GENERAL STATISTICS ON OHIO'S GENERATION & MANAGEMENT OF HAZARDOUS WASTES 1991 THROUGH 1995

OHIO ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF HAZARDOUS WASTE MANAGEMENT
DATA MANAGEMENT SECTION

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EXECUTIVE SUMMARY

This document is a tabular summary of data submitted by generators and treatment, storage or disposal (TSD) facilities of hazardous wastes in Ohio for the years 1991 through 1995. The source of the data is the Ohio EPA database compiled from the Annual Hazardous Waste Reports required to be filed under the federal Resource Conservation and Recovery Act and the Ohio Administrative Code.

The information presented in this document is based upon amounts of hazardous waste generation and management <u>as reported</u> by Ohio TSD facilities and generators. The information contained in this document is only as accurate as the information contained in the reports submitted by these respondents.

The topics covered include the regulatory background of the data, the wastes which are included and excluded from reporting requirements, the content and domain of the Annual Reports, the interpretation of the data and tabular summaries of the tonnage of hazardous wastes generated and sent off-site, the tonnage of wastes managed on and off-site, the handling methods utilized by Ohio TSDs, the tonnage of imports and exports of hazardous wastes and facility-specific information. The Data Management Section, Division of Hazardous Waste Management, Ohio EPA, may be contacted at (614) 644-2977 for additional information. This document will soon be available on Ohio EPA's World Wide Web page. The URL is http://www.epa.ohio.gov.

The statistics presented in this document supercede any previous edition of "General Statistics on Ohio's Generation, Treatment, Storage & Disposal of Hazardous Waste". Ohio EPA receives amendments and late submissions and enters these as they are received. Information for the years 1982 through 1990 is available in past versions of this document; call the Data Management Section if additional historical data is needed. Data for 1991-1994 is the same as that shown in the March 1996 version of this summary.

All units in this report are short tons (2000 pounds = 1 short ton).

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1. INTRODUCTION

This document is a tabular summary of data submitted by generators and treatment, storage or disposal (TSD) facilities of hazardous wastes in Ohio for the years 1991 through 1995. The source of the data is the Ohio EPA database compiled from the Annual Hazardous Waste Reports required to be filed under the federal Resource Conservation and Recovery Act (RCRA) and the Ohio Administrative Code (OAC). This introduction explains the regulatory background of the data, the wastes which are included and excluded from reporting requirements, the content and domain of the Annual Report and the interpretation of the data. The following sections provide tabular summaries of the tonnage of hazardous wastes generated and sent off-site, the tonnage of wastes managed on and off-site, the handling methods utilized by Ohio TSDs, the tonnage of imports and exports of hazardous wastes and facility-specific information. The Data Management Section, Division of Hazardous Waste Management (DHWM), Ohio EPA, may be contacted at (614) 644-2977 for additional information.

1.a. *Regulatory Background*

RCRA, passed by Congress in 1976 and amended in 1980 and 1984, provides the statutory authority for the federal hazardous waste program as promulgated under Title 40 of the Code of Federal Regulations (CFR), Parts 260 through 272 (40 CFR 260 through 40 CFR 272). The RCRA program explicitly defines which wastes are to be regulated as hazardous wastes and establishes reporting requirements for generators and TSD facilities. The Ohio hazardous waste program is administered by the Ohio EPA, DHWM, which implements the hazardous waste rules set forth in the OAC Chapters 3745-50 through 3745-69, pursuant to Section 3734 of the Ohio Revised Code. Ohio EPA's RCRA reporting regulations are identical to U.S. EPA's with the exception that Ohio's require more frequent reporting of hazardous waste generation and management activity (annual rather than biennial).

1.b. *Included Wastes*

Only wastes that are defined as hazardous by RCRA (40 CFR 261) and Ohio's hazardous waste rules (OAC Chapter 3745-51) are summarized in the Annual Report. No other wastes are included; Section 1.c Excluded Wastes discusses the wastes not included by the hazardous waste definitions. There are no additional hazardous wastes specified in Ohio's regulations (i.e., Ohio does not have any "state-regulated" non-federal hazardous wastes).

There are two basic categories of hazardous wastes, characteristic and listed, which are designated by specific waste codes. It should be noted that a material becomes a waste when it exits the manufacturing unit in which it was generated [40 CFR 261.04(c) and OAC 3745-51-04(c)].

Listed wastes (40 CFR 261.30 through 261.33 and OAC Rules 3745-51-30 through 51-33) are defined and identified by a specific chemical name or a specific production process name. Any mixture containing a listed hazardous waste (e.g. contaminated soil), regardless of the contaminant concentration, is considered to be a listed hazardous waste (40 CFR 261.3 and OAC Rule 3745-51-03).

Listed wastes include the following:

* ***F-wastes*** (waste codes F001 through F039) are spent halogenated and non-halogenated solvents, electroplating and heat-treating wastes, and dioxin-bearing production wastes;
* ***K-wastes*** (waste codes K001 through K161) are production wastes from specific sources, including wood preservation, inorganic pigments, organic chemicals, inorganic chemicals, pesticides, explosives, petroleum refining, iron and steel, secondary lead, veterinary pharmaceuticals, ink formulation and coking;
* ***P-wastes*** (waste codes P001 through P205, acutely hazardous) are acutely toxic commercial chemical products, off-specification species, container residues and spill residues;
* ***U-wastes*** (waste codes U001 through U411) are toxic commercial chemical products, off-specification species, container residues and spill residues.

Characteristic wastes (40 CFR 261.20 through 261.24 and OAC Rules 3745-51-20 through 3745-51-24) are "catch-all" categories in which a waste is defined as hazardous due to its characteristics, not by name as with the listed wastes.

Characteristic wastes are divided into six groups which include:

* ***Ignitable wastes*** (waste code D001) have a flashpoint less than 140 degrees F.;
* ***Corrosive wastes*** (waste code D002) have a pH less than 2.0 or greater than 12.5;
* ***Reactive wastes*** (waste code D003) are unstable, explosive, react dangerously with water or can generate toxic gases under normal conditions;
* ***Toxic Metals*** (waste codes D004 through D011) which contain high concentrations of arsenic, barium, cadmium, chromium, lead mercury, selenium and silver;
* ***Toxic Insecticides*** (waste codes D012 through D015) which contain concentrations of the insecticides endrin, lindane, methoxychlor, and toxaphene.
* ***Toxic Herbicides*** (waste codes D016 and D017) which contain concentrations of the herbicides 2,4-D and 2,4,5-TP Silvex.
* ***Toxic Organic Chemicals*** (waste codes D018 through D043) which were added when U.S. EPA replaced the Extraction Procedure (EP) toxicity test with the Toxicity Characteristic Leaching Procedure (TCLP). This rule change appeared in the March 29, 1990 Federal Register.

1.c. *Excluded Wastes*

Many wastes commonly thought to be "hazardous" are not legally defined as hazardous under RCRA or Ohio's hazardous waste rules and may be regulated and reported under other legislation (e.g., asbestos and PCBs). Also, several wastes are specifically exempted from regulation as hazardous waste, including domestic sewage, Clean Water Act industrial wastewater discharges, irrigation return flows, Atomic Energy Act nuclear material, in-situ mining wastes, certain pulping liquors, spent sulfuric acid used to produce virgin sulfuric acid, household wastes, municipal incinerator ash, farm wastes, mining overburden, coal ash, drilling fluids, certain chromium wastes, certain mining wastes, cement kiln dust and scrap arsenically-treated wood (40 CFR 261.4 and OAC Rule 3745-51-04).

