

Ohio EPA

1996 Toxic Release Inventory Annual Report

Ohio Environmental Protection Agency
Division of Air Pollution Control
Toxic Release Inventory Program

June 1998

Executive Summary

Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) provides for the collection and public release of annual Toxic Release Inventory (TRI) reports regarding the release of toxic chemicals into the community. In 1988, the Ohio Right-to-Know Act charged Ohio EPA with the implementation of Section 313, establishing an annual filing fee, and establishing the authority to enforce Section 313. The Pollution Prevention Act of 1990 expanded TRI to include mandatory reporting of additional waste management and pollution prevention activities.

As of April 20, 1998, the Ohio EPA received TRI reports from 1,612 facilities. The following table represents the amount of toxic releases reported by Ohio facilities in 1995 and 1996. One major change was made to the list of reportable chemicals, which resulted in significant changes in the releases reported. Non-aerosol forms of sulfuric acid and hydrochloric acid are no longer reportable. Seventy facilities reported sulfuric acid in 1995, while only 33 facilities continue to report sulfuric acid following this change. **For purposes of comparing the data and calculating the percent change with previous year's data, the following table includes only those chemicals which were reportable in both 1995 and 1996.**

Environmental Medium	Amount released in 1995 in lbs/yr	Amount released in 1996 in lbs/yr	Percent Change
Releases to Air	74,804,382	70,343,270	-5.97%
Releases to Water	5,485,410	5,722,950	4.33%
Deepwell Injection	14,469,718	13,680,825	-5.45%
Releases to Land on-site	30,260,736	28,465,627	-5.93%
Releases to POTW	16,152,157	16,397,038	1.52%
Transfers Offsite for Disposal and treatment	46,311,764	48,333,451	4.37%
Total Releases and Transfers	187,485,490	182,943,161	-2.42%
Number of Reporting Facilities	1,668	1,612	-3.36%

The following waste management data is required under the Pollution Prevention Act.

Environmental Medium	lbs/yr in 1995	lbs/yr in 1996	Percent Change
Energy Recovery On-site	91,209,009	96,814,418	6.15%
Energy Recovery Off-site	38,096,572	40,193,664	5.50%
Recycling On-site	221,623,333	192,803,408	-13.0%
Recycling Off-site	348,988,202	327,552,890	-6.14%
Treated On-site	162,025,885	155,171,725	-4.23%

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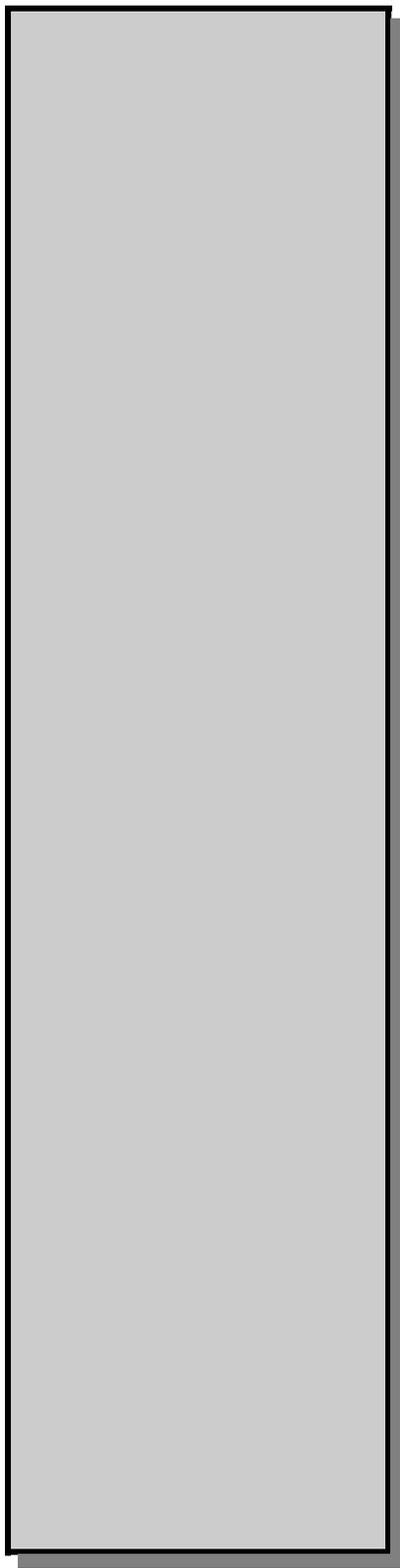
This is the ninth annual Toxic Release Inventory (TRI) Report published by Ohio Environmental Protection Agency. This report presents the data submitted by manufacturing facilities and represents the releases and transfers of toxic chemicals during calendar year 1996. This report is not intended to be an interpretation of data relative to health and environmental risks or effects, but is a summary of the information available.

The TRI reporting requirements continue to change. The 1995 and 1996 data includes an additional 282 chemicals and chemical categories which were added by U.S. EPA. For the purposes of presenting trends in this report, the additional chemicals are not included. Chemicals which were removed from the list of reportable chemicals were also removed from the data presented for past years within this report.

TRI is a constantly changing body of information. Ohio EPA receives revisions from facilities and regularly enters these changes into Ohio EPA's database. The numerical data in this report includes submissions and revisions received by Ohio EPA before April 20, 1998. Updates to the database will begin again after this report is published.

The TRI data has become a significant tool for Ohio EPA in its efforts to improve the quality of our environment as demonstrated by the following actions:

- ◆ The Division of Air Pollution Control (DAPC) uses the TRI data to assist in identifying facilities that will be subject to new regulations, such as Section 112(r), the Emergency Preparedness and Response Program required by the Clean Air Act. The TRI data is used to evaluate industries compliance with recently adopted rules concerning toxic releases. The TRI data is used to focus efforts in ambient air monitoring evaluations, and to determine county-wide levels of toxics for air pollution studies.
- ◆ The Office of Pollution Prevention used the TRI data to identify the top 100 facilities that report the most releases of toxic chemicals to the environment and invite them to participate in Ohio Prevention First. Under this program, facilities voluntarily develop comprehensive pollution prevention plans.
- ◆ The Division of Surface Water (DSW) uses the TRI data in the development of water quality based effluent limits in the National Pollutant Discharge Elimination System (NPDES) permits. DSW's pretreatment program also uses the TRI data when developing indirect discharge permits. The data is screened to determine if additional pollutants need to be evaluated for possible inclusion in the permit.
- ◆ The TRI data has been used to fill information requests from private citizens, legislators, journalists, schools, consulting firms, attorneys, business and trade associations, environmental groups, industry, and various state and federal agencies.
- ◆ The TRI data is used by the public to raise awareness regarding the toxic chemicals released from manufacturing industries within their communities.



INTRODUCTION

WHAT IS THE TOXIC RELEASE INVENTORY?

The Toxic Release Inventory, or TRI, is a publicly available database that contains specific toxic chemical release and transfer information from manufacturing facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), which Congress passed to provide information to the public about the presence and release of toxic and hazardous chemicals in communities. The Pollution Prevention Act of 1990 expanded TRI to include mandatory reporting of additional waste management and pollution prevention activities.

Each year, manufacturing facilities meeting chemical use thresholds must report their estimated releases and transfers of toxic chemicals to U.S. EPA and to the state where the facility is located. The TRI list for 1996 includes over 600 chemicals and chemical categories. A separate report is required for each chemical the facility has manufactured, processed or otherwise used in amounts exceeding the thresholds.

OHIO'S TRI PROGRAM

In 1988, the Ohio General Assembly passed the Ohio Right-to-Know Act, Substitute Senate Bill 367. This law provided for state implementation of EPCRA. Under this law, Ohio EPA is charged with the administration of Section 313 (Ohio Administrative Code 3745-100). The law gave Ohio EPA authority to enforce Section 313 and established filing fees for covered facilities to support the TRI Program. Ohio EPA's Division of Air Pollution Control coordinates the TRI Program.

WHO MUST REPORT

A facility is required to report if it meets each of the following requirements:

1. It has 10 or more full-time employees;
2. It is included in the Standard Industrial Classification codes 20 through 39;
3. It manufactured or processed a reportable toxic chemical in quantities exceeding the thresholds established by EPA for that year, or it otherwise used 10,000 pounds or more of a reportable toxic chemical for that calendar year. The threshold amounts for manufacturing and processing a toxic chemical are:

Calendar year 1987	75,000 pounds
Calendar year 1988	50,000 pounds
Calendar year 1989 and subsequent years	25,000 pounds

Facilities must submit a report for any listed chemical used in amounts that exceed the reporting threshold, even if the chemical is not released to the environment. Ohio facilities submitted an average of

three TRI reports, or three chemicals per facility. The reporting criteria are such that only large users of toxic chemicals are obligated to file.

FEDERAL FACILITIES

President Clinton issued an executive order under which federal facilities must comply with the planning and reporting provisions of EPCRA and the Pollution Prevention Act (PPA) of 1990. Executive Order #12856 requires all federal facilities that manufacture, process or otherwise use any listed chemical above the reporting threshold to submit a toxic chemical release inventory form or Form R. The first reports for federal facilities were submitted July 1, 1995 for calendar year 1994.

CHEMICALS

The list of reportable toxic chemicals has evolved since the enactment of Section 313. Over 600 toxic chemicals and 20 chemical categories are currently subject to reporting under Section 313. These chemicals vary widely in form (solid, liquid and gas) and in toxicity.

The Administrator of U.S. EPA has the authority to modify the list of chemicals that must be reported. Petitions to add and delete chemicals have been submitted by industry, environmental groups, and the state governors. U.S. EPA is currently evaluating chemicals which may be added or deleted from the list of reportable chemicals. Chemicals are removed from the list because they have not been shown to cause significant adverse human health or environmental effects. Chemicals which were delisted prior to July 1, 1997 were not required to be reported for calendar year 1996. The reports were due September 8, 1997. The extension was provided in 1997 from July 1 to September 8 due to problems in the electronic reporting package.

The most significant change to the chemical list occurred on November 28, 1995, when U.S. EPA published the final rule which added 282 toxic chemicals to the list of reportable chemicals. Approximately 170 of these chemicals are active ingredients in pesticides. These chemicals were reportable beginning with calendar year 1995, with the first reports due July 1, 1996. The addition of these chemicals resulted in significant increase in the total releases reported under TRI. For example, 54 facilities reported nitrate compounds, which accounted for over 11 million pounds of releases and transfers. These new chemicals were not included in the data used for trends analysis.

Four recent changes to the chemical list significantly affected the releases reported for calendar year 1996. Non-aerosol forms of sulfuric acid and hydrochloric acid were delisted on June 30, 1995 and July 25, 1996, respectively. Air releases of sulfuric and hydrochloric acid are reportable; however, releases to water, land, deepwell injection or transfers off-site are no longer reportable. US EPA also delisted diethyl phthalate and bis (2-ethylhexyl) adipate on July 29, 1996 and July 31, 1996. Table 1 and 2 identify the changes to the chemical list.

Table 1: Chemicals removed from the TRI list or redefined

Chemical	Effective Date	Chemical	Effective Date
Titanium dioxide	06/20/88	Glycol ethers (redefined)	07/05/94
C.I. Acid Blue 9	10/07/88	Hydrogen sulfide (stayed)	08/22/94
Melamine	03/29/89	Methyl mercaptan (stayed)	08/22/94
Sodium sulfate	06/20/89	Butyl benzyl phthalate	02/17/95
Sodium hydroxide	12/15/89	Copper phthalocyanine (redefined)	04/11/95
Aluminum oxide (non-fibrous)	12/14/90	Acetone	06/13/95
Terephthalic acid	12/10/90	Ammonia (redefined)	06/30/95
C.I. Pigment Blue 15	05/23/91	Sulfuric acid (non-aerosol)	06/30/95
C.I. Pigment Green 7	05/23/91	Ammonium sulfate	06/30/95
C.I. Pigment Green 36	05/23/91	Ammonium nitrate	06/30/95
n-Dioctyl phthalate	10/05/93	Hydrochloric acid (non-aerosol)	07/25/96
Barium sulfate	06/28/94	bis(2-ethylhexyl) adipate	07/31/96
		diethyl phthalate	07/29/96

Table 2: Chemicals Added to the TRI List

Chemical	Effective Date	Chemical	Effective Date
2,3-Dichloropropene	12/01/89	Halon 2402	8/03/90
m-Dinitrobenzene	12/01/89	Halon 1211	8/03/90
p-Dinitrobenzene	12/01/89	Halon 1301	8/03/90
o-Dinitrobenzene	12/01/89	CFC-11	8/03/90
Allyl alcohol	12/01/89	CFC-12	8/03/90
Isosafrole	12/01/89	CFC-114	8/03/90
Creosote	12/01/89	CFC-115	8/03/90
Toluene diisocyanate	12/01/89	34 RCRA chemicals	11/30/95
Dinitro toluene - mixed isomers	12/01/89	282 chemicals & categories	11/28/95

WHAT IS REPORTED?

FORM R

Facilities report to U.S. EPA and Ohio EPA using the toxic chemical release inventory reporting form, or Form R. Facilities may submit the reports using hard copy forms or on diskettes. Ohio EPA received over 50% of the reports electronically. The following information is reported on Form R:

- ◆ the name and location of the facility
- ◆ the wastewater discharge, hazardous waste and deepwell injection permit numbers
- ◆ the identity of the listed toxic chemical
- ◆ the maximum amount of chemical stored on-site
- ◆ the amount of toxic chemical transferred off-site for disposal, treatment, energy recovery, recycling or reuse
- ◆ waste treatment methods and efficiencies
- ◆ identification of on-site recycling or energy recovery processes
- ◆ amount of chemical used for energy recovery, on-site and off-site
- ◆ amount of chemical recycled on-site and off-site
- ◆ amount of chemical treated on-site and off-site
- ◆ amount of chemical released due to remedial action or catastrophic events
- ◆ production ratio
- ◆ source reduction activities implemented during the calendar year.

