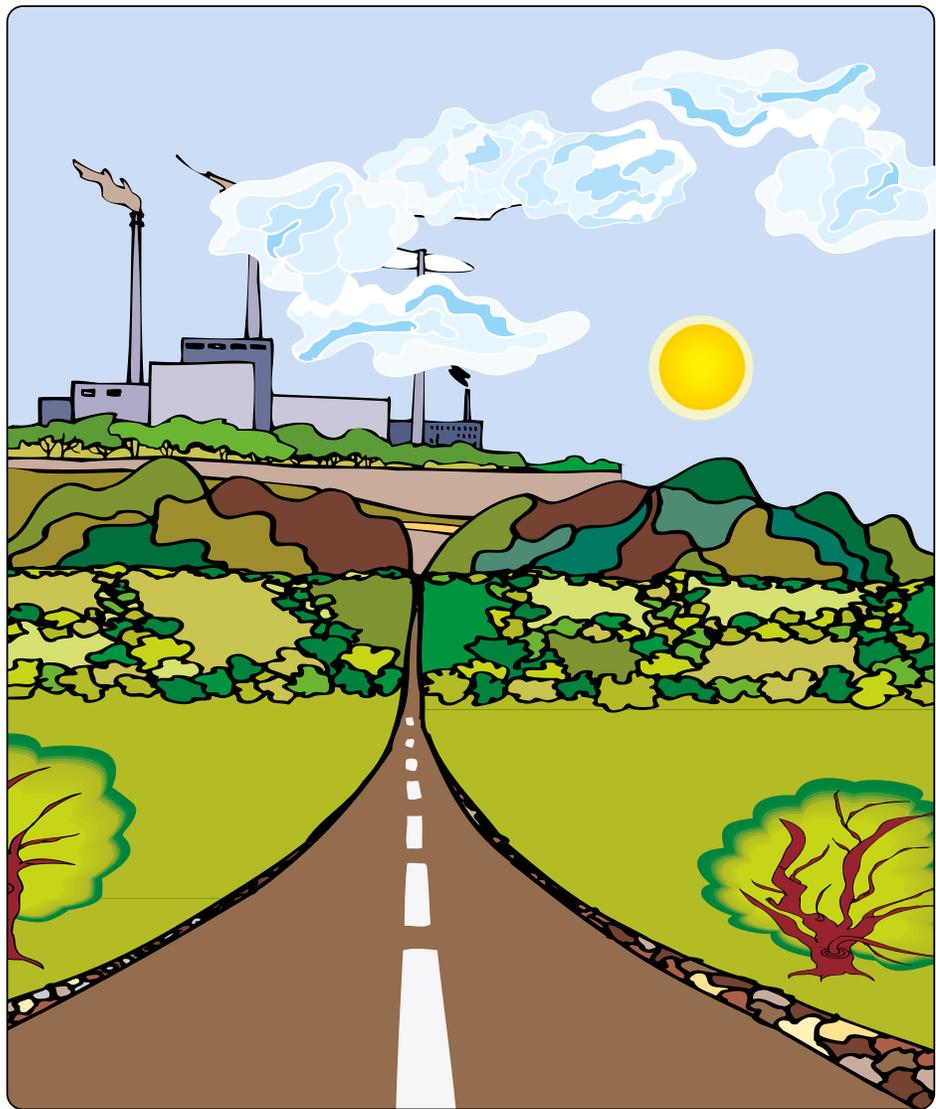


# 1998

## Oklahoma

### Toxics Release Inventory

#### Summary Report



Oklahoma Department of Environmental Quality  
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405-702-1000



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# Executive Summary

The continued decline of total toxic wastes produced in Oklahoma reflects the effectiveness of pollution prevention activities as seen in the 1998 Oklahoma Department of Environmental Quality TRI report. This is the twelfth year the DEQ has compiled this information, beginning at the inception of TRI. The U.S. Environmental Protection Agency (EPA) collects the TRI information on a national basis.

The information in this report provides figures for legal emissions, transfers and treatment of over 600 toxic chemicals used by manufacturing facilities. The chemicals are used in the manufacture of a wide variety of products. Permits issued by state and federal agencies regulate these releases and transfers of chemicals.

In 1998 EPA added seven industrial categories to TRI, four of which operate in Oklahoma. These are coal-fired power plants, industrial waste handlers, bulk petroleum terminals and chemical distributors and warehouses. Coal-fired utilities account for the majority of electrical power produced in the state, while Oklahoma industrial treatment, storage and disposal sites receive wastes from thirty-three states. Due to new reporting requirements, twenty-three facilities reported releases for the first time. The new reporting sectors impact the data in several ways, as seen in the 1998 report. Releases include those chemicals emitted directly into air, water or onto land. Transfers include chemicals going into public sewers or off-site landfills or other disposal facilities. Re-use figures include figures for chemicals recycled or used for energy recovery. Treatment numbers include both on-site and off-site treatment that

destroys the toxic chemical. When summed, the figures reflect total production-related wastes generated.

Oklahoma companies reported 38 million pounds released, 3 million pounds transferred, 63.2 million pounds reused and 25.6 million pounds treated. When only those facilities reporting in the previous year are considered, the figures are 22.7 million pounds released, 1.8 million pounds transferred, 62.5 million pounds reused and 23.6 million pounds treated, indicating a continued reduction in total chemical wastes. Even with the addition of new reporting facilities, total production related wastes in Oklahoma continue to decline, from 144 million pounds in 1997 to 129.8 million pounds in 1998. This represents a ten percent decrease in production wastes for 1998 and a fifty-four percent decrease in the past five years. These decreases are due to the elimination or reduction in use of toxic chemicals to levels below reporting thresholds. When considering that the total number of forms received, the number of facilities reporting and the number of chemicals reported all have increased over time, the decreases are even more significant. Oklahoma continues to reduce total produced wastes even though nationally the figures have risen over past years.

The 1998 report reflects the success of voluntary pollution prevention programs sponsored by the DEQ and cooperation from industry. The continued reduction in toxic wastes produced in the state, as reflected in the TRI report, shows that voluntary pollution prevention is an effective tool.

# Glossary

**De minimis** - An exemption to TRI reporting whereby any chemical or chemical group which comprises less than 1 percent of a mixture need not be reported even if the total quantity of the chemical exceeds the threshold quantity. If the chemical or chemical group is listed as a carcinogen by OSHA, the de minimis concentration drops to 0.1 percent.

**DEQ** - Oklahoma Department of Environmental Quality

**EPCRA**- Emergency Planning and Community Right to Know

**Energy Recovery**- Recovery of useful energy from waste mainly through combustion of chemical 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 entity.

**Fugitive (Non-Point) Air Releases**- Emissions to the air that 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 impoundments 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, energy recovery, recycling or disposal.

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

**Publicly Owned Treatment Works (POTW)**- 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 but is not limited to making mixtures, repackaging or using a toxic chemical as a feedstock, raw material or starting material for making another chemical.

**RCRA**- Resource Conservation and Recovery Act

**Recycle**- The process of capturing a useful product from a waste stream. Solvent recovery, metals recovery and acid regeneration are examples of recycling.

# Glossary

**Releases**- Refers to on-site discharges of TRI listed chemicals to the air, water, land or disposal in underground injection wells. Includes permitted, accidental and non-permitted discharges.

**Releases to Air**- Sum of Fugitive (Non-Point) Air Releases plus Stack (Point Source) Air Releases.

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

**Releases to Water**- Refers to discharging of chemicals to surface waters such as rivers, lakes, ponds and streams.

**Reuse**- The sum of recycling and energy recovery activities.

**SARA Title III**- The section of the Superfund Amendments and Reauthorization Act (SARA) which mandates Emergency Planning and Community Right to Know.

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

**Standard Industrial Classification Code (SIC Code)**- A four digit number code designated by the Federal Office of Management and Budget to describe the type of activity(s) at a facility. The first two numbers of the code define a major business sector, and the last two numbers define a facility's specialty within the major sector.