Some wastes which meet the definition of a hazardous waste become conditionally exempt from reporting requirements when recycled or reused. In general, industrial wastes which are to be directly used as substitute raw materials or feedstock are exempt (40 CFR 261.02 and OAC Rule 3745-51-02). In certain circumstances the following wastes are not subject to the reporting requirements when legitimately reclaimed: precious metals, lead-acid batteries and hazardous waste or off-specification used oil burned for energy recovery. Hazardous waste burned for energy recovery, however, must be reported by generators sending it off-site and by burners receiving it from off-site for storage prior to burning. Also, the following recyclable wastes are exempt: industrial ethyl alcohol when reclaimed, used batteries when returned to the manufacturer for regeneration, used oil, scrap metal, certain petroleum production wastes and coke and coal tar from the iron and steel industry (40 CFR 261.6 and OAC Rule 3745-51-06). Finally, a few site-specific listed hazardous wastes have been granted a delisting (i.e., declared non-hazardous) on a case-by-case basis by U.S. EPA [40 CFR 260.22, 40 CFR 261, App.IX and OAC Rule 3745-51-30(E)].

The Ohio hazardous waste rules (OAC 3745-50 through 3745-69) should be referenced for specific details on excluded wastes. The Compliance Assurance Section, DHWM, Ohio EPA, may be contacted at (614) 644-2956 for additional information.

1.d. *The Annual Report Requirement for Generators*

Annual Reports are required to be filed by sites which have generated more than 1000 kg/month (2200 pounds/month) of non-acute hazardous waste or greater than 1 kg/month (2.2 pounds/month) of acute hazardous waste (40 CFR 262.41 and OAC 3745-52-41). These sites are referred to as “large quantity generators” or LQGs. Wastes from one-time removals count toward the threshold amount as well as wastes from ongoing production processes. Small quantity generators (SQGs), those which generate less than 1000 kg/month of non-acute hazardous waste, are not required to file an Annual Report (40 CFR 261.5, 40 CFR

262.44, OAC 3745-51-05 and OAC 3745-52-44). However, the non-LQGs who file Annual Reports voluntarily are included in the statistics in this document.

Treatment, storage, or disposal (TSD) facilities which sent hazardous wastes off-site (e.g., brokers and intermediate treatment facilities) also file a report as a generator. The secondary generation of hazardous waste by TSD facilities (e.g., incinerator ash) is significant.

From 1981 to 1994, generators submitted a "Generator Annual Hazardous Waste Report" (GAR), and beginning with the 1989 reporting year, a "Waste Minimization Annual Report". The GAR was simply a compilation of a generator's shipments, listed by receiving facility. Manifests were the only reference documents needed. The Waste Minimization Annual Report required the listing of any wastes for which new or expanded waste minimization activities were conducted. Ongoing activities were not to be reported.

Only wastes sent off-site were reported in the GAR. Wastes generated and managed on-site in RCRA-regulated units were not included in the GAR; all on-site activities for permitted units were shown on the Facility Annual Report (see 1.e.). Since the report covered wastes sent off-site during a calendar year, wastes in storage from previous years were reported in a later year's GAR when they were shipped.

1.e. *The Annual Report Requirement for TSD Facilities*

The Annual Report must be filed by all sites acting as a TSD facility (40 CFR 264.75, 40 CFR 265.75, OAC 3745-54-75 and OAC 3745-65-75). Currently there are less than 50 TSD permit holders. Generally, two types of TSD facilities file an Annual Report: commercial sites which accept hazardous waste from off-site customers, and sites which only manage their own on-site hazardous wastes or that of "sister" or "satellite" facilities. Many of the on-site TSD facilities only store hazardous waste rather than treat or dispose. Note that a large quantity generator may store hazardous waste for up to 90 days prior to shipment off-site, but if the generator wishes to store for over 90 days they are acting as a TSD and a hazardous waste facility permit is required [40 CFR 262.34(b), 264.1(g)(3) and 265.1(c)(7) and OAC Rules 3745-52-34(b), 54-01(g)(3) and 65-01(c)(7)].

From 1981 to 1994, TSD facilities submitted a "Facility Annual Hazardous Waste Report" (FAR), and beginning with the 1989 reporting year, a "Waste Minimization Annual Report". On-site facilities reported wastes that were managed at that location (not shipped off-site) and the handling method(s) used. Off-site receiving TSD facilities reported waste receipts by customer and the handling method(s) used. Both types of facilities were to list any wastes remaining in storage or disposal units at the end of the year, regardless of the unit's status (active or inactive). Nearly all TSDs submitted a Generator Report as well.

It is possible that the handling method reported by a receiving TSD facility is not the final disposition; the waste may only receive intermediate treatment and not be rendered non-hazardous. The receiving facility reships the waste to another TSD facility for further treatment, storage, or disposal. Section 7 details the management methods used by Ohio's receiving facilities. Somes waste may receive no treatment whatsoever prior to reshipment; these are flagged with an Origin Code of 4 (see Section 4.d).

Beginning in 1986, sites receiving hazardous wastes from off-site and storing them prior to either recycling them or burning them for energy recovery are regulated [40 CFR 264.1(b), 40 CFR 265.1(b), OAC Rules 3745-54-01(b) and 3745-65-01(b)]; these sites are required to report. However, sites recycling their own hazardous waste on-site within specified accumulation periods are not regulated as a TSD and thus do not report as one (40 CFR 262.34 and OAC Rule 3745-52-34). These quantities of unreported recycling are not accounted for in the Annual Report.

Underground injection facilities permitted under the Safe Drinking Water Act are regulated if they are storing hazardous waste prior to injection [40 CFR 264.1(d), 40 CFR 265.1(c)(2), OAC Rule 3745-54-01(d) and OAC Rule 3745-65-01(c)(2)]; these sites are required to report. Publicly Owned Treatment Works (sewage treatment facilities) generally are not regulated as a TSD [40 CFR 264.1(e), 40 CFR 265.1(c)(3), OAC Rule 3745-54-01(e) and OAC Rule 3745-65-01(c)(3)]. Certain hazardous waste management activities are exempt from hazardous waste permitting requirements and are also not required to report. Such exempt activities include solid waste facilities which may handle non-hazardous industrial wastes (e.g., municipal landfills),

certain recycling facilities (e.g., used oil and lead-acid battery reclamation facilities), farmers disposing of their own pesticides, totally enclosed treatment facilities (e.g., waste acid neutralized in a pipe attached to the production process), industrial wastewater treatment units discharging under National Pollutant Discharge Elimination System (NPDES) permits, on-site elementary neutralization tanks, emergency spill response sites and short-term transportation transfer facilities [40 CFR 264.1(g), 40 CFR 265.1(c), OAC Rules 3745-54-01(g) and 3745-65- 01(c)]. Of these, it is estimated that NPDES wastewater treatment and elementary neutralization involve large amounts of unreported treatment.

1.f. *Report Form Changes Beginning in 1995*

A new set of report forms were adopted beginning with the 1995 report cycle. These are based on but not identical to U.S. EPA's Biennial Report forms. The original impetus for change at the federal level in 1989 was the need to collect data that would assist states in their completion of a Capacity Assurance Plan (CAP), a Superfund requirement. Several of the data elements on the forms were specifically added for that purpose. Past CAPs were very difficult for Ohio EPA to prepare because DHWM was still using the old forms. The new forms were adopted to solve this problem and to improve Ohio EPA's ability to use the data for managing the RCRA program.

There were numerous limitations to the data compiled from the Generator and Facility Reports, the most notable being those linked with calculating waste generation:

* **Double-counting within the Generator Report data**
  The term "Generator Report" was a misnomer; realistically, it was a shipment report. There was no way to discriminate between original generation and reshipment. The generators and the receiving facilities filed reports with substantial overlap due to the nature of the industry. The initial receiving facility is not always the one which renders the waste non-hazardous.

* **Inability to calculate true generation**
  There was no true way to calculate generation for a specific year. It had to be assumed that all wastes shipped and all wastes managed on-site were generated during the reporting year. End-of-year storage or disposal totals, particularly for surface impoundments, could actually represent accumulation from past years rather than on-site management of newly generated wastes. Significant fluctuations occurred in on-site management totals because not all facilities were consistently listing their inactive units once they had begun the closure process for these units.