Alternative Threshold, Form A

On November 28, 1994, U.S. EPA finalized an exemption for facilities which generate a small quantity of waste. This exemption is the result of a petition submitted by the Small Business Administration to exempt low level releases. The exemption applies to facilities which generate less than five hundred pounds of a listed chemical which is released to the environment, treated, recycled, or used for energy recovery, and use less than one million pounds of the toxic chemical in a calendar year. The facility would be allowed to file a certification statement instead of a full Form R. This exemption is also referred to as the alternative threshold. The first certification statements were permitted to be filed for reporting year 1995. For reporting year 1996, Ohio EPA received 550 Form A's from 236 facilities.

COMPLIANCE

Under the Ohio Right-to-Know Act, Ohio EPA has the authority to enforce the TRI reporting requirements. Failure to file reports undermines the integrity of the TRI program by denying the public the right to know what is being released into the environment. Failure to comply with the reporting requirements can result in penalties of up to \$25,000 per day for each violation. Ohio EPA annually inspects approximately 100 facilities. In calendar year 1997, Ohio EPA resolved 12 enforcement actions against facilities which had not filed TRI reports, resulting in the collection of approximately \$29,000 in civil penalties. In addition, administrative orders are used to incorporate pollution prevention projects into settlements when appropriate.

EXPLANATION OF TERMS

Energy Recovery - Recovery of useful energy from waste.

Facility - Defined for the purposes of TRI reporting as all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person.

Fugitive or Non-point Air Emissions - Releases to the air which are not conveyed through stacks, vents, ducts, pipes, or other confined air streams. Examples include equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open ended lines, and evaporative losses from surface impoundment and spills.

Manufacture - To produce, prepare, import or compound a toxic chemical.

Off-Site Locations - Locations outside the boundaries of a facility to which wastes are transported for treatment or disposal. Examples include transfers of a waste to a landfill or an incinerator. Transfers off-site for recycling and energy recovery are also reported, but are presented separately in this report.

Otherwise Use - Any use of a toxic chemical at a facility which is not covered by the definitions of manufacture or process. This includes any activities in which a listed toxic chemical does not become incorporated into the final product. Examples of otherwise use include degreasers, solvents in paints which are applied to a product, chemicals used in water treatment, and coolants or refrigerants.

POTW (Publicly Owned Treatment Works) - a wastewater treatment facility which is owned by a unit of the government.

Process - Refers to the preparation of a listed toxic chemical after its manufacture, for distribution in commerce. Processing is usually the intentional incorporation of a toxic chemical into a product. It includes making mixtures, repackaging, and using a toxic chemical as a feedstock, raw material or starting material for making another chemical.

Releases to Land - Refers to land filling, surface impoundment, land treatment/application farming, or any other release of a toxic chemical to land within the boundaries of a facility.

SARA (Superfund Amendments and Reauthorization Act) - The 1986 federal act that reauthorized Superfund and established "Emergency Planning & Community Right-to-Know", including Section 313 or Toxic Release Inventory reporting.

SIC Code (Standard Industrial Classification Code) - A two or four digit number code designated by the federal Department of Commerce which identifies an industry or industrial grouping.

Stack or Point Source Air Emissions - Releases to the air which are conveyed through stacks, vents, ducts, pipes, or other confined air streams. Examples include storage tank emissions and emissions from control equipment.

LIMITATIONS OF THE DATA

The TRI data has some significant limitations:

1. TRI covers only certain manufacturing industries. Many non-manufacturing industries release toxic chemicals into the environment. U.S. EPA has expanded the TRI requirement to non-manufacturing SIC codes. These facilities will file reports July 1, 1999.
2. For reporting year 1996, TRI covers approximately 600 toxic chemicals and chemical categories. U.S. EPA has added 282 additional chemicals and chemical categories to the list of reportable chemicals. These additional chemicals were reportable beginning with reports covering releases in calendar year 1995. The TRI data does not represent all chemicals used by manufacturing industry.
3. Releases are reported as total annual releases without reference to frequency or duration. The annual release totals alone are not sufficient to assess the health or environmental impact of the toxic chemical released.
4. The majority of releases are based on estimates. Facilities are required to base releases on monitoring data when available; otherwise, estimates are used. Estimates result in significant variability among reporting facilities.
5. High volume releases of relatively non-toxic chemicals may appear to be a more serious problem than lower volume releases of highly toxic chemicals, when just the opposite may be true. TRI data summaries must be interpreted with care.
6. The TRI report contains information regarding the release of chemicals, not the public's exposure to the chemicals. Some chemicals break down or detoxify when exposed to the environment, most disperse rapidly when released into the environment, eliminating their threat to public health and to the environment, while other highly toxic chemicals may not disperse when released. Screening risk assessments must be completed before health and environmental assessments can be made.
7. Some reported releases result in no potential exposure to the public. In particular, the disposal of toxic chemicals in underground injection wells does not expose the public since the material is injected thousands of feet into the ground. Also, off-site transfers may not expose the population to chemicals.
8. Because the TRI data is based on estimates, facilities are encouraged to revise their reports when the estimates are improved. Revisions are entered into the Ohio TRI database on an ongoing basis. Likewise, revisions are submitted to U.S. EPA and the national database is updated. At any time, the two databases may not provide corresponding data due to delays in revision entry as well as data quality errors.

TRI REGULATORY CHANGES

The TRI Program has grown and change over the years and will continue to expand in coming years. U.S. EPA is making the following changes:

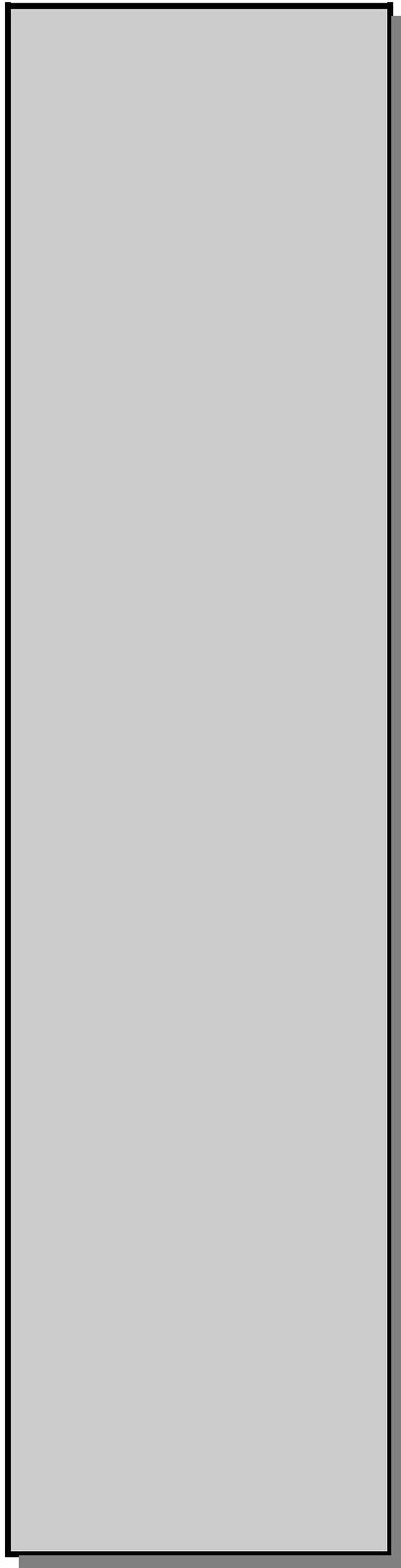
Chemical List Expansion: On November 28, 1994, U.S. EPA published the final rule which added 282 toxic chemicals and chemical categories to the list of reportable chemicals. Approximately 170 of these chemicals are active ingredients in pesticides. These chemicals were reportable beginning with calendar year 1995, with the first reports filed July 1, 1996.

Alternative Threshold: On November 28, 1994, U.S. EPA finalized an exemption for facilities which generate a small quantity of waste. This exemption is the result of a petition submitted by the Small Business Administration to exempt low level releases. The exemption applies to facilities which generate less than five hundred pounds of a listed chemical which is released to the environment, treated, recycled, or used for energy recovery, and use less than one million pounds of the toxic chemical in a calendar year. The facility would be permitted to file a certification statement instead of a full Form R. This exemption is also referred to as the alternative threshold. The first certification statements were accepted July 1, 1996. Ohio EPA received 550 certification statements in 1997.

Facility Expansion: On May 1, 1997, U.S. EPA finalized the addition of non-manufacturing industry sectors. Seven industrial groups were added: metal mining, coal mining, coal and oil-fired electricity generating facilities, commercial hazardous waste treatment, chemicals and allied products - wholesale, petroleum bulk stations - wholesale, and solvent recovery services. Reports for these facilities will be filed July 1, 1999, covering calendar year 1998.

Materials Accounting: U.S. EPA is examining additional data elements including throughput information to measure waste management. U.S. EPA published an advanced notice of proposed rulemaking (ANPR) on October 1, 1996 to seek comment on the addition of this information which includes the quantity of chemical used, the quantity remaining in the final product, and quantity remaining in the waste stream. A time frame for this expansion has not yet been established by U.S. EPA.

Form R Redesign: U.S. EPA is holding a series of public meetings to obtain input on Form R redesign. U.S. EPA has made minor changes to date, which included modifying the reporting of deepwell injection to reflect the well type (Class I verses Class II-V). Additional modifications may be made to the Form R in the future.



THE DATA

SUMMARY OF DATA

In 1996, 183 million pounds of toxic chemicals were reported as having been released to the environment and transferred off-site for treatment or disposal. Changes to the list of reportable chemicals create difficulties in presenting the TRI data in an accurate and understandable form. This report presents the data in the following manner:

- ◆ Chemicals which were no longer reportable for calendar year 1996 have been excluded from all years' TRI data.
- ◆ The 282 chemicals and chemical categories were added to the chemical list, which were reported for the first time for calendar year 1995 and are included in the data presented for 1995 and 1996. This effort was referred to as "Phase 1 expansion"
- ◆ Releases for chemicals which were "redefined" were modified in this report to reflect the change, if the change did not require a case by case evaluation. Non-aerosol forms of hydrochloric acid and sulfuric acid are no longer reportable, therefore, only air releases of hydrochloric acid and sulfuric acid were included in the TRI data presented in this report. Ammonium nitrate was delisted for calendar year 1995, however, the ammonia portion is still reportable. Due to the change in the reporting requirement for ammonia in 1994, only ten percent of the ammonia portion of ammonium nitrate was reportable for calendar year 1995. Only 10 percent of the ammonia portion of ammonium nitrate was included in the data presented in this report.
- ◆ Ammonia was "redefined" and for calendar year 1994, only 10% of aqueous ammonia is reportable. Because this change requires a case by case evaluation, past years' data was not modified to reflect this change.
- ◆ The data presented for 1996, including the listings of top companies, chemicals and counties, reflects the TRI data as it was reportable July 1, 1997. The above mentioned changes are reflected in this data.
- ◆ To accurately represent trends in the toxic releases, the Phase 1 expansion chemicals and all chemicals which were "redefined" or delisted were not included in the calculation of trends for the figures representing trends within this report. Table 3A represents the TRI data as reportable in 1996. The changes summarized above were made to all years of data. Table 3B represents the TRI data as it was used to calculate trends. All Phase 1 expansion chemicals, delisted chemicals or "redefined" chemicals were excluded from this data, so that the trends analysis would reflect true changes in the reported releases and not reflect changes in the reporting requirements.

Table 3A: Summary of Tri Data in Millions of Pounds Per Year
Including All Reported Chemicals Including Phase 1 Expansion Chemicals (in millions of pounds)

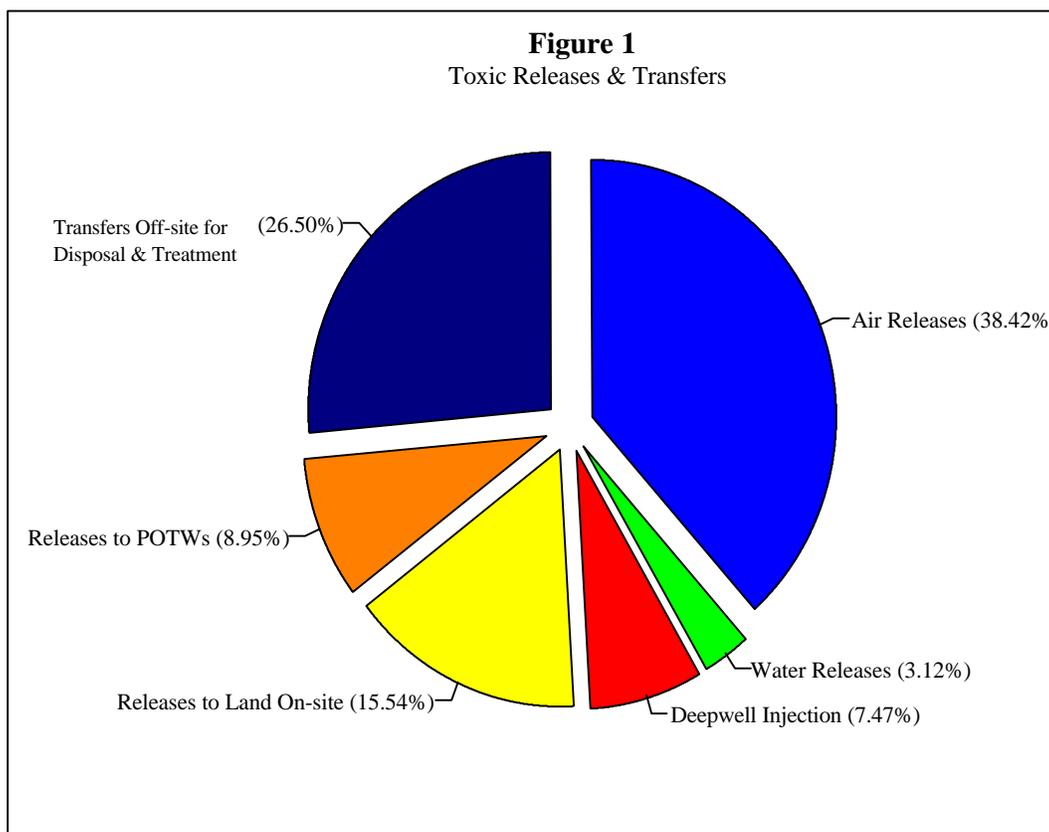
Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Air	136.82	140.39	132.74	115.08	104.52	91.78	83.92	79.39	74.80	70.39
Water	7.77	4.68	5.95	5.87	5.98	4.76	4.76	1.20	5.49	5.72
Deepwell Injection	22.30	17.08	16.31	24.80	28.38	24.03	25.19	14.49	14.47	13.68
Land On-Site	53.62	74.18	33.81	25.01	23.07	22.18	19.51	21.75	30.26	28.47
POTW	20.99	22.37	18.05	24.69	22.38	21.53	16.78	8.83	16.15	16.4
Transfers Off-Site for Treatment & Disposal	211.46	210.89	104.33	81.79	53.14	58.62	60.56	47.33	46.31	48.65
Total Releases & Transfers	452.96	469.57	311.19	277.25	237.47	222.91	210.22	172.98	187.49	183.23
Off-Site Energy Recovery	NA	NA	NA	NA	36.15	34.38	28.25	37.17	38.10	40.71
On-Site Energy Recovery	NA	NA	NA	NA	103.43	106.84	104.33	95.23	91.21	96.81
Off-Site Recycling	NA	NA	NA	NA	153.56	189.36	204.77	228.79	221.62	192.80
On-Site Recycling	NA	NA	NA	NA	547.45	679.20	581.66	263.93	348.99	327.58
On-Site Treatment	NA	NA	NA	NA	448.98	487.77	383.25	266.53	162.03	155.17
No. of Reporting Facilities	1,396	1,608	1,769	1,790	1,755	1,759	1,766	1,736	1,668	1,613
F.R	5.52	6.33	6.50	6.55	6.33	6.21	6.14	5.73	5.04	4.77
Cert	NA	4.85	5.50							
No. of Form Rs	5,519	6,338	6,505	6,545	6,326	6,205	6,111	5,695	4,983	4,796
No. of Chemicals Reported	171	177	181	182	182	182	185	177	223	220