**Toxic**- A substance that produces or causes a systemic damage to an organism.

**TRI**- Toxics Release Inventory; Section 313 of SARA Title III

**Transfers**- Refers to TRI listed chemicals sent off-site for energy recovery, recycling, treatment or disposal. Reported as transfers to either Publicly Owned Treatment Works or other off-site transfers (non-POTW) such as incinerators, landfills, other treatment, recycling, energy recovery or disposal facilities not part of the reporting facility.



# Background

In 1984 an accidental release of deadly methyl isocyanate gas in Bhopal, India caused the deaths of thousands. Soon after, a serious, although not fatal, chemical release occurred at a similar plant in West Virginia. These incidents, along with the need for communities to be informed of hazardous materials in their midst, prompted the United States Congress to pass Title III of the Superfund Amendments and Reauthorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986. The fundamental purposes of the Act are to provide the public with information about toxic chemicals used and stored within communities, thereby raising public awareness of potential chemical hazards, and to encourage local planning for chemical emergencies. Section 313 of this Bill requires that specified facilities which manufacture, process or otherwise use listed toxic chemicals report releases of these chemicals to the federal Environmental Protection Agency (EPA) and to states on an annual basis. By mandate, the information contained in the Toxics Release Inventory (TRI) is available to the public.

Facilities covered by TRI report total quantities of wastes generated, as well as the maximum amounts of listed toxic chemicals present on-site during the calendar year. Releases of chemical wastes are reported according to the media into which they are released, air, water, land or underground injection. Additionally, figures for off-site transfers of waste chemicals to separate facilities for treatment, disposal, or reuse are reported. The Pollution Prevention Act of 1990 required additional information regarding source reductions of toxic chemicals in wastes to

be reported in the TRI. These changes highlight the importance of pollution prevention and encourage development and implementation of measures for reducing wastes. Since 1991, TRI has contained information on the re-use of chemicals, including the quantities of chemicals recycled or combusted for energy recovery. Treatment numbers include both on-site and off-site treatments to neutralize or reduce the effects of the toxic chemical. The total of release, transfer, and re-use numbers yields the total production-related wastes generated annually.

The Oklahoma Department of Environmental Quality annually receives TRI report forms from covered Oklahoma industries, compiles and maintains a TRI database, reconciles it to the EPA database and analyzes the data. In 1999, DEQ received 1,038 reports from 313 facilities for the 1998 reporting year. The information is made available by DEQ to emergency managers, fire departments, Local Emergency Planning Committees, emergency medical services, law enforcement and the general public. These local entities can use the data to identify potential chemical hazards and plan for chemical emergencies, allowing faster and more efficient responses.

Additional copies of this report or more in depth information about TRI reporting or other EPCRA programs may be obtained by contacting the Oklahoma DEQ Customer Services Division/SARA Title III Programs at 405-702-1000 or at 1-800-869-1400 or by visiting the DEQ website at: [http:// www. deq.state.ok.us/Riskintro.htm](http://www.deq.state.ok.us/Riskintro.htm)

# Limitations of TRI Data

TRI reports information on the quantities of specified toxic chemicals released and managed by facilities covered under Section 313 of SARA Title III. As such, TRI provides the most comprehensive overview available of chemical releases and waste management techniques. Responsible use of this information can enable the public to identify and better understand potential hazards in the community. From there, communities can delineate plans of action in the event of chemical emergencies and work with industry and government to reduce toxic releases. However, there are limitations to consider when using TRI data.

Releases reported in the TRI are regulated under permits issued by State and Federal agencies. Transfers to off-site locations for treatment, storage or disposal also are regulated, as are on-site disposals. For example, sites permitted under RCRA Subtitle C are strictly regulated and monitored to insure that human exposure and impact to the environment are minimal. It should not be construed that all TRI releases have direct deleterious effects. Prior to the current reporting year, only manufacturing facilities were required to report to the TRI. Although the 1998 additions expand TRI reporting, not all sources of toxic materials are covered. For example, neither transportation emissions nor releases from small facilities are reported.

TRI expanded for reporting year 1995 to double the number of covered chemicals or chemical groups. At present, 604 chemicals and chemical groups known to impact human health, the environment, or both are reported. As extensive as the current list is, it does not include every toxic chemical used in industry. Reportable chemicals vary widely in individual toxicity and persistence in the environment. For example, the release of a small quantity of a highly toxic material, which may fall below the reporting threshold, could pose a more serious health or environmental hazard than a larger release of a less toxic one. TRI provides information on chemical releases, not exposure levels to the public of those chemicals. Quantities

in the TRI database are yearly totals; peak concentrations or accidental discharges are not specifically sited. The different media into which toxic chemicals are released greatly affect exposure levels and the means of exposure, (inhalation, dermal absorption or ingestion). Therefore, health assessments or environmental risks/exposures based solely on TRI data are not valid.

Facilities are required to base TRI reports on monitoring data when available. However, if actual measurements are not available, TRI data can be based on estimates. In fact, much of the data generated is estimated. Although EPA publishes estimation guidance, several techniques can be used. Variations between similar facilities may result from the use of different estimation methodologies or differences in technologies. The production level of a facility may change from year to year and consequently affect the quantities of chemicals released. Productivity ratios are provided by facilities for each chemical released and can be used to compare quantities released from year to year. This assumes a direct linear relationship between production levels and wastes generated. Total wastes may fall as productivity improves due to waste reduction or improved process efficiency. Also productivity ratios will not take into account chemical releases resulting from any remedial action or one-time event. These factors should be considered when reviewing TRI figures.

Continued changes in TRI reporting, such as the increase in the number of chemicals covered and the addition of industrial categories, reflect efforts to build the TRI into an increasingly comprehensive database. These expansions of the program, however, necessitate that the data be viewed with caution when making comparisons from year to year. Many of the chemical releases reported in the TRI are permitted under State programs, and data from these regulatory programs should provide additional information to inform citizens about toxic chemicals in the environment.

# 1998 TRI Overview

Forty-eight of seventy-seven Oklahoma counties contain industrial facilities that meet threshold requirements for TRI reporting, and a total of 313 facilities reported in 1998 (Figure 1). In eight counties, the total of releases from all TRI facilities exceeded one million pounds. These counties include the major metropolitan areas of Oklahoma City and Tulsa, counties accessing the Port of Catoosa, and counties with major wood processing/paper manufacturing facilities or major treatment, storage and disposal sites. Further information on releases in individual counties can be found in Table A. (Table A is located on the next page.)

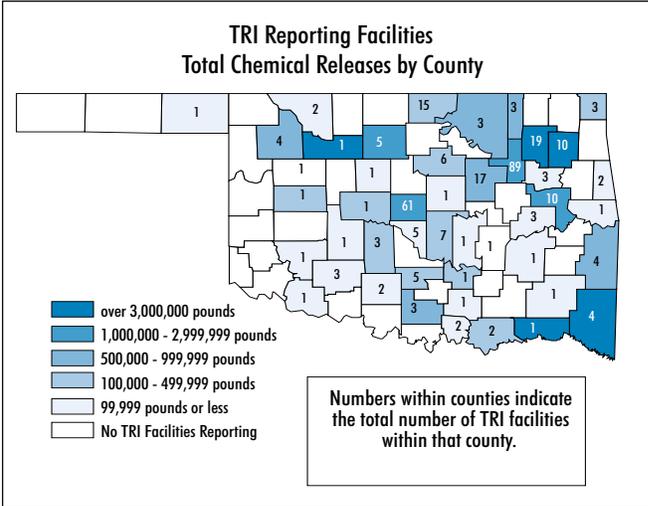


Figure 1

Oklahoma continues to see a decline in the quantities of toxic chemical wastes, even with the addition of the new industrial categories. Total production related wastes dropped from 144 million pounds in 1997 to 129.8 million pounds for the current reporting year (Figure 2). This represents a ten percent decrease in total production wastes in one year and a fifty-four percent decrease in the past five years. For 1998 Oklahoma companies reported:

- 38 million pounds released
- 3 million pounds transferred for disposal
- 63.2 million pounds reused
- 25.6 million pounds treated