The new forms are collectively referred to as the "Annual Hazardous Waste Report" and consist of five different form types, the completion of which depends on the site's activities. Each waste stream generated/managed is listed on its own page and detailed descriptors give information on the waste's origin, source, form (physical state), and density. A specific data element flagging inactive storage or disposal units has been added so they can be easily distinguished. Also, the management method of fuels blending will no longer be obscured by the reporting of it as a storage activity.

1.g. *Data Interpretation*

In addition to the previous information regarding the range and content of the reports and the included and excluded wastes, the following points should be kept in mind while interpreting the data tables, regardless of the type of form the data was compiled from:

* A limited number of generators account for a large share of generation totals. Similarly, a few on-site deep well injection facilities account for a great portion of the on-site management totals. These examples represent the impact a small percentage of companies, or even one key facility, can have on hazardous waste trends. Thus it is difficult at times to attribute cause and effect to trends without detailed analysis.

* The hazardous waste market is very dynamic due to private sector decisions, changing regulations, public and private waste minimization efforts and the uncertain future of hazardous waste management capacity,

particularly in terms of new or expanded sites. This has impacted both the amounts generated and managed and the physical routing of the wastes.

* The database does not include all large quantity generators because of some generators' non-compliance with the reporting requirement. DHWM has increased its efforts to facilitate increased generator compliance with the reporting requirement each year. As a result of those efforts, the number of generators filing Annual Reports has increased.

* The database may contain discrepancies between the wastes a generator reports having shipped and what the off-site TSD facility lists as receipts. By comparing waste receipt data from TSD facilities with generator-reported shipments, and notifying the generator or TSD facility of discrepancies, DHWM has increased the accuracy of the data.

* As with any large-scale reporting program, instructions may be interpreted differently by respondents and thus limited inconsistency does occur. For example, a treatment method may be identified differently by a TSD facility from year to year. Each year new generators enter the reporting system and must become familiar with the program. The 1995 cycle was particularly demanding for all involved due to the change in forms and the new waste descriptor codes.

Past editions of this document contained several tables of historical data that encompassed the entire period of record for annual reporting. These tables became cumbersome to work with and their relevancy has decreased over time, especially since some of the information has changed very little in recent years. With the advent of new forms, the statistics have been overhauled and more emphasis will be placed on the current data and less on the historical aspect. Where necessary, values for 1995 have been simulated based on what they would have been if the forms had not changed. Pre-1991 historical data is available from the Data Management Section upon request.

2. TOTAL HAZARDOUS WASTE GENERATION IN OHIO (Tons)

In the past, the total amount of hazardous waste generated (**Table 2.a**) was obtained by adding (A) the amount of hazardous waste generated and managed on-site from the FAR; (B) the amount of hazardous waste generated and sent off-site (exported) to other states, from the GAR; (C) the amount of hazardous waste generated and sent off-site to Ohio TSDs, also from the GAR; and subtracting (D) the amount of hazardous waste reported as temporary storage in surface impoundments (S04 data from the FAR). This hazardous waste generation calculation assumed that on-site treatment, disposal, and all other types of storage except S04 represent quantities of hazardous waste generated in that reporting year. It was recognized that this method did not give a completely accurate generation total. However, it was the best that could be attained with the forms used.

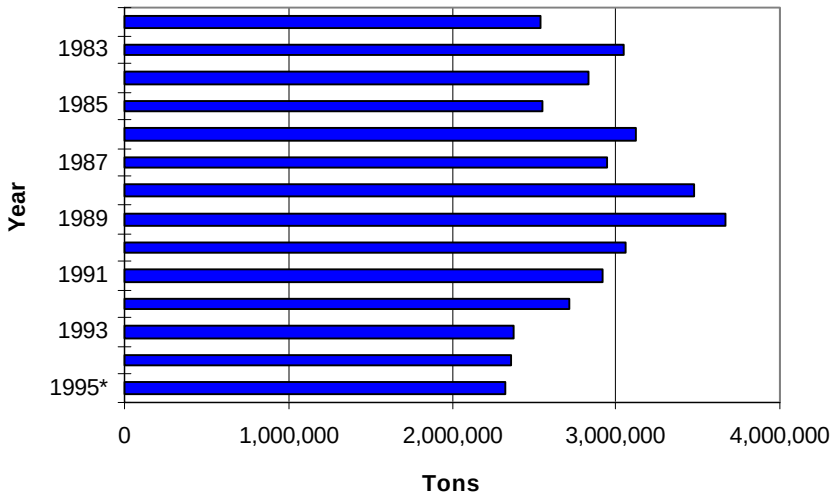
Problems encountered in using this method included: 1) The total generation amount did not cover the excluded wastes and treatments discussed earlier; 2) A few key sites accounted for a large percentage of on-site management; 3) Inactive storage or disposal sites reported aggregate totals, not newly-generated waste; 4) The GAR totals included substantial double-counting due to reshipment by intermediate TSD facilities; and 5) In some cases recycling is reported (i.e. commercial solvent recovery) but in others it is not. Items 3 and 4 are no longer a factor when compiling data from the new report forms.

In the historical table on the next page, data for 1995 has been simulated as if the new forms had not been adopted. Please note that 2,971,800 tons of waste in inactive disposal units (D83) was removed from analysis in this table. Reserve Environmental Systems first reported these units in 1993, although they have been on-site in past years and should have been listed in previous reports. This is an example of the impact one site can have on the analysis of the Annual Report data by changing the way they report information.

The simulated total for 1995 is the lowest ever recorded since the beginning of the Annual Report program. Using the data from the new report forms, **the total amount of hazardous waste generated by Annual Report respondents in 1995 was 1,909,491 tons.** This is 417,923 tons smaller than the 2,327,414 tons derived using the same method as the old report forms.

2.a. HISTORICAL HAZARDOUS WASTE GENERATION IN OHIO (Tons)					
	A.	*B.*	*C.*	*D.*	***TOTAL***
	Managed	*Exported*	*Shipped to*	*Surface Imp.*	***GEN.***
Year	*On-Site*		*Ohio TSD*	*Storage*	*A+B+C-D*
	(FAR)	*(GAR)*	*(GAR)*	*(S04)*	
*1995**	1,903,133	332,070	427,045	334,834	2,327,414
1994	1,878,580	272,859	491,831	283,005	2,360,265
1993	1,848,049	296,009	561,138	325,931	2,379,265
1992	2,173,168	285,550	576,012	320,240	2,714,490
1991	2,645,642	292,885	448,413	465,349	2,921,591
1990	2,603,400	341,611	487,723	369,074	3,063,660
1989	3,162,930	333,937	561,584	383,872	3,674,579
1988	2,637,529	556,587	685,110	398,574	3,480,652
1987	2,403,871	275,777	518,298	255,629	2,942,317
1986	2,828,446	321,550	444,210	468,386	3,125,820
1985	2,842,729	263,504	492,608	1,042,073	2,556,768
1984	3,348,689	278,605	527,908	1,327,023	2,828,179
1983	2,795,022	205,703	453,481	408,541	3,045,665
1982	2,854,260	175,147	297,643	783,621	2,543,429

2.a. HISTORICAL HAZARDOUS WASTE GENERATION



* 1995 values in the table and chart are simulated based on the old calculation method and do not reflect the more accurate data compiled from the new report forms.

2.b. *Generation and Management by Generator Size - 1995*

Although the Annual Report is only required of LQGs, DHWM also receives voluntary submittals from small quantity or conditionally exempt generators. There are also cases in which a site that is currently a non-generator will file a report if the waste was generated in a previous year but not shipped until the reporting year. Sites that were not LQGs but want to be kept on the mailing list may only file the Identification and Certification form, which accounts for most of the 111 non-generators and some of the small quantity generators. **Table 2.b** summarizes tons generated and shipped by generator size. The "Number" column represents the number of sites which submitted reports.