** includes Form R and certifications statements

Table: 3B: Summary of data in millions of pounds per year

excluding all Phase 1 expansion chemicals, delisted chemicals, and redefined chemicals

Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Air	114.40	118.64	113.73	98.77	87.49	75.42	67.51	61.63	53.32	49.12
Water	1.42	1.34	1.46	0.57	1.46	0.79	0.55	0.63	1.16	1.49
Deepwell Injection	16.87	11.50	10.96	10.54	11.70	5.99	8.64	8.21	11.78	11.57
Land On-Site	53.30	74.13	33.76	24.96	23.01	22.11	19.38	21.63	30.10	28.34
POTW	12.97	15.49	12.79	13.84	11.80	10.53	8.80	6.63	6.30	7.43
Transfers Off-Site for Treatment & Disposal	182.31	164.75	77.14	62.86	37.46	37.57	35.38	39.32	44.41	46.49
Total Releases & Transfers	381.27	385.86	249.85	211.54	172.92	152.41	140.28	138.06	147.07	144.45
Off-Site Energy Recovery	NA	NA	NA	NA	36.14	34.38	28.24	37.17	37.51	40.22
On-Site Energy Recovery	NA	NA	NA	NA	103.42	106.66	104.15	95.05	83.51	88.00
Off-Site Recycling	NA	NA	NA	NA	138.59	173.19	186.48	213.48	219.88	191.33
On-Site Recycling	NA	NA	NA	NA	168.38	294.01	240.46	209.54	332.98	302.56
On-Site Treatment	NA	NA	NA	NA	155.26	186.66	173.65	124.48	131.91	137.12



TOTAL RELEASES AND TRANSFERS

The following tables, as well as the pie chart (Figure 1, prior page) represent releases to the air, water, and, Publicly Owned Treatment Works (POTWs) and transfers off-site for disposal or treatment only. Transfers off-site for recycling or energy recovery are addressed at the end of this report.

Table 4: Top 10 Counties

	County	Total Releases (lbs/yr)
1	Washington	23,013,548
2	Allen	17,458,223
3	Defiance	15,755,778
4	Cuyahoga	11,442,205
5	Hamilton	11,192,130
6	Ashtabula	9,625,916
7	Stark	7,965,003
8	Franklin	6,926,647
9	Muskingum	5,155,517
10	Montgomery	4,545,515

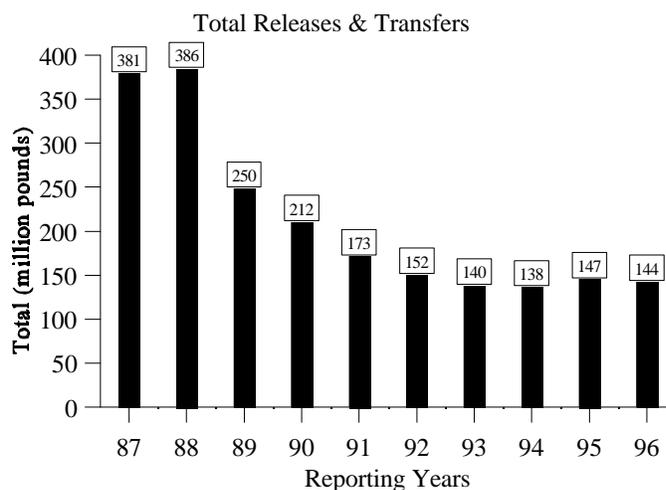
Table 5: Top 10 Facilities

	Facility	County	Total Releases (lbs/yr)
1	Elkem Metals Co.	Washington	17,050,768
2	GMC Powertrain	Defiance	14,410,420
3	BP Chemicals Inc.	Allen	13,154,010
4	Millennium Inorganic Chemical Plant 2	Ashtabula	5,943,142
5	Armco Advanced Materials	Muskingum	4,541,037
6	Shepherd Chemical Co.	Hamilton	3,130,404
7	Millennium Inorganic Chemicals Inc.- PL	Ashtabula	2,983,855
8	Arcadian Ohio, L.P.	Allen	2,793,890
9	Eveready Battery Co..	Washington	2,541,200
10	Cincinnati Specialties Inc. (PMC Inc).	Hamilton	2,297,187

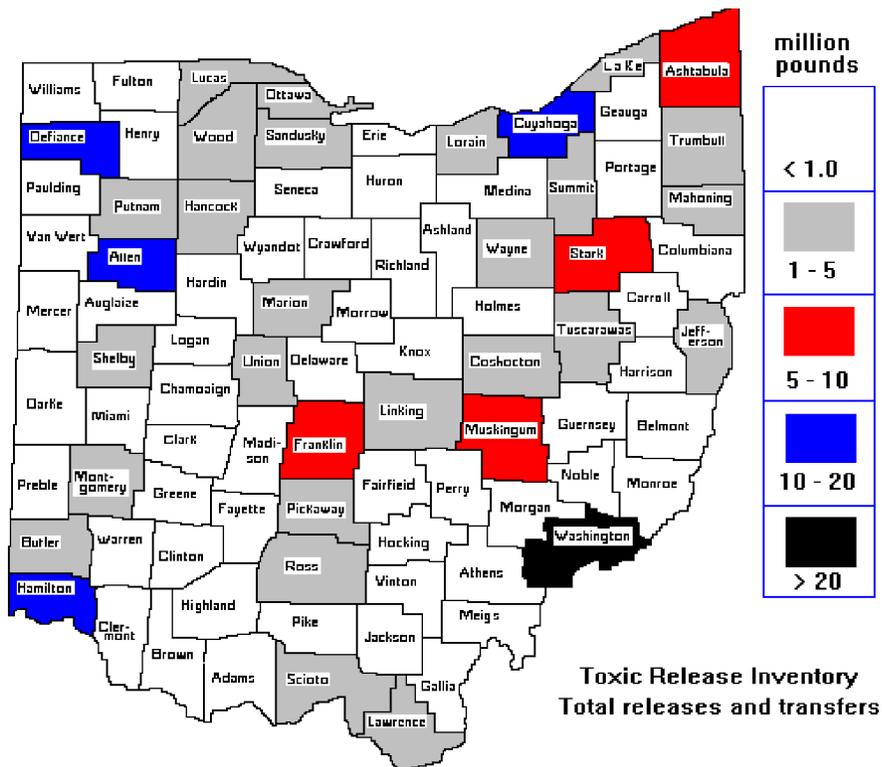
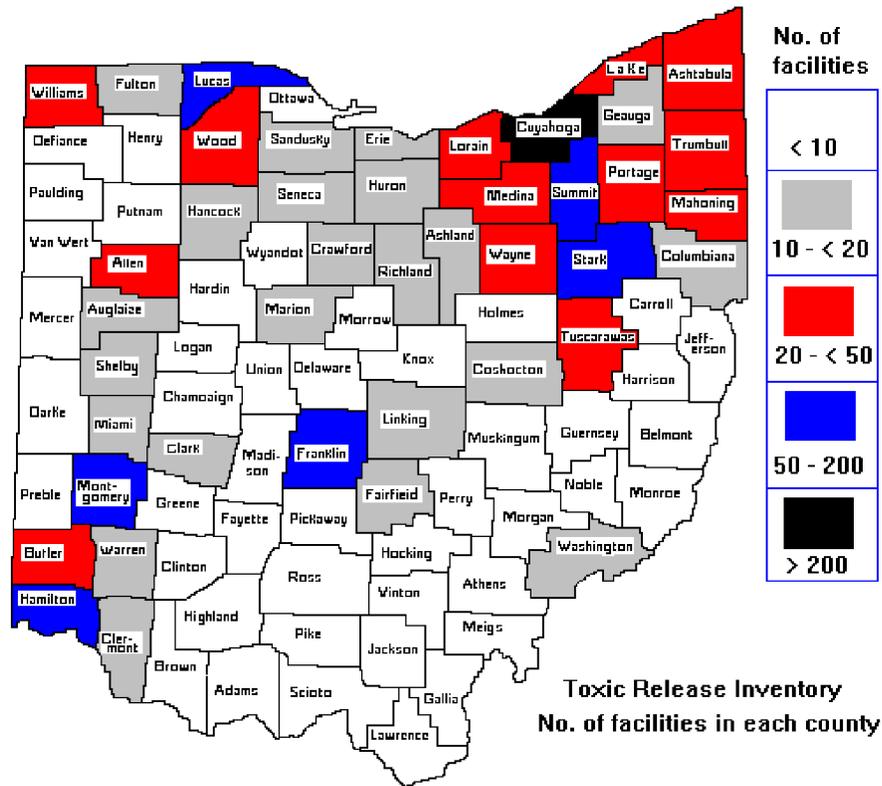
Table 6: Top 10 Chemicals

	Chemical	Total Toxic Releases (lbs/yr)
1	Manganese & Compounds	27,282,757
2	Zinc & Compounds	20,667,851
3	Ammonia	15,245,381
4	Nitrate Compounds	11,491,574
5	Methanol	9,080,063
6	Xylene (mixed isomers)	6,082,512
7	Certain Glycol Ethers	6,077,743
8	Nitric Acid	5,639,068
9	Acetonitrile	5,627,519
10	Chromium & Compounds	4,976,250

Figure 2 - Toxic Trends



The first map of Ohio illustrates the number of companies reporting under TRI for the reporting year 1996. The second map illustrates the total releases and transfers reported for the reporting year 1996.



RELEASES TO AIR

Facilities filing TRI forms reported total air emissions of 70 million pounds in 1996. The air emissions resulted in 38% of the total toxic releases and transfers for 1996. The reported air emissions can be divided into 2 categories: stack and fugitive emissions. Stack or point source emissions are releases to the air from a discrete source, such as a smokestack or vent. Fugitive or non-point air emissions are releases to the air that are not conveyed from ducts, stacks, or pipes. In 1996, Ohio facilities reported 20 million pounds of fugitive air emissions and 50 million pounds of stack or point source air emissions.

Table 7: Top 10 Counties

	County	Air Releases (lbs/yr)
1	Washington	7,723,426
2	Ashtabula	4,645,856
3	Cuyahoga	3,962,916
4	Allen	3,813,257
5	Lucas	3,356,535
6	Union	2,850,427
7	Lorain	2,375,399
8	Defiance	2,203,478
9	Coshocton	2,180,832
10	Scioto	2,112,692

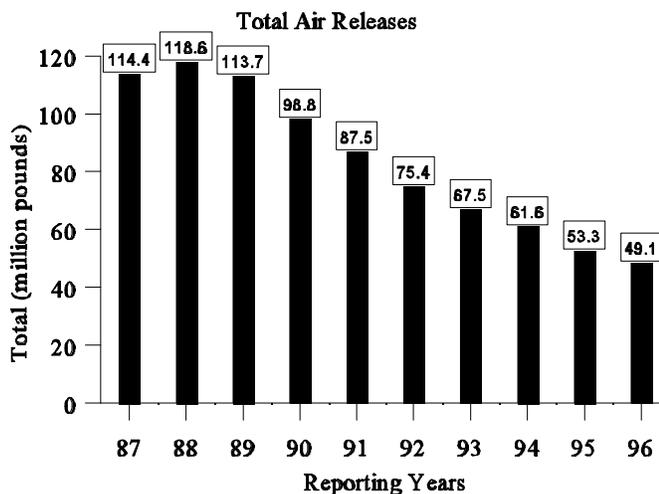
Table 8: Top 10 Companies

	Facility	County	Air Releases (lbs/yr)
1	Elkem Metal Co.	Washington	5,437,768
2	Millennium Inorganic Cheical Plant 2	Ashtabula	3,210,218
3	Arcadian Ohio LP	Allen	2,745,035
4	Owens Corning Fiberglass	Licking	1,673,127
5	Stone Container Corp.	Coshocton	1,577,485
6	Scotts Co.	Union	1,480,651
7	New Boston Coke Corp.	Scioto	1,312,645
8	Mead Fine Paper Division	Ross	1,297,730
9	Honda of America Mfg.Inc.	Union	1,213,399
10	Chrysler Corp. - Jeep Parkway	Lucas	1,207,328

Table 9: Top Chemicals

	Chemical	Air Releases (lbs/yr)
1	Ammonia	12,083,259
2	Xylene (mixed isomers)	5,507,765
3	Certain Glycol Ethers	4,442,719
4	Carbonyl Sulfide	4,303,031
5	Methanol	3,957,620
6	Toluene	3,895,492
7	Methyl Ethyl Ketone	3,754,242
8	Hydrochloric Acid	2,920,449
9	n-Hexane	2,773,078
10	Dichloromethane	1,920,666

Figure 3 - Toxic Trends



Air Pollution Control in Ohio

Ohio EPA's Division of Air Pollution Control (DAPC) regulates new sources of toxic air emissions through an air permitting program. Each potential new source of air toxics undergoes a technical evaluation through which each toxic chemical's potential threat to human health and the environment is reviewed.

