | | | | | | | | |
| | 99o | 10,150,418 | 0 | 0 | 0 | 11,339,630 | 543 | 16,440 | 21,507,031 | 34 |
| | 99n | 0 | 0 | 0 | 0 | 112,537 | 0 | 95 | 112,632 | 0 |
| * Phosphine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 2,491 | 2,491 | 10 |
| | 98o | 0 | 0 | 0 | 0 | 328,000 | 0 | 38,368 | 366,368 | 135 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 385,101 | 0 | 54,385 | 439,486 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 54,236 | 0 | 95 | 54,331 | 0 |
| * Phosphorus (yellow or white) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,091 | 26,089 | 0 | 0 | 5,052 | 147,342 | 1,929,173 | 2,108,747 | 1,080 |
| | 98o | 1 | 236,289 | 0 | 0 | 900,878 | 1,235 | 2,306,947 | 3,445,350 | 4,401 |
| | 98n | 0 | 0 | 0 | 0 | 80,274 | 0 | 576 | 80,850 | 0 |
| | 99o | 1 | 202,852 | 0 | 0 | 570,350 | 1,771 | 2,737,051 | 3,512,025 | 4 |
| | 99n | 75,121 | 0 | 0 | 0 | 19,836 | 0 | 112 | 95,069 | 1 |
| Phthalic anhydride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 421,574 | 1,317 | 2,420,922 | 4,951,573 | 18,689,501 | 446,526 | 670,336 | 27,601,749 | 26,167 |
| | 98o | 169,533 | 49,603 | 3,110,037 | 2,975,259 | 16,603,832 | 560,162 | 4,128,871 | 27,597,297 | 15,049 |
| | 98n | 0 | 0 | 0 | 13,502 | 177,000 | 0 | 31,446 | 221,948 | 1 |
| | 99o | 79,831 | 29,939 | 2,993,912 | 1,871,113 | 15,571,615 | 153,837 | 3,201,920 | 23,902,167 | 72,442 |
| | 99n | 0 | 0 | 0 | 33,034 | 322,550 | 492 | 12,199 | 368,275 | 5 |
| * Picloram | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 23,208 | 0 | 221 | 23,429 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 59,000 | 0 | 380,006 | 439,006 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 51,940 | 0 | 2,810 | 54,750 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|----------------|----------------------------------|------|--------------------|---------------------|--------------------------|-----------------------|------------------|------------------------|--------------------------------|---------------------------------|
| | | | | Total Air Emissions | Surface Water Discharges | Underground Injection | Releases to Land | Total On-site Releases | Transfers Off-site to Disposal | |
| | | | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| 88-89-1 | Picric acid | 88 | 5 | 252 | 251 | 1,362,180 | 250 | 1,362,933 | 0 | 1,362,933 |
| | | 95 | 9 | 221 | 0 | 49,256 | 0 | 49,477 | 0 | 49,477 |
| | | 98o | 8 | 0 | 1 | 63,950 | 0 | 63,951 | 0 | 63,951 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 8 | 0 | 1 | 129,398 | 0 | 129,399 | 0 | 129,399 |
| | | 99n | No reports | | | | | | | |
| 51-03-6 * | Piperonyl butoxide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 12 | 775 | 0 | 0 | 0 | 775 | 750 | 1,525 |
| | | 98o | 12 | 501 | 0 | 0 | 0 | 501 | 0 | 501 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 12 | 1,005 | 0 | 0 | 0 | 1,005 | 0 | 1,005 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29232-93-7 * | Pirimiphos methyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | No reports | | | | | | | |
| — | ** Polybrominated biphenyls | 88 | 1 | 250 | 0 | 0 | 0 | 250 | 0 | 250 |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| — | Polychlorinated alkanes | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 72 | 23,250 | 6,206 | 0 | 0 | 29,456 | 197,607 | 227,063 |
| | | 98o | 69 | 4,085 | 4,131 | 0 | 0 | 8,216 | 109,932 | 118,148 |
| | | 98n | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 66 | 5,788 | 4,805 | 0 | 0 | 10,593 | 110,943 | 121,536 |
| | | 99n | 3 | 0 | 0 | 0 | 16,065 | 16,065 | 8,713 | 24,778 |
| 1336-36-3 *,** | Polychlorinated biphenyls (PCBs) | 88 | 120 | 6 | 10 | 0 | 752 | 768 | 410,996 | 411,764 |
| | | 95 | 9 | 0 | 0 | 0 | 0 | 0 | 34,432 | 34,432 |
| | | 98o | 7 | 0 | 0 | 0 | 134,160 | 134,160 | 135 | 134,295 |
| | | 98n | 14 | 446 | 251 | 5 | 3,607,976 | 3,608,678 | 4,192 | 3,612,870 |
| | | 99o | 8 | 0 | 0 | 0 | 0 | 0 | 108 | 108 |
| | | 99n | 16 | 531 | 2 | 0 | 10,630,427 | 10,630,960 | 1,533 | 10,632,493 |
| — | ** Polycyclic aromatic compounds | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 158 | 433,980 | 4,995 | 0 | 39,551 | 478,526 | 1,226,135 | 1,704,661 |
| | | 98o | 186 | 1,478,696 | 1,987 | 0 | 169,011 | 1,649,694 | 1,750,357 | 3,400,051 |
| | | 98n | 78 | 1,377 | 21 | 0 | 115,530 | 116,928 | 3,206 | 120,134 |
| | | 99o | 192 | 1,338,751 | 1,720 | 0 | 16,958 | 1,357,429 | 2,071,022 | 3,428,451 |
| | | 99n | 84 | 41,139 | 43 | 0 | 186,055 | 227,237 | 6,931 | 234,168 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Picric acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 53,393 | 2 | 1,261,618 | 0 | 49,477 | 1,364,490 | 0 |
| | 98o | 0 | 0 | 129,412 | 12,941 | 1,627,444 | 0 | 63,951 | 1,833,748 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 582 | 0 | 1,582,234 | 0 | 129,399 | 1,712,215 | 1 |
| | 99n | No reports | | | | | | | | |
| * Piperonyl butoxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 5 | 0 | 16,290 | 1,099 | 17,394 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 3,412 | 426 | 3,838 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 3,432 | 595 | 4,027 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 21,382 | 0 | 0 | 21,382 | 0 |
| * Pirimiphos methyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Polybrominated biphenyls | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 2,720 | 0 | 0 | 0 | 0 | 0 | 2,720 | 0 |
| | 98o | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 1,000 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 448 | 0 | 0 | 0 | 0 | 0 | 448 | 0 |
| | 99n | No reports | | | | | | | | |
| Polychlorinated alkanes | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 229,803 | 208,674 | 0 | 137,632 | 335,520 | 489,977 | 242,014 | 1,643,620 | 7 |
| | 98o | 110,100 | 469,915 | 32,400 | 83,293 | 36,201 | 232,498 | 145,365 | 1,109,772 | 633 |
| | 98n | 0 | 0 | 0 | 0 | 11,325 | 846 | 0 | 12,171 | 0 |
| | 99o | 127,200 | 425,913 | 28,000 | 94,229 | 340 | 227,335 | 137,900 | 1,040,917 | 4 |
| | 99n | 0 | 0 | 0 | 0 | 29,848 | 0 | 24,823 | 54,671 | 0 |
| Polychlorinated biphenyls (PCBs) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 64,494 | 8,242 | 72,736 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 261,979 | 0 | 261,979 | 1 |
| | 98n | 0 | 140,018 | 0 | 0 | 8,446,718 | 428,113 | 3,626,637 | 12,641,486 | 2 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 644,531 | 0 | 644,531 | 111 |
| | 99n | 0 | 92,003 | 0 | 0 | 11,690,585 | 388,219 | 7,095,524 | 19,266,331 | 1 |
| ** Polycyclic aromatic compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,473,048 | 116,093 | 10,499,200 | 59,223 | 2,502,982 | 13,825 | 1,734,470 | 16,398,841 | 22,303 |
| | 98o | 1,900,617 | 246,834 | 3,835,404 | 259,788 | 4,695,159 | 37,484 | 3,292,953 | 14,268,239 | 43,947 |
| | 98n | 312 | 216 | 0 | 0 | 48,107,002 | 1,345 | 120,494 | 48,229,369 | 110 |
| | 99o | 3,440,747 | 218,251 | 4,126,035 | 80,493 | 3,953,604 | 63,552 | 3,564,705 | 15,447,387 | 131,636 |
| | 99n | 59 | 2,099 | 0 | 10 | 68,390,656 | 2,522 | 233,319 | 68,628,665 | 337 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|--------------------------------------|------|--------------------------|----------------------------------|--|------------------------------------|-------------------------------|---|--|---|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On- site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 7758-01-2 | ** Potassium bromate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 4 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99n | No reports | | | | | | | |
| 128-03-0 | * Potassium dimethyldithio-carbamate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 224 | 10,170 | 0 | 0 | 10,394 | 0 | 10,394 |
| | | 98o | 19 | 533 | 43,088 | 0 | 5 | 43,626 | 5 | 43,631 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 18 | 10,523 | 18,417 | 0 | 5 | 28,945 | 676 | 29,621 |
| | | 99n | No reports | | | | | | | |
| 137-41-7 | * Potassium N-methyldithiocarbamate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 35 | 0 | 0 | 0 | 35 | 0 | 35 |
| | | 98o | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 10 | 5,680 | 0 | 0 | 5,690 | 0 | 5,690 |
| | | 99n | No reports | | | | | | | |
| 41198-08-7 | * Profenofos | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | No reports | | | | | | | |
| 7287-19-6 | * Prometryn | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 6 | 1,481 | 159 | 0 | 0 | 1,640 | 890 | 2,530 |
| | | 98o | 5 | 725 | 8 | 0 | 0 | 733 | 1,047 | 1,780 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 502 | 4 | 0 | 0 | 506 | 0 | 506 |
| | | 99n | No reports | | | | | | | |
| 23950-58-5 | * Pronamide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98o | 2 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98n | 2 | 110 | 0 | 0 | 0 | 110 | 0 | 110 |
| | | 99o | 2 | 330 | 0 | 0 | 0 | 330 | 0 | 330 |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 16 | 19 |
| 1918-16-7 | * Propachlor | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 331 | 0 | 0 | 0 | 331 | 777 | 1,108 |
| | | 98o | 4 | 62 | 0 | 0 | 0 | 62 | 600 | 662 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 60 | 0 | 0 | 0 | 60 | 0 | 60 |
| | | 99n | 2 | 21 | 0 | 0 | 14,208 | 14,229 | 10 | 14,239 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



**Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Potassium bromate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 51,447 | 1 | 0 | 0 | 13 | 51,461 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 |
| | 99n | No reports | | | | | | | | |
| * Potassium dimethyldithio-carbamate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 19,317 | 161,362 | 10,394 | 191,073 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 23,596 | 120,325 | 54,888 | 198,809 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 40,169 | 72,363 | 45,669 | 158,201 | 1 |
| | 99n | No reports | | | | | | | | |
| * Potassium N-methyldithio-carbamate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 35 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 4,647 | 0 | 5,690 | 10,337 | 0 |
| | 99n | No reports | | | | | | | | |
| * Profenofos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 109 | 0 | 0 | 109 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 7,270 | 7,270 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 6,420 | 6,420 | 0 |
| | 99n | No reports | | | | | | | | |
| * Prometryn | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 1 | 1,314 | 7,603 | 4,028 | 12,946 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 30,035 | 38,455 | 789 | 69,279 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 51,018 | 6,238 | 4,342 | 61,598 | 0 |
| | 99n | No reports | | | | | | | | |
| * Pronamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,700 | 0 | 0 | 0 | 0 | 1,200 | 260 | 5,160 | 0 |
| | 98o | 5,500 | 0 | 0 | 0 | 0 | 2,095 | 290 | 7,885 | 0 |
| | 98n | 0 | 0 | 0 | 234,265 | 0 | 0 | 110 | 234,375 | 1 |
| | 99o | 14,000 | 0 | 0 | 0 | 0 | 2,393 | 1,613 | 18,006 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 33,000 | 0 | 15 | 33,015 | 0 |
| * Propachlor | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 7,270 | 1,237 | 8,507 | 14,000 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 91,800 | 662 | 92,462 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 85,700 | 660 | 86,360 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 77,027 | 0 | 14,224 | 91,251 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | Total On-site Releases Pounds | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|---------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | | Transfers Off-site to Disposal Pounds | |
| 1120-71-4 | ** Propane sultone | 88 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| 709-98-8 | * Propanil | 99n | 2 | 5 | 0 | 5 | 0 | 10 | 157 | 167 |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 4 | 2,357 | 250 | 0 | 0 | 2,607 | 3,723 | 6,330 |
| | | 98o | 5 | 2,505 | 750 | 0 | 0 | 3,255 | 11,250 | 14,505 |
| | | 98n | 1 | 2 | 0 | 0 | 0 | 2 | 270 | 272 |
| 2312-35-8 | * Propargite | 99o | 5 | 2,010 | 750 | 0 | 0 | 2,760 | 26,250 | 29,010 |
| | | 99n | No reports | | | | | | | |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 426 | 0 | 0 | 0 | 426 | 0 | 426 |
| | | 98o | 3 | 525 | 0 | 0 | 0 | 525 | 3,546 | 4,071 |
| 107-19-7 | * Propargyl alcohol | 98n | No reports | | | | | | | |
| | | 99o | 3 | 739 | 0 | 0 | 0 | 739 | 9,446 | 10,185 |
| | | 99n | No reports | | | | | | | |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 11 | 10,245 | 0 | 290,680 | 0 | 300,925 | 936 | 301,861 |
| 31218-83-4 | * Propetamphos | 98o | 14 | 15,675 | 0 | 418,223 | 7,620 | 441,518 | 253 | 441,771 |
| | | 98n | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 99o | 12 | 9,960 | 0 | 545,399 | 0 | 555,359 | 10,085 | 565,444 |
| | | 99n | 3 | 14 | 0 | 0 | 0 | 14 | 152 | 166 |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| 60207-90-1 | * Propiconazole | 95 | 1 | 500 | 0 | 0 | 0 | 500 | 750 | 1,250 |
| | | 98o | 1 | 10 | 0 | 0 | 0 | 10 | 250 | 260 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 10 | 0 | 0 | 0 | 10 | 250 | 260 |
| | | 99n | No reports | | | | | | | |
| 123-38-6 | * Propionaldehyde | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 5 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | No reports | | | | | | | |
| | | 88 | 15 | 1,267,839 | 1,156 | 930 | 0 | 1,269,925 | 0 | 1,269,925 |
| | | 95 | 24 | 263,349 | 27,012 | 101,432 | 0 | 391,793 | 0 | 391,793 |
| | | 98o | 26 | 311,153 | 6,017 | 92,183 | 78 | 409,431 | 14 | 409,445 |
| | | 98n | 3 | 192 | 0 | 0 | 0 | 192 | 0 | 192 |
| | | 99o | 24 | 426,111 | 2,604 | 97,144 | 0 | 525,859 | 331 | 526,190 |
| | | 99n | 3 | 11 | 0 | 15,576 | 0 | 15,587 | 0 | 15,587 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Propane sultone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 16 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 129,321 | 0 | 165 | 129,486 | 0 |
| * Propanil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 402 | 4,468 | 4,870 | 0 |
| | 98o | 200,000 | 0 | 0 | 0 | 0 | 86,745 | 12,552 | 299,297 | 50 |
| | 98n | 0 | 0 | 0 | 0 | 202,192 | 0 | 272 | 202,464 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 270,452 | 3,357 | 273,809 | 50 |
| | 99n | No reports | | | | | | | | |
| * Propargite | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 544 | 0 | 4,365 | 426 | 5,335 | 0 |
| | 98o | 0 | 0 | 0 | 2,216 | 0 | 76,189 | 3,896 | 82,301 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 4,164 | 255 | 13,305 | 564 | 18,288 | 0 |
| | 99n | No reports | | | | | | | | |
| * Propargyl alcohol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 198,867 | 344,704 | 56,027 | 78,003 | 301,422 | 979,023 | 0 |
| | 98o | 0 | 0 | 60,400 | 520,327 | 109,142 | 41,800 | 444,545 | 1,176,214 | 1 |
| | 98n | 0 | 0 | 0 | 909 | 13,178 | 1,000 | 2 | 15,089 | 0 |
| | 99o | 0 | 0 | 13,091 | 4 | 94,786 | 62,376 | 591,893 | 762,150 | 5 |
| | 99n | 0 | 0 | 0 | 0 | 137,838 | 0 | 159 | 137,997 | 0 |
| * Propetamphos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 1,067 | 1,067 | 1 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 482 | 482 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 490 | 490 | 0 |
| | 99n | No reports | | | | | | | | |
| * Propiconazole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,026 | 0 | 1,026 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 25,000 | 0 | 2,943 | 27,943 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 22,000 | 0 | 2,001 | 24,001 | 0 |
| | 99n | No reports | | | | | | | | |
| * Propionaldehyde | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 898,697 | 5,565 | 2,348,820 | 79,790 | 387,308 | 3,720,180 | 24 |
| | 98o | 0 | 0 | 2,021,614 | 4,648 | 5,082,153 | 46,283 | 411,365 | 7,566,063 | 402 |
| | 98n | 0 | 0 | 0 | 442,609 | 3 | 15 | 192 | 442,819 | 1 |
| | 99o | 440,000 | 0 | 2,311,283 | 6,236 | 3,030,972 | 34,933 | 518,997 | 6,342,421 | 1 |
| | 99n | 0 | 0 | 0 | 270 | 17 | 0 | 15,578 | 15,865 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|----------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 114-26-1 | * Propoxur | 88 | 5 | 250 | 0 | 0 | 0 | 250 | 250 | 500 |
| | | 95 | 5 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 1 | 11 | 0 | 0 | 0 | 11 | 10 | 21 |
| 115-07-1 | Propylene | 88 | 334 | 32,200,231 | 10,003 | 0 | 0 | 32,210,234 | 3,320 | 32,213,554 |
| | | 95 | 353 | 27,576,252 | 4,047 | 0 | 169 | 27,580,468 | 298 | 27,580,766 |
| | | 98o | 368 | 16,332,670 | 3,104 | 2,870 | 389 | 16,339,033 | 897 | 16,339,930 |
| | | 98n | 41 | 79,765 | 0 | 0 | 0 | 79,765 | 0 | 79,765 |
| | | 99o | 385 | 13,496,827 | 1,023 | 136,393 | 396 | 13,634,639 | 118 | 13,634,757 |
| | | 99n | 47 | 63,996 | 0 | 0 | 0 | 63,996 | 0 | 63,996 |
| 75-55-8 | ** Propyleneimine | 88 | 1 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 95 | 7 | 600 | 0 | 0 | 0 | 600 | 0 | 600 |
| | | 98o | 4 | 385 | 5 | 0 | 0 | 390 | 5 | 395 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 104 | 0 | 0 | 0 | 104 | 0 | 104 |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 153 | 157 |
| 75-56-9 | *,** Propylene oxide | 88 | 128 | 3,680,215 | 112,503 | 1,113,780 | 11,630 | 4,918,128 | 16,626 | 4,934,754 |
| | | 95 | 137 | 839,153 | 29,934 | 22,577 | 4,403 | 896,067 | 10,633 | 906,700 |
| | | 98o | 115 | 740,027 | 1,124 | 1,923 | 691 | 743,765 | 5,687 | 749,452 |
| | | 98n | 7 | 32 | 0 | 13,380 | 0 | 13,412 | 0 | 13,412 |
| | | 99o | 119 | 704,873 | 10,847 | 4,580 | 715 | 721,015 | 5,266 | 726,281 |
| | | 99n | 8 | 4 | 0 | 10,491 | 28,649 | 39,144 | 0 | 39,144 |
| 110-86-1 | * Pyridine | 88 | 31 | 251,799 | 2,158 | 491,775 | 1,125 | 746,857 | 40,699 | 787,556 |
| | | 95 | 42 | 100,190 | 830 | 532,497 | 4 | 633,521 | 433 | 633,954 |
| | | 98o | 50 | 70,262 | 1,056 | 593,199 | 0 | 664,517 | 13,854 | 678,371 |
| | | 98n | 16 | 697 | 0 | 5 | 0 | 702 | 2,292 | 2,994 |
| | | 99o | 52 | 68,647 | 1,074 | 953,995 | 0 | 1,023,716 | 378 | 1,024,094 |
| | | 99n | 14 | 899 | 1 | 0 | 0 | 900 | 52,862 | 53,762 |
| 91-22-5 | Quinoline | 88 | 34 | 49,350 | 502 | 0 | 896 | 50,748 | 6,242 | 56,990 |
| | | 95 | 23 | 11,412 | 20 | 13,000 | 405 | 24,837 | 3,744 | 28,581 |
| | | 98o | 21 | 15,415 | 32 | 29,350 | 265 | 45,062 | 2,553 | 47,615 |
| | | 98n | 1 | 1 | 0 | 0 | 0 | 1 | 73 | 74 |
| | | 99o | 19 | 11,813 | 26 | 25,205 | 7 | 37,051 | 21,715 | 58,766 |
| | | 99n | No reports | | | | | | | |
| 106-51-4 | * Quinone | 88 | 5 | 11,300 | 140 | 0 | 0 | 11,440 | 0 | 11,440 |
| | | 95 | 4 | 7,101 | 1,500 | 0 | 0 | 8,601 | 0 | 8,601 |
| | | 98o | 6 | 482 | 1,600 | 0 | 0 | 2,082 | 0 | 2,082 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 6 | 415 | 1,400 | 0 | 0 | 1,815 | 0 | 1,815 |
| | | 99n | 3 | 24 | 1 | 0 | 0 | 25 | 161 | 186 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Propoxur | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,081 | 4 | 1,085 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 435 | 0 | 435 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 56,411 | 0 | 11 | 56,422 | 0 |
| Propylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 6,713,304 | 0 | 463,253,246 | 3,132,285 | 254,254,014 | 80,239 | 26,886,689 | 754,319,777 | 1,008,723 |
| | 98o | 74,791,416 | 23,152 | 456,059,665 | 2,218 | 299,247,194 | 2,896,808 | 14,962,907 | 847,983,360 | 1,239,982 |
| | 98n | 0 | 0 | 0 | 0 | 14,440 | 0 | 79,097 | 93,537 | 13 |
| | 99o | 105,899,757 | 28 | 395,331,079 | 10,337,809 | 387,944,876 | 1,579,785 | 13,370,607 | 914,463,941 | 267,586 |
| | 99n | 0 | 0 | 0 | 0 | 33,620 | 0 | 63,403 | 97,023 | 6 |
| ** Propyleneimine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,433 | 0 | 600 | 2,033 | 3 |
| | 98o | 0 | 0 | 0 | 0 | 2,788 | 6 | 680 | 3,474 | 0 |
| | 98n | No reports | | 0 | 0 | 4,319 | 0 | 104 | 4,423 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 106,854 | 0 | 157 | 107,011 | 0 |
| | 99n | 0 | 0 | 0 | 0 | | | | | |
| *,** Propylene oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 3,091 | 0 | 17,981,778 | 282,917 | 14,410,159 | 192,373 | 1,138,346 | 34,008,664 | 20,210 |
| | 98o | 1,081,157 | 0 | 13,924,312 | 79,248 | 14,397,389 | 475,463 | 754,076 | 30,711,645 | 1,417 |
| | 98n | 0 | 0 | 0 | 18,634 | 40,509 | 0 | 13,412 | 72,555 | 0 |
| | 99o | 508,380 | 619 | 12,895,870 | 13,529 | 12,243,188 | 192,824 | 730,161 | 26,584,571 | 1,260 |
| | 99n | 0 | 0 | 0 | 5,232 | 58,302 | 7,414 | 39,184 | 110,132 | 0 |
| * Pyridine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 4,074,830 | 14,008 | 1,713,719 | 186,855 | 348,378 | 483,295 | 631,050 | 7,452,135 | 1,077 |
| | 98o | 616,015 | 0 | 1,756,718 | 470,128 | 765,210 | 720,123 | 689,534 | 5,017,728 | 1,112 |
| | 98n | 0 | 0 | 16,073 | 620,143 | 1,333,326 | 28,086 | 2,577 | 2,000,205 | 1 |
| | 99o | 637,004 | 8,071 | 984,135 | 450,440 | 681,114 | 451,088 | 1,021,864 | 4,233,716 | 1,001 |
| | 99n | 278,231 | 44 | 5,645 | 189,439 | 1,915,397 | 598,710 | 1,020 | 2,988,486 | 10 |
| Quinoline | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,750 | 2,243 | 302,003 | 22 | 222,705 | 16,120 | 27,181 | 572,024 | 253 |
| | 98o | 27,147 | 1,713 | 122,038 | 11,582 | 109,680 | 961 | 47,741 | 320,862 | 300 |
| | 98n | 0 | 0 | 0 | 0 | 10,461 | 0 | 74 | 10,535 | 0 |
| | 99o | 12,831 | 1,137 | 87,056 | 11,353 | 135,351 | 4,200 | 58,429 | 310,357 | 0 |
| | 99n | No reports | | | | | | | | |
| * Quinone | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 179,870 | 1,328 | 130,500 | 30,173 | 8,601 | 350,472 | 0 |
| | 98o | 0 | 0 | 1,400 | 17,747 | 567,300 | 10,917 | 2,101 | 599,465 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 340 | 162,544 | 116,001 | 135,984 | 1,805 | 416,674 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 176,005 | 0 | 182 | 176,187 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|---------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 82-68-8 * | Quintozene | 88 | 6 | 1,064 | 0 | 0 | 0 | 1,064 | 12,625 | 13,689 |
| | | 95 | 10 | 1,424 | 0 | 0 | 800 | 2,224 | 192 | 2,416 |
| | | 98o | 11 | 1,788 | 0 | 0 | 0 | 1,788 | 2 | 1,790 |
| | | 98n | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99o | 14 | 408 | 0 | 0 | 0 | 408 | 5,007 | 5,415 |
| | | 99n | 3 | 14 | 1 | 0 | 0 | 15 | 15 | 30 |
| 76578-14-8 * | Quizalofop-ethyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 6 | 0 | 0 | 0 | 6 | 0 | 6 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 10453-86-8 * | Resmethrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 22 | 0 | 0 | 0 | 22 | 0 | 22 |
| | | 99n | No reports | | | | | | | |
| 81-07-2 ** | Saccharin (manufacturing) | 88 | 4 | 750 | 0 | 0 | 0 | 750 | 750 | 1,500 |
| | | 95 | 1 | 99 | 0 | 0 | 0 | 99 | 1,500 | 1,599 |
| | | 98o | 2 | 160 | 0 | 0 | 0 | 160 | 940 | 1,100 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 63 | 0 | 0 | 0 | 63 | 940 | 1,003 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 94-59-7 *,** | Safrole | 88 | 2 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 95 | 1 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 98o | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 260 | 0 | 0 | 0 | 260 | 0 | 260 |
| | | 99n | 2 | 21 | 0 | 0 | 6,005 | 6,026 | 3,239 | 9,265 |
| 7782-49-2 * | Selenium | 88 | 24 | 16,282 | 1,168 | 0 | 127,508 | 144,958 | 4,367 | 149,325 |
| | | 95 | 15 | 1,450 | 92 | 0 | 23 | 1,565 | 3,501 | 5,066 |
| | | 98o | 15 | 34,028 | 58 | 0 | 2,010 | 36,096 | 15,800 | 51,896 |
| | | 98n | 11 | 807 | 0 | 17,937 | 254,259 | 273,003 | 185,901 | 458,904 |
| | | 99o | 16 | 69,012 | 285 | 0 | 3,113 | 72,410 | 11,509 | 83,919 |
| | | 99n | 9 | 790 | 0 | 0 | 264,804 | 265,594 | 531 | 266,125 |
| — | Selenium compounds | 88 | 18 | 14,506 | 250 | 3,400 | 45,750 | 63,906 | 63,226 | 127,132 |
| | | 95 | 40 | 61,960 | 2,184 | 3,640 | 264,759 | 332,543 | 124,185 | 456,728 |
| | | 98o | 52 | 74,716 | 3,373 | 38,030 | 360,694 | 476,813 | 75,214 | 552,027 |
| | | 98n | 80 | 527,771 | 32,727 | 8 | 4,809,151 | 5,369,657 | 371,330 | 5,740,987 |
| | | 99o | 50 | 82,408 | 4,106 | 33,509 | 305,342 | 425,365 | 94,026 | 519,391 |
| | | 99n | 73 | 508,214 | 40,960 | 0 | 5,647,927 | 6,197,101 | 558,772 | 6,755,873 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1A. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Quintozene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 863 | 0 | 0 | 0 | 0 | 759,587 | 2,251 | 762,701 | 110 |
| | 98o | 515 | 0 | 0 | 342,800 | 0 | 13,168 | 1,790 | 358,273 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 44,515 | 0 | 3 | 44,518 | 0 |
| | 99o | 2,371 | 0 | 0 | 214,728 | 0 | 8,126 | 451 | 225,676 | 30 |
| | 99n | 0 | 0 | 0 | 0 | 126,058 | 0 | 21 | 126,079 | 0 |
| * Quizalofop-ethyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Resmethrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 46 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Saccharin (manufacturing) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 9,700 | 10 | 1,600 | 11,310 | 74 |
| | 98o | 0 | 0 | 0 | 0 | 7,300 | 7 | 1,100 | 8,407 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 6,800 | 7 | 1,000 | 7,807 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 117,930 | 0 | 0 | 117,930 | 0 |
| *** Safrole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 6 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 10 | 30 | 40 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 10 | 110 | 120 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 61,981 | 0 | 9,263 | 71,244 | 0 |
| * Selenium | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,604 | 4,604 | 0 | 0 | 23 | 2,271 | 1,524 | 10,026 | 1 |
| | 98o | 0 | 0 | 86,174 | 3,902 | 156 | 920 | 45,019 | 136,171 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 185,504 | 273,341 | 458,845 | 0 |
| | 99o | 4 | 800 | 0 | 0 | 1,166 | 50 | 81,686 | 83,706 | 47 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 265,869 | 265,869 | 0 |
| Selenium compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 590,805 | 158,278 | 0 | 10 | 2 | 49,853 | 356,404 | 1,155,352 | 49,259 |
| | 98o | 595,899 | 68,632 | 0 | 0 | 2,040 | 9,743 | 511,927 | 1,188,241 | 76,445 |
| | 98n | 53,228 | 9 | 0 | 0 | 4 | 23 | 5,750,788 | 5,804,052 | 12 |
| | 99o | 574,215 | 22,862 | 0 | 0 | 2,410 | 10,343 | 408,122 | 1,017,952 | 109,657 |
| | 99n | 56,980 | 4 | 0 | 0 | 0 | 20 | 6,176,689 | 6,233,693 | 670,007 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|---------------------------------|------|--------------------|-------------------------------|------------------------------------|---------------------------------|----------------------------|----------------------------------|--|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 74051-80-2 * | Sethoxydim | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 2 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | No reports | | | | | | | |
| 7440-22-4 * | Silver | 88 | 72 | 47,988 | 1,654 | 0 | 39,510 | 89,152 | 8,482 | 97,634 |
| | | 95 | 76 | 9,552 | 166 | 0 | 255 | 9,973 | 17,676 | 27,649 |
| | | 98o | 83 | 11,418 | 171 | 2 | 2,026 | 13,617 | 69,049 | 82,666 |
| | | 98n | 14 | 60 | 0 | 15,380 | 400,306 | 415,746 | 35,826 | 451,572 |
| | | 99o | 82 | 11,063 | 96 | 0 | 2,660 | 13,819 | 80,794 | 94,613 |
| | | 99n | 12 | 894 | 0 | 17,000 | 220,096 | 237,990 | 257,060 | 495,050 |
| — | Silver compounds | 88 | 46 | 15,406 | 8,684 | 250 | 11,550 | 35,890 | 15,803 | 51,693 |
| | | 95 | 59 | 15,573 | 6,284 | 380 | 35,325 | 57,562 | 7,575 | 65,137 |
| | | 98o | 64 | 6,636 | 5,704 | 109 | 76,755 | 89,204 | 194,916 | 284,120 |
| | | 98n | 21 | 847 | 676 | 140,000 | 4,091,351 | 4,232,874 | 163,250 | 4,396,124 |
| | | 99o | 68 | 8,705 | 7,218 | 222 | 64,399 | 80,544 | 32,480 | 113,024 |
| | | 99n | 16 | 1,309 | 322 | 160,000 | 3,519,852 | 3,681,483 | 40,061 | 3,721,544 |
| 122-34-9 * | Simazine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 7 | 4,990 | 232 | 0 | 5 | 5,227 | 26,231 | 31,458 |
| | | 98o | 7 | 3,321 | 332 | 0 | 0 | 3,653 | 4,497 | 8,150 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 6 | 3,928 | 385 | 0 | 0 | 4,313 | 2,385 | 6,698 |
| | | 99n | No reports | | | | | | | |
| 26628-22-8 * | Sodium azide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 14 | 35,575 | 200 | 0 | 255 | 36,030 | 133,837 | 169,867 |
| | | 98o | 11 | 15,392 | 20 | 0 | 250 | 15,662 | 10,891 | 26,553 |
| | | 98n | 3 | 14 | 0 | 0 | 190,646 | 190,660 | 180 | 190,840 |
| | | 99o | 9 | 5,946 | 15 | 0 | 0 | 5,961 | 5,652 | 11,613 |
| | | 99n | 3 | 11 | 0 | 0 | 33,542 | 33,553 | 318 | 33,871 |
| 1982-69-0 * | Sodium dicamba | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 14,350 | 0 | 750 | 0 | 15,100 | 0 | 15,100 |
| | | 98o | 2 | 8,560 | 0 | 750 | 0 | 9,310 | 0 | 9,310 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 5,150 | 0 | 250 | 0 | 5,400 | 0 | 5,400 |
| | | 99n | No reports | | | | | | | |
| 128-04-1 * | Sodium dimethyldithio-carbamate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 63 | 2,746 | 20 | 0 | 0 | 2,766 | 152,357 | 155,123 |
| | | 98o | 83 | 22,024 | 4,868 | 0 | 13,367 | 40,259 | 306,193 | 346,452 |
| | | 98n | 10 | 7 | 0 | 0 | 482,268 | 482,275 | 12,564 | 494,839 |
| | | 99o | 74 | 13,211 | 4 | 0 | 51,994 | 65,209 | 276,157 | 341,366 |
| | | 99n | 8 | 487 | 0 | 0 | 433,202 | 433,689 | 33,498 | 467,187 |