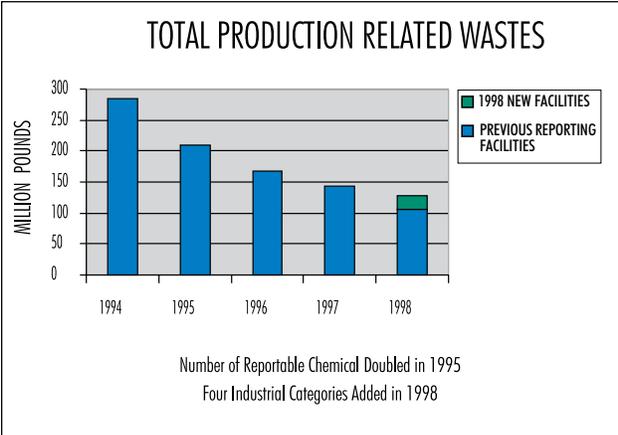


Figure 2

Releases were comprised of:

- 23.3 million pounds released to air
  - 6.7 million pounds released to land or permitted landfills
  - 4.4 million pounds disposed of in underground injection wells
  - 803,000 pounds discharged to surface waters.
- (Figure 3)

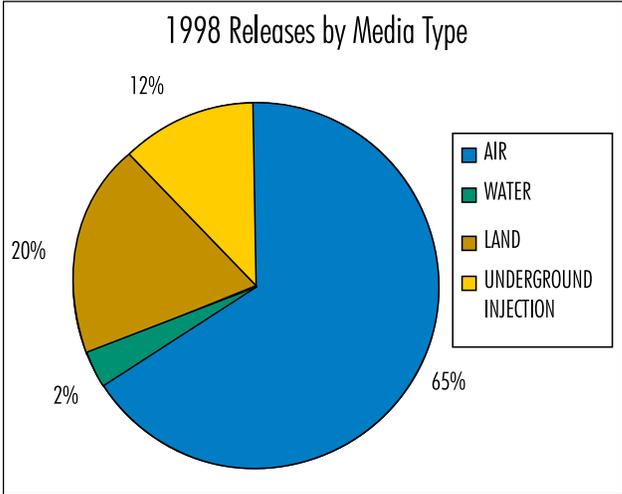


Figure 3

# Table A Total Releases and Total Transfers

COUNTY	AIR	LAND	UIC	WATER	TOTAL ON-SITE RELEASES	OFF-SITE TRANSFERS	POTW TRANSFERS	TOTAL RELEASES & TRANSFERS
Adair	54,716	-	-	-	54,716	-	-	54,716
Alfalfa	-	-	-	-	-	-	-	-
Atoka	-	-	-	-	-	-	-	-
Beaver	29,370	-	-	-	29,370	-	-	29,370
Beckham	-	-	-	-	-	-	-	-
Blaine	-	-	-	-	-	-	-	-
Bryan	232,467	-	-	-	232,467	-	-	232,467
Caddo	-	-	-	-	-	-	-	-
Canadian	153,664	-	-	-	153,664	1,338,800	147,585	1,640,049
Carter	422,209	5	-	5	422,219	164,227	945	587,391
Cherokee	-	-	-	-	-	-	-	-
Choctaw	3,392,000	8,350	-	-	3,400,350	-	-	3,400,350
Cimarron	-	-	-	-	-	-	-	-
Cleveland	5,312	-	-	5	5,317	318,889	14,925	339,131
Coal	-	-	-	-	-	-	-	-
Comanche	451	35,541	-	-	35,992	97,323	10,289	143,604
Cotton	-	-	-	-	-	-	-	-
Craig	-	-	-	-	-	-	-	-
Creek	60,175	163	-	-	60,338	40,996	40,996	142,330
Custer	118,580	-	-	-	118,580	-	-	118,580
Delaware	-	-	-	-	-	-	-	-
Dewey	-	-	-	-	-	-	-	-
Ellis	-	-	-	-	-	-	-	-
Garfield	1,827,637	1,005	-	6,010	1,834,652	186,000	15	2,020,667
Garvin	159,293	1,005	-	14,035	174,333	-	-	174,333
Grady	74,317	-	-	-	74,317	179,403	226	253,946
Grant	-	-	-	-	-	-	-	-
Greer	-	-	-	-	-	-	-	-
Harmon	-	-	-	-	-	-	-	-
Harper	-	-	-	-	-	-	-	-
Haskell	-	-	-	-	-	-	-	-
Hughes	-	-	-	-	-	-	-	-
Jackson	-	-	-	-	-	-	-	-
Jefferson	-	-	-	-	-	-	-	-
Johnston	11,760	-	-	-	11,760	-	-	11,760
Kay	339,359	827	-	15,634	355,820	275,800	760	632,380
Kingfisher	23,350	50	-	-	23,400	903,200	-	926,600
Kiowa	500	-	-	-	500	7,536	5	8,041

# Table A Continued Total Releases and Total Transfers

COUNTY	AIR	LAND	UIC	WATER	TOTAL ON-SITE RELEASES	OFF-SITE TRANSFERS	POTW TRANSFERS	TOTAL RELEASES & TRANSFERS
Latimer	-	-	-	-	-	-	-	-
Leflore	195,826	-	-	-	195,826	773,000	100,681	1,069,507
Lincolin	43,161	-	-	-	43,161	-	-	43,161
Logan	-	-	-	-	-	-	-	-
Love	-	-	-	-	-	-	-	-
Major	1,737	6,642,012	-	-	6,643,749	-	-	6,643,749
Marshall	394,514	-	-	-	394,514	-	-	394,514
Mayes	708,194	1,801	3,314,587	250	4,024,832	-	-	4,024,832
McCurtain	3,574,502	475,778	-	48,216	4,098,496	1,250	3,400	4,103,146
McIntosh	23,938	-	-	10	23,948	-	-	23,948
Murray	-	-	-	-	-	-	-	-
Muskogee	920,255	6,151	-	14,134	940,540	882,096	6,558	1,829,194
Noble	250,679	34,460	-	808	285,947	-	-	285,947
Nowata	-	-	-	-	-	-	-	-
Ofuskee	-	-	-	-	-	-	-	-
Oklahoma	2,131,064	5,523	-	255	2,136,842	1,049,548	76,025	3,262,415
Okmulgee	29,175	-	-	-	29,175	511	14,568	44,254
Osage	993,374	-	2,700	-	996,074	229,880	-	1,225,954
Ottawa	129,786	-	-	-	129,786	22,062	-	151,848
Pawnee	-	-	-	-	-	-	-	-
Payne	156,660	-	-	-	156,660	339,664	67,841	564,165
Pittsburg	5,499	144	-	-	5,643	96	-	5,739
Pontotoc	310,386	-	-	-	310,386	297,460	-	607,846
Pottawatomie	130,881	800	-	474	132,155	400,299	2,993	535,447
Pushmataha	-	1,188	-	-	1,188	-	-	1,188
Roger Mills	-	-	-	-	-	-	-	-
Rogers	4,569,489	10,767	-	300,207	4,880,463	2,893,970	1,743	7,776,176
Seminole	2	-	-	-	2	-	-	2
Sequoyah	4,396	-	-	-	4,396	-	-	4,396
Stephens	1,575	-	-	-	1,575	131,670	-	133,245
Texas	-	-	-	-	-	-	-	-
Tillman	20,800	-	-	-	20,800	6,806	-	27,606
Tulsa	1,338,985	18,405	1,109,751	18,199	2,485,340	9,381,570	28,650	11,895,560
Wagoner	27,702	-	-	5	27,707	59,613	18	87,338
Washington	487	-	982	-	1,469	436,361	9	437,839
Washita	-	-	-	-	-	-	-	-
Woods	30,000	-	-	-	30,000	-	-	30,000
Woodward	470,133	7,863	-	40,550	518,546	14,000	-	532,546
<b>TOTALS</b>	<b>23,368,360</b>	<b>7,251,838</b>	<b>4,428,020</b>	<b>458,797</b>	<b>35,507,015</b>	<b>20,432,030</b>	<b>518,232</b>	<b>56,457,277</b>

# RELEASES

Total air releases are the sum of permitted stack releases and fugitive air releases that result largely from the natural volatility of some chemical compounds. The increase in total air releases for 1998 compared to 1997 is due to the first time reporting by industries added for 1998, especially coal-fired electrical plants (Figure 4). The figures reflect an increase in the number of facilities reporting rather than an increase in actual air emissions. These facilities, which utilize coal primarily for start-ups, account for the majority of electrical utilities in the State.