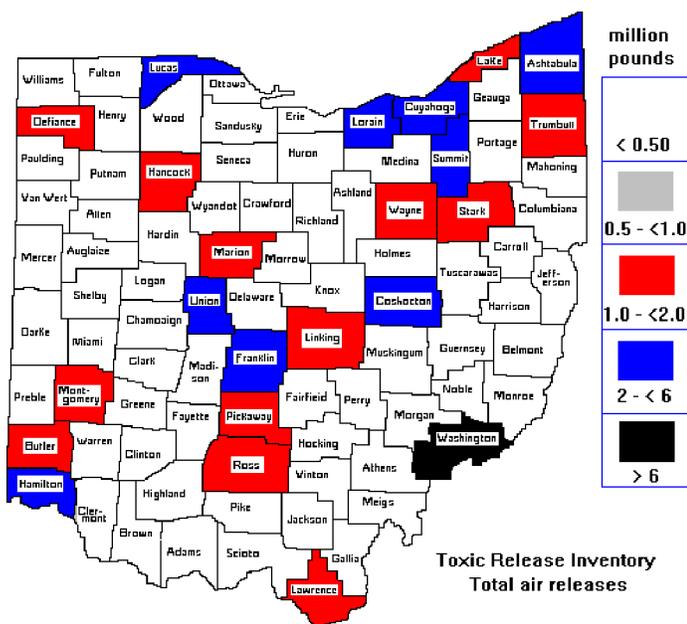
Currently, the TRI data is used by DAPC to: (1) help focus efforts in ambient air monitoring evaluation, (2) help determine county-wide levels of toxics for county-wide air pollution studies, and (3) help provide base-line data for non-routine (explosion or fire) air pollution episodes. The TRI data is used to estimate the release volumes of particular industries when evaluating proposed new source regulations or process modifications. Also, the TRI database is used to evaluate the compliance of industries with recently adopted rules concerning toxic releases.

Six TRI chemicals are currently regulated under U.S. EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP). They are benzene, asbestos, inorganic arsenic, vinyl chloride, beryllium and mercury. U.S. EPA creates NESHAP emission standards for air pollutants which may pose a serious health hazard on a national level, but are not covered by the National Ambient Air Quality Standards.

The Clean Air Act Amendments of 1990 requires U.S. EPA to regulate 189 additional air toxic chemicals, 173 of which are on the TRI list. The TRI data will be used by U.S. EPA to prioritize sources of air toxics that should be regulated. As these regulations are developed and implemented, the TRI data will be used to monitor the reduction of air toxics in Ohio.

U.S. EPA intends to regulate sources of air toxics by issuing maximum achievable control technology (MACT) standards for source categories of air toxics. U.S. EPA was mandated to issue MACT standards for 40 source categories by November 1992, with all categories covered in 10 years. A facility may gain a six year extension from the MACT standard if it decreased its emissions by 90% (95% for particulates) prior to the proposal of the MACT standard.

For additional information regarding the air toxics program, contact Paul Koval, Supervisor, Air Toxics Unit, Division of Air Pollution Control, Ohio EPA (614) 644-2270.



DISCHARGES TO WATER

The TRI reports include toxic chemicals discharged by facilities to surface waters, such as rivers, lakes, ponds, and streams. In 1996, TRI facilities discharged 5.7 million pounds of toxic chemicals into Ohio's bodies of water. Nitrate compounds, which were reportable for the first time in 1995, accounted for 3.8 million pounds or 67% of the reportable releases to water.

Table 10: Top 10 Counties

	County	Water Releases (lbs/yr)
1	Stark	1,895,997
2	Coshocton	1,300,829
3	Washington	1,218,480
4	Ashtabula	334,512
5	Hamilton	328,707
6	Allen	147,460
7	Scioto	98,273
8	Pickaway	91,532
9	Wayne	54,593
10	Muskingum	54,280

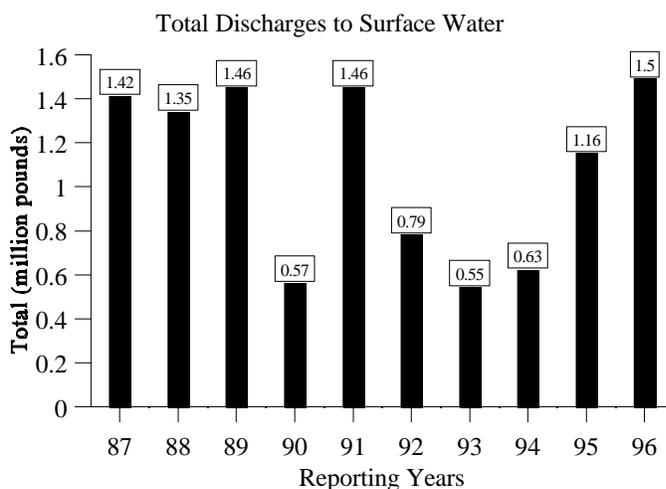
Table 11: Top 10 Facilities

	Facility	County	Water Releases (lbs/yr)
1	Armco Inc. Coshocton Stainless	Coshocton	1,300,810
2	J&L Specialty Steel Inc.	Stark	1,200,554
3	Elkem Metals	Washington	1,013,000
4	Washington Steel Corp. Massillon Plant	Stark	558,301
5	Monsanto	Hamilton	256,000
6	Millennium Inorganic Chemicals Inc.-PL	Ashtabula	180,000
7	Millennium Inorganic Chemical Plant 2	Ashtabula	151,000
8	Alliance Midwest Tubular Prod.	Stark	127,181
9	Shell Chemical Co.	Washington	104,550
10	Amoco Performance Products	Washington	100,510

Table 12: Top 10 Chemicals

	Chemical	Water Releases (lbs/yr)
1	Nitrate Compds.	3,811,148
2	Manganese & Compds	1,055,373
3	.Ammonia	338,836
4	Methanol	217,977
5	Formaldehyde	87,225
6	Formic acid	72,000
7	Diethanolamine	32,005
8	Ethylene glycol	28,849
9	Zinc & Compds.	16,122
10	Chromium & Compds.	14,334

Figure 4 - Toxic Trends



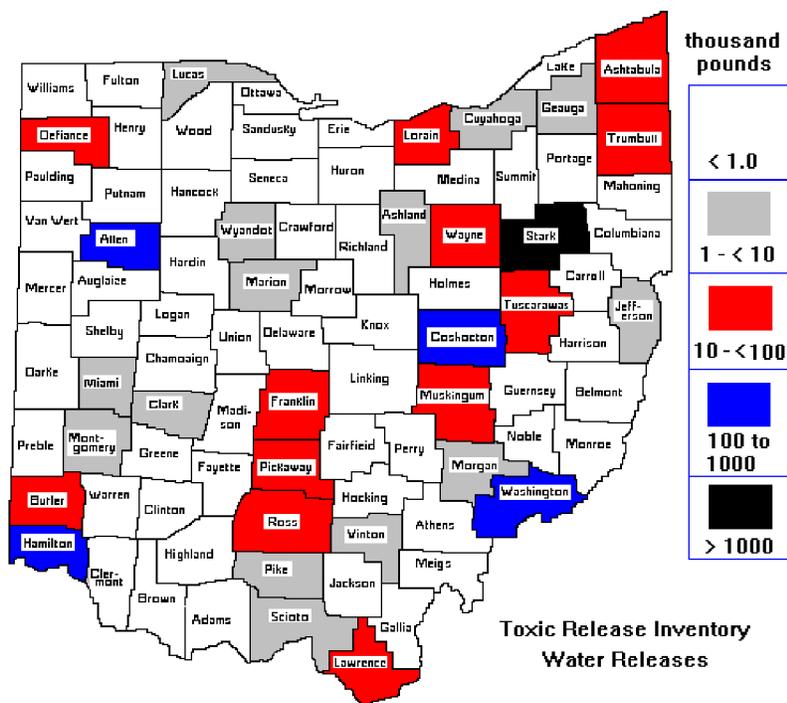
WATER POLLUTION CONTROL

Ohio EPA’s Division of Surface Water (DSW) regulates surface water discharges in Ohio primarily through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. Of the approximately 400 pollutants regulated by NPDES permits, 126 have been designated as priority pollutants under the Clean Water Act. Approximately 80 of these are TRI chemicals. The DSW uses the TRI data in the development of water quality based effluent limits in the NPDES permits. When evaluating a facility, TRI data is screened to determine if pollutants that are present may have the potential to cause an environmental hazard. Such pollutants will be further evaluated for possible inclusion in the permit. The TRI data can be used to confirm the presence of pollutants of concern when reviewing water quality monitoring data or could potentially flag a parameter that had not been previously monitored.

What are nitrate compounds? Nitrate compounds were added to the list of TRI chemicals and were first reported for calendar year 1995. Nitrate is the stable, most oxidized form of nitrogen found in the aquatic environment. Nitrates are formed through the treatment of ammonia, a compound which is a natural human waste product. Industrial wastewater discharges to a publicly owned treatment works may also contribute ammonia or nitrate.

Nitrates are a nutrient. Excessive amounts contribute to eutrophication in the aquatic environment, reducing the oxygen available to aquatic organisms such as fish and macroinvertebrates (such as shellfish, crayfish, water striders, dragon flies etc.). Elevated nitrates in drinking water may hamper the ability of an infant’s blood to carry and release oxygen.

The following map illustrates the releases to water in 1996 by county.



**UNDE
FOUND INJECTION**

RGR

Some facilities dispose of liquid chemical waste by injecting the waste deep underground. Although only reported by 3 facilities in Ohio, underground injection accounted for 7.5% (13.7 million pounds) of the total TRI releases and transfers. There are additional facilities that dispose of waste via underground injection, however, these facilities are not required to report under TRI. The delisting of liquid hydrochloric acid and sulfuric acid resulted in a significant reduction of reportable deepwell injection.

Table 13: Top Counties

	County	Underground Injection (lbs/yr)
1	Allen	12,865,790
2	Scioto	812,715
3	Lake	2,320

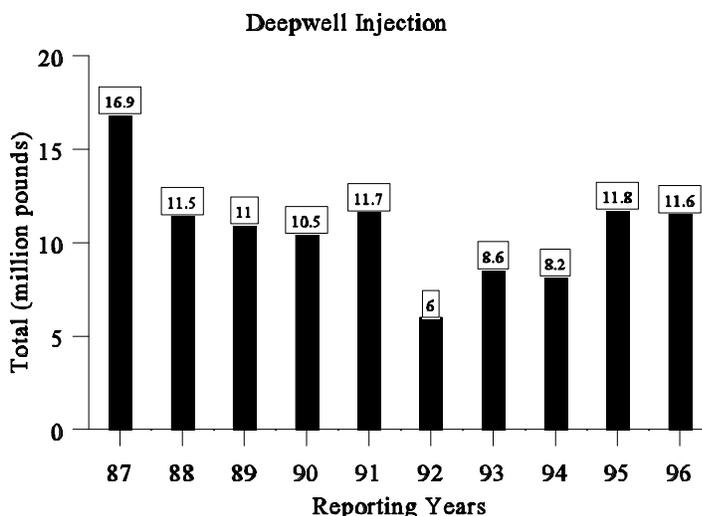
Table 14: Top Facilities

	Facility	County	Underground Injection (lbs/yr)
1	BP Chemicals	Allen	12,865,790
2	Aristech Chemical	Scioto	812,715
3	Zeneca Inc. Perry Plant	Lake	2,320

Table 15: Top 10 Chemicals

	Chemical	Underground Injection (lbs/yr)
1	Acetonitrile	5,600,000
2	Ammonia	1,709,000
3	Acrylamide	1,500,000
4	Acrylonitrile	1,000,000
5	Acrylic acid	870,000
6	Cyanide Compounds	700,000
7	Acetamide	610,000
8	Phenol	460,000
9	Methanol	410,000
10	Nitrate Compounds	300,000

Figure 5 - Toxic Trends



Underground Injection Control In Ohio

Ohio EPA’s Division of Drinking and Ground Waters (DDAGW) regulates facilities which use underground injection

RELEASES TO LAND ON-SITE

Facilities dispose of solid and liquid chemical waste on-site by either depositing or burying waste. These facilities reported over 28 million pounds of toxic chemicals released to land on-site. The methods of disposal include: (1) landfills; (2) surface impoundments (ponds where liquid wastes are left to evaporate); (3) land treatment, land application or farming; and (4) other disposal which includes leaks and spills.