Note: **On-site Releases** are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Sethoxydim | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 293 | 20 | 313 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 17,391 | 0 | 0 | 17,391 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 0 |
| | 99n | No reports | | | | | | | | |
| * Silver | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 563,590 | 1,266,487 | 0 | 1 | 87,462 | 531 | 20,608 | 1,938,679 | 619 |
| | 98o | 622,401 | 1,197,977 | 0 | 32 | 4,917 | 44,958 | 235,364 | 2,105,649 | 4 |
| | 98n | 400 | 0 | 0 | 0 | 0 | 17 | 415,721 | 416,138 | 1 |
| | 99o | 380,453 | 1,794,552 | 90,601 | 11 | 87 | 40,121 | 25,342 | 2,331,167 | 12 |
| | 99n | 0 | 124,430 | 0 | 0 | 0 | 143,364 | 237,610 | 505,404 | 10 |
| Silver compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 327,832 | 1,064,906 | 0 | 0 | 3,966,504 | 23,221 | 56,206 | 5,438,669 | 272 |
| | 98o | 236,220 | 1,053,421 | 0 | 0 | 52,854 | 2,248 | 444,517 | 1,789,260 | 5,418 |
| | 98n | 2,532 | 251 | 0 | 0 | 0 | 2,396 | 4,395,708 | 4,400,887 | 6 |
| | 99o | 3,855,024 | 1,201,930 | 0 | 0 | 2,090 | 1,470 | 287,351 | 5,347,865 | 9,972 |
| | 99n | 612 | 331 | 0 | 0 | 0 | 651 | 3,187,191 | 3,188,785 | 540,002 |
| * Simazine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 150,000 | 24,000 | 4,970 | 178,970 | 0 |
| | 98o | 50 | 0 | 0 | 0 | 68,000 | 1,500 | 6,294 | 75,844 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 50 | 0 | 0 | 0 | 77,000 | 8,251 | 14,154 | 99,455 | 0 |
| | 99n | No reports | | | | | | | | |
| * Sodium azide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 190,310 | 556,000 | 0 | 0 | 93,341 | 3,906,934 | 166,060 | 4,912,645 | 112 |
| | 98o | 34,600 | 439,942 | 0 | 0 | 11,732 | 609,400 | 26,186 | 1,121,860 | 5 |
| | 98n | 0 | 0 | 0 | 0 | 36,074 | 0 | 191,601 | 227,675 | 1 |
| | 99o | 15,800 | 148,200 | 0 | 0 | 12,180 | 297,891 | 11,616 | 485,687 | 3 |
| | 99n | 0 | 0 | 0 | 0 | 160,650 | 16 | 33,887 | 194,553 | 0 |
| * Sodium dicamba | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 800 | 15,200 | 16,000 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 414,800 | 46,680 | 9,546 | 471,026 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 248,383 | 0 | 5,400 | 253,783 | 0 |
| | 99n | No reports | | | | | | | | |
| * Sodium dimethyldithio-carbamate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 250 | 199,200 | 0 | 0 | 462,188 | 511,438 | 28,169 | 1,201,245 | 5,006 |
| | 98o | 250 | 183,221 | 192 | 0 | 741,898 | 663,564 | 280,326 | 1,869,451 | 3 |
| | 98n | 0 | 1 | 0 | 3 | 0 | 430 | 497,268 | 497,702 | 2 |
| | 99o | 250 | 196,401 | 0 | 0 | 780,422 | 576,882 | 153,080 | 1,707,035 | 5 |
| | 99n | 0 | 0 | 0 | 0 | 42,326 | 0 | 467,037 | 509,363 | 1 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

**Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)**

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|-------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 62-74-8 * | Sodium fluoroacetate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 2 | 4 | 0 | 0 | 0 | 4 | 153 | 157 |
| 7632-00-0 * | Sodium nitrite | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 356 | 291,951 | 1,384,082 | 1,004,363 | 81,948 | 2,762,344 | 291,378 | 3,053,722 |
| | | 98o | 412 | 137,796 | 1,009,077 | 841,400 | 538,533 | 2,526,806 | 474,212 | 3,001,018 |
| | | 98n | 24 | 1,016 | 500 | 27,801 | 14,910 | 44,227 | 78 | 44,305 |
| | | 99o | 418 | 155,107 | 1,556,633 | 807,410 | 260,917 | 2,780,067 | 404,423 | 3,184,490 |
| | | 99n | 17 | 811 | 36,579 | 0 | 12,010 | 49,400 | 0 | 49,400 |
| 132-27-4 ** | Sodium o-phenylphenoxide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| — | Strychnine and salts | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 5 | 0 | 0 | 0 | 5 | 171 | 176 |
| 100-42-5 ** | Styrene | 88 | 1,259 | 34,309,811 | 59,069 | 165 | 242,941 | 34,611,986 | 2,013,696 | 36,625,682 |
| | | 95 | 1,573 | 42,059,571 | 4,570 | 209,945 | 96,078 | 42,370,164 | 2,741,458 | 45,111,622 |
| | | 98o | 1,563 | 54,259,569 | 243,133 | 345,945 | 322,736 | 55,171,383 | 2,053,921 | 57,225,304 |
| | | 98n | 106 | 22,243 | 15 | 161,738 | 14,398 | 198,394 | 10,577 | 208,971 |
| | | 99o | 1,549 | 54,731,130 | 3,168 | 191,124 | 369,150 | 55,294,572 | 2,098,614 | 57,393,186 |
| | | 99n | 89 | 13,000 | 266 | 0 | 22,064 | 35,330 | 86,622 | 121,952 |
| 96-09-3 ** | Styrene oxide | 88 | 6 | 2,314 | 0 | 0 | 0 | 2,314 | 750 | 3,064 |
| | | 95 | 5 | 13 | 0 | 0 | 0 | 13 | 0 | 13 |
| | | 98o | 2 | 9 | 0 | 0 | 0 | 9 | 0 | 9 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 7 | 0 | 0 | 0 | 7 | 0 | 7 |
| | | 99n | No reports | | | | | | | |
| 7664-93-9 * | Sulfuric acid | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1,600 | 22,617,822 | 5,363 | 30,035 | 134,812 | 22,788,032 | 4,733,342 | 27,521,374 |
| | | 98o | 830 | 27,428,323 | 22,608 | 690,900 | 55,837 | 28,197,668 | 347,593 | 28,545,261 |
| | | 98n | 483 | 166,197,401 | 1 | 0 | 85,501 | 166,282,903 | 20,000 | 166,302,903 |
| | | 99o | 780 | 25,960,113 | 13,426 | 1,075,050 | 203,550 | 27,252,139 | 99,389 | 27,351,528 |
| | | 99n | 485 | 153,888,058 | 6 | 0 | 53,789 | 153,941,853 | 20,200 | 153,962,053 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Sodium fluoroacetate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 124,717 | 0 | 157 | 124,874 | 0 |
| * Sodium nitrite | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 374,426 | 4,657 | 0 | 0 | 17,461,874 | 5,813,965 | 3,946,119 | 27,601,041 | 280 |
| | 98o | 391,745 | 17,741 | 0 | 17 | 38,822,470 | 7,404,374 | 4,469,556 | 51,105,903 | 9,052 |
| | 98n | 46,249 | 0 | 0 | 0 | 779,173 | 176,991 | 44,292 | 1,046,705 | 2 |
| | 99o | 511,277 | 45,498 | 0 | 20 | 47,232,908 | 2,717,121 | 5,020,458 | 55,527,282 | 89,024 |
| | 99n | 0 | 0 | 0 | 0 | 1,169,880 | 200,126 | 49,634 | 1,419,640 | 0 |
| *** Sodium o-phenylphenoxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| Strychnine and salts | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 31,974 | 0 | 0 | 31,974 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 161,966 | 0 | 177 | 162,143 | 0 |
| ** Styrene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 9,297,615 | 820,377 | 20,677,749 | 9,261,346 | 14,069,737 | 4,187,657 | 44,302,260 | 102,616,741 | 171,055 |
| | 98o | 14,407,655 | 1,417,181 | 29,679,770 | 8,531,514 | 9,924,466 | 4,972,665 | 56,075,998 | 125,009,249 | 181,614 |
| | 98n | 163,600 | 482,410 | 0 | 2,877,212 | 1,307,660 | 163,076 | 676,686 | 5,670,644 | 967 |
| | 99o | 14,016,160 | 799,390 | 43,228,207 | 11,327,385 | 12,286,214 | 3,570,873 | 60,970,893 | 146,199,122 | 161,295 |
| | 99n | 341,558 | 37,258 | 0 | 698,514 | 2,203,112 | 508,366 | 36,398 | 3,825,206 | 561 |
| ** Styrene oxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 35,337 | 0 | 0 | 0 | 13 | 35,350 | 0 |
| | 98o | 0 | 0 | 30,000 | 0 | 0 | 0 | 9 | 30,009 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 70,000 | 0 | 0 | 0 | 7 | 70,007 | 0 |
| | 99n | No reports | | | | | | | | |
| * Sulfuric acid | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 686,624,536 | 5,892,020 | 66,777 | 24,524 | 652,611,988 | 11,622,000 | 24,070,854 | 1,380,912,699 | 86,027 |
| | 98o | 242,489,671 | 1,193,466 | 43,000 | 41 | 166,391,954 | 4,589,826 | 28,293,387 | 443,001,345 | 42,086 |
| | 98n | 1 | 15 | 0 | 17,184 | 152,227,525 | 327 | 165,301,643 | 317,546,695 | 1,893 |
| | 99o | 252,112,029 | 1,012,934 | 28,000 | 1,680 | 151,138,271 | 2,105,677 | 27,733,672 | 434,132,263 | 41,025 |
| | 99n | 0 | 1,595 | 0 | 0 | 171,822,760 | 85,332 | 153,898,955 | 325,808,642 | 302 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).
No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|--------------|---------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 2699-79-8 * | Sulfuryl fluoride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 355,007 | 0 | 0 | 0 | 355,007 | 0 | 355,007 |
| | | 98o | 3 | 466,000 | 0 | 0 | 0 | 466,000 | 0 | 466,000 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 505,600 | 0 | 0 | 0 | 505,600 | 0 | 505,600 |
| | | 99n | No reports | | | | | | | |
| 35400-43-2 * | Sulprofos | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 247 | 0 | 0 | 0 | 247 | 0 | 247 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 34014-18-1 * | Tebuthiuron | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 5 |
| | | 98o | 1 | 10 | 0 | 0 | 0 | 10 | 750 | 760 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 755 | 0 | 0 | 0 | 755 | 750 | 1,505 |
| | | 99n | No reports | | | | | | | |
| 3383-96-8 * | Temephos | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 7 | 0 | 0 | 0 | 7 | 0 | 7 |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5902-51-2 * | Terbacil | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 4,608 | 0 | 0 | 4,608 | 0 | 4,608 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 630-20-6 | 1,1,1,2-Tetrachloroethane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 8 | 7,011 | 0 | 0 | 0 | 7,011 | 2 | 7,013 |
| | | 98o | 7 | 8,612 | 5 | 0 | 0 | 8,617 | 2 | 8,619 |
| | | 98n | 5 | 952 | 0 | 0 | 0 | 952 | 67 | 1,019 |
| | | 99o | 11 | 5,232 | 0 | 0 | 0 | 5,232 | 1 | 5,233 |
| | | 99n | 3 | 141 | 1 | 0 | 0 | 142 | 734 | 876 |
| 79-34-5 * | 1,1,2,2-Tetrachloroethane | 88 | 13 | 43,865 | 1,903 | 0 | 29 | 45,797 | 128,750 | 174,547 |
| | | 95 | 16 | 8,275 | 2,222 | 0 | 0 | 10,497 | 7 | 10,504 |
| | | 98o | 15 | 7,247 | 19 | 0 | 0 | 7,266 | 6,458 | 13,724 |
| | | 98n | 6 | 52 | 250 | 5 | 0 | 307 | 45 | 352 |
| | | 99o | 13 | 5,183 | 0 | 0 | 15 | 5,198 | 10 | 5,208 |
| | | 99n | 5 | 32 | 1 | 0 | 0 | 33 | 20 | 53 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Sulfuryl fluoride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 371,500 | 371,500 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 461,000 | 461,000 | 5,700 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 505,600 | 505,600 | 0 |
| | 99n | No reports | | | | | | | | |
| * Sulprofos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,137 | 0 | 249 | 1,386 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| * Tebuthiuron | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1 | 0 | 0 | 0 | 1,000 | 1,100 | 1 | 2,102 | 0 |
| | 98o | 4 | 0 | 0 | 0 | 860 | 870 | 1 | 1,735 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 3 | 0 | 0 | 0 | 680 | 700 | 1 | 1,384 | 0 |
| | 99n | No reports | | | | | | | | |
| * Temephos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 31,269 | 0 | 7 | 31,276 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 51,378 | 0 | 0 | 51,378 | 0 |
| * Terbacil | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 5,070 | 7,558 | 4,608 | 17,236 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,600,000 | 0 | 0 | 0 | 4,234,676 | 379,203 | 8,341 | 7,222,220 | 40 |
| | 98o | 6,600,180 | 0 | 0 | 120,700 | 2,930,017 | 43,074 | 8,535 | 9,702,506 | 18 |
| | 98n | 0 | 0 | 0 | 0 | 158,326 | 2,580,168 | 1,015 | 2,739,509 | 1 |
| | 99o | 6,500,001 | 0 | 0 | 147,754 | 4,022,583 | 50,056 | 4,603 | 10,724,997 | 386 |
| | 99n | 0 | 0 | 0 | 0 | 708,087 | 12,991 | 807 | 721,885 | 0 |
| * 1,1,2,2-Tetrachloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 6,200,000 | 2,233,342 | 846,600 | 880 | 13,754,898 | 150,324 | 10,503 | 23,196,547 | 40 |
| | 98o | 6,692,000 | 2,339,618 | 597,000 | 0 | 10,254,173 | 119,300 | 8,847 | 20,010,938 | 803 |
| | 98n | 0 | 0 | 0 | 2,214 | 479,168 | 2,560,430 | 125 | 3,041,937 | 0 |
| | 99o | 6,492,000 | 3,095,391 | 0 | 0 | 11,976,729 | 53,056 | 4,773 | 21,621,949 | 294 |
| | 99n | 0 | 0 | 0 | 0 | 386,882 | 0 | 39 | 386,921 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|------------------------------------|------|--------------------|---------------------|--------------------------|-----------------------|------------------|------------------------|--------------------------------|---------------------------------|
| | | | | Total Air Emissions | Surface Water Discharges | Underground Injection | Releases to Land | Total On-site Releases | Transfers Off-site to Disposal | |
| | | | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| 127-18-4 | *** Tetrachloroethylene | 88 | 748 | 36,124,485 | 33,314 | 72,250 | 82,144 | 36,312,193 | 1,385,378 | 37,697,571 |
| | | 95 | 442 | 9,674,185 | 2,407 | 20,481 | 6 | 9,697,079 | 78,953 | 9,776,032 |
| | | 98o | 363 | 5,463,597 | 1,490 | 5,916 | 2,992 | 5,473,995 | 130,444 | 5,604,439 |
| | | 98n | 162 | 202,717 | 250 | 644 | 18,986 | 222,597 | 30,635 | 253,232 |
| | | 99o | 316 | 3,648,732 | 1,793 | 8,897 | 19,885 | 3,679,307 | 27,966 | 3,707,273 |
| | | 99n | 144 | 205,035 | 1 | 288 | 85,000 | 290,324 | 176,367 | 466,691 |
| 354-11-0 | 1,1,1,2-Tetrachloro-2-fluoroethane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 23,275 | 1 | 0 | 0 | 23,276 | 0 | 23,276 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 354-14-3 | 1,1,2,2-Tetrachloro-1-fluoroethane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | No reports | | | | | | | |
| 961-11-5 | * Tetrachlorvinphos | 88 | 6 | 251 | 0 | 0 | 0 | 251 | 9,270 | 9,521 |
| | | 95 | 5 | 626 | 5 | 0 | 0 | 631 | 4,200 | 4,831 |
| | | 98o | 4 | 360 | 5 | 0 | 0 | 365 | 0 | 365 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 196 | 5 | 0 | 0 | 201 | 1,037 | 1,238 |
| | | 99n | 2 | 5 | 0 | 0 | 0 | 5 | 809 | 814 |
| 64-75-5 | * Tetracycline hydrochloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 754 | 0 | 0 | 0 | 754 | 112 | 866 |
| | | 98o | 2 | 525 | 0 | 0 | 0 | 525 | 1,800 | 2,325 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 0 | 0 | 0 | 0 | 0 | 4,300 | 4,300 |
| | | 99n | No reports | | | | | | | |
| 7696-12-0 | * Tetramethrin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 10,080 | 0 | 0 | 0 | 10,080 | 0 | 10,080 |
| | | 99n | No reports | | | | | | | |
| 7440-28-0 | Thallium | 88 | No reports | | | | | | | |
| | | 95 | 1 | 255 | 0 | 0 | 755 | 1,010 | 195 | 1,205 |
| | | 98o | 5 | 15 | 0 | 0 | 3,400 | 3,415 | 3,665 | 7,080 |
| | | 98n | 5 | 533 | 65 | 0 | 96,339 | 96,937 | 5 | 96,942 |
| | | 99o | 4 | 2,137 | 0 | 0 | 4,355 | 6,492 | 4,578 | 11,070 |
| | | 99n | 3 | 1,020 | 600 | 0 | 72,700 | 74,320 | 99,000 | 173,320 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *** Tetrachloroethylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 46,318,487 | 6,830,809 | 8,865,647 | 781,602 | 26,279,022 | 2,315,885 | 9,666,477 | 101,057,929 | 14,474 |
| | 98o | 127,767,543 | 15,593,463 | 3,641,487 | 603,157 | 25,248,412 | 1,088,051 | 5,464,380 | 179,406,493 | 36,279 |
| | 98n | 5,857,745 | 975,944 | 434 | 2,898,228 | 1,516,150 | 4,609,315 | 248,825 | 16,106,641 | 130 |
| | 99o | 109,300,986 | 9,663,877 | 3,140,705 | 306,463 | 10,455,129 | 913,107 | 3,685,756 | 137,466,023 | 30,551 |
| | 99n | 12,178,051 | 442,582 | 887 | 4,858,731 | 4,189,196 | 6,145,006 | 323,794 | 28,138,247 | 86 |
| 1,1,1,2-Tetrachloro-2-fluoroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 6,600 | 270 | 0 | 0 | 0 | 0 | 21,000 | 27,870 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| 1,1,2,2-Tetrachloro-1-fluoroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 26,387 | 15 | 26,402 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 67,130 | 15 | 67,145 | 0 |
| | 99n | No reports | | | | | | | | |
| * Tetrachlorvinphos | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 330 | 0 | 17,000 | 47,000 | 1,020 | 4,244 | 4,395 | 73,989 | 0 |
| | 98o | 350 | 0 | 44,000 | 26,700 | 870 | 11,640 | 211 | 83,771 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 375 | 0 | 14,000 | 98,900 | 1,131 | 13,640 | 435 | 128,481 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 36,510 | 0 | 61 | 36,571 | 0 |
| * Tetracycline hydrochloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,736 | 677 | 2,413 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 700 | 2,160 | 2,860 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 2,001 | 4,501 | 6,502 | 0 |
| | 99n | No reports | | | | | | | | |
| * Tetramethrin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 437 | 0 | 437 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 260 | 10,080 | 10,340 | 0 |
| | 99n | No reports | | | | | | | | |
| Thallium | 88 | No reports | | | | | | | | |
| | 95 | 688,093 | 3,852 | 0 | 0 | 0 | 190 | 31 | 692,166 | 0 |
| | 98o | 0 | 0 | 52,353 | 1 | 0 | 9 | 3,406 | 55,769 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 21,600 | 1 | 96,826 | 118,427 | 0 |
| | 99o | 9 | 0 | 0 | 0 | 0 | 51 | 6,437 | 6,497 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 173,000 | 173,000 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|--------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| — | Thallium compounds | 88 | 4 | 253 | 0 | 0 | 250 | 503 | 1,256 | 1,759 |
| | | 95 | No reports | | | | | | | |
| | | 98o | 4 | 1,060 | 250 | 0 | 409,000 | 410,310 | 259 | 410,569 |
| | | 98n | 28 | 34,505 | 749 | 0 | 10,756,608 | 10,791,862 | 2,302 | 10,794,164 |
| | | 99o | 4 | 654 | 750 | 0 | 252,800 | 254,204 | 1,583 | 255,787 |
| 148-79-8 * | Thiabendazole | 99n | 31 | 4,617 | 2,129 | 0 | 3,029,157 | 3,035,903 | 60,062 | 3,095,965 |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 3,929 | 0 | 0 | 0 | 3,929 | 0 | 3,929 |
| | | 98o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| 62-55-5 ** | Thioacetamide | 99o | 3 | 255 | 0 | 0 | 0 | 255 | 0 | 255 |
| | | 99n | No reports | | | | | | | |
| | | 88 | 1 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| 28249-77-6 * | Thiobencarb | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 7 | 1 | 0 | 0 | 8 | 164 | 172 |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 510 | 0 | 0 | 0 | 510 | 3,032 | 3,542 |
| 59669-26-0 * | Thiodicarb | 98o | 2 | 286 | 0 | 0 | 0 | 286 | 760 | 1,046 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 343 | 0 | 0 | 0 | 343 | 832 | 1,175 |
| | | 99n | No reports | | | | | | | |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| 23564-05-8 * | Thiophanate-methyl | 95 | 2 | 376 | 0 | 0 | 0 | 376 | 500 | 876 |
| | | 98o | 3 | 359 | 0 | 0 | 0 | 359 | 5,966 | 6,325 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 438 | 0 | 0 | 6,843 | 7,281 | 239 | 7,520 |
| | | 99n | No reports | | | | | | | |
| 79-19-6 | Thiosemicarbazide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 502 | 0 | 0 | 0 | 502 | 0 | 502 |
| | | 98o | 7 | 431 | 0 | 0 | 0 | 431 | 442 | 873 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 10 | 493 | 0 | 0 | 0 | 493 | 7,165 | 7,658 |
| | | 99n | No reports | | | | | | | |
| | | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 2 | 3 | 0 | 0 | 0 | 3 | 98 | 101 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Thallium compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 250 | 310,000 | 310,250 | 100,000 |
| | 98n | 2,133 | 0 | 0 | 0 | 0 | 1 | 10,794,136 | 10,796,270 | 653 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 315 | 194,746 | 195,061 | 60,000 |
| | 99n | 1,884 | 0 | 0 | 0 | 0 | 0 | 2,929,108 | 2,930,992 | 120,001 |
| * Thiabendazole | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1 | 0 | 0 | 2,160 | 1,200 | 1,931 | 3,740 | 9,032 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 747 | 0 | 747 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 1,500 | 5,094 | 75 | 6,669 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Thioacetamide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 181,229 | 0 | 167 | 181,396 | 0 |
| * Thiobencarb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 620 | 3,162 | 3,782 | 0 |
| | 98o | 747 | 0 | 0 | 0 | 0 | 198 | 1,772 | 2,717 | 1 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 105 | 120 | 225 | 0 |
| | 99n | No reports | | | | | | | | |
| * Thiodicarb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,500 | 0 | 0 | 0 | 41,139 | 160 | 180 | 42,979 | 1 |
| | 98o | 108,880 | 0 | 0 | 0 | 34,243 | 19,476 | 362 | 162,961 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 84,500 | 0 | 0 | 0 | 35,246 | 11,073 | 1,200 | 132,019 | 0 |
| | 99n | No reports | | | | | | | | |
| * Thiophanate-methyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 320 | 0 | 0 | 0 | 0 | 2,677 | 507 | 3,504 | 0 |
| | 98o | 10,000 | 0 | 0 | 0 | 0 | 3,431 | 436 | 13,867 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 11,800 | 0 | 0 | 0 | 0 | 13,725 | 2,810 | 28,335 | 0 |
| | 99n | No reports | | | | | | | | |
| Thiosemicarbazide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 67,904 | 0 | 101 | 68,005 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|-----------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 62-56-6 | *** Thiourea | 88 | 26 | 2,004 | 16,951 | 5,940 | 750 | 25,645 | 2,303 | 27,948 |
| | | 95 | 26 | 1,630 | 1,487 | 5,000 | 250 | 8,367 | 4,269 | 12,636 |
| | | 98o | 27 | 1,422 | 358 | 1,250 | 250 | 3,280 | 5,895 | 9,175 |
| | | 98n | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 23 | 789 | 257 | 0 | 250 | 1,296 | 1,108 | 2,404 |
| | | 99n | 6 | 213 | 1 | 0 | 0 | 214 | 189 | 403 |
| 137-26-8 | * Thiram | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 61 | 2,856 | 50 | 0 | 0 | 2,906 | 98,617 | 101,523 |
| | | 98o | 64 | 3,279 | 22 | 0 | 1,751 | 5,052 | 81,375 | 86,427 |
| | | 98n | 3 | 15 | 0 | 0 | 0 | 15 | 25 | 40 |
| | | 99o | 58 | 3,231 | 30 | 0 | 589 | 3,850 | 64,788 | 68,638 |
| | | 99n | 5 | 42 | 1 | 0 | 0 | 43 | 222 | 265 |
| 1314-20-1 | Thorium dioxide | 88 | 3 | 1,580 | 0 | 0 | 0 | 1,580 | 677,549 | 679,129 |
| | | 95 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 7550-45-0 | Titanium tetrachloride | 88 | 41 | 78,668 | 0 | 0 | 1,400 | 80,068 | 0 | 80,068 |
| | | 95 | 33 | 20,299 | 0 | 0 | 0 | 20,299 | 32,282 | 52,581 |
| | | 98o | 34 | 31,991 | 0 | 0 | 0 | 31,991 | 380 | 32,371 |
| | | 98n | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 33 | 27,302 | 0 | 0 | 0 | 27,302 | 260,390 | 287,692 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 108-88-3 | * Toluene | 88 | 4,008 | 300,007,182 | 196,957 | 1,473,666 | 644,168 | 302,321,973 | 9,620,391 | 311,942,364 |
| | | 95 | 3,489 | 148,078,878 | 53,493 | 310,643 | 177,343 | 148,620,357 | 888,765 | 149,509,122 |
| | | 98o | 3,026 | 97,949,543 | 38,849 | 590,241 | 71,205 | 98,649,838 | 1,335,393 | 99,985,231 |
| | | 98n | 826 | 937,585 | 5,568 | 133,774 | 30,106 | 1,107,033 | 361,079 | 1,468,112 |
| | | 99o | 2,815 | 89,105,643 | 29,670 | 612,896 | 93,997 | 89,842,206 | 1,290,634 | 91,132,840 |
| | | 99n | 781 | 806,016 | 14,231 | 125,489 | 209,517 | 1,155,253 | 774,936 | 1,930,189 |
| 584-84-9 | ** Toluene-2,4-diisocyanate | 88 | 257 | 165,062 | 0 | 0 | 1,040 | 166,102 | 36,178 | 202,280 |
| | | 95 | 64 | 7,802 | 0 | 0 | 0 | 7,802 | 611 | 8,413 |
| | | 98o | 54 | 6,849 | 5 | 0 | 0 | 6,854 | 4,402 | 11,256 |
| | | 98n | 6 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| | | 99o | 50 | 4,386 | 5 | 0 | 0 | 4,391 | 14,442 | 18,833 |
| | | 99n | 11 | 456 | 1 | 0 | 14,201 | 14,658 | 531 | 15,189 |
| 91-08-7 | ** Toluene-2,6-diisocyanate | 88 | 189 | 492,192 | 0 | 0 | 510 | 492,702 | 9,444 | 502,146 |
| | | 95 | 40 | 3,043 | 0 | 0 | 0 | 3,043 | 153 | 3,196 |
| | | 98o | 24 | 1,560 | 0 | 0 | 0 | 1,560 | 1,079 | 2,639 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 25 | 2,395 | 0 | 0 | 0 | 2,395 | 1,258 | 3,653 |
| | | 99n | 3 | 5 | 0 | 0 | 0 | 5 | 160 | 165 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| *** Thiourea | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 7,082 | 0 | 0 | 0 | 18,535 | 11,867 | 10,652 | 48,136 | 1 |
| | 98o | 0 | 245 | 0 | 0 | 54,525 | 16,111 | 8,822 | 79,703 | 1 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 99o | 0 | 0 | 0 | 0 | 48,133 | 6,349 | 2,191 | 56,673 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 284,371 | 0 | 400 | 284,771 | 0 |
| * Thiram | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 18,712 | 31,501 | 0 | 5 | 407 | 10,622 | 101,354 | 162,601 | 6 |
| | 98o | 25,341 | 31,339 | 0 | 870 | 0 | 19,988 | 84,505 | 162,043 | 3 |
| | 98n | 0 | 0 | 0 | 0 | 42,192 | 0 | 40 | 42,232 | 0 |
| | 99o | 34,797 | 32,375 | 0 | 3,656 | 0 | 25,446 | 68,044 | 164,318 | 5 |
| | 99n | 0 | 0 | 0 | 0 | 261,724 | 0 | 260 | 261,984 | 0 |
| Thorium dioxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 26,000 | 0 | 0 | 0 | 0 | 2,600 | 1 | 28,601 | 0 |
| | 98o | 3,100 | 0 | 0 | 0 | 0 | 0 | 330 | 3,430 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| Titanium tetrachloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 129,787 | 0 | 0 | 23,836,598 | 2,928 | 52,646 | 24,021,959 | 13 |
| | 98o | 0 | 196,905 | 0 | 1 | 27,810,226 | 142,054 | 32,619 | 28,181,805 | 266 |
| | 98n | 0 | 0 | 0 | 0 | 122,039 | 0 | 0 | 122,039 | 0 |
| | 99o | 55,446,637 | 176,544 | 0 | 1 | 25,242,487 | 268,223 | 22,374 | 81,156,266 | 33 |
| | 99n | 0 | 0 | 0 | 0 | 17,391 | 0 | 0 | 17,391 | 0 |
| * Toluene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,003,613,351 | 25,307,195 | 214,670,733 | 78,806,874 | 192,185,056 | 19,537,051 | 145,298,684 | 1,679,418,944 | 370,444 |
| | 98o | 1,062,804,514 | 24,129,747 | 238,757,500 | 77,001,628 | 245,631,750 | 23,615,937 | 99,929,853 | 1,771,870,929 | 621,102 |
| | 98n | 30,295,476 | 3,635,211 | 303,316 | 76,869,911 | 19,686,833 | 11,314,621 | 4,234,873 | 146,340,241 | 350,349 |
| | 99o | 986,797,975 | 25,860,200 | 226,221,212 | 84,625,376 | 255,666,630 | 22,101,062 | 90,774,344 | 1,692,046,799 | 425,170 |
| | 99n | 32,381,067 | 425,958 | 618,910 | 72,640,417 | 29,935,236 | 13,277,239 | 1,237,129 | 150,515,956 | 206,312 |
| ** Toluene-2,4-diisocyanate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 427 | 0 | 37,664 | 16,408 | 3,311 | 20,201 | 6,224 | 84,235 | 13 |
| | 98o | 393 | 440 | 1,410 | 9,546 | 13,193 | 23,162 | 9,398 | 57,542 | 389 |
| | 98n | 0 | 0 | 0 | 40 | 8,723 | 0 | 302 | 9,065 | 300 |
| | 99o | 80 | 0 | 0 | 24,316 | 10,188 | 43,135 | 7,907 | 85,626 | 16 |
| | 99n | 0 | 0 | 0 | 418 | 1,304,958 | 944 | 14,975 | 1,321,295 | 0 |
| ** Toluene-2,6-diisocyanate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 107 | 0 | 9,416 | 3,705 | 652 | 1,542 | 7,510 | 22,932 | 7 |
| | 98o | 98 | 0 | 0 | 1,276 | 501 | 2,613 | 1,546 | 6,034 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | 220 | 0 | 0 | 48 | 648 | 8,890 | 3,275 | 13,081 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 133,019 | 0 | 166 | 133,185 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|---------------|-------------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 26471-62-5 ** | Toluenediisocyanate (mixed isomers) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 196 | 48,856 | 105 | 0 | 275 | 49,236 | 26,263 | 75,499 |
| | | 98o | 176 | 55,406 | 0 | 0 | 534 | 55,940 | 32,450 | 88,390 |
| | | 98n | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 176 | 35,162 | 2,500 | 0 | 256 | 37,918 | 29,085 | 67,003 |
| | | 99n | 7 | 38 | 1 | 0 | 0 | 39 | 6,985 | 7,024 |
| 95-53-4 ** | o-Toluidine | 88 | 18 | 46,922 | 1,902 | 250 | 5,024 | 54,098 | 670 | 54,768 |
| | | 95 | 23 | 13,499 | 256 | 22,140 | 12 | 35,907 | 55 | 35,962 |
| | | 98o | 19 | 7,750 | 5 | 17,020 | 5 | 24,780 | 11 | 24,791 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 20 | 7,714 | 1 | 10,010 | 0 | 17,725 | 15 | 17,740 |
| | | 99n | 5 | 22 | 1 | 0 | 0 | 23 | 620 | 643 |
| 636-21-5 | o-Toluidine hydrochloride | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 10 | 1 | 0 | 0 | 11 | 164 | 175 |