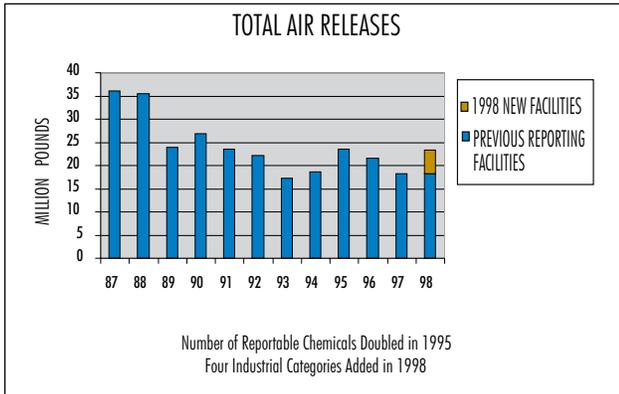


Figure 4

Total releases to land, which include surface impoundments, land application, use of permitted landfills or other release to land within the boundaries of a facility, increased significantly in 1998. However, this is also the result of changes in reporting requirements beginning with the current year, specifically one that required industrial waste handlers to report for the first time. These facilities receive wastes from other industries and treat and/or properly dispose of waste chemicals on-site. When only those facilities previously required to report are considered, total

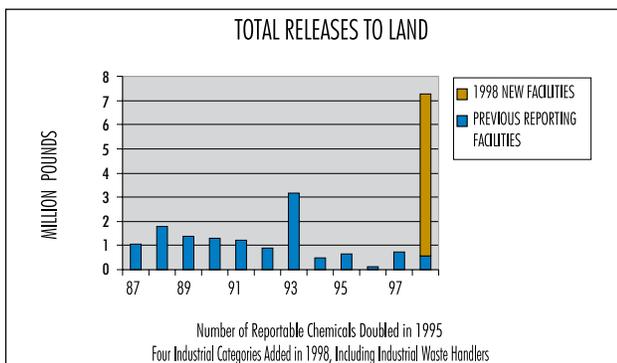


Figure 5

land releases declined for 1998 (Figure 5). This is an indication of the continued success of voluntary pollution prevention programs and the willingness of industries to participate in them. Oklahoma treatment, storage and disposal facilities received transfers from both in-state and out-of-state companies. In 1998, industries in thirty-three states utilized Oklahoma facilities permitted under RCRA Subtitle C for the safe management of toxic wastes.

Reported disposals to underground injection wells increased since 1996 primarily due to changes for reporting water

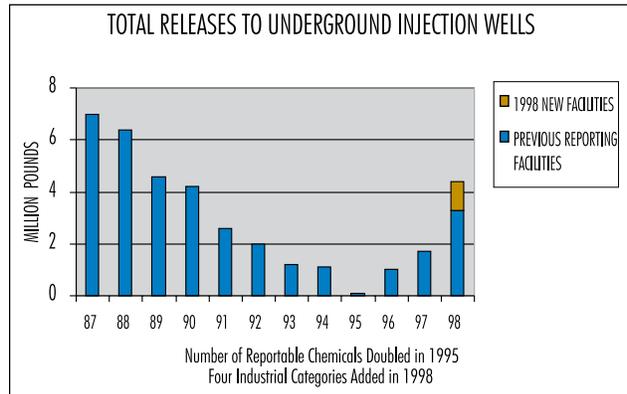


Figure 6

disassociable nitrate compounds (Figure 6). While disposals to deep underground injection wells are considered releases under TRI, this type of waste management has an extremely low potential for human exposure or contact with the environment. Releases to surface waters increased modestly; however, at less than a million pounds total for all reporting facilities in the State, Oklahoma remains one of the states with the lowest volume of discharges into rivers and streams (Figure 7).

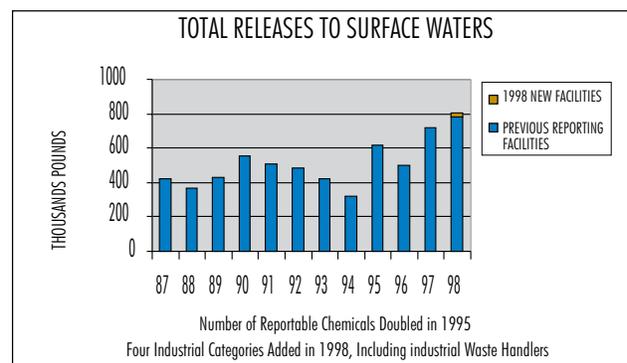


Figure 7

## TRANSFERS

Releases to Publicly Owned Treatment Works (POTW) consist of water discharges made into sanitary drains and sewers that then are received and treated by waste water treatment plants. As such, releases to POTW's are counted as transfers for treatment rather than releases. Quantities of toxic chemicals transferred to POTW's also remain comparatively low, especially as industrial productivity continues to rise (Figure 8).

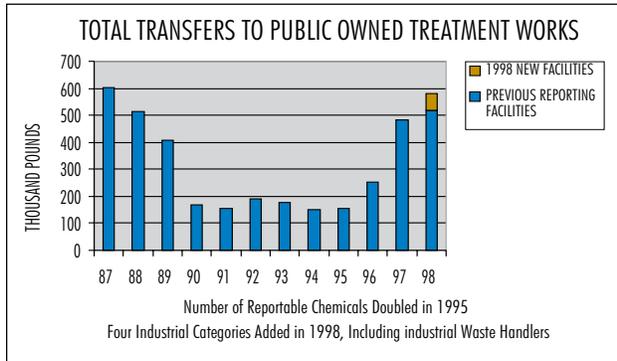


Figure 8

Transfers made to off-site facilities for disposal also continue to decline in Oklahoma, even with the inclusion of industrial categories added in 1998 (Figure 9). When

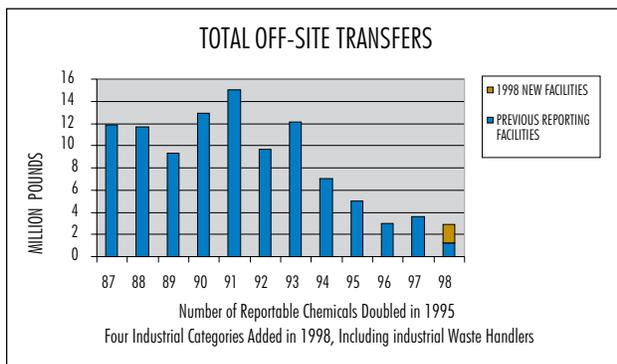


Figure 9 reviewing the figures for only those facilities required to report prior to 1998, total off-site transfers were reduced by greater than fifty percent. Again, this is the product of ongoing pollution prevention efforts aimed toward reductions in the quantities of toxic chemicals used, more efficient processes and improved recovery and recycling methods.

## REUSE

Total reuse is the sum of on- and off-site recycling along with on- and off-site energy recovery activities. Recycling captures useful materials from waste streams for reuse, which eliminates or reduces the need for treatment or disposal. Most on-site recycling involves a "closed loop" type of recovery whereby chemicals or materials used in a manufacturing process are separated from the waste stream and fed back into the same production process without removal from the facility. Examples include the collection of metal shavings from the floor of a foundry followed by remelting, or recovering small volumes of usable solvents from the waste stream and reusing, usually after concentration. The effects are a reduction in the need to purchase the recovered materials and less waste or waste with lower toxicity. Off-site recycling, most familiar to the public, involves the transportation of wastes to another location for reprocessing into materials which can be reused.