2.b. Tons Generated & Shipped by Respondents - 1995			
Generator Size	**Number**	**Generated**	**Shipped**
Large Quantity	1375	1,909,054	758,677
Small Quantity	251	420	420
Cond. Exempt	35	17	16
Non-Generator	111	0	69
Totals	**1772**	**1,909,491**	**759,181**

2.c. *Top Hazardous Waste Generators - 1995*

The top 50 hazardous waste generators in 1995 are listed in **Table 2.c.** These sites are responsible for 1,704,350 tons or 89% of all hazardous waste generated. Because the amount generated by BP Chemicals is so large (52% of the total), it dominates any statistical compilation of Ohio's hazardous waste data. There are 14 commercial TSDs in the top 50 list; they generate significant amounts of hazardous waste residuals from treatment or disposal processes. Examples of residuals are fuel blended material, incinerator ash, and landfill leachate. *The 1995 top generator list cannot be directly compared to past years* because waste origins were not identified on the old Generator Report forms and a TSD facility's generation could not be distinguished from reshipment; therefore commercial TSD facilities were intentionally removed from past "top generators" lists.

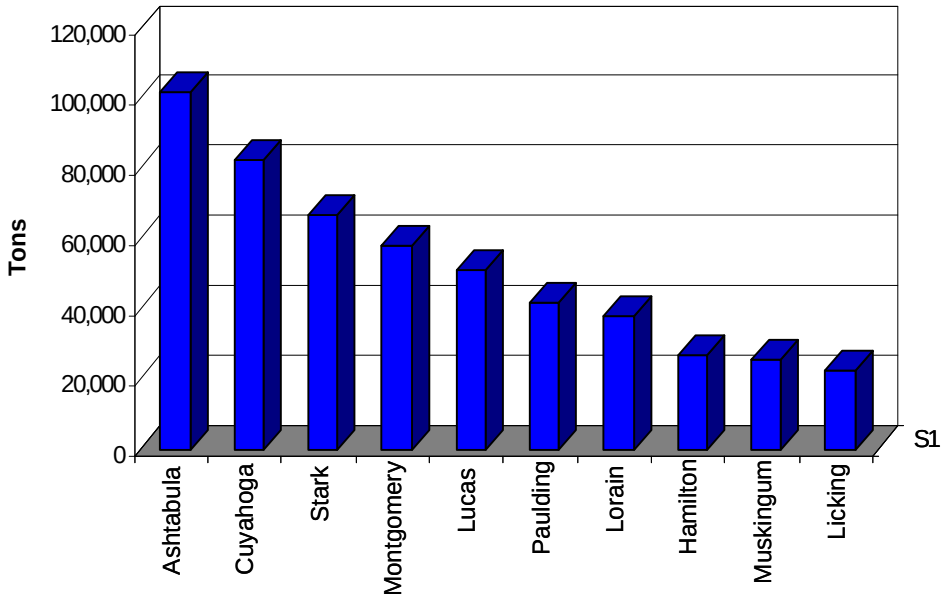
2.c. Top 50 Hazardous Waste Generators - 1995				
Rank	**Generator**	**Location**	**EPA ID**	**Tons**
1	BP Chemicals Inc.	Lima	OHD042157644	993,049
2	SCM Chemicals Inc.	Ashtabula	OHD076741149	96,847
3	AK Steel Corporation	Middletown	OHD004234480	86,743
4	Aristech Chemical Corp.	Haverhill	OHD005108477	46,414
5	Systech Environmental Corp.	Paulding	OHD005048947	39,921
6	Republic Engineered Steels	Canton	OHD004228003	34,174
7	Jennison-Wright Site	Toledo	OH0000923441	28,675
8	Ross Incineration Services	Grafton	OHD048415665	25,666
9	Armco Inc.	Zanesville	OHD004281598	24,515
10	Safety-Kleen Corp.	Hebron	OHD980587364	23,900
11	CWM Resource Recovery	West Carrollton	OHD093945293	23,190
12	Waste Technologies Ind.	East Liverpool	OHD980613541	22,036
13	Ormet Primary Aluminum Corp.	Hannibal	OHD004379970	15,963
14	Lubrizol Corporation	Painesville	OHD004172623	15,938
15	Timken Company	Canton	OHD004465100	14,177
16	Envirosafe Services of Ohio	Oregon	OHD045243706	11,623
17	Spring Grove Resource Recovery	Cincinnati	OHD000816629	10,895
18	Hukill Chemical Corporation	Bedford	OHD001926740	10,889
19	Chemical Waste Management	Vickery	OHD020273819	10,013
20	CECOS International	Williamsburg	OHD087433744	9,351

2.c. Top 50 Hazardous Waste Generators - 1995, Continued				
21	PPG Industries	Circleville	OHD004304689	9,096
22	Quality Chemicals	Dayton	OHD004855292	9,023
23	Eaglebrook Inc.	Cleveland	OHD000724088	8,390
24	Republic Engineered Steels	Massillon	OHD004227708	7,858
25	BASF Corporation	Greenville	OHD076796887	7,359
26	Chemical Solvents	Cleveland	OHD980897656	7,294
27	North Star Steel Ohio	Youngstown	OHD016077802	7,060
28	Research Oil Company	Cleveland	OHD004178612	6,968
29	Perma-Fix of Dayton	Dayton	OHD004274031	6,930
30	BFI Glenwillow Sanitary Landfill	Glenwillow	OHD131726481	6,759
31	Marion Steel Company	Marion	OHD032271975	6,659
32	Dover Chemical Corporation	Dover	OHD004210563	6,652
33	Amoco Performance Products	Marietta	OHD981529688	6,451
34	Hampshire Chemical Corporation	Lima	OHD987054657	6,060
35	Armco Inc.	Mansfield	OHD004157418	5,908
36	Environmental Enterprises Inc.	Cincinnati	OHD083377010	5,205
37	Copperweld Steel Company	Warren	OHD061731857	4,202
38	Philips Display Components	Ottawa	OHD038703484	4,191
39	Wheeling-Pittsburgh Steel	Yorkville	OHD082964313	4,039
40	Ohio Dept. of Transportation	New Philadelphia	OHD982072688	3,800
41	Timken Company	Wooster	OHD004465167	3,509
42	PPG Industries	Delaware	OHD004347308	3,503
43	PPG Industries	Cleveland	OHD004460143	3,205
44	BP Oil Co. - Toledo Refinery	Oregon	OHD005057542	3,181
45	LTV Steel Co. - Cleveland East	Cleveland	OHD004218673	3,123
46	Greer Steel Company	Dover	OHD004461927	3,085
47	BP Oil Co. - Lima Refinery	Lima	OHD005051826	2,885
48	SPS Technologies Inc.	Cleveland	OHD004954343	2,674
49	Wheeling-Pittsburgh Steel	Steubenville	OHD000810382	2,668
50	Ecolotec Inc.	Dayton	OHD980700942	2,636