Table 16: Top 10 Counties

	County	Land On-site (lbs/yr)
1	Defiance	13,454,063
2	Washington	10,504,000
3	Franklin	1,412,506
4	Cuyahoga	799,854
5	Butler	794,650
6	Trumbull	721,672
7	Ottawa	310,064
8	Licking	205,885
9	Marion	121,598
10	Tuscarawas	50,155

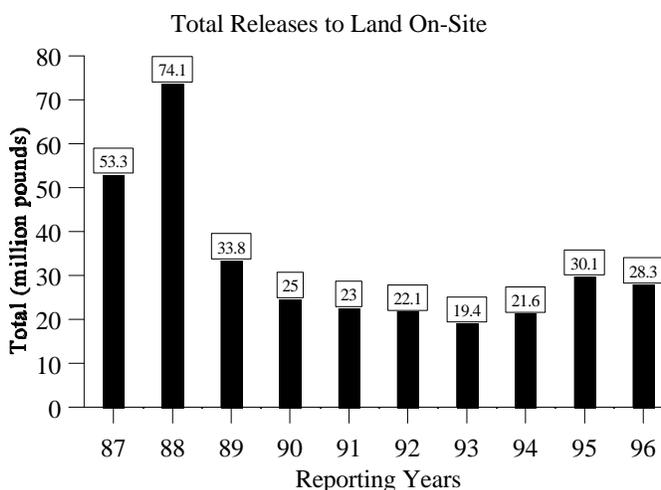
Table 17: Top 10 Facilities

	Facility	County	Land On-Site (lbs/yr)
1	GMC Powertrain	Defiance	13,390,915
2	Elkem Metals Co.	Washington	10,504,000
3	Griffin Wheel	Franklin	1,410,989
4	AK Steel Middletown	Butler	793,400
5	LTV Steel Cleveland Works	Cuyahoga	773,410
6	WCI Steel	Trumbull	716,080
7	Brush Wellman	Ottawa	310,060
8	Owen-Corning	Licking	205,885
9	Whirlpool Corp.	Marion	118,698
10	.Johns Manville Intl.Inc	Defiance	62,370

Table 18: Top 10 Chemicals

	Chemical	Land On-Site (lbs/yr)
1	Manganese & Compounds	13,749,288
2	Zinc & Compounds	12,278,217
3	Chromium & Compounds	1,147,075
4	Copper & Compounds	372,286
5	Lead & Compounds	338,116
6	Formaldehyde	87,335
7	Nickel & Compounds	70,579
8	Phosphoric acid	70,409
9	Ethylene glycol	70,004
10	Sodium nitrate	60,750

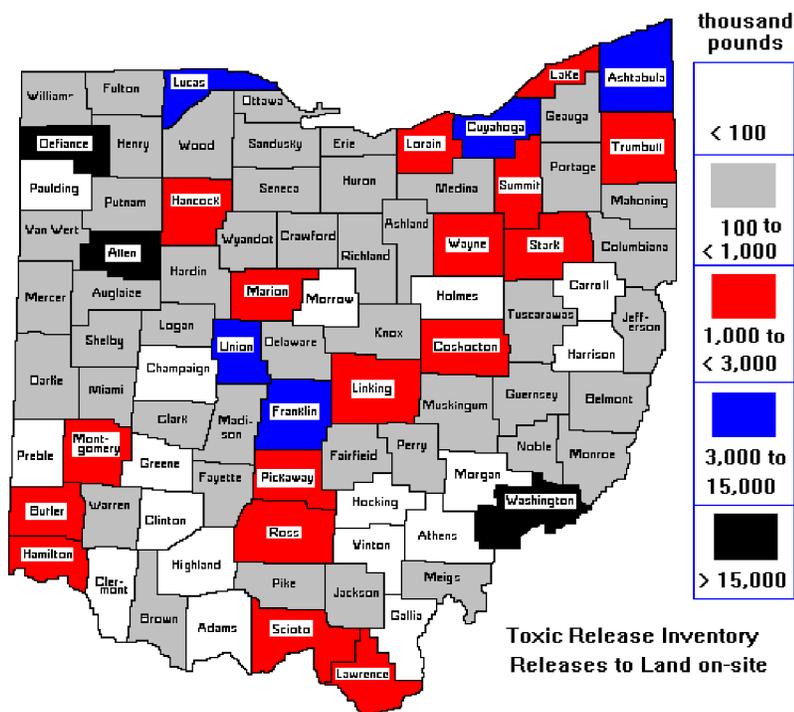
Figure 6 - Toxic Trends



Regulating Land Disposal In Ohio

Ohio EPA's Division of Hazardous Waste Management (DHWM) regulates generators of hazardous waste and facilities which treat, store, or dispose of such waste in landfills and surface impoundments. Ohio EPA assigns an identification number to every waste generating facility regulated under the Resource Conservation and Recovery Act (RCRA). Facilities using surface impoundment to dispose of TRI chemicals may also fall under the regulations of the Clean Water Act and may be regulated by the Division of Surface Water. Not all TRI chemicals are considered hazardous under RCRA. Some discharges to land may be considered solid waste, which is not regulated as hazardous. Large quantity generators and facilities that have a permit to treat, store, or dispose of RCRA-regulated waste must submit an Annual Hazardous Waste Report to DHWM. Contact DHWM's Data Management Section at (614) 644-2977 for more information about this report.

The following map illustrates the land on-site releases in each county.



DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTW)

In 1996, facilities reported 16 million pounds of toxic discharges to Publicly Owned Treatment Works (POTWs) or public sewage treatment plants. Nitrate compounds, reportable for the first time in 1995, accounted for 7.3 millions pounds, or 45% of the discharge to POTWs. (Figure 7, below, does not include delisted, added or modified chemicals, such as nitrate compounds.)

Table 19: Top 10 Counties

	County	Discharges to POTWs (lbs/yr)
1	Hamilton	8,236,905
2	Franklin	1,560,196
3	Montgomery	1,458,780
4	Cuyahoga	715,558
5	Ashland	694,480
6	Mahoning	654,538
7	Summit	420,029
8	Lucas	315,334
9	Lake	193,690
10	Marion	177,761

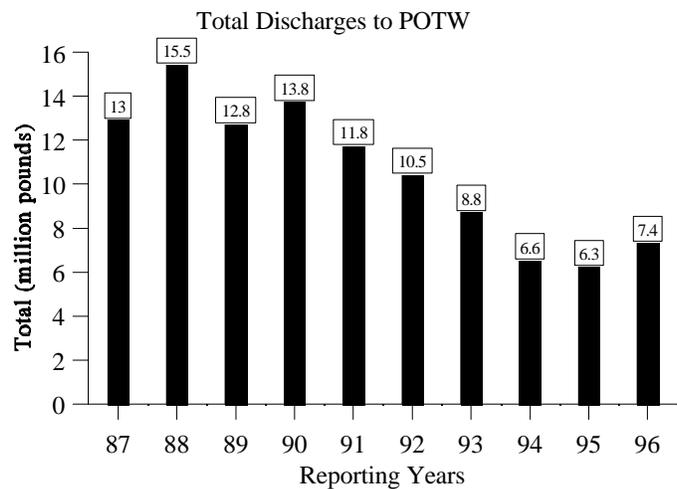
Table 20: Top 10 Facilities

	Facility	County	Discharges to POTWs (lbs/yr)
1	Shepherd Chemical Co.	Hamilton	3,128,805
2	Cincinnati Specialties (PMC)	Hamilton	2,140,627
3	GE.Co.Superabrasives	Franklin	1,195,517
4	Hilton Davis	Hamilton	1,029,070
5	GMC-Delphi Harrison Thermal Systems	Montgomery	928,412
6	Henkel Corp. Emery Group Phthalchem	Hamilton	849,400
7	Tremco Inc. Ashland	Ashland	658,040
8	GE Austintown Products Plastics	Mahoning	630,640
9	GE Chemical Products Plant	Cuyahoga	444,380
10	ISP Fine Chemicals Inc	Franklin	284,527

Table 21: Top 10 Chemicals

	Chemical	Discharges to POTWs (lbs/yr)
1	Nitrate Compounds	7,322,033
2	Methanol	4,192,237
3	Certain Glycol Ethers	1,343,076
4	Ammonia	828,011
5	Sodium nitrite	610,109
6	Ethylene glycol	288,769
7	Phosphoric acid	256,854
8	Allyl alcohol	174,856
9	Copper & Compounds	174,211
10	Potassium	145,300

Figure 7 - Toxic Trends

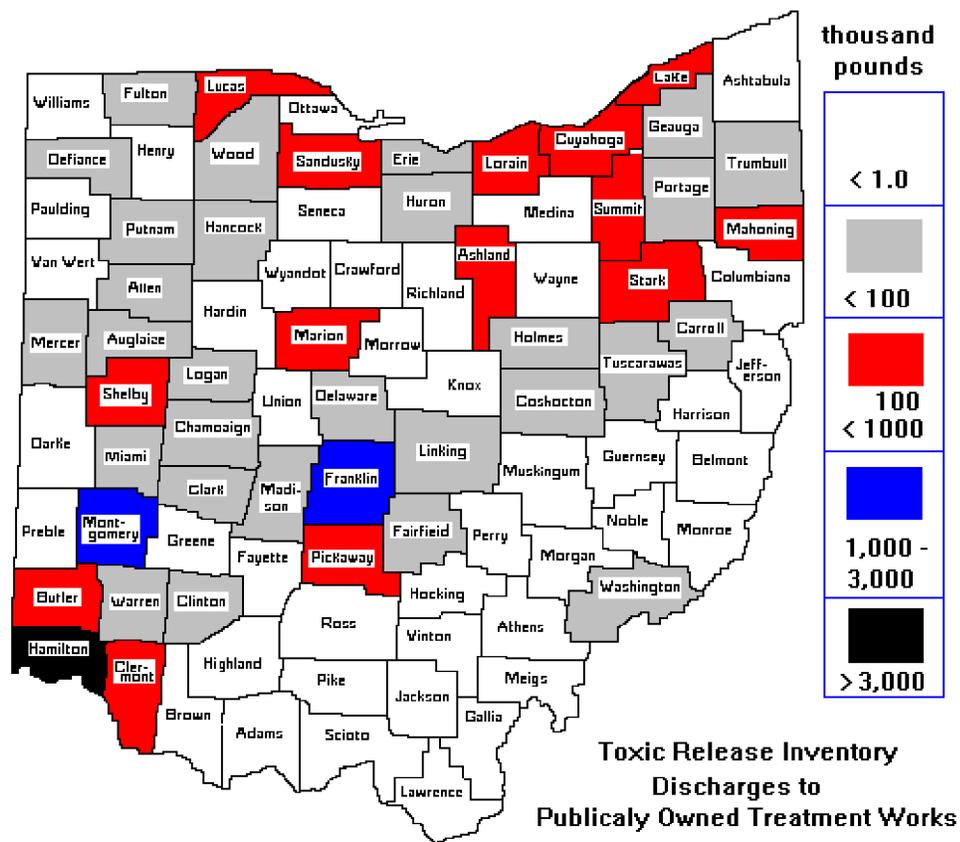


Regulating Discharges to POTW's in Ohio

Any reported discharge to a POTW must be interpreted carefully. The discharge leaves the facilities as part of a wastewater stream, but it is not released directly to surface waters. Some toxic chemicals are passed through the POTW to a receiving stream. Depending on the chemical, POTWs are capable of removing as little as 30% or more than 99% of the chemical pollutant from a wastestream. In some cases, chemicals are transferred to other segments of the environment in the form of air emissions or sewage sludge.

Ohio EPA's Division of Surface Water (DSW) regulates industries which discharge toxic chemicals to POTW's through its pretreatment program. These industries are regulated by the community if the community has a state approved pretreatment program, otherwise, Ohio EPA directly regulates these industries. In either case, significant industrial facilities are issued permits which contain discharge limitations as well as requirements for monitoring the waste streams. Non-complying facilities face enforcement action by either the community or Ohio EPA.

The pretreatment program uses TRI data when developing indirect discharge permits. The data is screened to determine if additional pollutants need to be evaluated for possible inclusion in the permit.



**TRA
NSFERS TO OFF-SITE LOCATIONS**

Ohio facilities sent over 48 million pounds of toxic chemicals off-site in 1996. The fate of chemicals transferred to off-site facilities varies. The chemicals may be deposited in landfills, injected into underground wells, or treated to reduce the toxicity before being released to the environment. Therefore, the amount of chemicals transferred to off-site locations does not directly indicate the amount or type of chemical eventually released to the environment. The following tables contain transfers off-site for treatment and disposal only. The additional information on recycling and energy recovery are covered in the next sections.

Table 22: Top 10 Counties

	County	Transfers Off-site (lbs/yr)
1	Cuyahoga	5,954,516
2	Stark	5,035,315
3	Muskingum	4,897,987
4	Ashtabula	4,640,765
5	Washington	3,509,852
6	Franklin	2,272,119
7	Pickaway	1,974,588
8	Tuscarawas	1,271,022
9	Shelby	1,136,832
10	Montgomery	1,018,255

Table 23: Top 10 Facilities

	Facility	County	Transfers Off-site (lbs/yr)
1	Armco Advanced Material	Muskingum	4,393,707
2	Millennium Inorganic Chem.Pl.2	Ashtabula	2,581,924
3	Eveready Battery Co.	Washington	2,530,000
4	Millennium Inorganic Chemicals Inc..PI	Ashtabula	1,800,000
5	Ford Motor Co. Casting Plant	Cuyahoga	1,640,950
6	Thompson Consumer Electronics	Pickaway	1,608,458
7	Timken Co.Faircrest Steel	Stark	1,550,600
8	LTV Steel Co.Inc.Cleve.Works	Cuyahoga	1,232,352
9	Timken Co.Harrusib Steel	Stark	1,150,140
10	Occidental Chemical Corp.	Hardin	984,226

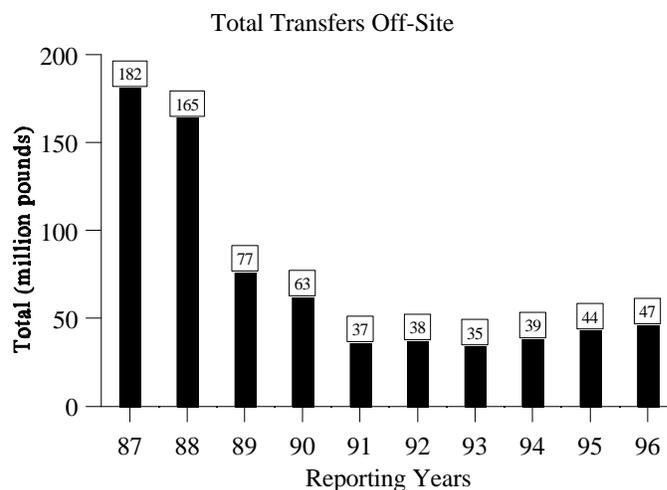
Table 24: Top 10 Chemicals

	Chemical	Transfers Off-site (lbs/yr)
1	Manganese & Compounds	11,726,027
2	Zinc & Compounds	7,934,386
3	Nitric acid	5,317,201
4	Chromium & Compounds	3,722,647
5	Lead & Compounds)	2,465,834
6	Nickel & Compounds	1,543,999
7	Aluminum (Fume & Dust	1,355,179
8	Phenol	1,244,324
9	Copper & Compounds	1,219,187
10	Styrene	1,110,344