Chemicals or materials reclaimed for energy recovery are combusted to provide heat for industrial processes. On-site energy recovery may yield the compound benefits of effectively destroying some toxic chemicals, again producing less waste, along with a reduction in fuel costs. The DEQ Pollution Prevention Program maintains a waste exchange list which facilities may use to locate usable chemicals in the waste streams of other industries, further promoting the reuse or recycling of produced wastes. Reuse not only reduces the quantities of toxic chemicals ultimately released to the environment, but also may reduce the need for some quantities of toxic chemicals to be manufactured, and thus eliminate other potential wastes.

The focus of DEQ pollution prevention is the reduction or elimination of the quantities of toxic chemicals used in industrial processes through the substitution of non-toxic materials or the introduction of more efficient processes. As source reduction efforts continue to be successful, the overall volume of wastes subject to reuse as management has fallen (Figure 10 on the next page).

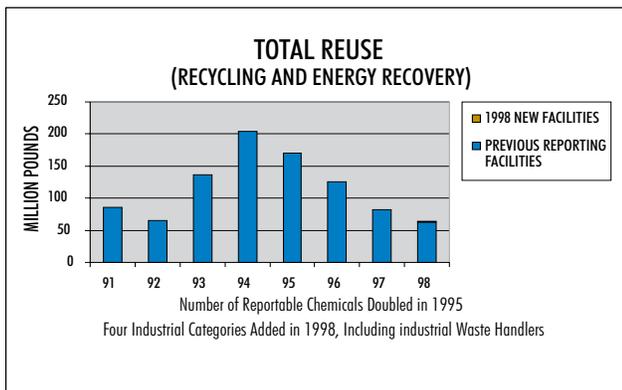


Figure 10

## TREATMENT

Post-production treatment, both on- and off-site, neutralizes or destroys toxic chemicals in the waste stream. Frequently some type of on-site treatment is required before wastes can be discharged or transferred for disposal. A common example of this is the neutralization of spent acids in an aqueous waste. Another example of on-site treatment is the bio-degradation of organic compounds in retention ponds due to bacterial action. Industrial waste handlers are responsible for the majority of off-site treatment of wastes containing toxic chemicals. As with on-site treatment, off-site treatment frequently is a requirement prior to disposal.

The continued success of source reduction programs is apparent in the on- and off-site treatment figures for 1998 (Figure 11). As fewer TRI listed chemicals are used or used in diminished amounts, the need for post-production treatment has declined as well.

As quantities for total production related wastes continue to diminish, reuse accounts for a greater percentage of post-production waste management. In 1998, recycling and

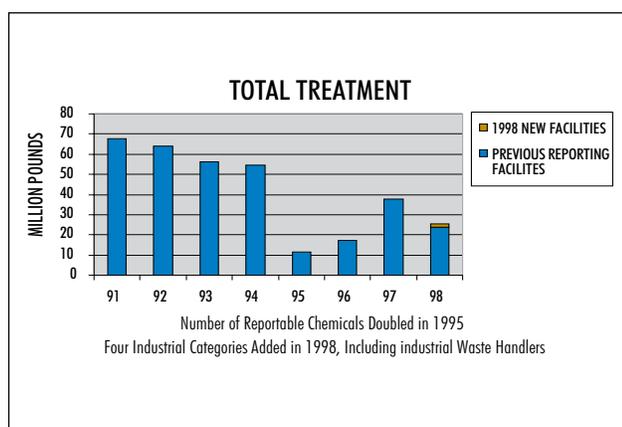


Figure 11

energy recovery accounted for fifty per cent of all waste management in Oklahoma (Figure 12). Only thirty per cent of production related wastes statewide are released into the environment. When those wastes entombed by proper disposal and underground injection are taken into account, the percentage of actual releases drops to about twenty percent. On-site recycling and voluntary reductions in the

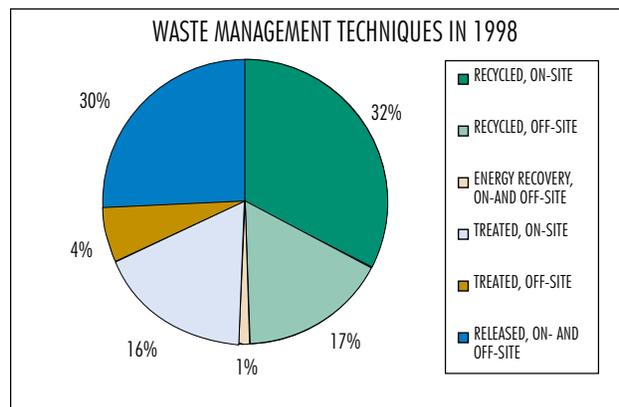


Figure 12

quantity and toxicity of chemicals used are important ways industries across the State are working with the DEQ to reduce the total volume of chemical releases.

Nationally, the figures for total production related wastes have increased for several years. Often states report a reduction in releases while reporting a corresponding increase in off-site transfers. This waste management system transfers toxic wastes from one medium to another rather than generating less waste. Oklahoma continues to see its total production wastes fall long with a decrease in off-site transfers, indicating that the total amount of toxic wastes in the State actually is decreasing. DEQ provides assistance to businesses wanting to reduce the overall volume of toxic chemicals used and also offers strategies for the best reuse techniques.

The 1998 Oklahoma TRI report reflects the success of voluntary pollution prevention programs sponsored by DEQ and cooperation from industries. For additional information about pollution prevention or for business assistance in implementing source reduction measures, please contact the DEQ Customer Services Division/Pollution Prevention Programs at 405-702-1000 or 1-800-869-1400, or visit the DEQ website at: <http://www.deq.state.ok.us/P2intro.htm>

# TRI Reporting Requirements

A plant, factory or other facility is subject to TRI and must annually report releases, transfers and waste management activities if it meets all three of the following criteria:

- Is included in one of the covered Standard Industrial Classification (SIC) codes. Initially, the listed codes covered manufacturing activities, however, seven additional categories were added for reporting year 1998; (Table B)
- Has ten or more full-time employees (or the equivalent 20,000 hours per year);
- Manufactures, imports, processes or otherwise uses any of 604 listed toxic chemicals or chemical categories in quantities greater than the specified thresholds. The threshold quantity for toxic chemicals manufactured, imported or processed is 25,000 pounds over the calendar year. For other uses, the threshold quantity is 10,000 pounds over the calendar year. In 1995, the number of reportable chemicals doubled, and the list may change again in the future.

Federal facilities meeting the threshold requirements, regardless of SIC classification, are required to report releases annually as well and have done so since 1994. A facility may need to report if it has one or more of the listed chemicals, even if it has no releases, because reporting is based on the amount of chemical manufactured, processed or used.

Certain exemptions may apply to threshold reporting quantities. The de minimis concentration exemption applies if a toxic chemical comprises less than 1 percent of a mixture even though the total amount of the chemical exceeds the reporting threshold. If the Occupational Safety and Health Administration (OSHA) also defines a listed chemical as carcinogenic, the de minimis concentration drops to 0.1 percent. Owners of leased property may not be required to report to TRI, nor are the activities of analytical laboratories. Structural components of a facility or items deemed to be articles are also exempted from reporting. For more information about TRI reporting, threshold quantities and exemptions, contact the EPA- Region 6, the Oklahoma DEQ, or visit the following website: <http://www.epa.gov/tri/general.htm>