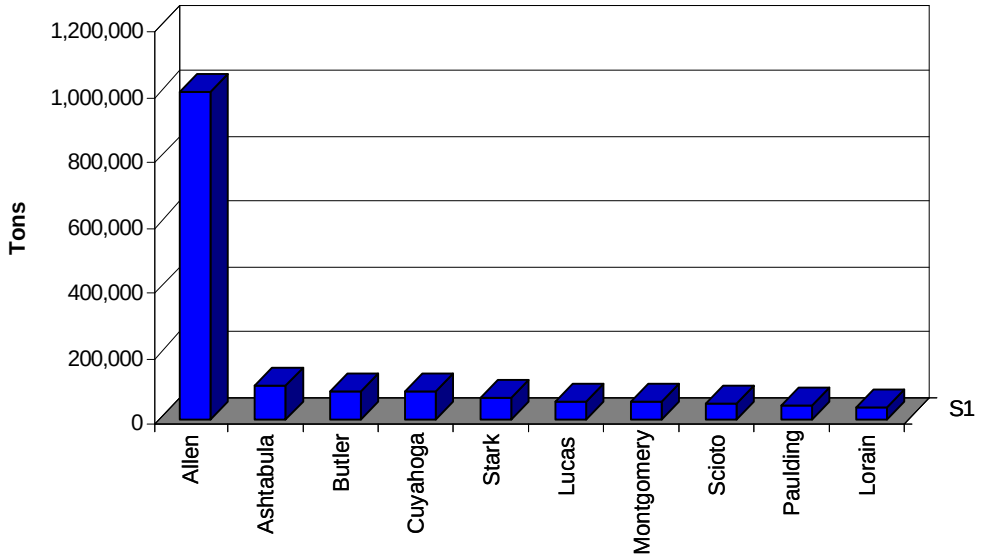
2.d. *Generation and Shipment by County - 1995*

Table 2.d on page 10 lists tons generated and shipped by county for 1995 and the number of Annual Report respondents in that county. Only the shipment column can be directly compared historically because of the change in the report forms (see Table 4.a. for historical data). The charts on page 9 show the top 10 counties for generation and shipment. Allen County's generation is significantly higher than all others because BP Chemicals is located there. The ranking of top shipment counties is likely influenced by the geographic locations of commercial TSD facilities and the largest generators who ship their waste off-site.

2.d.1. TOP 10 WASTE SHIPMENT COUNTIES - 1995



2.d.2. TOP 10 WASTE GENERATION COUNTIES - 1995



2.d. Generation and Shipment by County - 1995							
County	# of Reports	Tons Generated	Tons Shipped	County	# of Reports	Tons Generated	Tons Shipped
Adams	1	5	5	Licking	21	25,220	22,963
Allen	29	1,004,897	12,290	Logan	6	1,042	1,042
Ashland	13	530	514	Lorain	41	34,079	38,466
Ashtabula	30	102,404	102,380	Lucas	72	51,827	51,519
Athens	3	977	977	Madison	4	535	492
Auglaize	10	1,932	1,937	Mahoning	34	12,921	12,963
Belmont	9	407	406	Marion	9	8,033	8,012
Brown	3	54	54	Medina	15	2,174	2,182
Butler	34	88,013	4,368	Meigs	0	0	0
Carroll	3	79	79	Mercer	5	305	305
Champaign	6	599	599	Miami	21	3,690	3,693
Clark	16	2,380	2,373	Monroe	6	16,072	16,069
Clermont	6	9,458	7,346	Montgomery	65	51,983	58,614
Clinton	9	1,205	1,204	Morgan	4	2,288	2,286
Columbiana	17	26,928	21,953	Morrow	1	17	17
Coshocton	10	1,166	1,170	Muskingum	6	25,832	25,830
Crawford	13	396	394	Noble	4	518	518
Cuyahoga	286	82,682	82,937	Ottawa	3	293	292
Darke	10	7,521	6,084	Paulding	6	41,878	41,933
Defiance	4	440	440	Perry	5	90	90
Delaware	9	3,824	3,824	Pickaway	9	12,359	7,953
Erie	19	2,670	2,719	Pike	6	548	1,137
Fairfield	13	2,152	2,155	Portage	29	1,791	1,785
Fayette	3	135	135	Preble	4	399	392
Franklin	100	14,241	14,265	Putnam	7	4,285	4,286
Fulton	13	313	296	Richland	25	7,960	8,313
Gallia	4	16	16	Ross	13	344	295
Geauga	10	1,384	1,384	Sandusky	10	10,769	1,598
Greene	16	904	894	Scioto	8	46,437	831
Guernsey	9	1,944	1,942	Seneca	10	207	207
Hamilton	143	25,627	27,066	Shelby	12	2,123	4,028
Hancock	12	372	376	Stark	60	66,935	67,222
Hardin	4	1,000	1,000	Summit	95	8,454	8,591
Harrison	2	6	6	Trumbull	32	11,574	11,693
Henry	4	115	115	Tuscarawas	25	16,547	16,580
Highland	3	54	53	Union	8	2,406	2,377
Hocking	4	53	61	Van Wert	7	715	713
Holmes	4	128	128	Vinton	3	67	10
Huron	16	384	383	Warren	22	2,041	2,039
Jackson	7	450	444	Washington	20	9,313	2,012
Jefferson	8	7,362	7,430	Wayne	29	6,178	6,177
Knox	3	225	156	Williams	10	499	492
Lake	46	20,370	7,859	Wood	23	2,327	2,326
Lawrence	7	508	530	Wyandot	6	108	94

2.e. *Generation and Shipment by Geographical Region - 1995*

A large portion of the 1,772 Annual Report respondents (41%) are located in northeast Ohio as well as the highest quantity shipped (48%), but the greater amount of waste generation (60%) is in northwest Ohio, as shown in **Table 2.e.** The geographic areas below follow the delineation of Ohio EPA's five District Offices.

2.e. Generation & Shipment by Geographic Region			
District Area	# of Reports	Tons Generated	Tons Shipped
Central	171	61,113	54,336
Northeast	731	378,080	365,799
Northwest	330	1,142,255	140,552
Southeast	164	130,951	78,645
Southwest	376	197,093	119,849

3. EXAMINATION OF GENERATED WASTE VIA DESCRIPTIVE CODES - 1995

The new report forms contain additional waste descriptors that can be used to obtain a better picture of the processes that create hazardous wastes and their physical and chemical composition. Please note that as with all data in this summary, the information is only as accurate as the data contained in the reports submitted by the generators. This is particularly true with the 1995 data since the new forms required more knowledge to complete than in the past and needed a considerable amount of review by DHWM staff.

3.a. *Generation by Origin Code*

The Origin Code describes the process or activity that was the source of the hazardous waste. It is of great importance statistically because it enables DHWM to differentiate between waste shipped by the original generator and waste shipped by an intermediate receiving facility.

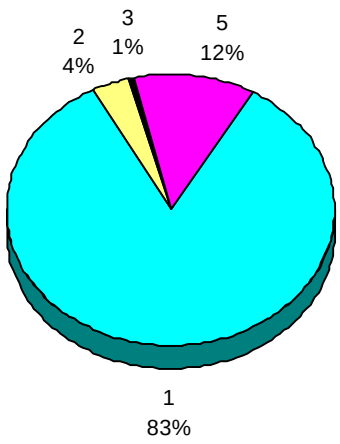
Origin Code Definitions	
1	Generated on-site from a production process, service activity, or routine cleanup (including off-specification or spent chemicals).
2	Result of a spill cleanup, equipment decommissioning, or other remedial cleanup activity.
3	Derived from management of a non-hazardous waste.
4	Received from off-site and was not recycled or treated on-site.
5	Residual from the on-site treatment, disposal, or recycling of a previously existing hazardous waste.

Origin Code 1 represents wastes generated under normal operating conditions whereas Origin Code 2 is to be used to report events that would not represent routine generation activities, such as remediation or the decomissioning of a tank. Residuals from treatment, disposal, or recycling have their own code so they can be accounted for separately.

Generation by Origin Code is represented in **Chart 3.a** on the next page. Note that Origin Code 4 is not listed because the generation amount is zero; the waste was reshipped by an intermediate facility. This quantity would have been double-counted as generation on the old report forms.