| 8001-35-2 | Toxaphene | 88 | No reports | | | | | | | |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | 5 | 13 | 0 | 0 | 25,476 | 25,489 | 113 | 25,602 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 4 | 16 | 1 | 0 | 0 | 17 | 14 | 31 |
| 43121-43-3 * | Triadimefon | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 4 | 3 | 0 | 0 | 1 | 4 | 0 | 4 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 2303-17-5 * | Triallate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 588 | 0 | 0 | 0 | 588 | 24,076 | 24,664 |
| | | 98o | 2 | 519 | 0 | 0 | 0 | 519 | 21,640 | 22,159 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 511 | 0 | 0 | 0 | 511 | 436 | 947 |
| | | 99n | 1 | 2 | 0 | 0 | 0 | 2 | 60 | 62 |
| 101200-48-0 * | Tribenuron methyl | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Toluenediisocyanate (mixed isomers) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 15,224 | 2,784 | 5,800,065 | 60,045 | 2,876,258 | 195,978 | 60,100 | 9,010,454 | 11,617 |
| | 98o | 7,260 | 1,996 | 7,812,428 | 2,054,210 | 1,029,937 | 299,050 | 71,319 | 11,276,200 | 17,918 |
| | 98n | 0 | 0 | 0 | 40 | 188,824 | 0 | 1 | 188,865 | 0 |
| | 99o | 13,350 | 438 | 5,076,288 | 67,400 | 4,084,948 | 178,241 | 39,603 | 9,460,268 | 18,380 |
| | 99n | 0 | 0 | 0 | 0 | 501,918 | 4,530 | 4,997 | 511,445 | 0 |
| ** o-Toluidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 49 | 0 | 95,623 | 139,297 | 98,950 | 127,937 | 35,498 | 497,354 | 0 |
| | 98o | 220 | 198 | 303,180 | 120,352 | 150,729 | 105,606 | 24,800 | 705,085 | 461 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 1,953,205 | 501,259 | 150,020 | 67,511 | 17,689 | 2,689,684 | 5,132 |
| | 99n | 0 | 0 | 2 | 24 | 607,614 | 0 | 639 | 608,279 | 0 |
| o-Toluidine hydrochloride | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 191,883 | 0 | 168 | 192,051 | 0 |
| Toxaphene | 88 | No reports | | | | | | | | |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | 0 | 0 | 0 | 0 | 103,929 | 1 | 25,602 | 129,532 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 134,998 | 28 | 27 | 135,053 | 0 |
| * Triadimefon | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 280 | 1,984 | 4 | 2,268 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| * Triallate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 19,838 | 0 | 0 | 0 | 93,000 | 52,830 | 24,149 | 189,817 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 6,480 | 97,751 | 22,410 | 126,641 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 840 | 0 | 0 | 0 | 1,700 | 47,151 | 1,446 | 51,137 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 11,125 | 0 | 62 | 11,187 | 0 |
| * Tribenuron methyl | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 5,144 | 1 | 5,145 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 13,016 | 1 | 13,017 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 14,832 | 1 | 14,833 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|-------------|---------------------------------|------|--------------------|-------------------------------|------------------------------------|---------------------------------|----------------------------|----------------------------------|--|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 1983-10-4 * | Tributyltin fluoride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 23 | 0 | 0 | 23 | 0 | 23 |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 2155-70-6 * | Tributyltin methacrylate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 25 | 23 | 0 | 0 | 48 | 0 | 48 |
| | | 98o | 2 | 14 | 10 | 0 | 0 | 24 | 0 | 24 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 510 | 0 | 0 | 0 | 510 | 0 | 510 |
| | | 99n | No reports | | | | | | | |
| 78-48-8 * | S,S,S-Tributyltrithio-phosphate | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 1,730 | 2 | 0 | 0 | 1,732 | 0 | 1,732 |
| | | 98o | 2 | 250 | 36 | 0 | 0 | 286 | 0 | 286 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 250 | 161 | 0 | 0 | 411 | 0 | 411 |
| | | 99n | No reports | | | | | | | |
| 52-68-6 * | Trichlorfon | 88 | 5 | 253 | 0 | 0 | 0 | 253 | 487 | 740 |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 5 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 1 | 39 | 0 | 0 | 11,242 | 11,281 | 6,058 | 17,339 |
| 76-02-8 | Trichloroacetyl chloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | No reports | | | | | | | |
| 120-82-1 * | 1,2,4-Trichlorobenzene | 88 | 57 | 1,532,913 | 31,628 | 7,408 | 3,073 | 1,575,022 | 164,144 | 1,739,166 |
| | | 95 | 31 | 168,490 | 259 | 12,500 | 0 | 181,249 | 41,648 | 222,897 |
| | | 98o | 26 | 159,689 | 191 | 8,960 | 20 | 168,860 | 1,651 | 170,511 |
| | | 98n | 8 | 775 | 250 | 5 | 0 | 1,030 | 507 | 1,537 |
| | | 99o | 27 | 168,783 | 266 | 7,100 | 10 | 176,159 | 1,409 | 177,568 |
| | | 99n | 6 | 1,142 | 1 | 0 | 0 | 1,143 | 543 | 1,686 |
| 71-55-6 * | 1,1,1-Trichloroethane | 88 | 3,921 | 180,841,849 | 95,624 | 1,000 | 204,923 | 181,143,396 | 5,947,625 | 187,091,021 |
| | | 95 | 812 | 23,587,848 | 1,118 | 126 | 38,690 | 23,627,782 | 124,778 | 23,752,560 |
| | | 98o | 129 | 816,617 | 417 | 0 | 4,980 | 822,014 | 12,219 | 834,233 |
| | | 98n | 39 | 24,491 | 250 | 0 | 0 | 24,741 | 19,180 | 43,921 |
| | | 99o | 60 | 407,051 | 45 | 0 | 276 | 407,372 | 521 | 407,893 |
| | | 99n | 36 | 8,715 | 0 | 0 | 15,705 | 24,420 | 52,572 | 76,992 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * Tributyltin fluoride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 250 | 0 | 23 | 273 | 0 |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| * Tributyltin methacrylate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 25 | 9,096 | 4,320 | 48 | 13,489 | 0 |
| | 98o | 253 | 0 | 0 | 419 | 0 | 0 | 34 | 706 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 3,458 | 0 | 0 | 3,218 | 0 | 3,100 | 3,330 | 13,106 | 0 |
| | 99n | No reports | | | | | | | | |
| * S,S,S-Tributyltrithio-phosphate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 2,541 | 316 | 1,717 | 4,574 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 10,276 | 691 | 367 | 11,334 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 13,441 | 694 | 292 | 14,427 | 0 |
| | 99n | No reports | | | | | | | | |
| * Trichlorfon | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 213 | 2,831 | 2 | 3,046 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 890 | 890 | 1,780 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 1,331 | 0 | 17,339 | 18,670 | 0 |
| Trichloroacetyl chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| | 99n | No reports | | | | | | | | |
| * 1,2,4-Trichlorobenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 40,745 | 10,541 | 2,400 | 108,129 | 1,137,925 | 393,319 | 183,352 | 1,876,411 | 6,387 |
| | 98o | 1,115,301 | 22,393 | 66,119 | 15,718 | 601,733 | 199,720 | 170,025 | 2,191,009 | 35 |
| | 98n | 3,951 | 22,068 | 0 | 12,172 | 88,370 | 216 | 699 | 127,476 | 3 |
| | 99o | 1,262,006 | 6,595 | 1,494,567 | 59,115 | 1,020,948 | 234,017 | 177,034 | 4,254,282 | 182 |
| | 99n | 0 | 0 | 0 | 2,963 | 469,316 | 1 | 698 | 472,978 | 0 |
| * 1,1,1-Trichloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 60,033,102 | 3,743,437 | 3,718,698 | 1,058,904 | 1,108,250 | 1,338,934 | 23,404,962 | 94,406,287 | 14,559 |
| | 98o | 1,173,558 | 157,496 | 2,508,207 | 489,624 | 455,010 | 236,114 | 781,290 | 5,801,299 | 19,818 |
| | 98n | 1,098,055 | 7,057 | 474,196 | 2,246,894 | 1,424,735 | 661,718 | 28,588 | 5,941,243 | 35 |
| | 99o | 580,713 | 61,748 | 1,537,877 | 506,102 | 1,635,948 | 134,998 | 407,002 | 4,864,388 | 851 |
| | 99n | 1,096,513 | 144,831 | 505,336 | 978,273 | 2,695,365 | 317,689 | 30,340 | 5,768,347 | 137 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|-----------------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 79-00-5 | * 1,1,2-Trichloroethane | 88 | 29 | 1,741,442 | 5,303 | 0 | 89 | 1,746,834 | 19,810 | 1,766,644 |
| | | 95 | 22 | 280,352 | 870 | 0 | 0 | 281,222 | 113 | 281,335 |
| | | 98o | 22 | 279,470 | 540 | 0 | 1 | 280,011 | 1,203 | 281,214 |
| | | 98n | 13 | 743 | 250 | 5 | 0 | 998 | 1,123 | 2,121 |
| | | 99o | 25 | 198,539 | 925 | 0 | 123 | 199,587 | 91 | 199,678 |
| | | 99n | 10 | 633 | 1 | 0 | 13,665 | 14,299 | 393 | 14,692 |
| 79-01-6 | *,** Trichloroethylene | 88 | 953 | 55,943,736 | 13,801 | 390 | 21,186 | 55,979,113 | 1,466,469 | 57,445,582 |
| | | 95 | 747 | 26,265,512 | 1,477 | 550 | 3,577 | 26,271,116 | 74,145 | 26,345,261 |
| | | 98o | 578 | 13,137,700 | 867 | 588 | 800 | 13,139,955 | 98,024 | 13,237,979 |
| | | 98n | 150 | 30,270 | 10 | 5 | 0 | 30,285 | 28,029 | 58,314 |
| | | 99o | 498 | 10,510,064 | 1,043 | 0 | 138,522 | 10,649,629 | 113,378 | 10,763,007 |
| | | 99n | 139 | 25,542 | 1 | 0 | 10,345 | 35,888 | 52,705 | 88,593 |
| 75-69-4 | * Trichlorofluoromethane (CFC-11) | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 54 | 959,461 | 410 | 22 | 0 | 959,893 | 272 | 960,165 |
| | | 98o | 28 | 440,509 | 1,484 | 0 | 0 | 441,993 | 1 | 441,994 |
| | | 98n | 14 | 2,258 | 250 | 250 | 0 | 2,758 | 108 | 2,866 |
| | | 99o | 29 | 392,445 | 1,000 | 0 | 0 | 393,445 | 2 | 393,447 |
| | | 99n | 11 | 7,141 | 1 | 0 | 10,078 | 17,220 | 14,674 | 31,894 |
| 95-95-4 | * 2,4,5-Trichlorophenol | 88 | 1 | 91 | 0 | 0 | 0 | 91 | 20 | 111 |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 198 | 36 | 0 | 69 | 303 | 0 | 303 |
| | | 98n | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 99o | 1 | 263 | 41 | 0 | 78 | 382 | 0 | 382 |
| | | 99n | 4 | 15 | 1 | 0 | 21,844 | 21,860 | 269 | 22,129 |
| 88-06-2 | *,** 2,4,6-Trichlorophenol | 88 | 3 | 250 | 50 | 12,000 | 0 | 12,300 | 10 | 12,310 |
| | | 95 | 1 | 161 | 210 | 0 | 0 | 371 | 0 | 371 |
| | | 98o | 1 | 114 | 26 | 0 | 0 | 140 | 0 | 140 |
| | | 98n | 3 | 4 | 0 | 0 | 0 | 4 | 10 | 14 |
| | | 99o | 2 | 86 | 38 | 0 | 2 | 126 | 0 | 126 |
| | | 99n | 3 | 6 | 1 | 0 | 2,000 | 2,007 | 6 | 2,013 |
| 96-18-4 | ** 1,2,3-Trichloropropane | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 5 | 11,081 | 1,600 | 0 | 0 | 12,681 | 0 | 12,681 |
| | | 98o | 8 | 13,837 | 300 | 0 | 0 | 14,137 | 6,758 | 20,895 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 9 | 13,931 | 2,300 | 0 | 0 | 16,231 | 0 | 16,231 |
| | | 99n | 3 | 28 | 0 | 0 | 8,189 | 8,217 | 4,412 | 12,629 |
| 57213-69-1 | * Triclopyr triethylammonium salt | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 98o | 3 | 6 | 0 | 0 | 0 | 6 | 0 | 6 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 37 | 0 | 0 | 0 | 37 | 0 | 37 |
| | | 99n | No reports | | | | | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| * 1,1,2-Trichloroethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 18,699,000 | 11,817,647 | 12,091,000 | 200,596 | 24,559,416 | 3,265,021 | 275,059 | 70,907,739 | 482 |
| | 98o | 55,855,000 | 12,399,585 | 4,961,599 | 47 | 43,283,780 | 2,017,174 | 284,126 | 118,801,311 | 48 |
| | 98n | 0 | 0 | 0 | 33,005 | 1,166,146 | 38,490 | 1,550 | 1,239,191 | 2 |
| | 99o | 50,477,000 | 16,038,204 | 189,669 | 3,866 | 43,700,428 | 754,218 | 201,266 | 111,364,651 | 893 |
| | 99n | 0 | 0 | 0 | 208,583 | 2,586,183 | 54 | 14,082 | 2,808,902 | 0 |
| *,** Trichloroethylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 153,698,396 | 8,519,411 | 2,624,155 | 1,112,208 | 5,218,927 | 2,316,428 | 25,982,621 | 199,472,146 | 221,357 |
| | 98o | 133,098,282 | 4,792,168 | 2,418,830 | 654,278 | 6,221,614 | 1,211,680 | 13,074,138 | 161,470,990 | 123,617 |
| | 98n | 3,921,526 | 3,302 | 3,559 | 816,314 | 1,338,616 | 6,251,209 | 37,307 | 12,371,833 | 382 |
| | 99o | 132,198,261 | 3,977,967 | 3,511,302 | 703,687 | 4,516,041 | 1,274,976 | 10,375,103 | 156,557,337 | 50,295 |
| | 99n | 5,188,985 | 34,859 | 4,093 | 571,104 | 2,345,598 | 652,482 | 63,344 | 8,860,465 | 115 |
| * Trichlorofluoromethane (CFC-11) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 138,712 | 227,287 | 618,422 | 170,699 | 4,200 | 291,955 | 961,314 | 2,412,589 | 1,038 |
| | 98o | 0 | 138,866 | 210,039 | 10,519 | 63,773 | 280,199 | 441,666 | 1,145,062 | 27 |
| | 98n | 0 | 0 | 0 | 117,603 | 569,323 | 13,150 | 2,135 | 702,211 | 1 |
| | 99o | 36,075 | 92,780 | 1,189,772 | 31,000 | 39,251 | 441,197 | 400,283 | 2,230,358 | 8,689 |
| | 99n | 47,450 | 0 | 0 | 93,082 | 578,508 | 10,859 | 22,108 | 752,007 | 0 |
| * 2,4,5-Trichlorophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 23,152 | 5 | 303 | 23,460 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 28,000 | 0 | 3 | 28,003 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 26,020 | 0 | 382 | 26,402 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 275,626 | 40 | 22,152 | 297,818 | 0 |
| *,** 2,4,6-Trichlorophenol | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 1,294,115 | 0 | 371 | 1,294,486 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 1,100,000 | 0 | 140 | 1,100,140 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 28,000 | 0 | 10 | 28,010 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 1,264,603 | 46 | 120 | 1,264,769 | 1 |
| | 99n | 0 | 0 | 0 | 0 | 177,026 | 0 | 9 | 177,035 | 2,000 |
| ** 1,2,3-Trichloropropane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 88,000 | 9 | 460,000 | 0 | 1,330,000 | 10,000,000 | 12,551 | 11,890,560 | 0 |
| | 98o | 7,100,000 | 0 | 870,000 | 0 | 2,553,000 | 5,949,995 | 14,187 | 16,487,182 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 9,300,000 | 0 | 678,000 | 0 | 46,789,300 | 660,000 | 16,243 | 57,443,543 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 495,664 | 0 | 12,629 | 508,293 | 0 |
| * Triclopyr triethylammonium salt | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 4 | 110 | 3 | 117 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 70 | 6 | 76 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 55 | 68 | 37 | 160 | 0 |
| | 99n | No reports | | | | | | | | |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 121-44-8 | Triethylamine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 153 | 2,138,526 | 27,705 | 309,512 | 14,010 | 2,489,753 | 17,181 | 2,506,934 |
| | | 98o | 174 | 1,580,464 | 26,281 | 186,190 | 23,755 | 1,816,690 | 56,293 | 1,872,983 |
| | | 98n | 22 | 1,641 | 0 | 0 | 0 | 1,641 | 20 | 1,661 |
| | | 99o | 168 | 1,868,060 | 17,937 | 28,659 | 35,032 | 1,949,688 | 289,541 | 2,239,229 |
| | | 99n | 17 | 3,139 | 0 | 0 | 0 | 3,139 | 264 | 3,403 |
| 1582-09-8 | * Trifluralin | 88 | 17 | 3,277 | 601 | 0 | 0 | 3,878 | 40,557 | 44,435 |
| | | 95 | 23 | 17,144 | 92 | 0 | 8,250 | 25,486 | 24,490 | 49,976 |
| | | 98o | 18 | 9,180 | 250 | 0 | 5 | 9,435 | 29,888 | 39,323 |
| | | 98n | 2 | 13 | 0 | 0 | 0 | 13 | 0 | 13 |
| | | 99o | 19 | 5,183 | 0 | 0 | 0 | 5,183 | 14,631 | 19,814 |
| | | 99n | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| 26644-46-2 | * Triforine | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 755 | 0 | 0 | 0 | 755 | 0 | 755 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | No reports | | | | | | | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 88 | 294 | 4,265,650 | 10,088 | 7,964 | 61,583 | 4,345,285 | 200,616 | 4,545,901 |
| | | 95 | 817 | 7,701,951 | 8,822 | 2,886 | 43,921 | 7,757,580 | 53,456 | 7,811,036 |
| | | 98o | 887 | 7,764,901 | 7,582 | 6,650 | 14,751 | 7,793,884 | 167,577 | 7,961,461 |
| | | 98n | 634 | 136,060 | 940 | 0 | 3,045 | 140,045 | 13,533 | 153,578 |
| | | 99o | 888 | 7,731,735 | 5,226 | 2,295 | 9,318 | 7,748,574 | 100,280 | 7,848,854 |
| | | 99n | 597 | 153,057 | 1,611 | 0 | 1,054 | 155,722 | 10,377 | 166,099 |
| 639-58-7 | * Triphenyltin chloride | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 3 |
| | | 99n | No reports | | | | | | | |
| 76-87-9 | * Triphenyltin hydroxide | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 3 | 21 | 0 | 0 | 0 | 21 | 250 | 271 |
| | | 98o | 3 | 7 | 0 | 0 | 0 | 7 | 235 | 242 |
| | | 99o | 5 | 1,001 | 0 | 0 | 0 | 1,001 | 1,085 | 2,086 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 1 | 2 | 1 | 0 | 0 | 3 | 5 | 8 |
| 72-57-1 | ** Trypan blue | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | No reports | | | | | | | |
| | | 99n | 3 | 5 | 0 | 0 | 0 | 5 | 163 | 168 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Triethylamine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 488,423 | 428,122 | 34,114 | 531,959 | 1,615,455 | 1,052,880 | 2,619,129 | 6,770,082 | 12 |
| | 98o | 332,653 | 670,856 | 380,472 | 406,920 | 4,290,600 | 870,481 | 2,144,682 | 9,096,664 | 123 |
| | 98n | 0 | 0 | 0 | 12,584 | 112,632 | 3,831 | 1,748 | 130,795 | 1 |
| | 99o | 113,198 | 737,914 | 479,881 | 461,495 | 3,662,859 | 1,095,986 | 2,564,180 | 9,115,513 | 377 |
| | 99n | 0 | 0 | 6,865 | 2,386 | 192,036 | 818 | 2,782 | 204,887 | 107 |
| * Trifluralin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 2,107 | 0 | 0 | 3 | 99,980 | 76,583 | 54,675 | 233,348 | 9,313 |
| | 98o | 80,000 | 0 | 0 | 0 | 6,880 | 75,025 | 30,415 | 192,320 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 29,827 | 0 | 10 | 29,837 | 0 |
| | 99o | 89,000 | 0 | 0 | 0 | 1,700 | 71,489 | 23,220 | 185,409 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 38,510 | 0 | 2 | 38,512 | 0 |
| * Triforine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 300 | 890 | 1,190 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | No reports | | | | | | | | |
| 1,2,4-Trimethylbenzene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 15,823,608 | 1,477,380 | 5,089,783 | 2,992,920 | 9,502,994 | 470,799 | 7,927,617 | 43,285,101 | 11,102 |
| | 98o | 14,389,987 | 1,864,096 | 8,156,093 | 3,654,699 | 10,397,545 | 674,090 | 8,004,511 | 47,141,021 | 4,438 |
| | 98n | 1,750,455 | 614,296 | 12,446 | 196,546 | 617,270 | 115,464 | 832,097 | 4,138,574 | 149,373 |
| | 99o | 19,070,696 | 1,573,546 | 11,602,529 | 3,417,205 | 10,669,320 | 543,438 | 7,932,184 | 54,808,918 | 5,784 |
| | 99n | 2,786,953 | 103,691 | 15,322 | 1,458,587 | 341,872 | 33,778 | 136,315 | 4,876,518 | 25,772 |
| * Triphenyltin chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 2,555 | 0 | 0 | 2,555 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 26,226 | 0 | 3 | 26,229 | 0 |
| | 99n | No reports | | | | | | | | |
| * Triphenyltin hydroxide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 1 | 109,816 | 390 | 401 | 110,608 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 16,465 | 1,273 | 237 | 17,975 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 6,900 | 2,867 | 609 | 10,376 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 0 | 0 | 33,000 | 0 | 2 | 33,002 | 0 |
| ** Trypan blue | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 192,524 | 0 | 168 | 192,692 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases |
|------------|----------------------------|------|--------------------|-------------------------------|------------------------------------|---------------------------------|----------------------------|----------------------------------|--|---------------------------------|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| 51-79-6 | ** Urethane | 88 | 11 | 145,123 | 0 | 0 | 0 | 145,123 | 1,350 | 146,473 |
| | | 95 | 4 | 124 | 0 | 0 | 0 | 124 | 3,750 | 3,874 |
| | | 98o | 2 | 1,413 | 22 | 0 | 0 | 1,435 | 0 | 1,435 |
| | | 98n | 1 | 4 | 0 | 0 | 0 | 4 | 2,224 | 2,228 |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | 6 | 90 | 1 | 0 | 14,249 | 14,340 | 929 | 15,269 |
| 7440-62-2 | Vanadium (fume or dust) | 88 | 33 | 17,178 | 4,704 | 0 | 87,296 | 109,178 | 93,417 | 202,595 |
| | | 95 | 19 | 14,649 | 5 | 0 | 144,086 | 158,740 | 28,780 | 187,520 |
| | | 98o | 20 | 16,018 | 16 | 0 | 128,809 | 144,843 | 4,749 | 149,592 |
| | | 98n | 9 | 38,102 | 600 | 0 | 573,228 | 611,930 | 89,250 | 701,180 |
| | | 99o | 27 | 15,105 | 283 | 0 | 100,235 | 115,623 | 17,242 | 132,865 |
| | | 99n | 8 | 3,000 | 400 | 0 | 414,925 | 418,325 | 169,011 | 587,336 |
| 50471-44-8 | * Vinclozolin | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 2 | 10 | 0 | 0 | 0 | 10 | 750 | 760 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| 108-05-4 | ** Vinyl acetate | 88 | 146 | 6,087,497 | 10,021 | 2,109,851 | 18,889 | 8,226,258 | 21,811 | 8,248,069 |
| | | 95 | 156 | 4,106,027 | 8,269 | 783,829 | 1,717 | 4,899,842 | 45,052 | 4,944,894 |
| | | 98o | 195 | 3,344,047 | 3,665 | 285,141 | 1,125 | 3,633,978 | 108,410 | 3,742,388 |
| | | 98n | 12 | 35,943 | 0 | 0 | 55,000 | 90,943 | 18,957 | 109,900 |
| | | 99o | 185 | 3,354,275 | 3,948 | 286,764 | 2,029 | 3,647,016 | 35,406 | 3,682,422 |
| | | 99n | 12 | 28,832 | 0 | 0 | 36,311 | 65,143 | 336,802 | 401,945 |
| 593-60-2 | ** Vinyl bromide | 88 | 2 | 4,950 | 400 | 0 | 0 | 5,350 | 0 | 5,350 |
| | | 95 | 2 | 54,930 | 0 | 0 | 0 | 54,930 | 0 | 54,930 |
| | | 98o | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 2 | 500 | 0 | 0 | 0 | 500 | 0 | 500 |
| | | 99n | No reports | | | | | | | |
| 75-01-4 | ** Vinyl chloride | 88 | 53 | 1,439,189 | 2,051 | 53 | 4,409 | 1,445,702 | 4,555 | 1,450,257 |
| | | 95 | 48 | 1,044,665 | 525 | 33 | 1 | 1,045,224 | 15,645 | 1,060,869 |
| | | 98o | 46 | 884,214 | 78 | 149 | 0 | 884,441 | 68,039 | 952,480 |
| | | 98n | 9 | 1,473 | 0 | 5 | 0 | 1,478 | 1,175 | 2,653 |
| | | 99o | 45 | 846,885 | 105 | 405 | 1 | 847,396 | 477 | 847,873 |
| | | 99n | 6 | 1,691 | 1 | 0 | 0 | 1,692 | 13,538 | 15,230 |
| 75-35-4 | * Vinylidene chloride | 88 | 21 | 296,353 | 3,462 | 170 | 429 | 300,414 | 44,281 | 344,695 |
| | | 95 | 24 | 193,550 | 642 | 0 | 0 | 194,192 | 260 | 194,452 |
| | | 98o | 25 | 179,391 | 311 | 218 | 0 | 179,920 | 3 | 179,923 |
| | | 98n | 8 | 1,903 | 250 | 45,812 | 82,000 | 129,965 | 12,354 | 142,319 |
| | | 99o | 25 | 155,891 | 132 | 99 | 0 | 156,122 | 8 | 156,130 |
| | | 99n | 8 | 6,644 | 1 | 0 | 14,945 | 21,590 | 929 | 22,519 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| ** Urethane | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,165 | 4,742 | 5,907 | 2,500 |
| | 98o | 0 | 0 | 0 | 0 | 26,432 | 0 | 1,435 | 27,867 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 142,049 | 0 | 2,228 | 144,277 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | 0 | 0 | 518 | 1,473 | 680,048 | 0 | 14,765 | 696,804 | 0 |
| Vanadium (fume or dust) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 191,454 | 54,731 | 217 | 0 | 0 | 820 | 188,573 | 435,795 | 0 |
| | 98o | 29,920 | 44,826 | 0 | 0 | 0 | 0 | 146,404 | 221,150 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 0 | 0 | 683,751 | 683,751 | 0 |
| | 99o | 113,633 | 35,862 | 0 | 0 | 0 | 2,809 | 132,442 | 284,746 | 27 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 0 | 479,721 | 479,721 | 90,000 |
| * Vinclozolin | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 1,030 | 0 | 1,030 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 650 | 660 | 1 | 1,311 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| ** Vinyl acetate | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 311,385 | 533,356 | 15,379,353 | 6,544,593 | 19,205,133 | 9,194,987 | 5,196,125 | 56,364,932 | 14,797 |
| | 98o | 993,710 | 86,990 | 18,008,261 | 14,361,541 | 27,164,709 | 1,452,870 | 3,577,202 | 65,645,283 | 62,311 |
| | 98n | 0 | 1 | 0 | 2,444,457 | 741,302 | 45,992 | 109,100 | 3,340,852 | 1 |
| | 99o | 1,158,990 | 13,249 | 21,815,185 | 12,228,901 | 18,156,883 | 697,009 | 3,693,357 | 57,763,574 | 2,313,487 |
| | 99n | 0 | 0 | 0 | 1,345,712 | 2,516,017 | 393,581 | 66,430 | 4,321,740 | 0 |
| ** Vinyl bromide | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 36 | 0 | 54,910 | 54,946 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 50 | 1 |
| | 99n | No reports | | | | | | | | |
| ** Vinyl chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 318,121,038 | 90,685 | 23,368,507 | 20,853 | 40,034,145 | 55,842 | 1,051,733 | 382,742,803 | 31,509 |
| | 98o | 377,999,298 | 857,715 | 40,383,408 | 14,028 | 36,705,295 | 275,230 | 873,395 | 457,108,369 | 19,820 |
| | 98n | 0 | 0 | 0 | 6,752 | 320,294 | 315,826 | 1,421 | 644,293 | 1 |
| | 99o | 421,183,195 | 785,132 | 28,607,150 | 13,644 | 35,675,866 | 439,386 | 888,888 | 487,593,261 | 57,478 |
| | 99n | 139,884 | 0 | 0 | 124,028 | 378,842 | 101 | 1,587 | 644,442 | 10 |
| * Vinylidene chloride | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,438,000 | 55 | 190,253 | 102,442 | 6,754,873 | 85,282 | 177,394 | 8,748,299 | 16,577 |
| | 98o | 1,830,000 | 8,605 | 125,000 | 82,946 | 3,494,987 | 15,029 | 180,378 | 5,736,945 | 82 |
| | 98n | 0 | 1 | 0 | 8,069 | 799,244 | 2,116 | 142,052 | 951,482 | 1 |
| | 99o | 3,977,000 | 21,860 | 100,000 | 65,165 | 1,498,463 | 40,816 | 156,102 | 5,859,406 | 146 |
| | 99n | 0 | 0 | 0 | 1,799 | 1,046,020 | 194 | 56,156 | 1,104,169 | 0 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the de minimis level of 0.1%.