**Table B Standard Industrial Classifications Subject to Section 313**

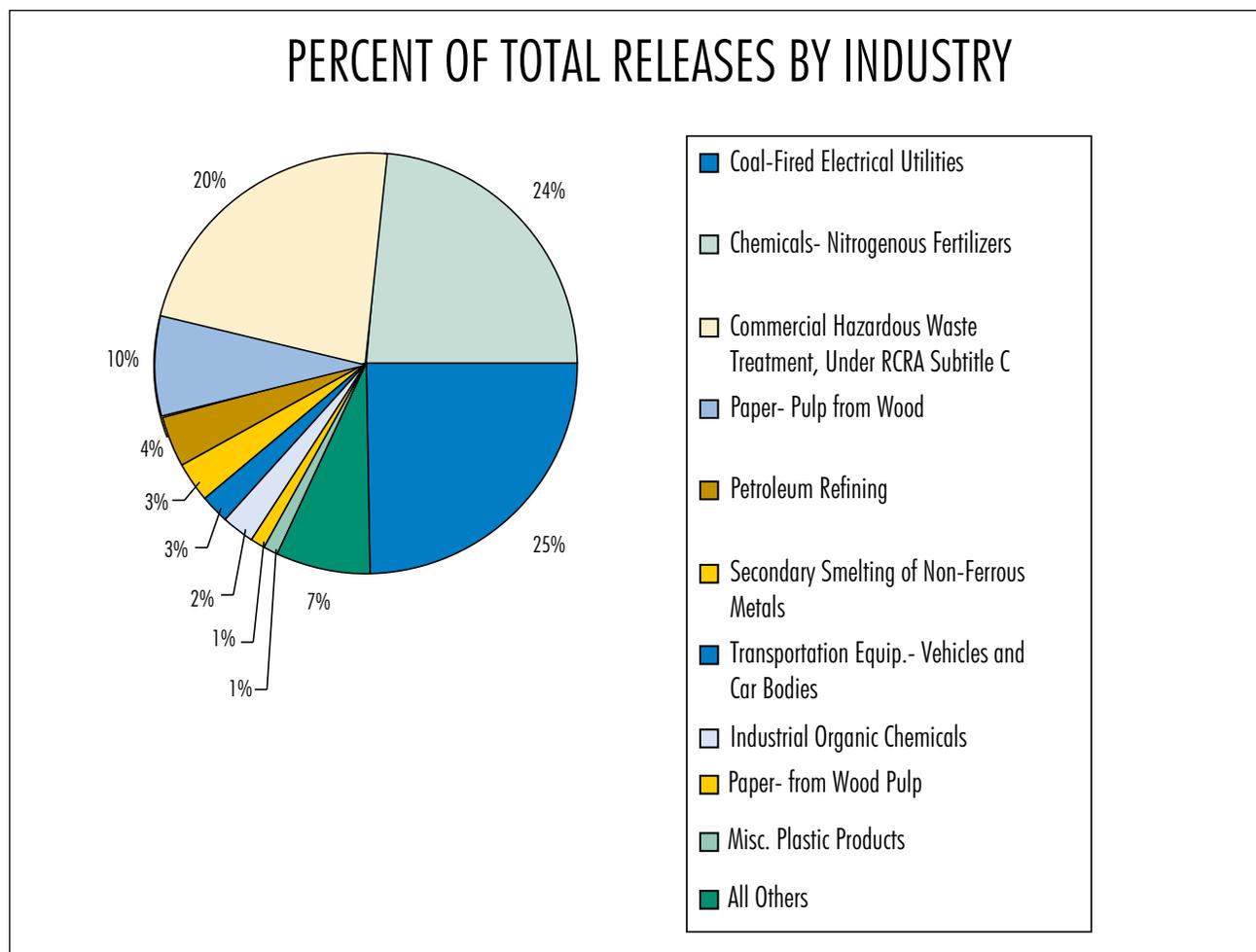
Industrial Sector	SIC Code
Manufacturing	20-39
Metal Mining	10 (except 1011, 1081 and 1094)
Coal Mining	12 (except 12411)
Electrical Utilities	4911, 4931 and 4939, limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce
Treatment, Storage and Disposal facilities	4953, limited to RCRA Subtitle C permitted or interim status facilities
Solvent Recovery Services	7389, limited to facilities primarily engaged in solvent recovery services on a contract or fee basis
Chemical Distributors	5169
Petroleum Bulk Terminals	5171

# Facilities Reporting in 1998

EPA expanded TRI for reporting year 1998 by adding seven industrial categories. The newly added industries are linked to manufacturing by providing energy, managing products or managing wastes from the manufacturing sector. Four of the seven new categories operate in Oklahoma: coal-fired power plants, industrial waste handlers, bulk petroleum terminals and chemical distributors and warehouses. Under the new requirements, twenty-three Oklahoma facilities reported to TRI for the first time. An additional seventeen facilities covered under the original requirements reported for the first time in 1998, indicating continued economic growth in the State. In all, 313 Oklahoma facilities reported to TRI, operating under 128 primary SIC Codes (Table C).

Manufacturing facilities continue to be the majority of TRI reporters, comprising 293 of 313 facilities that reported in 1998. "Traditional" reporting facilities, such as nitrogenous fertilizer producers, paper producers and petroleum refineries, still account for the majority of releases as well (Figure 13). However, the addition of new industrial sectors dynamically impacts TRI data in several ways. Coal- and oil-fired electrical plants and commercial hazardous waste management facilities permitted under RCRA Subtitle C account for forty-five percent of all TRI releases in Oklahoma in 1998. This should not be viewed as an increase in actual chemical wastes, either released or managed, but rather the result of a TRI expansion which makes the database more comprehensive. Six of the ten facilities with the largest total releases for 1998 reported for the first time under the new requirements, and all of these six were operational prior to 1998 (Table D).

Figure 13 below



## Table C Industries Reporting in Oklahoma in 1998

SIC CODE	INDUSTRY	QUANTITY RELEASED, in pounds
4911	Coal-fired Electrical Utilities	9,650,000
2873	Chemicals- Nitrogenous Fertilizers	9,116,000
4953	Commercial Hazardous Waste Treatment, Under RCRA Subtitle C	7,762,000
2631	Paper- Pulp from Wood	3,797,000
2911	Petroleum Refining	1,584,000
3341	Secondary Smelting of Non-Ferrous Metals	1,107,000
3711	Transportation Equip.- Vehicles and Car Bodies	988,000
2869	Industrial Organic Chemicals	840,000
2621	Paper from Wood Pulp	399,000
3089	Misc. Plastic Products	378,000
3011	Rubber and Plastic- Tires and Inner Tubes	319,000
9711	National Security	304,000
3499	Misc. Fabricated Metals Prod.	275,000
3411	Fabricated Metals- Cans	208,000
2074	Foods- Cottonseed Oil Mills	203,000
3728	Transportation Equip.- Aircraft and Parts	191,000
2421	Sawmills and Planing Mills	179,000
3479	Fabricated Metals- Coating, Engraving and Allied Services	148,000
2999	Misc. Petroleum Products	137,000
3695	Magnetic and Optical Recording Media	122,000
3315	Steel Wiredrawing, Nails and Spikes	117,000
3519	Internal Combustion Engines, esp. diesel or gas powered	117,000
3251	Brick and Structural Brick	114,000
3081	Unsupported Plastics Film and Sheet	112,000
3053	Gaskets, packing and Sealing Devices	111,000

**Table D Facilities Reporting the Largest Total Releases in 1998**

RANKING	SIC CODE	FACILITY	COUNTY	TOTAL RELEASES
1	4953	Safety Kleen-Lone Mnt. *	Major	6,652,000
2	2973	Wil-Gro Fertilizer	Mayes	3,978,000
3	2631	Weyerhaeuser-Valliant	McCurtain	3,893,000
4	4911	Western Farmers Electric CoOp. *	Choctaw	3,380,000
5	2873	Terra Nitrogen- Catoosa	Rogers	2,761,000
6	4911	Northeastern Station * (PSO)	Rogers	2,578,000
7	2873	Farmland Industries, Inc.	Garfield	1,832,000
8	4911	Grand River Dam Authority * (OG&E)	Mayes	1,325,000
9	4953	Perma-Fix Treatment Services *	Tulsa	1,110,000
10	4911	Muskogee Generating Station * (OG&E)	Muskogee	1,096,000
11	3711	General Motors SCG- Okla. City	Oklahoma	988,000
12	2899	Baker Petrolite Corp.- Barnsdall	Tulsa	840,000
13	2873	Terra Nitrogen- Woodward	Woodward	541,000
14	2911	Sunoco, Inc.	Tulsa	439,000
15	2911	TPI Petroleum	Carter	421,000
16	2621	Fort James Operating Co.	Muskogee	399,000
17	9711	U.S. DOD- Tinker Air Field	Oklahoma	298,000
18	2911	Conoco, Inc.	Kay	277,000
19	2911	Sinclair Oil Corp.	Tulsa	274,000
20	4911	Sooner Generating Station * (OG&E)	Noble	250,430
21	3089	Camrose Technologies, L.L.C.	Pontotoc	225,000
22	4911	American National Can Co.- Okla. City	Oklahoma	208,000
23	3411	Producers Co-operative Oil Mill	Oklahoma	203,000
24	2074	Weyerhaeuser-Wright City	McCurtain	179,000
25	2421	Wynnewood Refining Co.	Garvin	173,000

\* Facility reporting for the first time under industrial categories added in '98

# Chemicals Reported in 1998

Oklahoma facilities reported the manufacture, processing or otherwise use of 122 toxic chemicals or chemical groups. The percentage of these chemicals in the total TRI releases is represented in Figure 14. The fifteen chemicals reported in greatest quantities in Oklahoma for 1998 reflect the nature of commerce in the State. The five chemicals most frequently released are discussed below. These account for sixty-five percent of all chemicals managed, as defined under TRI. None of these five chemicals are classified as known, probable or suspected cancer causing chemicals.