Origin Code	# of Records	Tons
1	9442	1,601,024
2	977	67,238
3	72	12,450
5	455	228,779

3.a. GENERATION BY ORIGIN CODE



3.b. *Generation and Management of Residuals*

Although residuals comprise only 12% (228,779 tons) of the total generated, they were the second highest source of hazardous waste generation in 1995. **Table 3.b** on page 14 lists a breakdown of residuals by the management method category they resulted from. The Annual Report uses System Type Codes as a descriptor of management methods. A reference list for System Type Codes reported in 1995 for either generation or shipment begins below and is continued on the next page.

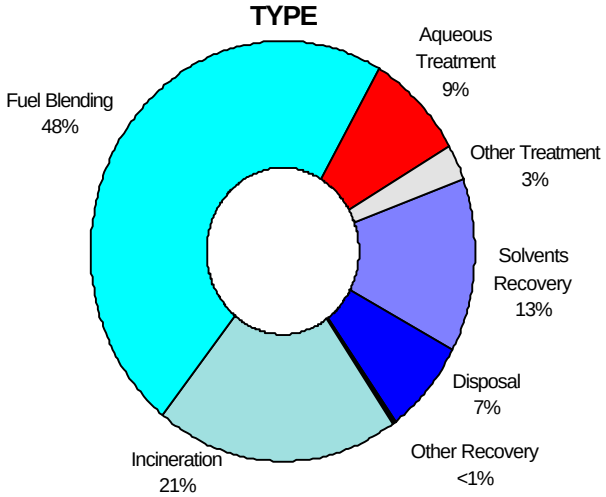
System Type Code Descriptions			
	Metals Recovery		**Incineration**
M011	High temperature metals recovery	**M041**	Liquids
M012	Retorting	**M042**	Sludges
M013	Secondary smelting	**M043**	Solids
M014	Other metals recovery for reuse	**M044**	Gases
M019	Metals recovery - type unknown	**M049**	Type unknown
	Solvents Recovery		**Energy Recovery (Reuse as Fuel)**
M021	Fractionation/distillation	**M051**	Liquids
M022	Thin film evaporation	**M052**	Sludges
M023	Solvent extraction	**M053**	Solids
M024	Other solvent recovery		**Fuel Blending**
M029	Solvents recovery - type unknown	**M061**	Fuel blending
	Other Recovery		**Aqueous Inorganic Treatment**
M031	Acid regeneration	**M071**	Chrome reduction followed by chemical precipitation
M032	Other recovery (nonsolvent)	**M072**	Cyanide destruction followed by chemical precipitation
M039	Other recovery - type unknown	**M073**	Cyanide destruction only

System Type Code Descriptions			
	Aqueous Inorganic, Continued		**Sludge Treatment, Continued**
M074	Chemical oxidation followed by chemical precipitation	**M104**	Solvent extraction
M075	Chemical oxidation only	**M109**	Sludge treatment - type unknown
M076	Wet air oxidation		**Stabilization**
M077	Chemical precipitation	**M111**	Stabilization/Chemical fixation using cementious and/or pozzolanic materials
M078	Other aqueous inorganic treatment	**M112**	Other stabilization
M079	Aqueous inorganic treatment - type unknown	**M119**	Stabilization - type unknown
	Aqueous Organic Treatment		**Other Treatment**
M081	Biological treatment	**M121**	Neutralization only
M082	Carbon adsorption	**M122**	Evaporation only
M085	Other aqueous organic treatment	**M123**	Settling/clarification only
M089	Aqueous organic treatment - type unknown	**M124**	Phase separation only
	Aqueous Organic & Inorganic Treatment	**M125**	Other treatment
M091	Chemical precipitation in combination with biological treatment	**M129**	Other treatment - type unknown
M092	Chemical precipitation in combination with carbon adsorption		**Disposal**
M094	Other organic/inorganic treatment	**M132**	Landfill
M099	Aqueous organic/inorganic treatment - type unknown	**M133**	Surface impoundment (to be closed as a landfill)
	Sludge Treatment	**M134**	Deepwell/underground injection
M101	Sludge dewatering	**M137**	Other disposal
M102	Addition of excess lime		**Transfer Facility Storage**
M103	Absorption/adsorption	**M141**	Transfer facility storage, waste was shipped off-site with no treatment, disposal, or recycling activity

A total of 455 records were listed as residuals. The most frequently reported System Type for residuals was fuel blending - M061, with 125 records. It also had the largest quantity at 108,676 tons. Other frequently reported System Type codes for residuals (more than 20 records) were M094, M021, M071, and M077. In tonnage order, large values for residuals were from incineration - M041 (37,476 tons of ash); solvent recovery - M021 (22,125 tons of still bottoms); and landfill disposal - M132 (15,133 tons of leachate). **Chart 3.b** shows residual quantities by the System Type categories. For easier viewing, some of the smaller categories were combined. The source data is listed to the left of the chart.

System Type Category	Residuals (Tons)
Metals Recovery	205
Solvents Recovery	30,251
Other Recovery	337
Incineration	47,450
Energy Recovery	241
Fuel Blending	108,676
Aqueous Inorganic Trtmt	18,241
Aqueous Organic Trtmt	112
Aqueous Org & Inorg Trtmt	388
Sludge Treatment	2,023
Stabilization	1,420
Other Treatment	2,941
Disposal	16,494

3.b. RESIDUAL GENERATION BY SYSTEM TYPE



3.c. *Generation by Source Code*

Source Codes describe the production, service, or waste management process that was the source associated with generation of the waste. There are specific codes for one-time/intermittent and remedial activities so they can be differentiated from routine processes. **Table 3.c.1** lists the amount generated for each Source Code along with the number of records and a subtotal by category. The most frequently reported Source Codes (greater than 100 records) are listed in **Table 3.c.2** and the codes with the highest quantities (more than 10,000 tons) are in **Table 3.c.3**. A chart on page 16 shows the percentages by category.

3.c.1. Generation by Source Code

Code	# of Records	Tons	Category
			Cleaning and Degreasing
A01	104	645	Stripping
A02	109	21,250	Acid cleaning
A03	154	9,849	Caustic (Alkali) cleaning
A04	181	5,222	Flush rinsing
A05	192	1,146	Dip rinsing
A06	86	2,439	Spray rinsing
A07	100	932	Vapor degreasing
A08	73	666	Physical scraping & removal
A09	576	24,180	Clean out process equipment
A19	581	15,064	Other cleaning & degreasing
	2156	*81,391*	**Cleaning and Degreasing Total**
			Surface Preparation and Finishing
A21	694	13,761	Painting
A22	322	14,871	Electroplating
A23	30	1,271	Electroless plating
A24	35	730	Phosphating
A25	32	422	Heat treating
A26	78	140,372	Pickling
A27	79	3,394	Etching
A29	268	5,779	Other surface coating/prep
	1538	*180,600*	**Surface Preparation and Finishing Total**