Appendix A —Chemical-specific TRI Release and Waste Management Data, 1988, 1995, 1998, and 1999

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases Transfers Off-site to Disposal Pounds | Total On- and Off-site Releases Pounds |
|------------|--------------------------|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | | |
| — | Warfarin and salts | 88 | NR | NR | NR | NR | NR | NR | NR | NR |
| | | 95 | No reports | | | | | | | |
| | | 98o | No reports | | | | | | | |
| | | 98n | No reports | | | | | | | |
| | | 99o | No reports | | | | | | | |
| | | 99n | 4 | 10 | 0 | 0 | 0 | 10 | 327 | 337 |
| 108-38-3 | m-Xylene | 88 | 68 | 2,463,043 | 2,566 | 0 | 18,045 | 2,483,654 | 107,746 | 2,591,400 |
| | | 95 | 61 | 1,151,489 | 892 | 569 | 13,838 | 1,166,788 | 8,650 | 1,175,438 |
| | | 98o | 74 | 1,192,267 | 4,292 | 4,199 | 860 | 1,201,618 | 29,929 | 1,231,547 |
| | | 98n | 12 | 4,315 | 5 | 0 | 0 | 4,320 | 10 | 4,330 |
| | | 99o | 70 | 929,445 | 85 | 3,578 | 3,945 | 937,053 | 45,753 | 982,806 |
| | | 99n | 14 | 14,881 | 0 | 0 | 3 | 14,884 | 0 | 14,884 |
| 95-47-6 | o-Xylene | 88 | 66 | 2,241,814 | 2,786 | 250 | 22,461 | 2,267,311 | 52,881 | 2,320,192 |
| | | 95 | 67 | 1,384,483 | 869 | 569 | 485 | 1,386,406 | 1,152 | 1,387,558 |
| | | 98o | 82 | 1,345,071 | 960 | 3,088 | 41,350 | 1,390,469 | 101,998 | 1,492,467 |
| | | 98n | 22 | 1,885 | 5 | 0 | 0 | 1,890 | 779 | 2,669 |
| | | 99o | 80 | 871,321 | 82 | 3,379 | 44,284 | 919,066 | 138,162 | 1,057,228 |
| | | 99n | 19 | 11,910 | 0 | 0 | 3 | 11,913 | 0 | 11,913 |
| 106-42-3 | p-Xylene | 88 | 48 | 5,992,743 | 3,200 | 0 | 49,226 | 6,045,169 | 31,108 | 6,076,277 |
| | | 95 | 39 | 2,937,312 | 532 | 569 | 29,401 | 2,967,814 | 1,261 | 2,969,075 |
| | | 98o | 51 | 1,841,632 | 725 | 3,227 | 55 | 1,845,639 | 18,212 | 1,863,851 |
| | | 98n | 8 | 13,269 | 5 | 0 | 0 | 13,274 | 0 | 13,274 |
| | | 99o | 45 | 1,799,010 | 87 | 3,578 | 280 | 1,802,955 | 22,692 | 1,825,647 |
| | | 99n | 10 | 22,169 | 0 | 0 | 290 | 22,459 | 2,106 | 24,565 |
| 1330-20-7 | * Xylene (mixed isomers) | 88 | 3,469 | 158,986,408 | 204,480 | 144,728 | 558,257 | 159,893,873 | 6,455,911 | 166,349,784 |
| | | 95 | 3,323 | 97,708,785 | 33,834 | 123,396 | 99,686 | 97,965,701 | 583,967 | 98,549,668 |
| | | 98o | 2,863 | 68,714,039 | 51,887 | 121,085 | 41,455 | 68,928,466 | 818,947 | 69,747,413 |
| | | 98n | 818 | 573,493 | 5,328 | 2,788 | 70,548 | 652,157 | 690,535 | 1,342,692 |
| | | 99o | 2,712 | 66,131,554 | 24,818 | 49,979 | 42,882 | 66,249,233 | 1,079,734 | 67,328,967 |
| | | 99n | 774 | 502,625 | 4,940 | 37,541 | 211,146 | 756,252 | 1,042,463 | 1,798,715 |
| 87-62-7 | *,** 2,6-Xyldine | 88 | 2 | 337 | 1,537 | 0 | 0 | 1,874 | 0 | 1,874 |
| | | 95 | 4 | 304 | 0 | 0 | 0 | 304 | 0 | 304 |
| | | 98o | 2 | 453 | 0 | 0 | 0 | 453 | 0 | 453 |
| | | 98n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99o | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | | 99n | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7440-66-6 | * Zinc (fume or dust) | 88 | 644 | 3,455,937 | 849,544 | 140,010 | 25,617,365 | 30,062,856 | 31,450,587 | 61,513,443 |
| | | 95 | 437 | 2,047,893 | 45,159 | 0 | 6,402,574 | 8,495,626 | 9,629,895 | 18,125,521 |
| | | 98o | 419 | 1,318,346 | 9,556 | 1 | 7,677,150 | 9,005,053 | 8,201,172 | 17,206,225 |
| | | 98n | 39 | 2,647,359 | 31,044 | 294,942 | 66,841,176 | 69,814,521 | 261,445 | 70,075,966 |
| | | 99o | 405 | 1,227,091 | 15,306 | 1 | 2,322,910 | 3,565,308 | 13,770,162 | 17,335,470 |
| | | 99n | 26 | 2,411,681 | 7,900 | 0 | 53,878,527 | 56,298,108 | 182,685 | 56,480,793 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Warfarin and salts | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | No reports | | | | | | | | |
| | 98o | No reports | | | | | | | | |
| | 98n | No reports | | | | | | | | |
| | 99o | No reports | | | | | | | | |
| | 99n | 0 | 0 | 0 | 0 | 309,501 | 1 | 338 | 309,840 | 0 |
| m-Xylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 1,917,515 | 27,006 | 4,141,480 | 245,136 | 3,100,716 | 131,806 | 1,160,477 | 10,724,136 | 1,434 |
| | 98o | 1,912,614 | 162,262 | 9,462,285 | 241,065 | 1,084,879 | 124,993 | 1,226,352 | 14,214,450 | 19,072 |
| | 98n | 2,913 | 80 | 0 | 194,683 | 0 | 1,045 | 4,129 | 202,850 | 0 |
| | 99o | 1,333,398 | 110,315 | 11,882,415 | 307,105 | 925,163 | 93,300 | 950,775 | 15,602,471 | 15,147 |
| | 99n | 2,311 | 2,357 | 0 | 178,261 | 35,289 | 10,616 | 14,997 | 243,831 | 134 |
| o-Xylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 317,695 | 59,486 | 15,563,897 | 1,859,258 | 2,219,346 | 814,980 | 1,448,714 | 22,283,376 | 11,493 |
| | 98o | 102,107 | 14,743 | 6,965,568 | 1,756,281 | 2,049,794 | 815,174 | 1,401,232 | 13,104,899 | 14,902 |
| | 98n | 1,260 | 475 | 0 | 192,004 | 49,441 | 552 | 1,999 | 245,731 | 3 |
| | 99o | 75,426 | 7,358 | 7,989,008 | 1,838,625 | 2,063,253 | 409,431 | 1,151,419 | 13,534,520 | 13,451 |
| | 99n | 972,480 | 1,406 | 0 | 181,552 | 0 | 4,662 | 11,963 | 1,172,063 | 67 |
| p-Xylene | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 468,689 | 8,192 | 2,168,729 | 3,563 | 645,579 | 8,722 | 2,958,765 | 6,262,239 | 17,281 |
| | 98o | 125,970 | 395 | 4,670,124 | 7,322 | 2,866,722 | 156,678 | 1,861,654 | 9,688,865 | 10,987 |
| | 98n | 870 | 0 | 0 | 182,126 | 0 | 0 | 10,070 | 193,066 | 3,200 |
| | 99o | 147,153 | 7 | 683,856 | 57,153 | 1,902,287 | 69,312 | 1,851,844 | 4,711,612 | 8,634 |
| | 99n | 693 | 0 | 0 | 177,081 | 35,289 | 8,309 | 21,566 | 242,938 | 3,200 |
| * Xylene (mixed isomers) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 135,260,404 | 41,489,747 | 141,804,106 | 70,025,436 | 55,806,217 | 9,880,737 | 97,056,001 | 551,322,648 | 239,363 |
| | 98o | 101,018,976 | 35,322,088 | 140,723,082 | 58,328,397 | 63,502,224 | 13,603,886 | 71,036,122 | 483,534,775 | 179,438 |
| | 98n | 29,465,352 | 3,616,563 | 730,790 | 85,960,710 | 10,113,113 | 8,961,696 | 3,806,685 | 142,654,909 | 75,797 |
| | 99o | 102,068,245 | 34,015,903 | 118,627,966 | 56,045,748 | 59,080,021 | 9,062,560 | 67,283,081 | 446,183,524 | 160,291 |
| | 99n | 30,948,750 | 601,639 | 990,581 | 52,241,890 | 10,032,127 | 11,364,163 | 848,122 | 107,027,272 | 204,117 |
| *,** 2,6-Xylidine | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 8,000 | 0 | 300 | 258 | 254 | 8,812 | 0 |
| | 98o | 0 | 0 | 22,235 | 0 | 0 | 0 | 453 | 22,688 | 0 |
| | 98n | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| | 99o | 0 | 0 | 0 | 2,900 | 17 | 0 | 1 | 2,918 | 0 |
| | 99n | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 |
| * Zinc (fume or dust) | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 27,847,425 | 78,625,090 | 0 | 53,501 | 3,815,022 | 6,476,716 | 10,750,762 | 127,568,516 | 35,494 |
| | 98o | 28,252,595 | 49,723,575 | 0 | 125,059 | 654,672 | 741,490 | 29,383,456 | 108,880,847 | 2,282,691 |
| | 98n | 0 | 69,000 | 0 | 0 | 0 | 0 | 70,053,321 | 70,122,321 | 6 |
| | 99o | 6,124,363 | 54,872,983 | 0 | 58,144 | 606,425 | 606,257 | 27,748,480 | 90,016,652 | 44 |
| | 99n | 0 | 290,000 | 0 | 0 | 0 | 0 | 56,474,807 | 56,764,807 | 9 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.



**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**

Table A-1A. TRI On-site and Off-site Releases, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| CAS Number | Chemical | Year | Total Forms Number | On-site Releases | | | | | Off-site Releases | Total On- and Off-site Releases Pounds |
|--------------|--|------|--------------------|----------------------------|---------------------------------|------------------------------|-------------------------|-------------------------------|---------------------------------------|--|
| | | | | Total Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Pounds | Releases to Land Pounds | Total On-site Releases Pounds | Transfers Off-site to Disposal Pounds | |
| — | Zinc compounds | 88 | 1,667 | 7,265,829 | 1,201,410 | 109,555 | 113,361,611 | 121,938,405 | 84,389,611 | 206,328,016 |
| | | 95 | 2,707 | 4,836,050 | 1,091,335 | 397,844 | 113,660,632 | 119,985,861 | 107,101,733 | 227,087,594 |
| | | 98o | 2,907 | 6,927,992 | 1,252,934 | 246,175 | 122,700,579 | 131,127,680 | 111,772,118 | 242,899,798 |
| | | 98n | 458 | 1,568,284 | 555,882 | 21,751,486 | 664,325,790 | 688,201,442 | 12,270,400 | 700,471,842 |
| | | 99o | 2,928 | 5,521,766 | 1,002,707 | 228,062 | 129,657,798 | 136,410,333 | 130,151,560 | 266,561,893 |
| | | 99n | 459 | 2,488,568 | 370,455 | 21,940,510 | 715,810,240 | 740,609,773 | 15,101,370 | 755,711,143 |
| 12122-67-7 * | Zineb | 88 | 2 | 1,250 | 0 | 0 | 0 | 1,250 | 2,600 | 3,850 |
| | | 95 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 1 | 100 | 0 | 0 | 0 | 100 | 0 | 100 |
| | | 98n | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 2 |
| | | 99o | 1 | 10 | 0 | 0 | 0 | 10 | 0 | 10 |
| | | 99n | No reports | | | | | | | |
| — | Mixtures and other trade name products | 88 | 176 | 3,450,870 | 59,460 | 0 | 18,699 | 3,529,029 | 10,662,177 | 14,191,206 |
| | | 95 | 30 | 334,194 | 3,171 | 0 | 0 | 337,365 | 4,400 | 341,765 |
| | | 98o | 50 | 116,270 | 0 | 0 | 9 | 116,279 | 86,098 | 202,377 |
| | | 98n | 7 | 7,550 | 0 | 0 | 0 | 7,550 | 0 | 7,550 |
| | | 99o | 46 | 222,430 | 0 | 0 | 500 | 222,930 | 20,717 | 243,647 |
| | | 99n | 5 | 665 | 0 | 0 | 0 | 665 | 0 | 665 |
| — | Trade secrets | 88 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 95 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 98o | 11 | 30 | 0 | 0 | 0 | 30 | 0 | 30 |
| | | 98n | No reports | | | | | | | |
| | | 99o | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 99n | No reports | | | | | | | |
| Total | | 88 | 60,312 | 2,180,639,873 | 41,919,468 | 161,915,411 | 405,909,382 | 2,790,384,134 | 422,713,934 | 3,213,098,068 |
| | | 95 | 74,465 | 1,590,651,239 | 191,919,759 | 248,927,637 | 284,190,539 | 2,315,689,174 | 320,730,208 | 2,636,419,382 |
| | | 98o | 70,975 | 1,270,193,503 | 238,483,036 | 209,711,433 | 343,781,378 | 2,062,169,350 | 324,059,939 | 2,386,229,289 |
| | | 98n | 15,142 | 811,010,244 | 7,553,237 | 56,708,764 | 4,022,499,616 | 4,897,771,861 | 100,060,679 | 4,997,832,540 |
| | | 99o | 69,471 | 1,175,054,932 | 253,591,816 | 199,547,803 | 323,667,851 | 1,951,862,402 | 374,647,596 | 2,326,509,998 |
| | | 99n | 14,597 | 854,309,491 | 5,289,960 | 58,097,341 | 4,423,054,923 | 5,340,751,715 | 104,775,858 | 5,445,527,573 |

Note: On-site Releases are from Section 5 of Form K. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form K. Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NR: not reportable (chemicals added to the TRI list after 1988 or whose reporting definition has changed since 1988). No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

**Appendix A —Chemical-specific TRI Release and Waste Management Data,
1988, 1995, 1998, and 1999**



Table A-1B. Quantities of TRI Chemicals in Waste, by Chemical, 1988, 1995 and 1998 and 1999 (Original and New Industries)
(continued)

| Chemical | Year | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site 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 | | | |
| Zinc compounds | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 130,342,228 | 252,508,296 | 446,100 | 365,736 | 4,084,591 | 26,382,764 | 213,836,910 | 627,966,625 | 11,143,290 |
| | 98o | 66,816,553 | 271,001,524 | 367,541 | 266,041 | 4,065,652 | 12,444,558 | 302,640,006 | 657,601,875 | 1,360,367 |
| | 98n | 9,220,552 | 1,797,539 | 0 | 5,747 | 1,569,443 | 143,209 | 701,887,578 | 714,624,068 | 48,595 |
| | 99o | 80,840,858 | 280,480,195 | 142,280 | 173,258 | 23,547,168 | 26,504,817 | 305,850,743 | 717,539,319 | 233,011,755 |
| | 99n | 9,808,546 | 2,375,741 | 0 | 0 | 66,270 | 292,548 | 762,076,323 | 774,619,428 | 34,034,404 |
| * Zineb | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 200 | 0 |
| | 98n | 0 | 0 | 0 | 0 | 11,715 | 0 | 2 | 11,717 | 0 |
| | 99o | 0 | 0 | 0 | 0 | 0 | 320 | 9 | 329 | 0 |
| | 99n | No reports | | | | | | | | |
| Mixtures and other trade name products | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 8,025 | 19,282 | 96,280,793 | 375,381 | 72,738,249 | 294,743 | 384,186 | 170,100,659 | 1 |
| | 98o | 6,651,848 | 9,249 | 1,367,661 | 14,955 | 23,598 | 67,846 | 143,441 | 8,278,598 | 16 |
| | 98n | 3,775,989 | 0 | 0 | 0 | 0 | 0 | 7,392 | 3,783,381 | 1 |
| | 99o | 39,297 | 0 | 700 | 43,758 | 239,015 | 8,465 | 267,533 | 598,768 | 7 |
| | 99n | 0 | 0 | 0 | 0 | 0 | 2,599 | 665 | 3,264 | 0 |
| Trade secrets | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 98o | 0 | 0 | 0 | 0 | 2,700 | 0 | 30 | 2,730 | 0 |
| | 98n | No reports | | | | | | | | |
| | 99o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 99n | No reports | | | | | | | | |
| Total | 88 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 95 | 11,253,331,442 | 2,340,012,471 | 2,740,693,446 | 504,296,260 | 6,504,643,933 | 604,897,307 | 2,588,477,206 | 26,536,352,065 | 30,108,369 |
| | 98o | 8,407,381,641 | 2,071,439,013 | 2,827,695,743 | 487,588,775 | 5,913,717,613 | 592,216,295 | 2,475,386,574 | 22,775,425,654 | 26,311,489 |
| | 98n | 204,380,355 | 37,327,609 | 11,399,201 | 413,103,773 | 629,209,581 | 90,988,751 | 5,118,407,472 | 6,504,816,742 | 1,613,324 |
| | 99o | 7,839,852,848 | 2,134,897,467 | 2,806,098,993 | 511,631,406 | 6,850,326,119 | 571,669,556 | 2,384,303,476 | 23,098,779,865 | 305,727,127 |
| | 99n | 198,496,815 | 35,157,658 | 10,762,603 | 267,664,335 | 754,327,458 | 72,630,384 | 5,056,288,914 | 6,395,328,167 | 506,658,122 |

Note: Data from Section 8 (Current Year) of Form R.

98o and 99o are data from original industries, 98n and 99n are data from new industries. NA: not applicable (waste management data not required for 1988 reporting year).

No reports: No reports received for the chemical in that reporting year.

*Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

**Chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the *de minimis* level of 0.1%.

Appendix B

TRI Release and Waste Management Data for Metals and Metal Compounds, 1999



Appendix B —TRI Release and Waste Management Data for Metals and Metal Compounds, 1999

Table B-1. TRI On-site and Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999

| Chemical | | On-site Releases | | | | | | | | | | Off-site Releases | Total On- and Off-site Releases | | | |
|-------------------------------------|---|-------------------------------|-----------|------------------------------------|-----------|--|------------|----------------------------|-------------|-------------------------------------|---------------------------|--------------------------|---------------------------------|--------------------------------|----------------------------------|--------------------------|
| | | Total Air Emissions Pounds | | Surface Water Discharges Pounds | | Underground Injection Class I Wells Pounds | | Class II-V Wells Pounds | | On-site Land Releases | | | | | Total On-site Releases Pounds | |
| | | | | | | | | | | RCRA Subtitle C Landfills Pounds | Other Landfills Pounds | Land Treatment Pounds | | Surface Impoundments Pounds | | Other Disposal Pounds |
| Aluminum* (CAS Number 7429-09-5) | O | 5,634,715 | 4,753 | 0 | 0 | 47,925 | 597,309 | 19,883 | 180,000 | 500,941 | 6,985,526 | 13,809,568 | 20,795,094 | | | |
| | N | 1,144,097 | 0 | 0 | 0 | 4,072,525 | 1,053 | 0 | 99,052 | 111,277 | 5,428,004 | 18,368 | 5,446,372 | | | |
| Antimony and antimony compounds | O | 125,905 | 44,785 | 62,911 | 0 | 58,202 | 297,499 | 308 | 280,855 | 400,964 | 1,271,429 | 3,365,688 | 4,637,117 | | | |
| | N | 14,157 | 31,354 | 0 | 610,086 | 973,119 | 436,457 | 2 | 10,445,341 | 15,971,462 | 28,481,978 | 392,921 | 28,874,899 | | | |
| Arsenic and arsenic compounds | O | 92,874 | 16,131 | 198,310 | 0 | 150,111 | 2,993,418 | 5 | 5,674,927 | 536,035 | 9,661,811 | 2,073,922 | 11,735,733 | | | |
| | N | 205,423 | 168,578 | 250 | 880,034 | 2,788,158 | 2,367,618 | 13,711 | 187,517,056 | 398,708,824 | 592,649,652 | 1,987,448 | 594,637,100 | | | |
| Barium and barium compounds | O | 930,150 | 1,122,361 | 268 | 0 | 181,833 | 3,984,180 | 130,273 | 956,082 | 1,319,760 | 8,624,907 | 7,687,710 | 16,312,617 | | | |
| | N | 2,405,305 | 1,117,404 | 24,403 | 1,982,400 | 7,065,244 | 77,002,235 | 940,204 | 72,195,924 | 94,081,078 | 256,814,197 | 37,662,423 | 294,476,620 | | | |
| Beryllium and beryllium compounds | O | 1,242 | 84 | 4,100 | 0 | 2,650 | 50,529 | 5 | 32 | 74 | 58,716 | 25,109 | 83,825 | | | |
| | N | 7,343 | 3,483 | 0 | 0 | 288,832 | 253,640 | 1 | 274,750 | 5,705 | 833,754 | 49,840 | 883,594 | | | |
| Cadmium and cadmium compounds | O | 32,215 | 2,192 | 23 | 0 | 3,680 | 65,868 | 5 | 358,306 | 260,037 | 722,326 | 746,769 | 1,469,095 | | | |
| | N | 20,688 | 765 | 61,000 | 100,000 | 2,989,490 | 12,343 | 12 | 2,269,906 | 6,290,816 | 11,745,020 | 472,327 | 12,217,347 | | | |
| Chromium and chromium compounds | O | 767,885 | 108,615 | 816,768 | 5 | 431,728 | 1,714,091 | 36,291 | 24,472,106 | 3,652,262 | 31,999,751 | 26,931,218 | 58,930,969 | | | |
| | N | 285,275 | 117,535 | 720,250 | 38,000 | 4,877,156 | 4,951,964 | 61,231 | 11,394,334 | 112,027,121 | 134,472,866 | 6,723,106 | 141,195,972 | | | |
| Cobalt and cobalt compounds | O | 58,186 | 64,426 | 30,421 | 0 | 34,768 | 21,785 | 8,320 | 48,861 | 386,670 | 653,437 | 831,930 | 1,485,367 | | | |
| | N | 45,046 | 24,948 | 0 | 17,001 | 204,595 | 1,351,441 | 8,725 | 3,349,556 | 9,938,544 | 14,939,856 | 401,287 | 15,341,143 | | | |
| Copper and copper compounds | O | 3,700,149 | 118,477 | 310,117 | 5 | 401,462 | 3,361,484 | 87,227 | 6,534,444 | 35,244,654 | 49,758,019 | 18,767,102 | 68,525,121 | | | |
| | N | 741,296 | 279,810 | 68,005 | 1,205,581 | 9,092,867 | 8,200,446 | 51,550 | 398,746,700 | 1,328,496,172 | 1,746,882,427 | 5,882,850 | 1,752,765,277 | | | |
| Lead and lead compounds | O | 1,221,654 | 40,130 | 182,869 | 0 | 678,818 | 3,828,990 | 3,866 | 3,624,266 | 9,406,578 | 18,987,171 | 25,492,311 | 44,479,482 | | | |
| | N | 356,460 | 33,838 | 13,250 | 7,959,140 | 21,090,031 | 7,795,339 | 13,822 | 117,181,330 | 158,285,519 | 312,728,729 | 8,409,618 | 321,138,347 | | | |
| manganese compounds | O | 2,683,444 | 4,990,006 | 7,011,377 | 255 | 2,047,723 | 32,060,876 | 375,419 | 14,852,268 | 5,238,694 | 69,260,062 | 55,823,265 | 125,083,327 | | | |
| | N | 590,455 | 685,433 | 36,000 | 1,150,500 | 8,399,165 | 20,657,640 | 259,278 | 33,091,283 | 357,217,903 | 422,087,657 | 9,052,033 | 431,139,690 | | | |
| Mercury and mercury compounds | O | 13,385 | 169 | 0 | 0 | 1,453 | 3,358 | 5 | 3,300 | 3 | 21,673 | 59,621 | 81,294 | | | |
| | N | 13,092 | 9 | 0 | 0 | 455,855 | 1,698 | 0 | 1,014,029 | 1,686,005 | 3,170,688 | 104,085 | 3,274,773 | | | |
| Nickel and nickel compounds | O | 736,607 | 108,703 | 226,687 | 0 | 59,827 | 863,807 | 5,178 | 1,252,131 | 775,137 | 4,028,077 | 9,071,803 | 13,099,880 | | | |
| | N | 765,962 | 161,939 | 140,250 | 41,012 | 3,725,386 | 4,534,018 | 62,526 | 10,912,205 | 38,284,691 | 58,627,989 | 9,280,808 | 67,908,797 | | | |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R.

Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release.

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

O: Original Industries.

N: New Industries.

*Only fume or dust forms are reportable.

Appendix B TRI Release and Waste Management Data for Metals and Metal Compounds, 1999



Table B-1. TRI On-site and Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999 (continued)

| Chemical | | On-site Releases | | | | | | | | | Off-site Releases | Total On- and Off-site Releases |
|----------------------------------|---|------------------|-----------|-----------------------|--------------------------|-----------------------|------------------|---------------------------|-----------------|------------------------|-------------------|---------------------------------|
| | | | | Underground Injection | | On-site Land Releases | | | | Total On-site Releases | | |
| | | | | Total Air Emissions | Surface Water Discharges | Class I Wells | Class II-V Wells | RCRA Subtitle C Landfills | Other Landfills | | Land Treatment | |
| | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Selenium and selenium compounds | O | 151,420 | 4,391 | 33,509 | 0 | 3,103 | 115,507 | 5 | 71,010 | 118,830 | 497,775 | 603,310 |
| | N | 509,004 | 40,960 | 0 | 0 | 1,595,481 | 572,455 | 267 | 400,499 | 3,344,029 | 559,303 | 7,021,998 |
| Silver and silver compounds | O | 19,768 | 7,314 | 222 | 0 | 2,650 | 9,665 | 380 | 5,107 | 49,257 | 113,274 | 207,637 |
| | N | 2,203 | 322 | 17,000 | 160,000 | 644,846 | 2,010 | 0 | 335,133 | 2,757,959 | 297,121 | 4,216,594 |
| Thallium and thallium compounds | O | 2,791 | 750 | 0 | 0 | 4,350 | 82,805 | 0 | 170,000 | 0 | 6,161 | 266,857 |
| | N | 5,637 | 2,729 | 0 | 0 | 306,458 | 687,889 | 0 | 713,772 | 1,393,738 | 159,062 | 3,269,285 |
| Vanadium* (CAS Number 7440-62-2) | O | 15,105 | 283 | 0 | 0 | 6,200 | 94,000 | 9 | 0 | 26 | 17,242 | 132,865 |
| | N | 3,000 | 400 | 0 | 0 | 202,925 | 0 | 0 | 212,000 | 0 | 169,011 | 587,336 |
| Zinc* and zinc compounds | O | 6,748,857 | 1,018,013 | 222,563 | 5,500 | 7,834,748 | 32,783,281 | 125,988 | 9,444,787 | 81,791,904 | 143,921,722 | 283,897,363 |
| | N | 4,900,249 | 378,355 | 850,750 | 21,089,760 | 84,578,153 | 18,860,487 | 239,070 | 297,804,020 | 368,207,037 | 15,284,055 | 812,191,936 |
| Total | O | 22,936,352 | 7,651,583 | 9,100,145 | 5,765 | 11,951,231 | 82,928,452 | 793,167 | 67,928,482 | 139,681,826 | 308,849,950 | 651,826,953 |
| | N | 12,014,692 | 3,047,862 | 1,931,158 | 35,233,514 | 153,350,286 | 147,688,733 | 1,650,399 | 1,147,956,890 | 2,896,807,880 | 96,905,666 | 4,496,587,080 |

Note: On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R.

Off-site Releases include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release.

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

O: Original Industries. N: New Industries.

*Only fume or dust forms are reportable.



Appendix B —TRI On- and Off-site Releases and Waste Management of Metals and Metal Compounds, O and N Industries

Table B-2. TRI Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999

| Chemical | | | | | | | | | | | | | Off-site Releases |
|-------------------------------------|---|---------------------------|---|---|---|------------------------|--------------------------------|----------------|---------------------|---------------------------|--|----------------------|--------------------------------|
| | | Storage Only ^a | Solidification/Stabilization Metals Only ^b | Wastewater Treatment (Excluding POTWs) Metals Only ^c | Transfers to POTWs Metals Only ^d | Under-ground Injection | Landfills/Surface Impoundments | Land Treatment | Other Land Disposal | Other Off-site Management | Transfers to Waste Broker for Disposal | Unknown ^e | Transfers Off-site to Disposal |
| | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Aluminum* (CAS Number 7429-09-5) | O | 3,105,861 | 6,370,192 | 5 | 6,290 | 0 | 3,665,170 | 0 | 23,794 | 850,205 | 13,813 | 6,568 | 14,041,898 |
| | N | 0 | 17,852 | 0 | 0 | 0 | 0 | 0 | 0 | 828 | 0 | 0 | 18,680 |
| Antimony and antimony compounds | O | 7,221 | 562,686 | 16,685 | 104,977 | 5,800 | 2,596,182 | 6,664 | 50,744 | 130,451 | 79,759 | 67,615 | 3,628,784 |
| | N | 250 | 195,856 | 1,558 | 860 | 505 | 86,642 | 37,303 | 30,127 | 35,066 | 4,005 | 930 | 393,102 |
| Arsenic and arsenic compounds | O | 22,629 | 801,204 | 291 | 1,070 | 425,893 | 1,052,314 | 262 | 40,375 | 45,312 | 78,686 | 8,657 | 2,476,693 |
| | N | 0 | 545,584 | 23,478 | 33 | 750 | 1,252,911 | 32,530 | 104,924 | 120,965 | 3,327 | 645 | 2,085,147 |
| Barium and barium compounds | O | 76,642 | 1,399,960 | 99,402 | 326,691 | 268 | 5,475,106 | 135,855 | 478,870 | 681,977 | 246,152 | 152,938 | 9,073,861 |
| | N | 1 | 862,926 | 117,570 | 1,622 | 750 | 24,288,889 | 91,217 | 7,091,175 | 6,975,816 | 204,278 | 67,967 | 39,702,211 |
| Beryllium and beryllium compounds | O | 0 | 10,762 | 150 | 11 | 0 | 14,086 | 0 | 0 | 0 | 100 | 0 | 25,109 |
| | N | 0 | 0 | 0 | 0 | 0 | 40,367 | 0 | 25,968 | 755 | 0 | 0 | 67,090 |
| Cadmium and cadmium compounds | O | 70 | 373,550 | 270 | 3,386 | 920 | 758,137 | 3,500 | 38,172 | 30,722 | 58,454 | 7,198 | 1,274,379 |
| | N | 0 | 370,937 | 10 | 305 | 25 | 98,970 | 0 | 0 | 40,035 | 1,787 | 16,373 | 528,442 |
| Chromium and chromium compounds | O | 312,628 | 3,547,397 | 838,181 | 329,950 | 400,665 | 16,196,426 | 14,264 | 6,937,101 | 420,569 | 828,738 | 150,230 | 29,976,149 |
| | N | 3,242 | 1,293,092 | 23,102 | 1,734 | 62,970 | 4,639,148 | 73,206 | 409,728 | 306,361 | 118,402 | 96,085 | 7,027,070 |
| Cobalt and cobalt compounds | O | 18,333 | 58,218 | 9,573 | 13,217 | 250 | 590,618 | 140 | 6,787 | 22,899 | 43,698 | 110,028 | 873,761 |
| | N | 0 | 3,587 | 0 | 1 | 1 | 299,703 | 12,629 | 84,087 | 22,917 | 0 | 0 | 422,925 |
| Copper and copper compounds | O | 229,879 | 4,014,202 | 1,051,343 | 751,414 | 21,621 | 10,673,303 | 19,364 | 497,678 | 1,428,936 | 1,655,368 | 464,659 | 20,807,767 |
| | N | 0 | 441,455 | 5,849 | 2,715 | 970 | 4,364,132 | 40,444 | 437,345 | 1,193,896 | 62,020 | 77,952 | 6,626,778 |
| Lead and lead compounds | O | 67,092 | 16,550,183 | 45,776 | 202,338 | 12,869 | 17,201,718 | 1,245,454 | 126,736 | 304,603 | 879,465 | 105,986 | 36,742,220 |
| | N | 68,723 | 1,065,604 | 10,844 | 41,435 | 105 | 3,497,323 | 23,356 | 187,464 | 3,584,490 | 447,641 | 46,532 | 8,973,517 |

Note: Off-site Releases are from Section 6 (off-site transfers to disposal) of Form R.

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

O: Original Industries. N: New Industries.

* Only fume or dust forms are reportable.

^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).

Appendix B TRI Release and Waste Management Data for Metals and Metal Compounds, 1999



Table B-2. TRI Off-site Releases of Metals and Metal Compounds, Original and New Industries, 1999 (continued)

| Chemical | | | | | | | | | | | | | Off-site Releases |
|-------------------------------------|---|---------------------------|--|---|--|------------------------------|--|-------------------|---------------------------|---------------------------------|--|----------------------|--------------------------------------|
| | | Storage Only ^a | Solidification/ Stabilization Metals Only ^b | Wastewater Treatment (Excluding POTWs) Metals Only ^c | Transfers to POTWs Metals Only ^d | Under ground Injection | Landfills/ Surface Disposal Impound- ments | Land Treatment | Other Land Disposal | Other Off-site Management | Transfers to Waste Broker for Disposal | Unknown ^e | Transfers Off-site to Disposal |
| | | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| Manganese and manganese compounds | O | 156,297 | 14,841,207 | 3,081,900 | 753,310 | 7,017 | 31,880,458 | 241,339 | 2,201,184 | 8,243,036 | 574,424 | 196,410 | 62,176,582 |
| | N | 82,778 | 537,086 | 338 | 1,771 | 1 | 6,948,636 | 120,399 | 1,041,277 | 555,748 | 27,163 | 6,356 | 9,321,553 |
| Mercury and mercury compounds | O | 20 | 20,603 | 191 | 69 | 9 | 37,450 | 0 | 16 | 178 | 1,585 | 0 | 60,121 |
| | N | 0 | 96,589 | 0 | 0 | 0 | 662 | 0 | 0 | 1,922 | 532 | 4,384 | 104,089 |
| Nickel and nickel compounds | O | 79,183 | 2,384,001 | 376,445 | 193,765 | 72,288 | 6,702,695 | 3,611 | 192,215 | 145,108 | 471,421 | 95,427 | 10,716,159 |
| | N | 50,005 | 408,343 | 2,238 | 4,780 | 1,253 | 7,339,809 | 75,551 | 423,158 | 190,402 | 1,403,493 | 27,027 | 9,926,059 |
| Selenium and selenium compounds | O | 0 | 19,807 | 6,617 | 259 | 0 | 35,656 | 2 | 4,932 | 42,757 | 0 | 6,790 | 116,820 |
| | N | 0 | 86,828 | 124 | 0 | 15 | 494,892 | 0 | 6,479 | 1,825 | 230 | 292 | 590,685 |
| Silver and silver compounds | O | 7,700 | 1,796 | 11 | 2,838 | 0 | 99,498 | 635 | 2,062 | 52 | 758 | 283 | 115,633 |
| | N | 0 | 298,175 | 3 | 5 | 0 | 10,790 | 0 | 0 | 1,133 | 6,681 | 84 | 316,871 |
| Thallium and thallium compounds | O | 0 | 571 | 0 | 0 | 0 | 6,090 | 0 | 0 | 5 | 0 | 0 | 6,666 |
| | N | 0 | 40,916 | 12 | 0 | 0 | 114,320 | 0 | 2,050 | 1,601 | 0 | 163 | 159,062 |
| Vanadium* (CAS Number 7440-62-2) | O | 0 | 10,620 | 0 | 1,521 | 0 | 17,486 | 0 | 0 | 0 | 0 | 0 | 29,627 |
| | N | 0 | 107,000 | 0 | 0 | 0 | 62,011 | 0 | 0 | 0 | 0 | 0 | 169,011 |
| Zinc* and zinc compounds | O | 115,687 | 88,466,751 | 955,957 | 654,218 | 2,441,072 | 106,458,928 | 82,822 | 1,188,670 | 18,549,348 | 1,031,693 | 319,527 | 220,264,673 |
| | N | 195,505 | 719,688 | 3,527 | 3,122 | 280 | 9,514,436 | 92,227 | 920,377 | 4,128,196 | 75,727 | 72,258 | 15,725,343 |
| Total | O | 4,199,242 | 139,433,710 | 6,482,797 | 3,345,324 | 3,388,672 | 203,461,321 | 1,753,912 | 11,789,336 | 30,896,158 | 5,964,114 | 1,692,316 | 412,406,902 |
| | N | 400,504 | 7,091,518 | 188,653 | 58,383 | 67,625 | 63,053,641 | 598,862 | 10,764,159 | 17,161,956 | 2,355,286 | 417,048 | 102,157,635 |

Note: Off-site Releases are from Section 6 (off-site transfers to disposal) of Form R.

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

O: Original Industries. N: New Industries.

* Only fume or dust forms are reportable.

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

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

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

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

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



Appendix B —TRI Release and Waste Management Data for Metals and Metal Compounds, 1999

Table B-3. Quantities of TRI Metals and Metal Compounds in Waste, Original and New Industries, 1999

| Chemical | | Recycled | | Energy Recovery | | Treated | | Quantity Released On- and Off-site Pounds | Total Production-related Waste Managed Pounds | Non-Production-related Waste Managed Pounds |
|-----------------------------------|---|----------------------|----------------------|-----------------|-----------------|-------------------|-------------------|---|---|---|
| | | On-site Pounds | Off-site Pounds | On-site Pounds | Off-site Pounds | On-site Pounds | Off-site Pounds | | | |
| Aluminum* (CAS Number 7429-09-5) | O | 15,508,535 | 28,604,288 | 0 | 5,058 | 21,798,263 | 425,726 | 19,199,937 | 85,541,807 | 25 |
| | N | 1,013,539 | 0 | 0 | 0 | 289,500 | 127,156 | 4,320,550 | 5,750,745 | 1 |
| Antimony and antimony compounds | O | 10,326,707 | 5,026,225 | 0 | 53,103 | 822,211 | 630,099 | 3,969,220 | 20,827,565 | 213,269 |
| | N | 11,713 | 14,752 | 0 | 0 | 0 | 470 | 28,571,356 | 28,598,291 | 300,004 |
| Arsenic and arsenic compounds | O | 5,031,994 | 1,655,537 | 300 | 0 | 153,013 | 205,899 | 8,100,640 | 15,147,383 | 2,439,811 |
| | N | 65,746 | 143,165 | 0 | 0 | 0 | 112,405 | 595,363,207 | 595,684,523 | 5,200,019 |
| Barium and barium compounds | O | 52,217,129 | 2,716,885 | 6,000 | 139,668 | 5,055,878 | 798,445 | 18,332,032 | 79,266,037 | 14,173 |
| | N | 582,193 | 3,031,849 | 0 | 0 | 1,214,330 | 387,170 | 294,985,180 | 300,200,722 | 11,321 |
| Beryllium and beryllium compounds | O | 101,065 | 62,538 | 0 | 0 | 0 | 2,315 | 74,525 | 240,443 | 2 |
| | N | 9,700 | 0 | 0 | 0 | 0 | 0 | 898,112 | 907,812 | 9 |
| Cadmium and cadmium compounds | O | 3,092,021 | 839,086 | 0 | 212 | 34,017 | 31,073 | 1,944,225 | 5,940,634 | 39,154 |
| | N | 220,837 | 167,099 | 0 | 0 | 0 | 1,521 | 8,433,009 | 8,822,466 | 120,019 |
| Chromium and chromium compounds | O | 54,619,373 | 121,166,954 | 2,000 | 66,394 | 9,443,342 | 2,128,928 | 55,812,213 | 243,239,204 | 5,331,804 |
| | N | 15,941 | 2,148,824 | 0 | 0 | 93,959 | 394,888 | 97,069,410 | 99,723,022 | 43,000,536 |
| Cobalt and cobalt compounds | O | 4,735,797 | 8,885,356 | 117 | 14,204 | 1,163,005 | 79,814 | 1,343,947 | 16,222,240 | 3,811 |
| | N | 164,666 | 11,144 | 0 | 0 | 0 | 10 | 15,339,663 | 15,515,483 | 30 |
| Copper and copper compounds | O | 687,450,913 | 746,609,196 | 1,200 | 324,671 | 3,842,961 | 3,101,617 | 61,160,208 | 1,502,490,766 | 4,641,244 |
| | N | 5,368,443 | 3,883,289 | 0 | 0 | 7,265,333 | 533,299 | 1,490,742,033 | 1,507,792,397 | 330,001,092 |
| Lead and lead compounds | O | 655,768,754 | 329,657,165 | 700 | 18,492 | 1,821,109 | 3,108,433 | 43,599,113 | 1,033,973,766 | 29,097,238 |
| | N | 486,397 | 3,136,030 | 0 | 0 | 764,817 | 220,850 | 287,737,594 | 292,345,688 | 39,001,949 |
| Manganese and manganese compounds | O | 61,530,770 | 115,055,084 | 2,876 | 58,512 | 1,689,240 | 7,738,519 | 122,989,530 | 309,064,531 | 18,968,296 |
| | N | 769,421 | 971,871 | 0 | 0 | 65,792 | 83,200 | 382,507,399 | 384,397,683 | 47,000,056 |
| Mercury and mercury compounds | O | 861,988 | 40,477 | 0 | 0 | 4,021 | 5,682 | 76,702 | 988,870 | 2,412 |
| | N | 43,155 | 87,770 | 0 | 0 | 0 | 550 | 3,255,808 | 3,387,283 | 15,003 |
| Nickel and nickel compounds | O | 34,046,852 | 110,495,866 | 2,900 | 27,846 | 1,475,056 | 1,353,733 | 13,052,736 | 160,454,989 | 576,940 |
| | N | 999,461 | 1,443,880 | 0 | 0 | 107,177 | 104,304 | 62,932,713 | 65,587,535 | 5,230,057 |
| Selenium and selenium compounds | O | 574,219 | 23,662 | 0 | 0 | 3,576 | 10,393 | 489,808 | 1,101,658 | 109,704 |
| | N | 56,980 | 4 | 0 | 0 | 0 | 20 | 6,442,558 | 6,499,562 | 670,007 |
| Silver and silver compounds | O | 4,235,477 | 2,996,482 | 90,601 | 11 | 2,177 | 41,591 | 312,693 | 7,679,032 | 9,984 |
| | N | 612 | 124,761 | 0 | 0 | 0 | 144,015 | 3,424,801 | 3,694,189 | 540,012 |
| Thallium and thallium compounds | O | 9 | 0 | 0 | 0 | 0 | 366 | 201,183 | 201,558 | 60,000 |
| | N | 1,884 | 0 | 0 | 0 | 0 | 0 | 3,102,108 | 3,103,992 | 120,001 |
| Vanadium* (CAS Number 7440-62-2) | O | 113,633 | 35,862 | 0 | 0 | 0 | 2,809 | 132,442 | 284,746 | 27 |
| | N | 0 | 0 | 0 | 0 | 0 | 0 | 479,721 | 479,721 | 90,000 |
| Zinc and zinc compounds* | O | 86,965,221 | 335,353,178 | 142,280 | 231,402 | 24,153,593 | 27,111,074 | 333,599,223 | 807,555,971 | 233,011,799 |
| | N | 9,808,546 | 2,665,741 | 0 | 0 | 66,270 | 292,548 | 818,551,130 | 831,384,235 | 34,034,413 |
| Total | O | 1,677,180,457 | 1,809,223,841 | 248,974 | 939,573 | 71,461,462 | 46,776,516 | 684,390,377 | 4,290,221,200 | 294,519,693 |
| | N | 19,619,234 | 17,830,179 | 0 | 0 | 9,867,178 | 2,402,406 | 4,104,156,352 | 4,153,875,349 | 505,334,529 |

Note: Data are from Section 8 of Form R.

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

O: Original Industries. N: New Industries.

* Only fume or dust forms are reportable.

Appendix C

Basis of OSHA Carcinogen Listing for Individual Chemicals



Under section 313, a chemical does not have to be counted towards threshold determinations and release and other waste management calculations if it is present in a mixture below a certain concentration. This is known as the section 313 “*de minimus*” concentration in mixture. When the section 313 rule was developed, EPA adopted the *de minimus* percentages from the Occupational Safety and Health Administration’s (OSHA) Hazard Communication Standards (29 CFR 1910.1900) because much of the information that industry would have relating to chemicals in mixtures would most likely be from the material safety data sheet (MSDS) on that mixture. The OSHA *de minimus* limitation is 0.1 percent if the chemical is a known or suspect carcinogen by virtue of appearing in one of three sources:

1. National Toxicology Program (NTP), “Annual Report on Carcinogens” (Latest Edition);
2. International Agency for Research on Cancer (IARC) “Monographs” (Latest Edition); or
3. 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

The *de minimus* limitation is 1.0 percent for chemicals that do not meet the above OSHA carcinogen criteria. The carcinogen designation in the list of chemicals relates to any chemical that the Agency determined met the above OSHA criteria for the 0.1 percent *de minimus* limitation. Certain metal compound categories have two *de minimus* limitations. For example, hexavalent chromium compounds and inorganic arsenic compounds meet the OSHA carcinogen criteria, while trivalent chromium compounds and organic arsenic do not meet the OSHA criteria.

Table C–1 shows the specific bases for which the individual chemical was designated as a known or suspect carcinogen. This list was updated for the 1999 TRI Public Data Release, based on a review of the most current NTP, IARC, and OSHA sources.