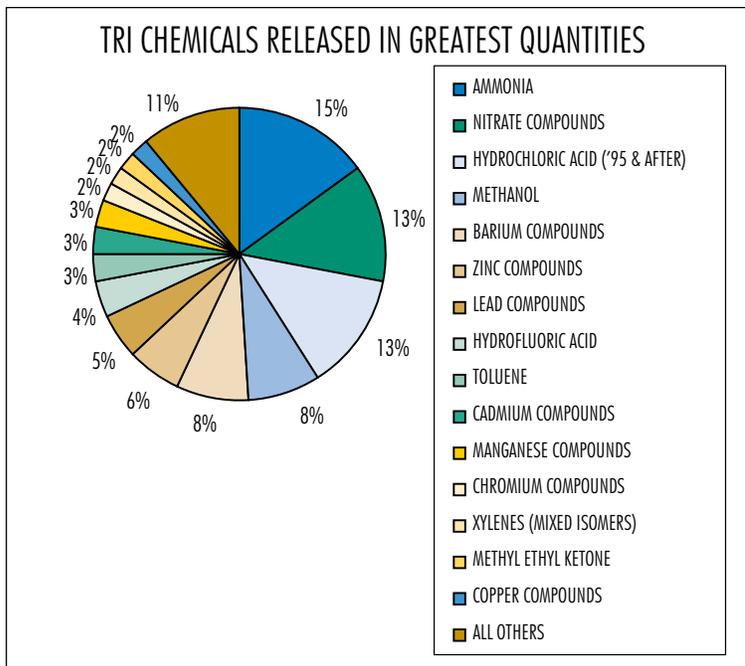


Figure 14

While the addition of industrial categories in 1998 impacts the TRI data in several ways, ammonia and nitrate compounds remain the two materials released in greatest quantities in the State. These nitrogen-based compounds are vital in the manufacture of fertilizers and account for twenty-eight percent of all toxic chemicals released in the current reporting year. The manufacture of agricultural chemicals results in eighty-five percent of all ammonia and nitrate compounds released. Ammonia also is used by several other industries operating in Oklahoma, especially food processing facilities (Figure 15). Nitrate releases were affected by the changes in TRI requirements. Industrial

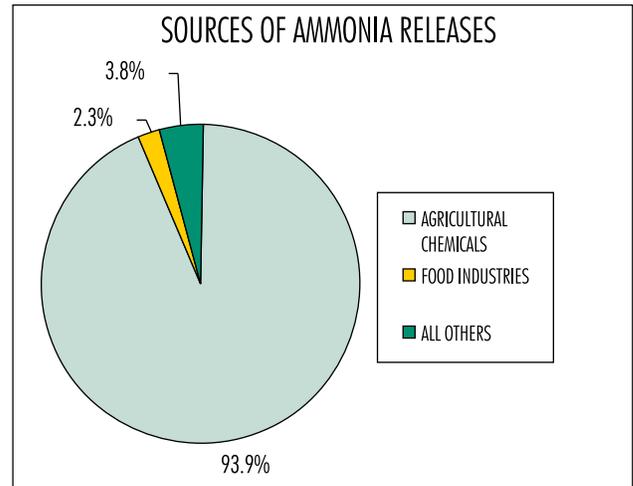


Figure 15

waste handlers engaged in the disposal of manufacturing wastes now account for over twenty percent of all nitrates released (Figure 16). Owing to the volatility of the compound itself, the majority of ammonia released is emitted into air (Figure 17). Nitrates, which are less volatile, can be disposed of into deep underground injection wells (Figure 18). Ammonia produces irritating vapors and is an inhalation and dermal hazard. Nitrate ingestion, which most often occurs through contaminated drinking water, may cause methemoglobinemia ("blue-baby" syndrome) in children under the age of six months.

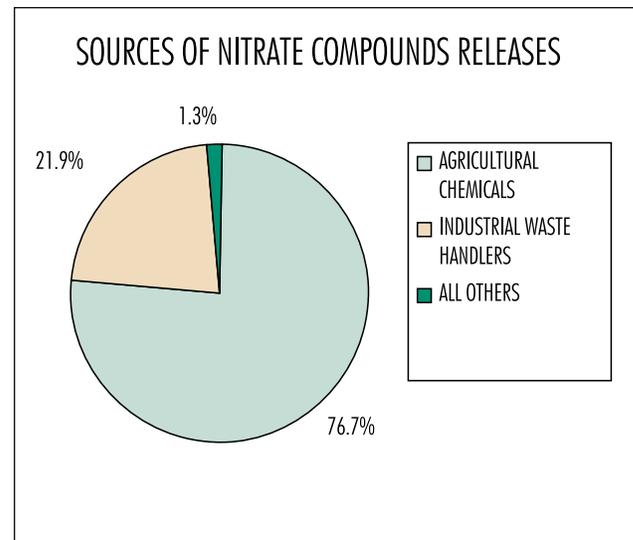


Figure 16

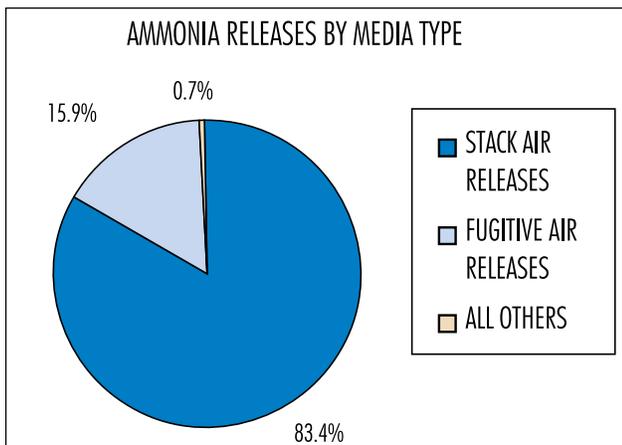


Figure 17

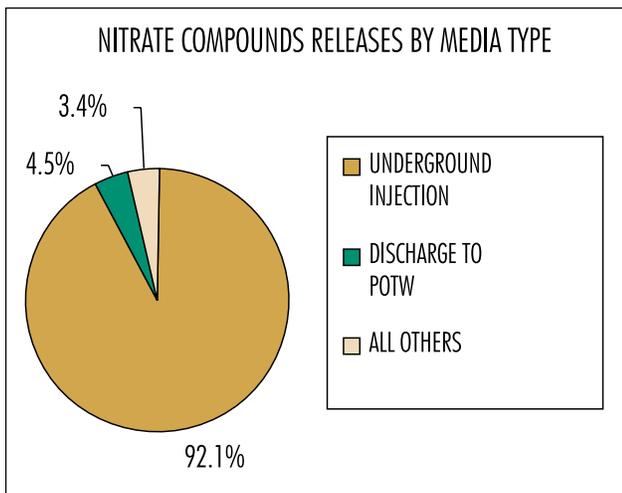


Figure 18

Hydrochloric acid is a commonly used acid with many industrial applications. Like barium, it also is a by-product of coal combustion. Therefore, the largest source of releases for these two chemicals, by industries required to report under TRI, is coal-fired utilities (Figures 19 and 20). The 1998 data for hydrochloric acid and barium should not be misconstrued as indicating actual increases in the quantities of these chemicals used or released in the State. Rather, the increases in both should be seen as the results of an increase in the scope of TRI reporting.