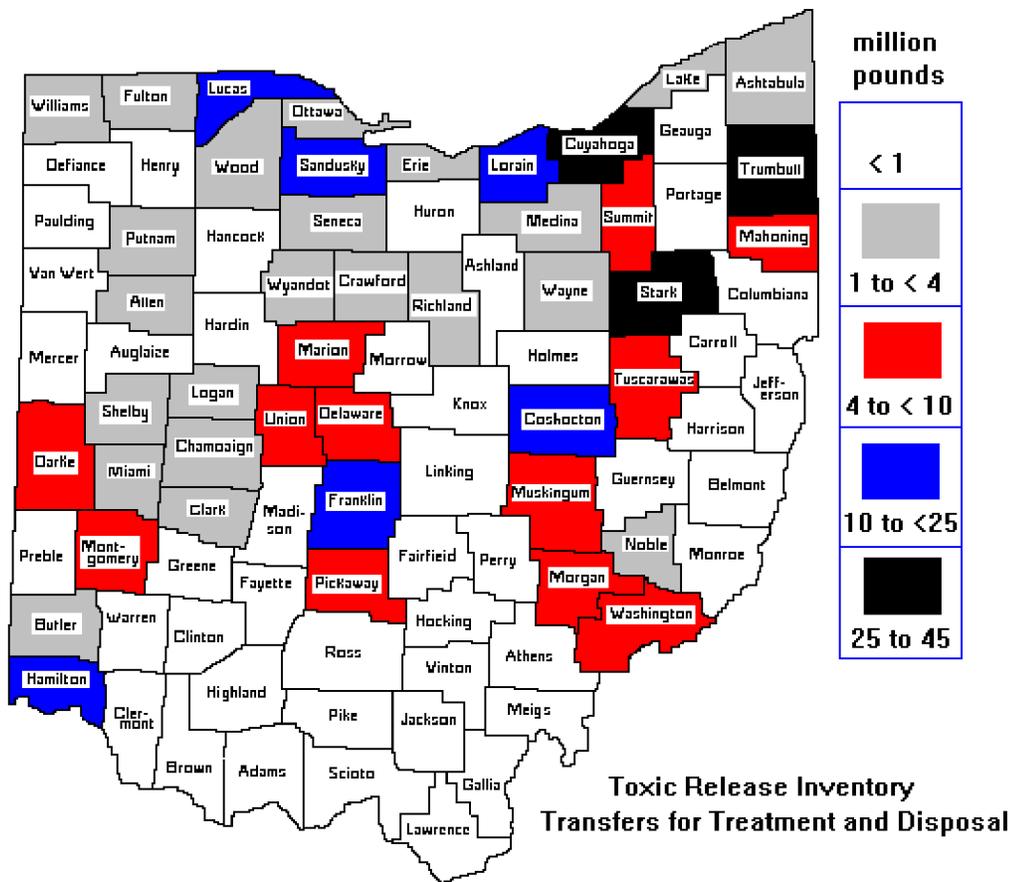
Regulating Transfers Off-site in Ohio

Ohio EPA's Division of Hazardous Waste

Figure 8 - Toxic Trends



Management and Division of Solid and Infectious Waste Mangement regulate many of the facilities which generate and receive waste. Resource Conservation and Recovery Act (RCRA) regulations cover hazardous and solid waste, however, not all TRI chemicals are considered hazardous. Some facilities are “Small Quantity Generators” which are not required to file reports under RCRA, but are required to file reports under TRI.



Transfers Off-Site for Recycling/Reuse

If a waste cannot be prevented through source reduction, the Pollution Prevention Act established recycling or reuse as

the most desired alternatives. Over 192 million pounds of toxic chemicals were transferred off-site to be recycled or reused during 1995. Recycling or reuse can include solvent recovery, metals recovery and acid regeneration. The amount of toxic chemical reported as transferred off-site for recycling is the amount sent from the facility to be recycled. This amount does not reflect the quantity of toxic chemical recovered through the recycling process. Table 28 lists the top 10 toxic chemicals reported as being recycled off-site.

Transfers Off-Site for Energy Recovery

A toxic chemical which is combustible and has a heating value high enough to sustain combustion, may be used in a combustion unit that is integrated into an energy recovery system, such as an industrial furnace, industrial kiln, or boiler. This use of the chemical as a fuel constitutes energy recovery. Approximately 41 million pounds of toxic chemicals were transferred off-site for energy recovery. Table 26 lists the toxic chemicals which were reported as being used in the greatest quantities as fuel for energy recovery.

Table 25: Top 10 Chemicals Recycled Off-Site

	Chemical	Recycled Off-Site (lbs/yr)
1	Copper & Compounds	68,996,596
2	Zinc & Compounds	43,500,734
3	Lead & Compounds	17,785,512
4	Chromium & Compounds	16,474,749
5	Manganese & Compounds	14,796,047
6	Nickel & Compounds	10,557,184
7	Xylene (mixed isomers)	5,283,138
8	Toluene	2,584,831
9	Methyl Ethyl Ketone	2,419,414
10	Methanol	1,522,594

Table 26: Top 10 Chemicals Used for Energy Recovery

	Chemical	Transfer Off-site Energy Recovery (lbs/yr)
1	Xylene (mixed isomers)	10,902,491
2	Methanol	5,705,503
3	Toluene	5,402,476
4	Methyl Ethyl Ketone	3,013,190
5	Ethylene glycol	2,630,876
6	Methyl Isobutyl Ketone	1,979,773
7	Naphthalene	1,795,943
8	Certain Glycol Ethers	1,615,503
9	n-Butyl alcohol	1,318,879
10	Ethylbenzene	1,284,810

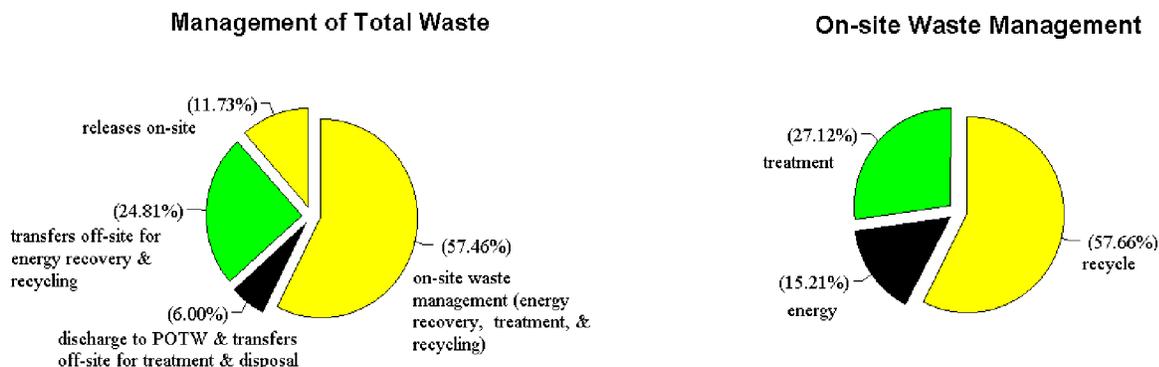
WASTE MANAGEMENT

As reported under TRI, waste that is generated falls under one of four categories based upon its final disposition. The first category is releases on-site, which includes releases to air, water, deepwell injection, and land on-site. The second category is discharges to POTWs and transfers off-site for treatment and disposal. The third category is transfers off-site for recycling and energy recovery, which includes waste recycled or used as fuel. The fourth category is waste management on-site, which includes on-site treatment, recycling and energy recovery. This table identifies the amount of waste generated in these four categories by industrial classification.

SIC Code	Major Business Sector	Number of Reporting Facilities	Releases to On-site Air, Water Deepwell, & Land	Discharges to POTW & Transfers Off-site for Treatment & Disposal	Transfers Off-site for Energy Recovery & Recycling	On-site Waste Management (Treatment, Recycling, and Energy Recovery)
20	Food	74	2,440,262	433,196	142,120	2,210,023
22	Textiles	12	1,425,044	371,287	746,818	4,398,608
23	Apparel	3	87,225	14,100	2,480	591,640
24	Lumber & Wood	22	719,863	93,979	862,007	2,567,797
25	Furniture	5	218,678	158,716	0	300
26	Paper	34	7,337,223	380,365	2,161,265	23,077,398
27	Printing & Publishing	22	570,399	45,140	234,006	600,208
28	Chemicals	286	32,031,757	23,675,591	43,393,532	183,055,566
29	Petroleum & Coal	24	654,710	190,296	233,860	28,087,424
30	Rubber & Plastics	200	7,070,805	3,005,775	3,020,380	5,200,142
32	Stone, Clay & Glass	76	4,070,626	4,067,712	3,051,474	126,441,173
33	Primary Metals	234	44,409,302	19,816,421	80,805,335	155,057,888
34	Fabricated Metals	295	6,081,330	3,897,101	25,361,558	21,746,773
35	Machinery (excluding electrical)	102	1,009,892	2,052,984	7,355,528	2,104,188
36	Electrical & Electronic Equip.	66	1,565,132	2,637,604	18,053,690	10,686,594
37	Transportation Equip.	122	8,124,690	3,193,060	44,106,797	10,069,707
38	Instruments	15	76,265	233,581	1,416,241	316,768
39	Miscellaneous Mfg.	19	356,104	775,065	2,564,019	3,282,691
	Federal Facilities	2	7,394	340	0	69,000
Totals		1613	118,256,701	65,042,293	233,511,080	579,563,888

The following figures provide the relative percentages of the total amount of waste generated in these four categories.

As illustrated by the pie chart, the majority of waste generated never leaves the facility, but is managed on-site through treatment, recycling, or energy recovery. The figure on the left illustrates the statewide management of waste on-site. The on-site waste management data, when combined with the amounts released on-site and transferred off-site, are important in understanding the overall amount of waste which is generated at a facility annually.



So

Source Reduction

Approximately 373 facilities implemented source reduction activities during calendar year 1996. Source reduction means any practice which : (1) reduces the amount of any chemical entering any waste stream or released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and (2) reduces the hazards to public health and the environment associated with the releases of such substances. Source reduction includes equipment or technology modifications, process or procedure modifications, reformulations or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control. It does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a pollutant through a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service. Methods used to identify source reduction activities include internal pollution prevention audits, external pollution prevention audits, state or federal government technical assistance programs, employee recommendations, team management, and trade association or industry technical assistance programs.

One-Time Releases

Facilities reported one-time releases as the total quantity of toxic chemicals released directly into the environment or sent off-site for recycling, waste treatment, energy recovery or disposal during the reporting year due to: (1) remedial actions; (2) catastrophic events such as earthquakes, fires or floods; or (3) one-time events not associated with normal production processes. The purpose of this requirement is to separate releases associated with normal or routine production operations from those that are not. This requirement also separates the quantities that are more likely to be reduced or eliminated by process-oriented source reduction activities from those releases that are largely unpredictable and are less amenable to such source reduction activities. For example, spills that occur as a routine part of production can be reduced by improved handling procedures. These spills are not included in this section. A total loss of containment resulting from a tank rupture caused by a tornado would be included in the quantity reported in this section.

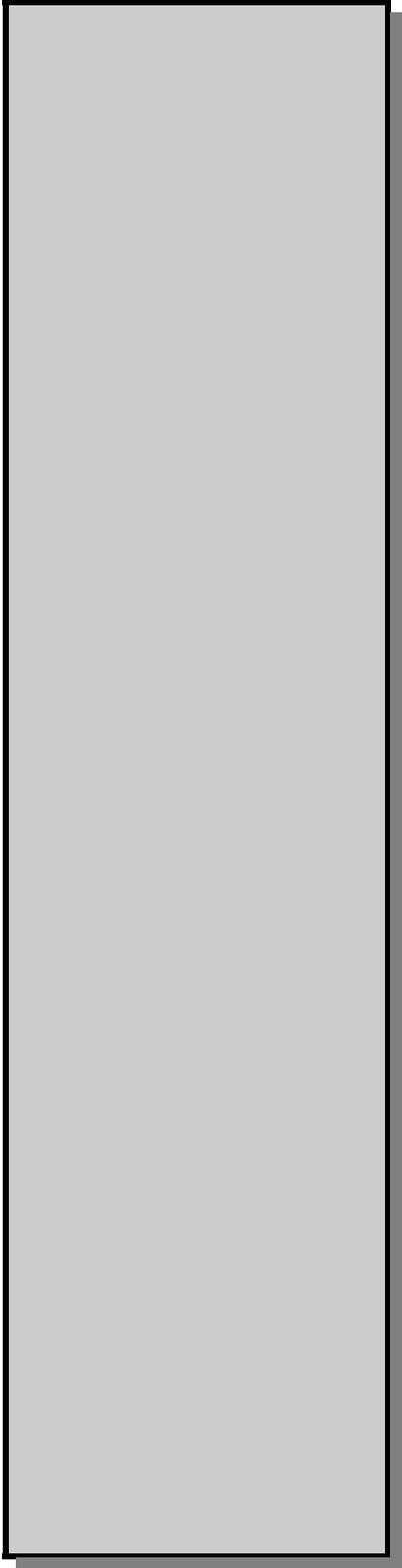
Although one-time releases are not associated with the production process, in many cases, these releases are authorized by the Ohio EPA. A facility would contact Ohio EPA when conducting a remedial action to clean up the environmental contamination resulting from past practices. Approximately 50 Ohio facilities reported 231,528 pounds released due to remedial actions, catastrophic events or one-time events not associated with production processes. Approximately 0.13% of the toxic releases reported under TRI are the result of one-time releases.