**Appendix C –Basis of OSHA Carcinogen
Listing for Individual Chemicals**



Table C-1 Basis of OSHA Carcinogen Listing for Individual Chemicals

| Chemical | IARC | NTP | OSHA-Z | Chemical | IARC | NTP | OSHA-Z |
|---|------|-----|--------|--|------|-----|--------|
| Acetaldehyde | 2B | P | – | Catechol | 2B | – | – |
| Acetamide | 2B | – | – | Chlordane | 2B | – | – |
| 2-Acetylaminofluorene | – | P | Z | Chlorendic acid | 2B | P | – |
| Acrylamide | 2A | P | – | p-Chloroaniline | 2B | – | – |
| Acrylonitrile | 2B | P | Z | Chloroform | 2B | P | – |
| 2-Aminoanthraquinone | – | P | – | Chloromethyl methyl ether | 1 | K | Z |
| 4-Aminoazobenzene | 2B | – | – | 3-Chloro-2-methyl-1-propene | – | P | – |
| 4-Aminobiphenyl | 1 | K | Z | Chlorophenols | 2B | – | – |
| 1-Amino-2-methylantraquinone | – | P | – | Chloroprene** | 2B | P | – |
| Amitrole | 2B | P | – | Chlorothalonil | 2B | – | – |
| o-Anisidine | 2B | – | – | p-Chloro-o-toluidine | 2A | P | – |
| o-Anisidine hydrochloride | – | P | – | Chromium (VI) compounds | 1 | K | – |
| Arsenic and inorganic arsenic compounds | 1 | K* | Z | Cobalt and cobalt compounds | 2B | – | – |
| Asbestos (friable) | 1 | K | Z | Creosote | 2A | K | – |
| Atrazine** | – | – | – | p-Cresidine | 2B | P | – |
| Benzene | 1 | K | Z | Cupferron | – | P | – |
| Benzidine | 1 | K | Z | 2,4-D**** | 2B | – | – |
| Benzoic trichloride | 2B | P | – | 2,4-D butoxyethyl ester**** | 2B | – | – |
| Beryllium and beryllium compounds | 1 | P* | – | 2,4-D butyl ester**** | 2B | – | – |
| Bis(chloromethyl)ether | 1 | K | Z | 2,4-D chlorocrotyl ester**** | 2B | – | – |
| 1,3-Butadiene | 2A | K | – | 2,4-D 2-ethylhexyl ester**** | 2B | – | – |
| 1,2-Butylene oxide | 2B | – | – | 2,4-D 2-ethyl-4-methylpentyl ester**** | 2B | – | – |
| C.I. Acid Red 114 | 2B | – | – | 2,4-Diaminoanisole | 2B | – | – |
| C.I. Direct Black 38 | 2A | K | – | 2,4-Diaminoanisole sulfate | – | P | – |
| C.I. Direct Blue 6 | 2A | K | – | 4,4'-Diaminodiphenyl ether | 2B | – | – |
| C.I. Direct Brown 95 | 2A | – | – | 2,4-Diaminotoluene | 2B | P | – |
| C.I. Food Red 5 | 2B | – | – | Diaminotoluene (mixed isomers) | 2B | P | – |
| C.I. Solvent Yellow 3 (o-aminoazotoluene) | 2B | P | – | 1,2-Dibromo-3-chloropropane | 2B | P | Z |
| C.I. Solvent Yellow 34 (Auramine) | 2B | – | – | 1,2-Dibromoethane | 2A | P | – |
| Cadmium and cadmium compounds | 1 | K* | – | 1,4-Dichlorobenzene | 2B | P | – |
| Carbon tetrachloride | 2B | P | – | Dichlorobenzene (mixed isomers) | 2B | P | – |

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IARC: 1–The chemical is carcinogenic to humans; 2A–The chemical is probably carcinogenic to humans; 2B–The chemical is possibly carcinogenic to humans.

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OSHA: Z–The chemical appears at 29 CFR part 1910 Subpart Z.

*Certain compounds.

**IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).

***NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

****Chlorophenoxy herbicides (IARC 2B).

*****IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)



Appendix C —Basis of OSHA Carcinogen Listing for Individual Chemicals

Table C-1 Basis of OSHA Carcinogen Listing for Individual Chemicals (continued)

| Chemical | IARC | NTP | OSHA-Z | Chemical | IARC | NTP | OSHA-Z |
|---|------|-----|--------|---|------|-----|--------|
| 3,3'-Dichlorobenzidine | 2B | P | Z | 2,4-D propylene glycol butyl ether ester**** | 2B | – | – |
| 3,3'-Dichlorobenzidine dihydrochloride | 2B | P | – | 2,4-D sodium salt**** | 2B | – | – |
| 3,3'-Dichlorobenzidine sulfate | 2B | P | – | Epichlorohydrin | 2A | P | – |
| Dichlorobromomethane | 2B | P | – | Ethyl acrylate | 2B | – | – |
| 1,2-Dichloroethane | 2B | P | – | Ethyl benzene***** | 2B | – | – |
| Dichloromethane | 2B | P | – | Ethyleneimine | – | – | Z |
| trans-1,3-Dichloropropene | 2B | – | – | Ethylene oxide | 1 | K | Z |
| 1,3-Dichloropropylene | 2B | P | – | Ethylene thiourea | 2B | P | – |
| Dichlorvos | 2B | – | – | Formaldehyde | 2A | P | Z |
| Diepoxybutane | 2B | P | – | Heptachlor | 2B | – | – |
| Di-(2-ethylhexyl)phthalate | – | P | – | Hexachlorobenzene | 2B | P | – |
| Diethyl sulfate | 2A | P | – | alpha-Hexachlorocyclohexane | 2B | P | – |
| Diglycidyl resorcinol ether | 2B | P | – | Hexachloroethane | 2B | P | – |
| Dihydrosafrole | 2B | – | – | Hexamethylphosphoramide | 2B | P | – |
| 3,3'-Dimethoxybenzidine | 2B | P | – | Hydrazine | 2B | P | – |
| 3,3'-Dimethoxybenzidine dihydrochloride | 2B | P | – | Hydrazine sulfate | – | P | – |
| 3,3'-Dimethoxybenzidine hydrochloride | 2B | P | – | Lead and inorganic lead compounds | 2B | – | Z |
| 4-Dimethylaminoazobenzene | 2B | P | Z | Lindane | 2B | P | – |
| 3,3'-Dimethylbenzidine | 2B | P | – | Mecoprop**** | 2B | – | – |
| 3,3'-Dimethylbenzidine dihydrochloride | 2B | P | – | Methoxone**** | 2B | – | – |
| 3,3'-Dimethylbenzidine dihydrofluoride | 2B | P | – | Methoxone sodium salt***** | 2B | – | – |
| Dimethylcarbaryl chloride | 2A | P | – | 4,4-Methylenebis (2-chloroaniline) | 2A | P | – |
| N,N-Dimethylformamide** | – | – | – | 4,4'-Methylenebis (N,N-dimethyl) benzeneamine | 2B | P | – |
| 1,1-Dimethylhydrazine | 2B | P | – | 4,4'-Methylenedianiline | 2B | P | Z |
| Dimethyl sulfate | 2A | P | – | Michler's ketone | – | P | – |
| 2,4-Dinitrotoluene | 2B | – | – | Mustard gas | 1 | K | – |
| 2,6-Dinitrotoluene | 2B | – | – | alpha-Naphthylamine | – | – | Z |
| 1,4-Dioxane | 2B | P | – | beta-Naphthylamine | 1 | K | Z |
| 1,2-Diphenylhydrazine | – | P | – | Nickel | 2B | P | – |
| 2,4-D isopropyl ester**** | 2B | – | – | Nickel compounds | 1 | P* | – |
| 2,4-DP**** | 2B | – | – | Nitritotriacetic acid | – | P | – |

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*Certain compounds.

**IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).

***NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

****Chlorophenoxy herbicides (IARC 2B).

*****IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

**Appendix C –Basis of OSHA Carcinogen
Listing for Individual Chemicals**



Table C-1 Basis of OSHA Carcinogen Listing for Individual Chemicals (continued)

| Chemical | IARC | NTP | OSHA-Z | Chemical | IARC | NTP | OSHA-Z |
|---|------|-----|--------|---|------|-----|--------|
| Nitrobenzene | 2B | – | – | 7,12-Dimethylbenz(a)anthracene | 2B | – | – |
| 4-Nitrobiphenyl | – | – | Z | Indeno[1,2,3-cd]pyrene | 2B | P | – |
| Nitrofen | 2B | P | – | 5-Methylchrysene | 2B | P | – |
| Nitrogen mustard | 2A | – | – | 1-Nitropyrene | 2B | P | – |
| 2-Nitropropane | 2B | P | – | Potassium bromate | 2B | – | – |
| N-Nitrosodi-n-butylamine | 2B | P | – | Propane sultone | 2B | P | – |
| N-Nitrosodiethylamine | 2A | P | – | beta-Propiolactone | 2B | P | Z |
| N-Nitrosodimethylamine | 2A | P | Z | Propyleneimine | 2B | P | – |
| N-Nitrosodi-n-propylamine | 2B | P | – | Propylene oxide | 2B | P | – |
| N-Nitroso-N-ethylurea | 2A | P | – | Saccharin (manufacturing)** | – | – | – |
| N-Nitroso-N-methylurea | 2A | P | – | Safrole | 2B | P | – |
| N-Nitrosomethylvinylamine | 2B | P | – | Sodium o-phenylphenoxide | 2B | – | – |
| N-Nitrosomorpholine | 2B | P | – | Styrene | 2B | – | – |
| N-Nitrosornicotine | 2B | P | – | Styrene oxide | 2A | – | – |
| N-Nitrosopiperidine | 2B | P | – | Tetrachloroethylene | 2B | P | – |
| Pentachlorophenol | 2B | – | – | Thioacetamide | 2B | P | – |
| Phenytion | 2B | P | – | 4,4'-Thiodianiline | 2B | – | – |
| Polychlorinated alkanes (C12, 60% chlorinated) | – | P | – | Thiourea | 2B | P | – |
| Polybrominated biphenyls (PBBs) | 2B | P | – | Toluene-2,4-diisocyanate | 2B | P | – |
| Polychlorinated biphenyls (PCBs) | 2A | P | – | Toluene-2,6-diisocyanate | 2B | P | – |
| Polycyclic aromatic compounds (PACs): | | | | Toluene diisocyanate (mixed isomers) | 2B | P | – |
| Benzo(a)anthracene | 2A | P | – | o-Toluidine | 2A | P | – |
| Benzo(b)fluoranthene | 2B | P | – | o-Toluidine hydrochloride | – | P | – |
| Benzo(j)fluoranthene | 2B | P | – | Toxaphene | 2B | P | – |
| Benzo(k)fluoranthene | 2B | P | – | Trichloroethylene | 2A | P | – |
| Benzo(rst)pentaphene | 2B | – | – | 2,4,6-Trichlorophenol | 2B | P | – |
| Benzo(a)pyrene | 2A | P | – | 1,2,3-Trichloropropane | 2A | P | – |
| Dibenz(a,h)acridine | 2A | P | – | Tris(2,3-dibromopropyl) phosphate | 2A | P | – |
| Dibenz(a,j)acridine | 2B | P | – | Trypan blue | 2B | – | – |
| Dibenzo(a,h)anthracene | 2B | P | – | Urethane | 2B | P | – |
| 7H-Dibenzo(c,g)carbazole | 2B | P | – | Vinyl acetate | 2B | – | – |
| Dibenzo(a,e)pyrene | 2B | P | – | Vinyl bromide | 2A | – | – |
| Dibenzo(a,h)pyrene | 2B | P | – | Vinyl chloride | 1 | K | Z |
| Dibenzo(a,l)pyrene | 2B | P | – | 2,6-Xylidine | 2B | – | – |

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*Certain compounds.

**IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).

***NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

****Chlorophenoxy herbicides (IARC 2B).

*****IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

Appendix D

Public Access to the Toxics Release Inventory and Related Information

Appendix D



Public Access to the Toxics Release Inventory and Related Information

EPA makes its Toxic Releases Inventory (TRI) and other related information available to the public both electronically and in hard copy. Every year, EPA enhances its databases to make the data easier to access and search and expands its outreach activities to include new potential users of the data. In May 2000, EPA released a new TRI tool—the TRI Explorer. The TRI Explorer provides access to TRI data that is both easy to understand and flexible to use. In addition to this new tool, the data are available in a wide variety of computer and hard copy formats to meet most user's

needs. TRI publications can be obtained from EPA's National Service Center for Environmental Publications (NSCEP). TRI data can also be accessed online at EPA's web site, <http://www.epa.gov/tri>.

In addition, state officials receive TRI reports from facilities in their jurisdiction, and many states publish reports highlighting state and local trends. Tables D-1 through D-3 highlight the products and services available from the above mentioned resources and several others.

| | |
|---|---|
| National Service Center for Environmental Publications (NSCEP) P.O. Box 42419 Cincinnati, OH 45242-2419 Call: (800) 490-9198 (513) 489-8190 Fax: (513) 489-8695 Hours: 7:30 a.m. – 5:30 p.m., EST Order online: http://www.epa.gov/ncepihom | TRI User Support Service (TRI-US) U.S. EPA Ariel Rios Building 1200 Pennsylvania Avenue, NW (MC-2844) Washington, DC 20460 Call: (202) 260-1531 Fax: (202) 401-2347 Email: tri.us@epamail.epa.gov |
| U.S. EPA EPCRA Hotline (800) 424-9346 (703) 412-9810 Hours: 9:00 a.m. – 6:00 p.m., EST | U.S. EPA TRI Website http://www.epa.gov/tri http://www.epa.gov/tri/tri99 |



Table D-1. Toxics Release Inventory Products

| Product | Supplier | Order Information |
|---|---|--|
| 1999 TRI Public Data Release Report <p>The 1999 TRI Public Data Release Report is the TRI annual report that provides a general overview of the TRI data and information on trends. The State Fact Sheets are released with the Public Data Release Report and provide a brief summary of the TRI data by State.</p> <ul style="list-style-type: none"> ◆ 1999 TRI Public Data Release Report ◆ 1999 TRI State Fact Sheets ◆ 1999 TRI Executive Summary | NSCEP TRI-US | <p>Free while supplies last</p> <p>Free while supplies last</p> <p>EPA 260-R-01-001 EPA 260-F-01-001 EPA 260-S-01-001</p> |
| | <p>These documents can be viewed, printed, or downloaded on the Internet at http://www.epa.gov/tri/tri99</p> | |
| Chemicals in Your Community <p>This pamphlet summarizes the information the public can obtain under EPCRA and CAA; how to obtain such information; other information that may also be useful; and how to use these various sources of information to build a snapshot of chemicals stored and released in your community.</p> | NSCEP | <p>Free</p> <p>EPA 550-K-99-001</p> |
| Act Locally: Preventing Pollution at the Community Level with Resources that Control Pesticide and Toxic Chemical Use <p>This catalogue describes tools, resources, and programs of EPA's Office of Prevention, Pesticides and Toxic Substances (OPPTS). It provides information on the characteristics and effects of pesticides and industrial chemicals. These "tools" include databases, computer programs for chemical screening, funding resources, access to information hotlines, and descriptions of programs and initiatives that may be useful in protecting local environments.</p> | <p>The catalogue can be viewed, printed, or downloaded on the Internet at http://www.epa.gov/opptintr/cbep/actlocal</p> | Free |
| Chemical Fact Sheets <p>EPA is continuing to develop Chemical Fact Sheets as part of its effort to provide the public with information on chemicals. Two types of summaries are available for each chemical. One is a two-page document providing a non-technical summary of chemical information. The other is a longer, referenced presentation of information that provides the basis for statements included in the shorter summary.</p> | TSCA Assistance Information Services Hotline <p>(202) 554-1404</p> | Free |
| | <p>The Chemical Fact Sheets can be downloaded from the Internet at http://www.epa.gov/chemfact</p> | |



Appendix D —Public Access to the Toxics Release Inventory and Related Information

Table D-2. Toxics Release Inventory Assistance Services

| Assistance Service | Contact Information |
|---|---|
| TRI User Support Service (TRI-US) The TRI-US Service provides general information about the TRI and support for access to any of the data formats. TRI specialists can help determine the data product best suited for an individual user's needs. | TRI User Support Service (TRI-US) U.S. EPA 1200 Pennsylvania Avenue, NW (MC-2844) Washington, DC 20460 (202) 260-1531 |
| EPCRA Hotline The Emergency Planning and Community Right-to-Know (EPCRA) Hotline provides regulatory, policy, and technical assistance to the regulated community, federal agencies, local and state governments, the public, and other interested parties in response to questions related to EPCRA. The Hotline provides information on the availability of documents related to EPCRA and copies of selected EPCRA documents on a limited basis. For more information about the EPCRA Hotline, visit their Internet Web site at: http://www.epa.gov/epaoswer/hotline . | EPCRA Hotline (800) 424-9346 (703) 412-9810 TDD: (800) 553-7672 TDD: (703) 412-3323 |

Table D-3. Toxics Release Inventory On-line Services

| On-line Services | Web Address/Contact Information |
|---|---|
| U.S. Environmental Protection Agency (EPA) ◆ EPA Home Page ◆ Toxics Release Inventory (TRI) Home Page ◆ TRI Explorer—provides access EPA created the TRI Explorer to provide access to TRI data that is both easy to understand and flexible to use. The TRI Explorer will generate on- and off-site release reports for facilities, chemicals, geographic areas, or industry type (SIC code) at the county, state, and national level. ◆ TRI 1999 Data Release Page—provides access to information relating to the 1999 TRI data release. Includes press materials, data summary information, questions and answers, and other information about 1999 TRI data. ◆ EPA Envirofacts—provides access to TRI data. Provides user defined searches of the TRI database by facility name, geographic location, SIC Code, or chemical name and produces reports on the facilities and maps their locations. A variety of user specified parameters let users point and click to customize their searches. | http://www.epa.gov http://www.epa.gov/tri/ http://www.epa.gov/triexplorer/ http://www.epa.gov/tri/tri99 http://www.epa.gov/enviro/html/toxic_releases.html |
| TOXNET® , the National Library of Medicine's (NLM) Toxicology Data Network, provides free access to TRI data. Users can search by chemical or other name, chemical name fragment, or Chemical Abstracts Service Registry Number. Also searchable are facility or parent company name, state, city, county, or zip code. Search results can be limited to releases greater than a specified number of pounds, and individual releases can be summed together to display a total amount. | http://toxnet.nlm.nih.gov/ |



Table D-3. Toxics Release Inventory On-line Services *(continued)*

| On-line Services | Web Address/Contact Information |
|---|---|
| Right-to-Know Network is operated by two nonprofit organizations (OMB Watch and the Center for Public Data Access). RTK Net provides free access to TRI data and enables users to search by geographic area, facility, industry, parent company, or off-site waste transfer. | http://www.rtknet.org/trisearch.html |
| EPA's Integrated Risk Information System (IRIS) is an electronic database containing information on human health effects that may result from exposure to various chemicals in the environment. IRIS was initially developed for EPA staff in response to a growing demand for consistent information on chemical substances for use in risk assessments, decision-making and regulatory activities. The information in IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences. | http://www.epa.gov/iris |

Appendix E

EPA Regional Office and State TRI Contacts



EPA Regional Section 313 Coordinators

USEPA Region 1

***Connecticut, Maine, Massachusetts,
New Hampshire, Rhode Island, Vermont***

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USEPA Region 2

***New Jersey, New York, Puerto Rico,
Virgin Islands***

Nora Lopez
Pesticides and Toxics Substances Branch
USEPA Region 2 (MS-105)
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USEPA Region 3

***Delaware, District of Columbia,
Maryland, Pennsylvania, Virginia,
West Virginia***

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USEPA Region 4

***Alabama, Florida, Georgia, Kentucky,
Mississippi, North Carolina,
South Carolina, Tennessee***

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USEPA Region 4
Atlanta Federal Center
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USEPA Region 5

***Illinois, Indiana, Michigan, Minnesota,
Ohio, Wisconsin***

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Chicago, IL 60604
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USEPA Region 6

***Arkansas, Louisiana, New Mexico,
Oklahoma, Texas***

Warren Layne
Pesticides and Toxics Substances Branch
USEPA Region 6 (6PDT)
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USEPA Region 7

Iowa, Kansas, Missouri, Nebraska

Stephen Wurtz
Air, RCRA and Toxics Division
USEPA Region 7 (ARTD/CRIB)
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Kansas City, KS 66101
(913) 551-7315
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USEPA Region 8

***Colorado, Montana, North Dakota,
South Dakota, Utah, Wyoming***

Joyel Dhieux
Office of Pollution Prevention, Pesticides
and Toxics
USEPA Region 8 (8P-P3T)
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USEPA Region 9

***Arizona, California, Hawaii, Nevada,
American Samoa, Guam,
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USEPA Region 10

Alaska, Idaho, Oregon, Washington

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USEPA Region 10 (WCM-128)
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State TRI Program Officials

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Alaska

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Department of Environmental
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Government Preparedness and Response
Program
410 Willoughby Ave., Suite 105
Juneau, AK 99801-1795
(907) 465-5220
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cstephen@envircon.state.ak.us

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact whom provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



American Samoa

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International (684) 633-2304
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Arkansas Department of Emergency
Management
1835 South Donaghey
Conway, AR 72032

California

California Environmental Protection
Agency
Office of Environmental Information
Management
P.O. Box 806
Sacramento, CA 95812-0806

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Delaware

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Program
Delaware Air Quality Management Section
EPCRA Reporting Program
156 South State St.
Dover, DE 19901
(302) 739-4791
Fax: (302) 739-3106
dfees@dnrec.state.de.us

District of Columbia

Michele Penick
Environmental Planning Specialist
Emergency Response Commission for
Title III
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Washington, DC 20009
(202) 673-2101, ext. 3159
Fax: (202) 673-2290
mpenick-oep@dcgov.org

Florida

Sam Brackett
State Emergency Response Commission
Florida Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100
(850) 413-9970
Fax: (850) 488-1739
sam.brackett@dca.state.fl.us

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Appendix E —EPA Regional Office and State TRI Contacts

Georgia

Bert K. Langley
Georgia Environmental Protection Division
7 Martin Luther King, Jr. Dr.
Rm. 643
Atlanta, GA 30334
(404) 656-6905
Fax: (404) 657-7893
bert_langley@mail.dnr.state.ga.us

Guam

Jesus Salas, Administrator
Guam Environmental Protection Agency
P.O. Box 22439, GMF
Barrigada, Guam 96921
International (671) 475-1658
Fax: (671) 477-9402

Conchita S.N. Taitano, Division
Administrator*
Guam Environmental Protection Agency
Air and Land Division
P.O. Box 20439
Barrigada, Guam 96921
International (671) 646-8863
Fax: (671) 477-9402
taitano@kuentos.guam.net

Hawaii

Marsha Graf
Hawaii State Emergency Response
Commission
Hawaii Department of Health
919 Ala Moana Blvd., 3rd Fl., Rm. 206
Honolulu, HI 96814
(808) 586-4249
Fax: (808) 586-7537
heer@eha.health.state.hi.us

Idaho

Bill Bishop
Bureau of Hazardous Materials
4040 Guard St., Bldg. 600
Gowen Field
Boise, ID 83705-5004
(208) 422-5726
Fax: (208) 422-4485
bbishop@bds.state.id.us

Illinois

Stan Ostrem (Temporary)
Office of Chemical Safety #28
Illinois Environmental Protection Agency
1021 North Grand Ave., East
P.O. Box 19276
Springfield, IL 62794-9276
(217) 785-5735
Fax: (217) 782-1431
epa8579@epa.state.il.us

Certified or Express Mail ONLY:
Stan Ostrem
Office of Chemical Safety #28
Illinois Environmental Protection Agency
1021 North Grand Ave., East
Springfield, IL 62702

Indiana

John B. Chavez, Chief
Pollution Prevention Branch
Office of Pollution Prevention and
Technical Assistance
Indiana Government Center North
100 N. Senate Ave.
P.O. Box 6015
Indianapolis, IN 46206
(317) 232-6661
Fax: (317) 233-5627
jchavez@dem.state.in.us

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Iowa

Stuart Schmitz, Supervisor
Contamination Sites Section
Iowa Department of Natural Resources
900 E. Grand Ave.
Des Moines, IA 50319
(515) 242-5241
Fax: (515) 281-8895
stuart.schmitz@dnr.state.ia.us

Kansas

Scott Bangert
Kansas Department of Health and
Environment
Right-to-Know Program
J St. and 2 North
Forbes Field Bldg. 283
Topeka, KS 66620
(785) 296-1689
Fax: (785) 296-1545
sbangert@kdhe.state.ks.us

Kentucky

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Kentucky Department for Environmental
Protection
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Louisiana

Linda Brown
Departmental of Environmental Quality
Office of Environmental Assessment
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lindab@deq.state.la.us

Certified Mail/FedEx:

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Office of Environmental Assessment
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Maine