Hydrochloric acid is a fuming liquid in its concentrated form. It has substantial usage in paper manufacturing, fertilizer, paint and dye production, and metal coating processes. It is formed as a result of coal-fired electricity production. Spent hydrochloric acid frequently can be reused or neutralized prior to disposal. However, vapors from concentrated

hydrochloric acid or gases generated from coal combustion are highly volatile and are released through permitted, stack air emissions (Figure 21). The vapors are corrosive to eyes, skin and mucous membranes.

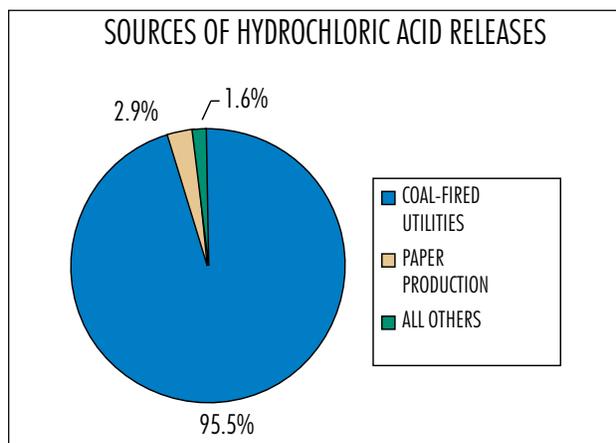


Figure 19

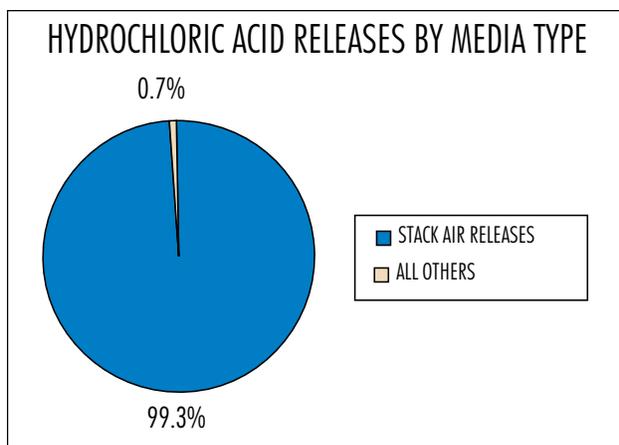


Figure 20

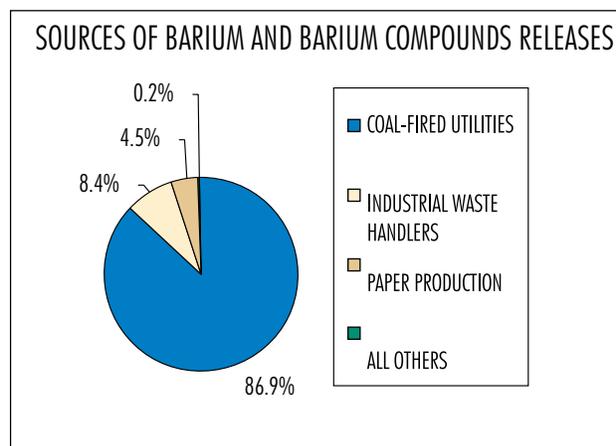


Figure 21

Barium is a non-combustible component of coal and a naturally occurring metal. It is found in the ash produced at coal-fired electricity generating plants. Barium and barium containing compounds are most frequently disposed to land by use of permitted sanitary landfills, RCRA Subtitle C regulated disposal facilities and surface impoundments (Figure 22). Small quantities of barium are normally present in soils. Barium is a heavy metal with a number of potential health effects. Its ability and that of barium containing compounds to create health or environmental hazards is dependent on solubility in water and high concentrations.

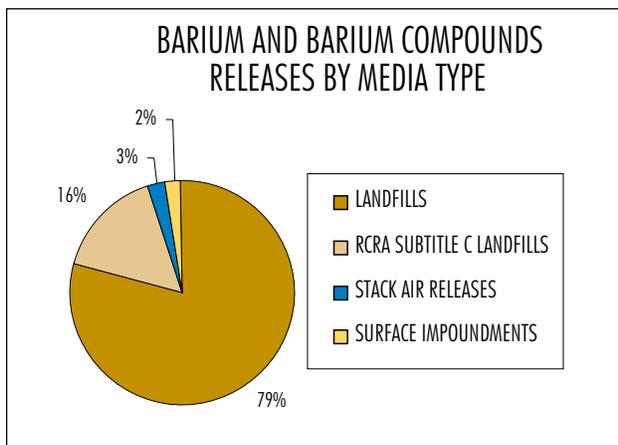


Figure 22

Methanol, also known as methyl alcohol or wood alcohol, is a common industrial solvent. The primary users of methanol in the State are the pulping and paper production industries (Figure 23). It is highly volatile and nearly all releases of methanol are permitted air emissions (Figure 24). Methanol increasingly is used in this sector as an alternative to more toxic organo-chloride compounds. It also is produced by plants manufacturing ammonia fertilizers. Exposure to methanol vapors can result in eye irritation, headaches, fatigue and drowsiness.

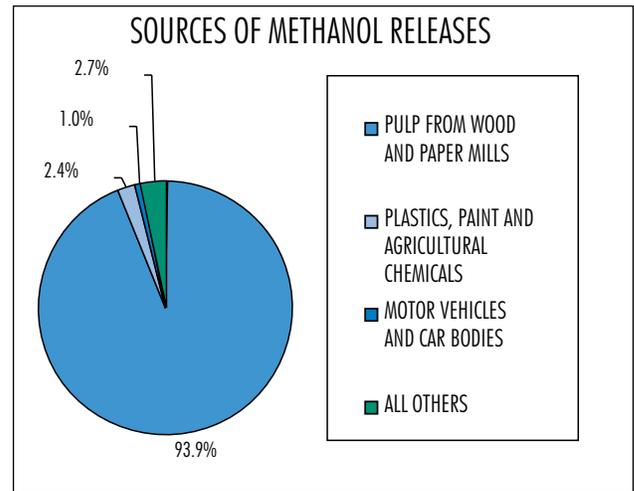


Figure 23

Chemicals reported under TRI again will see changes beginning with reporting year 2000. In 1999 EPA lowered thresholds for eighteen chemicals classified as persistent bioaccumulative toxics (PBT). Seven PBT chemicals and two chemical families are added to the list as well. These types of chemicals are of particular concern as they are not only toxic but persist in the environment for long periods of time, are difficult to destroy and accumulate in body tissue. None of the chemicals ranked in Oklahoma's top fifteen chemicals released in greatest quantities is classified as a PBT.

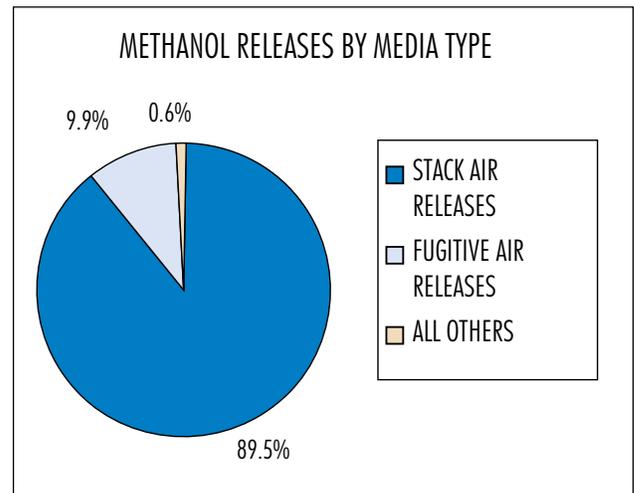


Figure 24

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