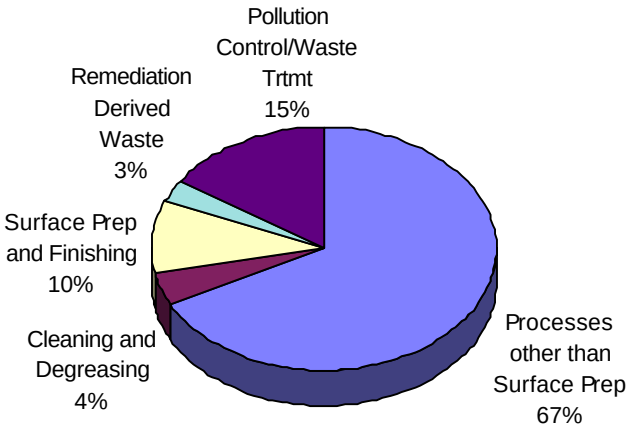
3.c.1. Generation by Source Code, Continued			
			Processes Other Than Surface Preparation
A31	43	7,435	Product rinsing
A32	109	9,886	Product filtering
A33	64	586,904	Product distillation
A34	17	1,316	Product solvent extraction
A35	61	491,791	By-product processing
A36	15	841	Spent catalyst removal
A37	161	116,146	Spent process liquids removal
A38	131	2,236	Tank sludge removal
A39	7	787	Slag removal
A40	23	17,085	Metal forming
A41	19	6,700	Plastics forming
A49	194	10,570	Other processes
	844	*1,251,697*	**Processes Other Than Surface Preparation Total**
			Production or Service Derived One-Time & Intermittent Processes
A51	45	138	Leak collection
A52	2	1	Leachate collection
A53	343	3,931	Cleanup of spill residues
A54	79	613	Oil changes
A55	151	142	Filter/Battery replacement
A56	215	4,874	Discontinue use of process equip
A57	562	9,126	Discarding off-spec material
A58	1529	1,400	Discarding out-of-date products or chemicals
A59	525	4,482	Other one-time and intermittent process
A60	79	1,398	Sludge removal
	3530	*26,105*	**One-Time & Intermittent Processes Total**
			Remediation Derived Waste
A61	57	1,027	Superfund Remedial Action
A62	2	296	Superfund Emergency Response
A63	21	1,719	RCRA Corrective Action at solid waste mgmt unit
A64	65	10,383	RCRA closure of hazardous waste mgmt unit
A65	33	172	Underground storage tank cleanup
A69	175	45,989	Other one-time & intermittent processes
	353	*59,586*	**Remediation Derived Waste Total**
			Pollution Control or Waste Treatment Processes
A71	49	1,594	Filtering/screening
A72	12	99	Metals recovery
A73	79	46,941	Solvents recovery
A74	22	44,042	Incineration/Thermal treatment
A75	175	23,371	Wastewater treatment
A76	29	7,030	Sludge dewatering
A77	1	1,854	Stabilization
A78	103	57,286	Air pollution control devices
A79	16	16,244	Leachate collection
A89	203	92,987	Other pollution control or waste treatment process
	689	*291,448*	**Pollution Control/Waste Treatment Total**
			Other Processes
A91	41	347	Clothing & personal protective equipment
A92	130	1,854	Routine cleanup waste (e.g., floor sweepings)
A93	48	323	Closure of management unit(s) other than by remediation
A94	1394	3,448	Laboratory waste
A99	223	12,692	Other processes
	1836	*18,664*	**Other Processes Total**

3.c.2. Most Frequently Reported Source Codes (> 100 Records)			
Code	**# of Records**	**Tons**	**Category**
A58	1529	1,400	Discarding out-of-date products or chemicals
A94	1394	3,448	Laboratory waste
A21	694	13,761	Painting
A19	581	15,064	Other cleaning & degreasing
A09	576	24,180	Clean out process equipment
A57	562	9,126	Discarding off-spec material
A59	525	4,482	Other one-time and intermittent processes
A53	343	3,931	Cleanup of spill residues
A22	322	14,871	Electroplating
A29	268	5,779	Other surface coating/prep - Surface Prep &
A99	223	12,692	Other processes
A56	215	4,874	Discontinue use of process equipment
A89	203	92,987	Other pollution control or waste treatment process
A49	194	10,570	Other processes (Surface Preparation category)
A05	192	1,146	Dip rinsing
A04	181	5,222	Flush rinsing
A69	175	45,989	Other one-time & intermittent processes
A75	175	23,371	Wastewater treatment
A37	161	116,146	Spent process liquids removal
A03	154	9,849	Caustic (alkali) cleaning
A55	151	142	Filter/Battery replacement
A38	131	2,236	Tank sludge removal
A92	130	1,854	Routine cleanup waste (e.g., floor sweepings)
A02	109	21,250	Acid cleaning
A32	109	9,886	Product filtering
A01	104	645	Stripping
A78	103	57,286	Air pollution control devices
A07	100	932	Vapor degreasing

Although the quantity listed under Source Code A58 is not large in the above table, it was the code reported most often. Several other codes from the One-Time & Intermittent category are also prevalent in the above table.

In terms of quantity, the table on page 17 shows that product distillation is the greatest source of hazardous waste, followed by by-product processing, pickling, and spent process liquids removal. Several of the larger sources are residuals from treatment processes. Processes Other Than Surface Preparation is the largest categorical source of waste generation at 67%.

3.c. GENERATION BY SOURCE CODE CATEGORY



3.c.3. Source Codes With > 10,000 Tons Reported			
Code	# of Records	Tons	Description
A33	64	586,904	Product distillation
A35	61	491,791	By-product processing
A26	78	140,372	Pickling
A37	161	116,146	Spent process liquids removal
A89	203	92,987	Other pollution control or waste treatment processes
A78	103	57,286	Air pollution control devices
A73	79	46,941	Solvents recovery
A69	175	45,989	Other one-time & intermittent processes
A74	22	44,042	Incineration/Thermal treatment
A09	576	24,180	Clean out process equipment
A75	175	23,371	Wastewater treatment
A02	109	21,250	Acid cleaning
A40	23	17,085	Metal forming
A79	16	16,244	Leachate collection
A19	581	15,064	Other cleaning & degreasing
A22	322	14,871	Electroplating
A21	694	13,761	Painting
A99	223	12,692	Other processes
A49	194	10,570	Other processes (Surface Preparation category)
A64	65	10,383	RCRA Closure of hazardous waste management unit

3.d. *Generation by Form Code*

Form Codes correspond to the physical form or chemical composition of a hazardous waste. The major categories are lab packs, liquids, solids, sludges and gases. All of these except lab packs are further broken down into inorganic and organic. The subcategories are described as:

Inorganic Liquids: Primarily inorganic and highly fluid (e.g., aqueous), with low suspended inorganic solids and low organic content.

Organic Liquids: Primarily organic and highly fluid, with low inorganic solids content and low-to-moderate water content.

Inorganic Solids: Primarily inorganic and solid, with low organic content and low-to-moderate water content; not pumpable.

Organic Solids: Primarily organic and solid, with low-to-moderate inorganic content and water content; not pumpable.

Inorganic Sludges: Primarily inorganic, with moderate-to-high water content and low organic content, and pumpable.

Organic Sludges: Primarily organic with low-to-moderate inorganic solids content and water content, and pumpable.

Inorganic Gases: Primarily inorganic with a low organic content and is a gas at atmospheric pressure.

Organic Gases: Primarily organic with low-to-moderate inorganic content and is a gas at atmospheric pressure.

Table 3.d.1 lists the amount generated for each Form Code along with the number of records and subtotals for categories. The most frequently reported Form Codes (greater than 200 records) are listed in **Table 3.d.2** and the codes with the highest quantities (more than 10,000 tons) are shown in **Table 3.d.3**. A 3-D bar chart

on page 21 compares the amounts generated by subcategory. Note that lab pack weights include the container weight if the container is disposed of or incinerated along with the contents. The actual number of lab packs is underestimated because respondents were permitted to consolidate lab pack data on one report page as long as the Form Code was the same for all the wastes included on that page.