Production Ratio

Facilities are required to provide a current reporting year to prior reporting year production ratio or similar activity index. This is to demonstrate the relative use of the particular toxic chemical; whether recycled, used for energy recovery, treated, or disposed. This ratio or index may vary for different chemicals used within a facility. This ratio or index must be based on some variable of production or activity which reflects the toxic chemicals or material usage (a ratio of 1.1 would indicate a 10% increase in production related to the Form R chemical). Indexes based on chemical usage may reflect source reduction rather than changes in business activity. Approximately 45% of the facilities reported an increase in production during 1996. Approximately 13% of the businesses did not report a ratio. Table 27 represents the changes in production reported by facilities covered by TRI.

Table 27: Production Ratio

Changes in Production (value indicated on form R)	% of Reporting Industry
Production increased more than 30% (1.3 +)	11%
Production increased between 20%-30% (1.2 - 1.3)	5%
Production increased between 10%-20% (1.1 - 1.2)	9%
Production increased by less than 10% (1.0 - 1.1)	20%
No change in production (1.0)	9%
Production decreased by less than 10% (0.9 - <1.0)	16%
Production decreased between 10% - 20% (0.8 - 0.9)	8%
Production decreased between 20%-30% (0.7 - 0.8)	4%
Production decreased more than 30% (< 0.7)	5%
Not reported	13%



POLLUTION PREVENTION

POLLUTION PREVENTION POLLUTION PREVENTION

Pollution Prevention means the use of source reduction techniques in order to reduce risk to public health, safety, welfare and the environment and, as a second preference, the use of environmentally sound recycling to achieve these same goals. Pollution prevention avoids cross-media transfers of wastes and/or pollutants and is multi-media in scope. It addresses all types of waste and environmental releases to the air, water and land.

The Ohio EPA **Office of Pollution Prevention** (OPP) was established on July 1, 1993. While the rest of Ohio EPA focuses on controlling pollution after it is generated through regulatory requirements, OPP works with companies on a voluntary, non-regulatory basis to help them modify their operating processes to generate less pollution in a cost-effective and technically feasible manner. The Office of Pollution Prevention provides the following services on an ongoing basis:

- Provides free on-site and other types of technical assistance for pollution prevention and provided assistance to more than 2,800 companies, individuals and/or organizations during 1997. Copies of hundreds of pollution prevention documents are available upon request and electronically through the Internet/World Wide Web at <http://www.epa.ohio.gov/opp>.
- Provides free assistance with completing pollution prevention plans; provides assistance in identifying and implementing pollution prevention credit projects to mitigate portions of environmental enforcement penalties in conjunction with other Ohio EPA Divisions and the Ohio Attorney General's Office.
- Provides low-interest loans (2/3rds of prime) from \$25,000 to \$350,000 to businesses and facilities with less than 500 employees on-site in conjunction with the Ohio Department of Development.
- Provides recognition for pollution prevention efforts through the "Ohio Prevention First" voluntary pollution prevention planning program and the annual Governor's Awards program.
- Coordinates the integration of pollution prevention activities into other Ohio EPA Divisions.

The Office of Pollution Prevention also coordinates a number of specific activities to help companies prevent pollution and to integrate pollution prevention concepts into the other environmental programs at Ohio EPA. Some of these activities include:

Ohio Prevention First: In 1993, Governor George V. Voinovich targeted the top 100 facilities that report the most releases to the environment, and asked Ohio EPA to work with each one to develop a comprehensive pollution prevention plan. Eighty-six of the top 100 facilities are in this program. In addition, 81 other facilities have volunteered to develop pollution plans. Participants have already reduced hazardous waste by 651,000 tons; solid waste by 229,000 tons; and materials reported for the Toxic Release Inventory by 135 million pounds. They have pledged to reduce approximately 422 million additional pounds of pollution, and estimate they will save more than \$37 million through pollution prevention efforts. Ohio EPA has also modified the existing annual Governor's Awards for Pollution Prevention to recognize Ohio Prevention First participants and established a new Director's Award program to provide additional recognition. In 1997 Ohio Prevention First was one of five programs nationwide to receive an award from the Council of State Governments for environmental innovation. A list of companies participating in Ohio Prevention First is listed in the table below.

Pollution Prevention Technical Assistance: Ohio has one of the leading technical assistance programs in the

country for a state without mandatory pollution prevention legislation. OPP provided technical assistance to over 6,000 companies, organizations and/or individuals. This included over 130 site visits to help Ohio companies implement pollution prevention programs. OPP provided over 70,000 pollution prevention documents free-of-charge to help Ohio businesses help themselves to prevent waste. In addition, OPP completed 150 presentations and training events to educate Ohio businesses and organizations about pollution prevention. Ohio's pollution prevention Internet site has also been acknowledged by U.S. EPA and others as one of the best sites in the nation to obtain practical pollution prevention information. Companies interested in receiving non-regulatory pollution prevention technical assistance should contact the Office of Pollution Prevention at (614) 644-3469.

Pollution Prevention Supplemental Environmental Projects: Ohio is recognized as a national leader in incorporating pollution prevention into environmental enforcement settlements. The basic approach is to reduce a portion of an enforcement penalty in exchange for completing some type of pollution prevention activity. Ohio has incorporated pollution prevention into more than 65 enforcement settlements to date.

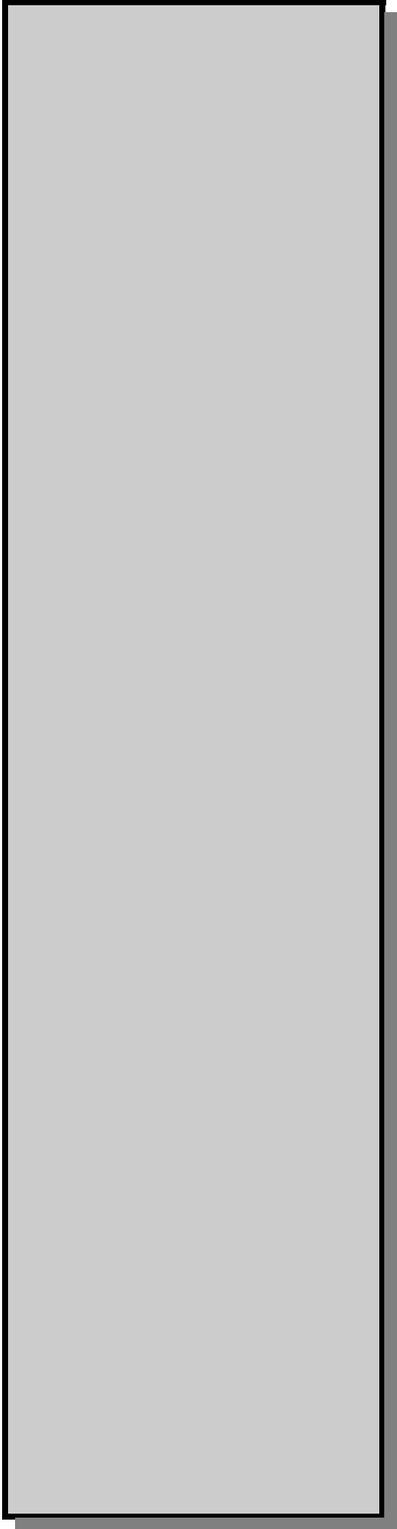
Pollution Prevention Loan Program: In November 1994, Governor Voinovich established a \$10 million fund to provide low-interest loans for pollution prevention to be jointly administered by Ohio EPA and the Ohio Department of Development. As of April 1998, 21 loans totaling \$4.1 million have been approved for projects that should result in an estimated reduction of 116 million pounds of pollution and recycling of 143 million pounds of materials.

National Pollution Prevention Roundtable: Ohio has been increasingly active in the National Pollution Prevention Roundtable providing significant input into national pollution prevention related laws and policies. Ohio hosted the National Pollution Prevention Roundtable Annual Conference in Cincinnati in April.

	<i>Ohio Prevention First Company/Facility Name</i>	<i>County</i>	<i>Participation Level</i>		<i>Ohio Prevention First Company/Facility Name</i>	<i>County</i>	<i>Participation Level</i>
1.	ABITEC Corporation	Franklin	Leadership	12.	Ashland Chemical Company - Foundry Products Division	Cuyahoga	Leadership
2.	AK Steel Corporation - Middletown Works	Butler	Leadership	13.	Ashland Chemical Company - Specialty Polymers and Adhesives	Ashland	Leadership
3.	Alcoa Cleveland Works	Cuyahoga	Leadership	14.	Avery Dennison - Building 3		
4.	Amoco Performance Products	Washington	Leadership	15.	Avery Dennison - Building 5	Lake	Partnership
5.	Amsted Industries - Griffin Wheel	Franklin	Leadership	16.	Avery Dennison - Building 7	Lake	Partnership
6.	Aristech Chemical Corporation	Scioto	Leadership	17.	Avery Dennison - Building 11	Lake	Partnership
7.	Ashland Chemical Company - Akron Distribution Services	Summit	Partnership	18.	Avery Dennison - Building 14	Lake	Partnership
8.	Ashland Chemical Company - Cincinnati Distribution Services	Hamilton	Partnership	19.	Avery Dennison - Building 17	Lake	Partnership
9.	Ashland Chemical Company - Columbus Distribution Services	Franklin	Partnership	20.	Avery Dennison - Building 18	Lake	Partnership
10.	Ashland Chemical Company - Composite Polymers Division	Ashtabula	Leadership	21.	Avery Dennison - Building 19	Lake	Partnership
11.	Ashland Chemical Company - Foundry Products Division	Cuyahoga	Leadership	22.	BASF Corporation - Resin Plant	Darke	Leadership
23.	BASF Corporation - Container Coatings Division	Clermont	Leadership	61.	General Electric - Glass Plant	Trumbull	Leadership
24.	BF Goodrich Company - Akron Specialty Chemical Plant	Summit	Leadership	62.	General Electric - Lamp Plant	Crawford	Leadership
25.	BF Goodrich Company - Specialty Chemicals - Avon Lake	Lorain	Leadership	63.	General Electric - Lamp Plant	Cuyahoga	Leadership

	<i>Ohio Prevention First Company/Facility Name</i>	<i>County</i>	<i>Participation Level</i>		<i>Ohio Prevention First Company/Facility Name</i>	<i>County</i>	<i>Participation Level</i>
26.	BF Goodrich Specialty Chemicals Segment - Brecksville Research and Development Center	Cuyahoga	Leadership	64.	General Electric - Lamp Plant	Pickaway	Leadership
27.	BP Chemicals Inc. - Lima	Allen	Leadership	65.	General Electric - Lamp Plant	Portage	Leadership
28.	BP Oil Company - Lima Refinery	Allen	Leadership	66.	General Electric - Lamp Plant	Trumbull	Leadership
29.	BP Oil Company - Toledo Refinery	Lucas	Leadership	67.	General Electric - Medical Systems	Cuyahoga	Leadership
30.	Battelle	Franklin	Leadership	68.	General Electric - Plastics Plant	Coshocton	Leadership
31.	Bayer (formerly Monsanto)	Hamilton	Partnership	69.	General Electric - Quartz	Lake	Leadership
32.	Borden - Columbus Coated Fabrics	Franklin	Leadership	70.	General Electric - Quartz Plant	Licking	Leadership
33.	Champion International Corporation - Hamilton Mill	Butler	Leadership	71.	General Electric - Superabrasives	Franklin	Leadership
34.	Chemcentral / Cincinnati	Butler	Partnership	72.	General Motors - Extrusions Inc	Mahoning	Leadership
35.	Chevron Chemical Company	Washington	Leadership	73.	General Motors - Assembly Plant	Trumbull	Leadership
36.	Chrysler Corporation - Dayton Thermal Products (formerly Acustar Chrysler)	Montgomery	Leadership	74.	General Motors - BOC, Lordstown	Trumbull	Leadership
37.	Chrysler Corporation - Toledo Assembly Plant	Lucas	Partnership	75.	General Motors - CPC Group	Erie	Leadership
38.	Chrysler Corporation - Toledo Machining Plant	Wood	Leadership	76.	General Motors - Delco Chassis	Richland	Leadership
39.	Cincinnati Specialties Inc.	Hamilton	Leadership	77.	General Motors - Delco Chassis	Montgomery	Leadership
40.	Degussa Corporation	Washington	Partnership	78.	General Motors - Delco Chassis	Montgomery	Leadership
41.	Dupont - Circleville	Pickaway	Leadership	79.	General Motors - Delco Chassis	Montgomery	Leadership
42.	Dupont - Fort Hill Plant	Hamilton	Partnership	80.	General Motors - Delco Products	Montgomery	Leadership
43.	Elkem Metals Company	Washington	Leadership	81.	General Motors - Delco Products	Montgomery	Leadership
44.	EKCO Housewares, Inc.	Stark	Leadership	82.	General Motors - Harrison Division	Montgomery	Leadership
45.	Eveready Battery Company Inc.	Washington	Partnership	83.	General Motors - Inland Fisher Guide	Franklin	Leadership
46.	Excello Fabric Finishers Inc.	Coshocton	Leadership	84.	General Motors - Inland Fisher Guide	Montgomery	Leadership
47.	Ford - Cleveland Casting Plant	Cuyahoga	Partnership	85.	General Motors - Moraine Engine	Montgomery	Leadership
48.	Ford - Lorain Assembly Plant	Lorain	Leadership	86.	General Motors - Packard Electric	Portage	Leadership
49.	Ford - Ohio Assembly Plant	Lorain	Leadership	87.	General Motors - Packard Electric	Trumbull	Leadership
50.	Franklin International, Inc.	Franklin	Leadership	88.	General Motors - Packard Electric	Trumbull	Leadership
51.	GRACE-Davison	Hamilton	Leadership	89.	General Motors - Packard Electric	Trumbull	Leadership
52.	General Electric - Aircraft Engines	Hamilton	Leadership	90.	General Motors - Powertrain	Lucas	Leadership
53.	General Electric - Aircraft Engines	Adams	Leadership	91.	General Motors - Powertrain	Defiance	Leadership
54.	General Electric - Austintown Products	Mahoning	Leadership	92.	General Motors - Truck & Bus	Montgomery	Leadership
55.	General Electric - Chemical Products	Cuyahoga	Leadership	93.	Georgia-Pacific Resins Inc.	Franklin	Leadership
56.	General Electric - Conneaut Base	Ashtabula	Leadership	94.	Goodyear Tire & Rubber Co.	Auglaize	Leadership
57.	General Electric - Dover Wire	Tuscarawas	Leadership	95.	Harwick Chemical Corporation	Summit	Partnership
58.	General Electric - Elano Corp.	Clark	Leadership	96.	Henkel Corporation Emery Group	Hamilton	Leadership
59.	General Electric - Euclid Lamp	Cuyahoga	Leadership	97.	Hilton Davis	Hamilton	Partnership
60.	General Electric - Glass Plant	Hocking	Leadership	98.	Honda - Anna Engine Plant	Shelby	Leadership
99.	Honda - East Liberty Plant	Logan	Leadership	134.	S.K. Wellman (formerly Sintermet Corporation)	Cuyahoga	Partnership
100.	Honda - Marysville Auto Plant	Union	Leadership	135.	Schuller International Plant 2	Defiance	Leadership
101.	Honda - Marysville Motorcycle	Union	Leadership	136.	Schuller International Plant 3	Defiance	Leadership
102.	Huffy Bicycles	Mercer	Partnership	137.	Schuller International Plant 8	Defiance	Leadership
103.	ISP Fine Chemicals, Incorporated	Franklin	Leadership	138.	Millennium Inorganic Chemicals, Inc. Plant I (formerly SCM Chemicals - Plant I)	Ashtabula	Partnership