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Senior Hazardous Materials Planner
State Emergency Management Agency
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rayna.b.leibowitz@state.me.us

Maryland

Patricia Williams
MDE/TARSA
Community Right-to-Know
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Baltimore, MD 21224
(410) 631-3800
Fax: (410) 631-3873
pwilliams@mde.state.md.us

Massachusetts

Walter Hope
Massachusetts Department of
Environmental Protection
Bureau of Waste Prevention
1 Winter St.
Boston, MA 02108
(617) 292-5982
Fax: (617) 292-5858
walter.hope@state.ma.us

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Michigan

Robert Jackson
Pollution Prevention Technical Assistance
Division
Michigan Department of Environmental
Quality
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(517) 373-2731
Fax: (517) 241-7966
JACKSORC@state.mi.us

Certified Mail ONLY:

Robert Jackson
Pollution Prevention Technical Assistance
Division
Michigan Department of Environmental
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Minnesota

Steve Tomlyanovich
Department of Public Safety
Emergency Response Commission
444 Cedar St., Suite 223
St. Paul, MN 55101
(651) 282-5396
Fax: (651) 296-0459
steve.tomlyanovich@state.mn.us

Mississippi

John David Burns, TRI Coordinator
Mississippi Department of Environmental
Quality
P.O. Box 20305
Jackson, MS 39289-1305
(601) 961-5005
Fax: (601) 961-5660
Community Right-to-Know Hotline:
1 (800) 535-0202
john_burns@deq.state.ms.us

Certified Mail ONLY:

John David Burns
Mississippi Department of Environmental
Quality
1410 Riverside Dr.
Jackson, MS 39202

Missouri

Gene Nickel
Technical Assistance Program
Missouri Department of Natural Resources
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Jefferson City, MO 65102
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Fax: (573) 526-5808
nrnicke@mail.dnr.state.mo.us

Certified Mail ONLY:

Gene Nickel
Technical Assistance Program
Missouri Department of Natural Resources
1659 East Elm St.
Jefferson City, MO 65101

Montana

Tom Ellerhoff
Montana Emergency Response
Commission DEQ
Metcalf Bldg.
1520 East 6th Ave.
Helena, MT 59620-0901
(406) 444-5263
Fax: (406) 444-4386
tellerhoff@state.mt.us

Navajo Nation

Phoebe Yazzie
Department of Emergency Management
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Window Rock, AZ 86515
(520) 871-6892
Fax: (520) 871-7261

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Certified Mail/FedEx ONLY:

Department of Emergency Management
Window Rock Blvd., 2nd Fl.
Fire and Rescue Bldg.
Window Rock, AZ 86515

Nebraska

Donnie Zach
SARA Title III and NEPCRA Coordinator
Nebraska Department of Environmental
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SARA Title III and NEPCRA Coordinator
Nebraska Department of Environmental
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Alene Coulson
Nevada Division Environmental Protection
333 West Nye Ln., Rm. 138
Carson City, NV 89706-0851
acoulson@ndep.carson-city.nv.us

Form R Package ONLY:

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c/o State Emergency Response Commission
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Carson City, NV 89711-0925
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Fax: (775) 687-6396

New Hampshire

Leland Kimball
New Hampshire Office of Emergency
Management Agency, Title III Program
State Office Park South
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Concord, NH 03301
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Fax: (603) 225-7341
leek@nhoem.state.nh.us

New Jersey

Andrew Opperman
Department of Environmental Protection
EPCRA Section 313
Bureau of Chemical Release Information
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(609) 292-6714
Fax: (609) 633-7031
aopperma@dep.state.nj.us

New Mexico

Max Johnson, Coordinator
New Mexico Emergency Response
Commission
Technological Hazards Bureau
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Santa Fe, NM 87504-1628
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Appendix E —EPA Regional Office and State TRI Contacts

New York

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North Carolina

Richard Berman
EPCRA Program Management
North Carolina Emergency Response
Commission
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Raleigh, NC 27603-1335
(919) 733-1361
Fax: (919) 733-2860
nc-sara@ncem.org

U.S. Postal Service ONLY:
4714 Mail Service Center
Raleigh, NC 27699-4714

North Dakota

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North Dakota State Division of Emergency
Management
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Bismarck, ND 58502-5511
(701) 328-8100
Fax: (701) 328-8181
rdeboer@state.nd.us

Certified Mail ONLY:

Ray De Boer
HCPR Program Plans Operations and
Mitigation Section
North Dakota State Division of Emergency
Management
Fraire Barracks Rd., Bldg. 35
Bismarck, ND 58506-5511

Ohio

Cindy DeWulf
Ohio U.S. Environmental Protection Agency
P.O. Box 1049
Columbus, OH 43216-1049
(614) 644-3606
Fax: (614) 644-3681
cindy.dewulf@epa.state.oh.us

Certified Mail ONLY:

Cindy DeWulf
Ohio U.S. Environmental Protection Agency
Lazarus Government Center
122 South Front St.
Columbus, OH 43215

Oklahoma

Monty Elder
Department of Environmental Quality
Risk Communication
P.O. Box 1677
Oklahoma City, OK 73101-1677
(405) 702-1017
(800) 869-1400
Fax: (405) 702-1001
monty.elder@deqmail.state.ok.us

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



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Fax: (503) 373-1825
Bob.ALBERS@state.or.us

Pennsylvania

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Bureau of PennSafe
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7th and Forster St., Rm. 1623
Harrisburg, PA 17120
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Fax: (717) 783-5099
pennsafe@dli.state.pa.us

Puerto Rico

Genaro Torres
Director of Superfund and Emergencies
Title III—SARA Section 313
Environmental Quality Board
Fernandez Junco Station
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(787) 766-2823
Fax: (787) 766-0150
jcaterr@prtc.net

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Environmental Quality Board, Emergency
Response and Remedial Office
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Hato Rey, PR 00917

Rhode Island

Karen Slattery
Rhode Island Department of
Environmental Management
Division of Air Resources
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Providence, RI 02908
Attn: Toxic Release Inventory
(401) 222-2808, ext. 7030
Fax: (401) 222-2017
kslatter@dem.state.ri.us

South Carolina

Michael Juras
Community Right-to-Know
South Carolina Department of Health and
Environmental Control
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Columbia, SC 29201
(803) 898-4385
Fax: (803) 898-4117
jurasms@columb31.dhec.state.sc.us

South Dakota

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South Dakota Department of Environment
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Pierre, SD 57501-3181
(605) 773-3296
Fax: (605) 773-6035
leeann.smith@state.sd.us

Tennessee

Betty Eaves, Administrator
Tennessee Emergency Response Council
Tennessee Emergency Management
Agency
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(615) 741-2986
Fax: (615) 242-9635
beaves@tnema.org

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Texas

Kenneth Kidd
U.S. Postal Service Deliver/Certified Mail
Toxics Release Inventory Program, MC 164
Texas Natural Resource Conservation
Commission
P.O. Box 13087
Austin, TX 78711-3087
(512) 239-6957
Fax: (512) 239-1515
kkidd@tnrcc.state.tx.us

Overnight Express Mail ONLY:

Kenneth Kidd
Toxics Release Inventory Program, MC 164
Texas Natural Resource Conservation
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12100 Park 35 Circle
Bldg. E., Third Fl.
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Utah

Neil Taylor
Utah Division of Environmental Response
and Remediation
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ntaylor@deq.state.ut.us

Vermont

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Conservation
Environmental Assistance Division
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Resources
Division of Environmental Protection
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Christianshead, St. Croix 00820-5965
(340) 773-0565 (St. Croix)
Fax: (340) 773-9310
(340) 777-4577 (St. Thomas)
Fax: (340) 774-5416
hlgrif12@viaccess.net

Virginia

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VERC
Virginia Department of Environmental
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SARA Title III Program
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Dona Huang
SARA Title III Program
Virginia Department of Environmental
Quality
629 E. Main St.
Richmond, VA 23219

Washington

Idell Hansen
Department of Ecology
Community Right-to-Know Unit
P.O. Box 47659
Olympia, WA 98504-7659
(360) 407-6727 or (800) 633-7585
Fax: (360) 407-6715
ihan461@ecy.wa.gov

Please note that a few states and territories have two TRI contacts. An asterisk (*) identifies the technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms. The public contact provides assistance to the public in using TRI data.



Federal Express or UPS Mail:

Idell Hansen
Department of Ecology
Community Right-to-Know Unit
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Lacey, WA 98503

West Virginia

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West Virginia Emergency Response
Commission
West Virginia Office of Emergency Services
1900 Kanawha Blvd., Bldg. 1, Rm. EB-80
Charleston, WV 25305-0360
(304) 558-5380
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jpack1@wvoes.state.wv.us

Wisconsin

Tara L. Edblom
Environmental Toxicologist & WI Toxic
Release Inventory Administrator
Bureau of Integrated Science Services
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Madison, WI 53707-7921
(608) 264-6043
Fax: (608) 267-5231
edblot@mail01.dnr.state.wi.us

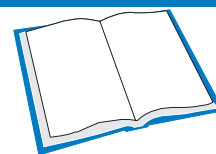
Wyoming

Bobbi Tenborg
Chief, Plans Division
Wyoming Emergency Management Agency
5500 Bishop Blvd.
Cheyenne, WY 82009-3302
(307) 777-4910
Fax: (307) 635-6017
btenborg@hotmail.com

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Appendix F
TRI Form R
and Form A for 1999

Appendix F



TRI Form R and Form A for 1999

Facilities reporting to the Toxics Release Inventory submit their information on TRI's Form R. If a facility's total annual reportable amount of a chemical does not exceed 500 pounds, and the facility does not manufacture, process, or otherwise use more than 1 million pounds of the chemical, it may submit a Form A certification statement. (Form A certification statement reporting is further explained in Chapter 1.) This appendix supplies copies of the Form R and Form A certification statement for the 1999 reporting year.

FORM R

The 1999 Form R is divided into two parts:

Part I, Facility Identification Information, contains information on such matters as name, address, parent company information, and contact names and phone numbers for the facility.

Part II, Chemical-Specific Information, contains information such as chemical identity, facility activities and uses of the chemical,

amounts of on- and off-site releases and transfers off-site for further waste management, on-site waste treatment methods and efficiencies, on- and off-site waste management quantities, and information on source reduction and recycling activities.

FORM A Certification Statement

The 1999 Form A certification statement consists of facility identification information and chemical identification, as in Form R. Facilities do not report on the Form A certification statement amounts or other information about their uses, releases, or waste management of the chemical.

Readers who are interested in a more in-depth understanding of who is required to report to TRI and how to fill out the forms, should refer to the EPCRA Information Hotline at 1-800-424-9346. Reporting software, forms, and instructions for the current reporting year are available from EPA's Web site at <http://www.epa.gov/tri/report.htm>.

**EPA**United States
Environmental Protection
Agency**FORM R****TOXIC CHEMICAL RELEASE
INVENTORY REPORTING FORM**Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986,
also known as Title III of the Superfund Amendments and Reauthorization Act**WHERE TO SEND COMPLETED FORMS:** 1. EPCRA Reporting Center
P.O Box 3348
Merrifield, VA 22116-3348
ATTN: TOXIC CHEMICAL RELEASE INVENTORY
2. APPROPRIATE STATE OFFICE
(See instructions in Appendix F)Enter "X" here if this
is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.**PART I. FACILITY IDENTIFICATION INFORMATION****SECTION 1. REPORTING YEAR _____****SECTION 2. TRADE SECRET INFORMATION**

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No (Do not answer 2.2; Go to Section 3)

2.2 Is this copy ☐ Sanitized ☐ Unsanitized
 (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:

Signature:

Date Signed:

SECTION 4. FACILITY IDENTIFICATION

| | | |
|--------------------------------|---|------------------|
| 4.1 | TRI Facility ID Number | |
| Facility or Establishment Name | Facility or Establishment Name or Mailing Address(if different from street address) | |
| Street | Mailing Address | |
| City/County/State/Zip Code | City/State/Zip Code | Country (Non-US) |

4.2 This report contains information for:
 (Important : check a or b; check c or d if applicable) a. ☐ An entire facility b. ☐ Part of a facility c. ☐ A Federal facility d. ☐ GOCO

| | | | | | | | | |
|------------|---------------------------------------|--------------------------------------|---|------------|--|-------------|--|---------|
| 4.3 | Technical Contact Name | Telephone Number (include area code) | | | | | | |
| 4.4 | Public Contact Name | Telephone Number (include area code) | | | | | | |
| 4.5 | SIC Code (s) (4 digits) | Primary a. | b. | c. | d. | e. | f. | |
| 4.6 | Latitude | Degrees | Minutes | Seconds | Longitude | Degrees | Minutes | Seconds |
| 4.7 | Dun & Bradstreet Number(s) (9 digits) | 4.8 | EPA Identification Number (RCRA I.D. No.) (12 characters) | 4.9 | Facility NPDES Permit Number(s) (9 characters) | 4.10 | Underground Injection Well Code (UIC) I.D. Number(s) (12 digits) | |
| a. | | a. | | a. | | a. | | |
| b. | | b. | | b. | | b. | | |

SECTION 5. PARENT COMPANY INFORMATION

| | | |
|------------|--|-----------------------------|
| 5.1 | Name of Parent Company | NA <input type="checkbox"/> |
| 5.2 | Parent Company's Dun & Bradstreet Number | NA <input type="checkbox"/> |

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

| | |
|------------|---|
| 1.1 | CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) |
| 1.2 | Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) |
| 1.3 | Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.) |
| 1.4 | Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category. (If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.) |
| | <div style="display: flex; justify-content: space-around; font-weight: bold;"> 1234567891011121314151617 </div> <div style="display: flex; justify-content: space-between;"> NA <input type="checkbox"/> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/> </div> |

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you completed Section 1 above.)

| | |
|------------|--|
| 2.1 | Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) |
|------------|--|

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY

(Important: Check all that apply.)

| | | |
|---|---|--|
| 3.1 Manufacture the toxic chemical: a. <input type="checkbox"/> Produce b. <input type="checkbox"/> Import If produce or import: c. <input type="checkbox"/> For on-site use/processing d. <input type="checkbox"/> For sale/distribution e. <input type="checkbox"/> As a byproduct f. <input type="checkbox"/> As an impurity | 3.2 Process the toxic chemical: a. <input type="checkbox"/> As a reactant b. <input type="checkbox"/> As a formulation component c. <input type="checkbox"/> As an article component d. <input type="checkbox"/> Repackaging e. <input type="checkbox"/> As an impurity | 3.3 Otherwise use the toxic chemical: a. <input type="checkbox"/> As a chemical processing aid b. <input type="checkbox"/> As a manufacturing aid c. <input type="checkbox"/> Ancillary or other use |
|---|---|--|

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

| | | |
|------------|--|--|
| 4.1 | <input style="width: 50px;" type="text"/> (Enter two-digit code from instruction package.) | |
|------------|--|--|

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

| | | A. Total Release (pounds/year*) (Enter range code or estimate**) | B. Basis of Estimate (enter code) | C. % From Stormwater |
|---------------------------|--|---|--------------------------------------|----------------------|
| 5.1 | Fugitive or non-point air emissions | NA <input type="checkbox"/> | | |
| 5.2 | Stack or point air emissions | NA <input type="checkbox"/> | | |
| 5.3 | Discharges to receiving streams or water bodies (enter one name per box) | | | |
| Stream or Water Body Name | | | | |
| 5.3.1 | | | | |
| 5.3.2 | | | | |
| 5.3.3 | | | | |

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box
 and indicate the Part II, Section 5.3 page number in this box. (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

| | |
|--|--|
| EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED) | TRI Facility ID Number |
| | |
| | Toxic Chemical, Category or Generic Name |
| | |

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

| | | NA | A. Total Release (pounds/year*) (enter range code** or estimate) | B. Basis of Estimate (enter code) |
|---------------|--|--------------------------|--|-----------------------------------|
| 5.4.1 | Underground Injection onsite to Class I Wells | <input type="checkbox"/> | | |
| 5.4.2 | Underground Injection onsite to Class II-V Wells | <input type="checkbox"/> | | |
| 5.5 | Disposal to land onsite | | | |
| 5.5.1A | RCRA Subtitle C landfills | <input type="checkbox"/> | | |
| 5.5.1B | Other landfills | <input type="checkbox"/> | | |
| 5.5.2 | Land treatment/application farming | <input type="checkbox"/> | | |
| 5.5.3 | Surface Impoundment | <input type="checkbox"/> | | |
| 5.5.4 | Other disposal | <input type="checkbox"/> | | |

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS
6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)
6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

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

| | | | | | | | |
|--------------------|-----------|-------|--|--------|--|-----|--|
| 6.1.B. ____ | POTW Name | | | | | | |
| | | | | | | | |
| POTW Address | | | | | | | |
| City | | State | | County | | Zip | |

| | | | | | | | |
|--------------------|-----------|-------|--|--------|--|-----|--|
| 6.1.B. ____ | POTW Name | | | | | | |
| | | | | | | | |
| POTW Address | | | | | | | |
| City | | State | | County | | Zip | |

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages

 in this box and indicate the Part II, Section 6.1 page number in this box (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

| | | | | | | | | | |
|---|--|-------|--|--------|--|-----|--|------------------|--|
| 6.2. ____ Off-Site EPA Identification Number (RCRA ID No.) | | | | | | | | | |
| Off-Site Location Name | | | | | | | | | |
| Off-Site Address | | | | | | | | | |
| City | | State | | County | | Zip | | Country (Non-US) | |
| Is location under control of reporting facility or parent company? <input style="width: 40px;" type="checkbox"/> Yes <input style="width: 40px;" type="checkbox"/> No | | | | | | | | | |

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

| A. Total Transfers (pounds/year*) (enter range code** or estimate) | B. Basis of Estimate (enter code) | C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code) |
|---|--------------------------------------|--|
| 1. | 1. | 1. M |
| 2. | 2. | 2. M |
| 3. | 3. | 3. M |
| 4. | 4. | 4. M |

6.2. ___ Off-Site EPA Identification Number (RCRA ID No.)

Off-Site location Name

Off-Site Address

City

State

County

Zip

Country
(Non-US)

Is location under control of reporting facility or parent company?

☐ Yes☐ No

| A. Total Transfers (pounds/year*) (enter range code** or estimate) | B. Basis of Estimate (enter code) | C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code) |
|---|--------------------------------------|--|
| 1. | 1. | 1. M |
| 2. | 2. | 2. M |
| 3. | 3. | 3. M |
| 4. | 4. | 4. M |

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

☐

Not Applicable (NA) -

Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

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

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box and indicate the Part II, Section 6.2/7A page number in this box : (example: 1,2,3, etc)

* For Dioxin or Dioxin-like compounds, report in grams/year

| | | | |
|--|--|---|--|
| EPA FORM R PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED) | | TRI Facility ID Number <div style="border: 1px solid black; height: 20px; width: 100%;"></div> | |
| | | Toxic Chemical, Category or Generic Name <div style="border: 1px solid black; height: 20px; width: 100%;"></div> | |

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

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

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

1

2

3

4

SECTION 7C. ON-SITE RECYCLING PROCESSES

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

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

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

| | | Column A Prior Year (pounds/year*) | Column B Current Reporting Year (pounds/year*) | Column C Following Year (pounds/year*) | Column D Second Following Year (pounds/year*) |
|--------|--|--|--|---|---|
| 8.1 | Quantity released *** | | | | |
| 8.2 | Quantity used for energy recovery onsite | | | | |
| 8.3 | Quantity used for energy recovery offsite | | | | |
| 8.4 | Quantity recycled onsite | | | | |
| 8.5 | Quantity recycled offsite | | | | |
| 8.6 | Quantity treated onsite | | | | |
| 8.7 | Quantity treated offsite | | | | |
| 8.8 | Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year) | | | | |
| 8.9 | Production ratio or activity index | | | | |
| 8.10 | Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11. | | | | |
| | Source Reduction Activities [enter code(s)] | Methods to Identify Activity (enter codes) | | | |
| 8.10.1 | | a. | b. | c. | |
| 8.10.2 | | a. | b. | c. | |
| 8.10.3 | | a. | b. | c. | |
| 8.10.4 | | a. | b. | c. | |
| 8.11 | Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one box) | | | <div style="display: flex; justify-content: space-around;"> <div>YES <input type="checkbox"/></div> <div>NO <input type="checkbox"/></div> </div> | |



**United States
Environmental Protection Agency**

**TOXIC CHEMICAL RELEASE INVENTORY
FORM A**

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center
P.O Box 3348
Merrifield, VA 22116-3348
ATTN: TOXIC CHEMICAL RELEASE INVENTORY

2. APPROPRIATE STATE OFFICE
(See instructions in Appendix F)

Enter "X" here if this
is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR _____

SECTION 2. TRADE SECRET INFORMATION

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
☐ Yes (Answer question 2.2;
Attach substantiation forms) ☐ No (Do not answer 2.2;
Go to Section 3)

2.2 Is this copy ☐ Sanitized ☐ Unsanitized
(Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that to the best of my knowledge and belief, for each toxic chemical listed in the statement, the annual reportable amount as defined in 40 CFR 372.27 (a), did not exceed 500 pounds for this reporting year and that the chemical was manufactured, processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year.

Name and official title of owner/operator or senior management official: _____ Signature: _____ Date Signed: _____

SECTION 4. FACILITY IDENTIFICATION

4.1 TRI Facility ID Number _____

Facility or Establishment Name _____ Facility or Establishment Name or Mailing Address(if different from street address) _____

Street _____ Mailing Address _____

City/County/State/Zip Code _____ City/State/Zip Code _____ Country (Non-US) _____

4.2 This report contains information for: (Important : check c or d if applicable)
c. ☐ A Federal facility d. ☐ GOCO

4.3 Technical Contact Name _____ Telephone Number (include area code) _____

4.4 Intentionally left blank

4.5 SIC Code (s) (4 digits) _____

| Primary | | b. | c. | d. | e. | f. |
|---------|--|----|----|----|----|----|
| a. | | | | | | |
| | | | | | | |

4.6 Latitude _____ Degrees _____ Minutes _____ Seconds _____ Longitude _____ Degrees _____ Minutes _____ Seconds _____

4.7 Dun & Bradstreet Number(s) (9 digits) _____ **4.8** EPA Identification Number (RCRA I.D. No.) (12 characters) _____ **4.9** Facility NPDES Permit Number(s) (9 characters) _____ **4.10** Underground Injection Well Code (UIC) I.D. Number(s) (12 digits) _____

a. _____ a. _____ a. _____ a. _____
b. _____ b. _____ b. _____ b. _____

SECTION 5. PARENT COMPANY INFORMATION

5.1 Name of Parent Company _____ NA ☐

5.2 Parent Company's Dun & Bradstreet Number _____ NA ☐

| EPA FORM A PART II. CHEMICAL IDENTIFICATION Do not use this form for reporting PBT chemicals including Dioxin and Dioxin-like Compounds* | | TRIFID: |
|--|--|-------------------|
| SECTION 1. TOXIC CHEMICAL IDENTITY | | Report ___ of ___ |
| 1.1 | CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) | |
| | | |
| 1.2 | Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) | |
| | | |
| 1.3 | Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.) | |
| | | |
| SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.) | | |
| 2.1 | Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) | |
| | | |
| SECTION 1. TOXIC CHEMICAL IDENTITY | | Report ___ of ___ |
| 1.1 | CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) | |
| | | |
| 1.2 | Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) | |
| | | |
| 1.3 | Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.) | |
| | | |
| SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.) | | |
| 2.1 | Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) | |
| | | |
| SECTION 1. TOXIC CHEMICAL IDENTITY | | Report ___ of ___ |
| 1.1 | CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) | |
| | | |
| 1.2 | Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) | |
| | | |
| 1.3 | Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.) | |
| | | |
| SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.) | | |
| 2.1 | Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) | |
| | | |
| SECTION 1. TOXIC CHEMICAL IDENTITY | | Report ___ of ___ |
| 1.1 | CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.) | |
| | | |
| 1.2 | Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.) | |
| | | |
| 1.3 | Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.) | |
| | | |
| SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.) | | |
| 2.1 | Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.) | |
| | | |

* See the TRI Reporting Forms and Instructions Manual for the list of PBT Chemicals (including Dioxin and Dioxin-like Compounds)