	<i>Ohio Prevention First Company/Facility Name</i>	<i>County</i>	<i>Participation Level</i>		<i>Ohio Prevention First Company/Facility Name</i>	<i>County</i>	<i>Participation Level</i>
104.	LTV Steel Company - Cleveland Works	Cuyahoga	Leadership	139.	Millennium Inorganic Chemicals, Inc. Plant II (formerly SCM Chemicals - Plant II)	Ashtabula	Partnership
105.	LTV Steel Company - Warren Coke Plant	Trumbul	Leadership	140.	Shell Chemical Company	Washington	Leadership
106.	Laidlaw Environmental Services (WT), Incorporated	Franklin	Partnership	141.	Sherwin-Williams	Cuyahoga	Leadership
107.	The Lubrizol Corporation	Lake	Partnership	142.	Smith & Nephew Perry	Stark	Leadership
108.	MACtac - Morgan Adhesives Co.	Summit	Leadership	143.	Techneglas	Franklin	Leadership
109.	Mead Corporation - Fine Paper Division	Ross	Leadership	144.	Tenneco Packaging (formerly Packaging Corp. of America)	Wayne	Leadership
110.	Merrell Pharmaceuticals Inc. (formerly Merrell Dow Pharmaceuticals, Inc.)	Hamilton	Leadership	145.	The Bron-shoe Company	Franklin	Partnership
111.	Metal Beverage Container Group (Ball)	Hancock	Leadership	146.	The Dow Chemical Company	Lawrence	Leadership
112.	Metal Processing Corporation	Cuyahoga	Leadership	147.	The Geon Company	Lorain	Partnership
113.	Morton International	Hamilton	Leadership	148.	The Lincoln Electric Company	Cuyahoga	Leadership
114.	Navistar International Transportation Corporation	Clark	Leadership	149.	The Scotts Company	Union	Leadership
115.	North Star Steel Ohio	Mahoning	Leadership	150.	The Timken Company - Faircrest	Stark	Leadership
116.	Owens-Corning - Mt. Vernon Plant	Knox	Partnership	151.	The Timken Company - Harrison	Stark	Leadership
117.	Owens-Corning Newark Plant	Licking	Partnership	152.	The Timken Company - Wooster	Wayne	Leadership
118.	OxyChem - Occidental Chemical	Ashtabula	Leadership	153.	The Village of Crooksville	Perry	Partnership
119.	PPG - Chemicals	Summit	Partnership	154.	UC Industries, Inc.- Technical Center	Summit	Leadership
120.	PPG - Coatings and Resin	Pickaway	Partnership	155.	US Department of Energy	Pike	Leadership
121.	PPG - Coatings and Resin	Cuyahoga	Partnership	156.	USS/KOBE Steel Company	Lorain	Leadership
122.	PPG - Coatings and Resins	Delaware	Leadership	157.	Union Camp Corporation - Chemical Division	uscarawas	Leadership
123.	Perstorp Polyols, Incorporated	Lucas	Partnership	158.	United States Enrichment Corp.	Pike	Leadership
124.	Phillips Display Components Co.	Putnam	Leadership	159.	WCI Steel, Incorporated	Trumbull	Leadership
125.	Phthalchem/Cychem, Inc.	Hamilton	Partnership	160.	Walbridge Coatings	Wood	Leadership
126.	Proctor & Gamble Manufacturing Company	Hamilton	Leadership	161.	Wheeling-Pittsburgh Steel Corp.	Belmont	Leadership
127.	Proctor & Gamble Manufacturing	Hamilton	Leadership	162.	Wheeling-Pittsburgh Steel Corporation	Jefferson	Leadership
128.	Proctor & Gamble Manufacturing	Allen	Leadership	163.	Wheeling-Pittsburgh Steel Corp.	Jefferson	Leadership
129.	Quality Chemicals, Incorporated	Montgomery	Partnership	164.	Wheeling-Pittsburgh Steel Corp.	Jefferson	Leadership
130.	Quantum Chemical Company	Licking	Leadership	165.	Wheeling-Pittsburgh Steel Corp.	Mahoning	Leadership
131.	Quantum Chemical Company	Lake	Leadership	166.	Whirlpool Corporation - Marion	Marion	Leadership
132.	Republic Engineered Steels	Stark	Leadership	167.	Whirlpool Corporation - Clyde Div.	Sandusky	Leadership
133.	Rotec Incorporated	Portage	Leadership				



THE NATIONAL PERSPECTIVE

THE NATIONAL PERSPECTIVE

Ohio, a leader in technology and industry, continues to represent a significant portion of the national TRI reporting industries and releases. Table 28 presents Ohio's national ranking for each type of release and transfer up to calendar year 1995. Because the 1996 national data was not available prior to the national data release, the national rankings for 1996 were not yet available.

Table 28: Ohio's National Ranking

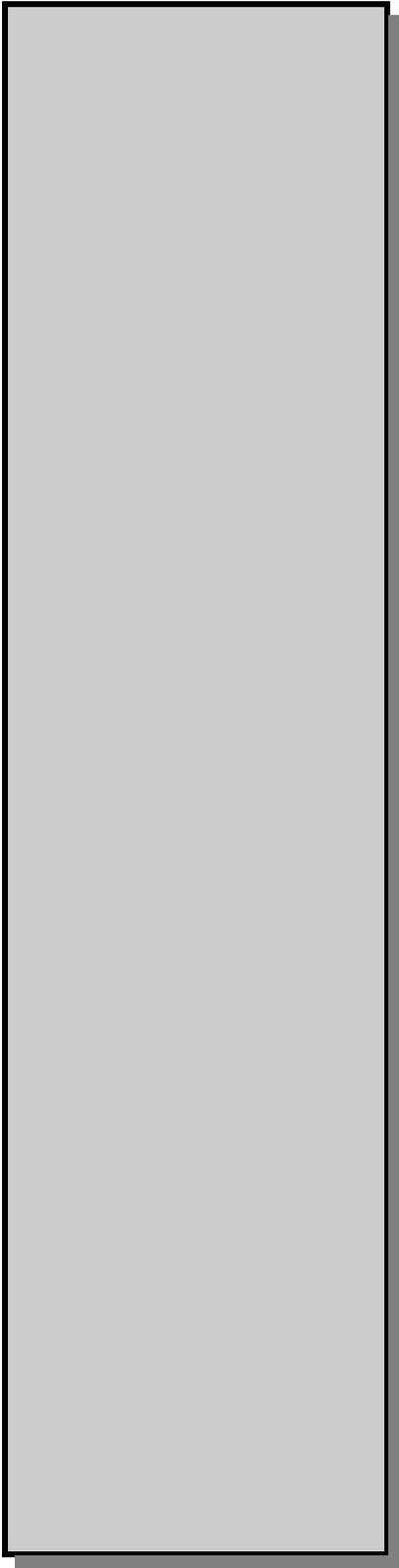
Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995
Air	2	2	3	3	3	4	4	5	5
Surface Water	11	12	9	5	4	6	4	12	11
Land On-Site	7	7	6	8	5	5	3	4	2
Underground Injection	5	4	4	6	6	7	5	7	4
POTW	8	10	7	6	2	7	7	9	4
Off-Site Transfers	2	1	1	3	2	3	2	3	4
Total Releases & Transfers for Treatment & Disposal	3	3	3	3	3	7	3	3	3
Number of Reporting Facilities	2	2	2	2	2	2	2	1	1

Where the TRI Releases Occur

The following tables identify the top-ranked states for 1995 toxic releases and transfers (from U.S.EPA's 1995 TRI Annual Report).

Releases to Air			Releases to Water			Releases to Land On-Site			Discharges to POTW		
Rank	State	RY 1995 pounds	Rank	State	RY 1995 pounds	Rank	State	RY 1995 pounds	Rank	State	RY 1995 pounds
1	Texas	128,694,945	1	Louisiana	28,268,576	1	Montana	39,420,586	1	Texas	41,325,733
2	Tennessee	103,130,070	2	Texas	23,413,945	2	Ohio	30,217,526	2	New Jersey	22,531,441
3	Alabama	91,867,818	3	W.Virginia	8,665,922	3	Arizona	28,520,806	3	Virginia	16,429,787
4	Louisiana	84,841,485	4	Mississippi	8,373,840	4	Florida	25,779,920	4	Ohio	16,019,258
5	Ohio	73,749,306	5	Georgia	6,345,066	5	Illinois	23,037,696	5	California	12,883,050
			11	Ohio	3,433,797						

Total Releases & Transfers			Deepwell Injection			Transfers for Treatment & Disposal			Number of Reporting Facilities		
Rank	State	RY 1995 pounds	Rank	State	RY 1995 pounds	Rank	State	RY 1995 pounds	Rank	State	Facilities
1	Texas	387,579,294	1	Texas	118,850,176	1	Pennsylvania	76,808,284	1	Ohio	1,623
2	Louisiana	184,431,550	2	Louisiana	54,494,533	2	Texas	62,321,418	2	California	1,478
3	Ohio	184,150,384	3	Florida	25,343,332	3	Michigan	49,586,120	3	Illinois	1,334
4	Illinois	141,515,996	4	Ohio	14,469,938	4	Ohio	46,260,559	4	Pennsylvania	1,213
5	Penn.	139,142,629	5	Wyoming	8,168,366	5	Indiana	35,177,231	5	Texas	1,193



**ADDITIONAL
INFORMATION**

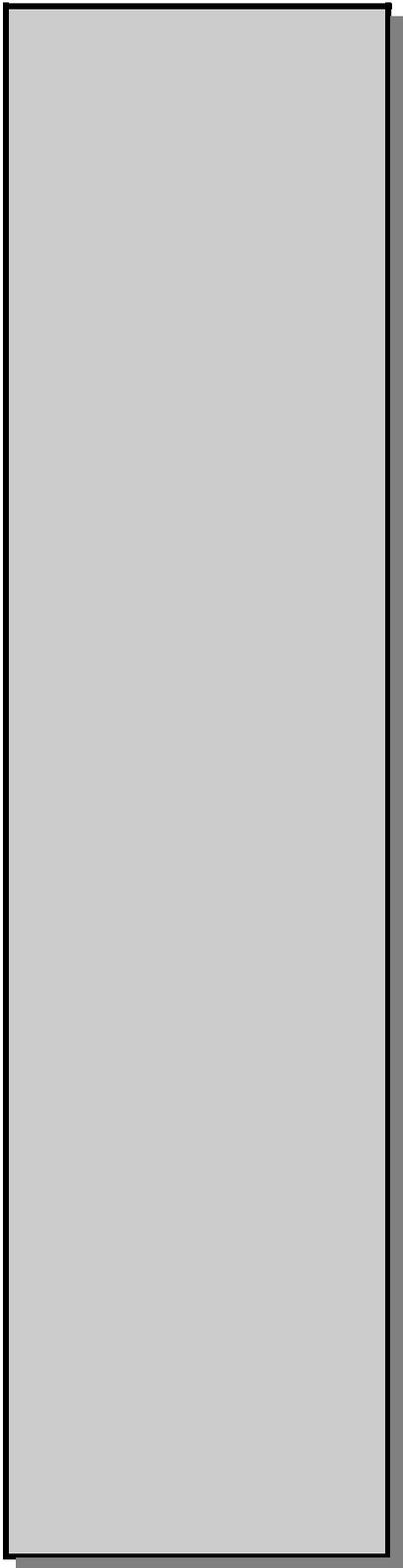
ADDITIONAL INFORMATION

Ohio EPA's Division of Air Pollution Control (DAPC) has the primary responsibility in Ohio for collecting, processing, and distributing information submitted under TRI. Additional information not contained in this report is available to the public through the TRI Program located within DAPC.

- ◆ Access to hardcopy reports - The reports submitted by facilities are available for review at Ohio EPA's office located at 1600 WaterMark Drive in Columbus from 8:00 a.m. to 5:00 p.m., Monday through Friday. Photocopies may be obtained.
- ◆ Information requests by telephone - TRI staff can take requests by phone to provide information on individual facilities. TRI information can be supplied by fax, or by mail as either a hard copy or on a computer disk. Data searches and summaries can also be performed on the data. Call the TRI staff at (614) 644-2270 during business hours.
- ◆ Information through the Internet - The TRI staff maintain a TRI site on Ohio EPA's web page. The complete Ohio database and copies of this report can be accessed through the web page. The TRI data can be found at the following Internet address: www.epa.state.oh.us/dapc/tri/
- ◆ 1996 Toxic Release Inventory Public Data Release - U.S. EPA's most recent annual TRI report. It covers information nationwide and provides a good perspective on how Ohio compares to other states. This report may be obtained by contacting U.S. EPA's toll-free hotline at 1-800-535-0202.

Questions or comments regarding TRI are welcome. Please direct questions, comments, or requests to:

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APPENDICES

Appendix A: Chemical Summary

Appendix B: County Summaries