3.d.1. Generation by Form Code			
Code	**# of Records**	**Tons**	**Description**
			Lab Packs
B001	391	214	Lab packs of old chemicals only
B002	31	6	Lab packs of debris only
B003	587	284	Mixed lab packs
B004	108	39	Lab packs containing acute hazardous wastes
B009	31	244	Other lab packs
	1148	*786*	**Lab Packs Total**
			Inorganic Liquids
B101	214	18,962	Aqueous waste with low solvents
B102	69	11,952	Aqueous waste w/low other toxic organics
B103	414	256,333	Spent acid with metals
B104	115	445	Spent acid without metals
B105	284	34,334	Acidic aqueous waste
B106	169	6,913	Caustic solution w/metals but no cyanides
B107	60	250	Caustic solution w/metals and cyanides
B108	13	10	Caustic solution w/cyanides but no metals
B109	60	1,399	Spent caustic
B110	223	4,913	Caustic aqueous waste
B111	10	495	Aqueous waste with reactive sulfides
B112	9	9	Aqueous waste with other reactives
B113	60	2,271	Other aqueous waste w/high dissolved solids
B114	86	4,498	Other aqueous waste w/low dissolved solids
B115	13	18,725	Scrubber water
B116	14	16,948	Leachate
B117	82	14	Waste liquid mercury
B119	130	8,951	Other inorganic liquids
	2025	*387,422*	**Inorganic Liquids Total**
			Organic Liquids
B201	214	8,261	Concentrated solvent-water solution
B202	444	5,639	Halogenated (e.g., chlorinated) solvent
B203	1075	47,105	Nonhalogenated solvent
B204	326	74,169	Halogenated/nonhalogenated solvent mixture
B205	105	2,198	Oil-water emulsion or mixture
B206	149	7,643	Waste oil
B207	216	999,130	Concentrated aqueous solution of other organics
B208	10	23,767	Concentrated phenolics
B209	510	9,158	Organic paint, ink, lacquer, or varnish
B210	147	1,819	Adhesives or epoxies
B211	634	22,270	Paint thinner or petroleum distillates
B212	116	614	Reactive or polymerizable organic liquid
B219	448	43,651	Other organic liquids
	4394	*1,245,426*	**Organic Liquids Total**

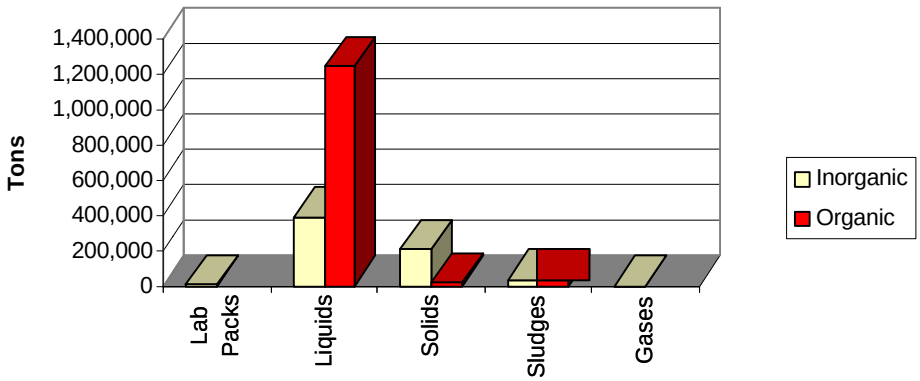
3.d.1. Generation by Form Code, Continued			
			Inorganic Solids
B301	111	41,427	Soil contaminated w ith organics
B302	57	17,543	Soil contaminated w ith inorganics only
B303	16	29,306	Ash, slag, or other residue from incineration of w astes
B304	36	37,344	Other "dry" ash, slag, or thermal residue
B305	20	3,506	"Dry" lime or metal hydroxide solids chemically "fixed"
B306	76	7,307	"Dry" lime or metal hydroxide solids not "fixed"
B307	97	14,663	Metal scale, filings, or scrap
B308	25	234	Empty or crushed metal drums or containers
B309	143	1,088	Batteries or battery parts, casings, cores
B310	295	2,183	Spent solid filters or adsorbents
B311	3	0	Asbestos solids and debris
B312	22	893	Metal-cyanide salts/chemicals
B313	18	76	Reactive cyanide salts/chemicals
B314	13	15	Reactive sulfide salts/chemicals
B315	52	77	Other reactive salts/chemicals
B316	195	4,633	Other metal salts/chemicals
B319	678	41,111	Other w aste inorganic solids
	1857	*201,406*	**Inorganic Solids Total**
			Organic Solids
B401	4	227	Halogenated pesticide solid
B402	6	26	Nonhalogenated pesticide solid
B403	135	1,027	Solid resins or polymerized organics
B404	54	475	Spent carbon
B405	23	83	Reactive organic solid
B406	16	95	Empty fiber or plastic containers
B407	154	6,506	Other halogenated organic solids
B409	415	5,327	Other nonhalogenated organic solids
	807	*13,765*	**Organic Solids Total**
			Inorganic Sludges
B501	5	115	Lime sludge w ithout metals
B502	45	8,466	Lime sludge w ith metals/metal hydroxide sludge
B503	22	2,458	Wastew ater treatment sludge w /toxic organics
B504	72	9,518	Other w astew ater treatment sludge
B505	51	2,808	Untreated plating sludge w ithout cyanides
B506	7	267	Untreated plating sludge w ith cyanides
B507	4	4	Other sludge w ith cyanides
B508	4	20	Sludge w ith reactive sulfides
B509	1	1	Sludge w ith other reactives
B510	11	154	Degreasing sludge w /metal scale or filings
B511	10	1,369	Air pollution control device sludge (e.g., fly ash)
B512	6	70	Sediment or lagoon dragout contaminated w /organics
B513	13	129	Sediment or lagoon dragout contaminated w /inorganics only
B514	3	121	Drilling mud
B515	0	0	Asbestos slurry or sludge
B516	1	58	Chloride or other brine sludge
B519	74	4,335	Other inorganic sludges
	329	*29,894*	**Inorganic Sludges Total**
			Organic Sludges
B601	36	11,422	Still bottoms of halogenated solvents or other organic liquids
B602	47	4,397	Still bottoms of nonhalogenated solvents or other org liquids
B603	68	7,941	Oily sludge
B604	94	3,898	Organic paint or ink sludge
B605	13	132	Reactive or polymerizable organics
B606	33	967	Resins, tars, or tarry sludge
B607	1	375	Biological treatment sludge
B608	0	0	Sew age or other untreated biological sludge
B609	48	1,637	Other organic sludges
	340	*30,769*	**Organic Sludges Total**
			Gases
B701	14	11	Inorganic gases
B801	32	11	Organic gases
	46	*22*	**Gases Total**

3.d.2. Most Frequently Reported Form Codes (> 200 Records)			
Code	**# of Records**	**Tons**	**Description**
B203	1075	47,105	Nonhalogenated solvent
B319	678	41,111	Other waste inorganic solids
B211	634	22,270	Paint thinner or petroleum distillates
B003	587	284	Mixed lab packs
B209	510	9,158	Organic paint, ink, lacquer, or varnish
B219	448	43,651	Other organic liquids
B202	444	5,639	Halogenated (e.g., chlorinated) solvent
B103	414	256,333	Spent acid with metals
B409	415	5,327	Other nonhalogenated organic solids
B001	391	214	Lab packs of old chemicals only
B204	326	74,169	Halogenated/nonhalogenated solvent mixture
B310	295	2,183	Spent solid filters or adsorbents
B105	284	34,334	Acidic aqueous waste
B110	223	4,913	Caustic aqueous waste
B207	216	999,130	Concentrated aqueous solution of other organics
B201	214	8,261	Concentrated solvent-water solution
B101	214	18,962	Aqueous waste with low solvents

3.d.3. Form Codes With > 10,000 Tons Reported			
Code	**# of Records**	**Tons**	**Description**
B207	216	999,130	Concentrated aqueous solution of other organics
B103	414	256,333	Spent acid with metals
B204	325	74,169	Halogenated/nonhalogenated solvent mixture
B203	1075	47,105	Nonhalogenated solvent
B219	448	43,651	Other organic liquids
B301	111	41,427	Soil contaminated with organics
B319	678	41,111	Other waste inorganic solids
B304	36	37,344	Other "dry" ash, slag, or thermal residue
B105	284	34,334	Acidic aqueous waste
B303	16	29,306	Ash, slag, or other residue from incineration of wastes
B208	10	23,767	Concentrated phenolics
B211	634	22,270	Paint thinner or petroleum distillates
B101	214	18,962	Aqueous waste with low solvents
B115	13	18,725	Scrubber water
B302	57	17,543	Soil contaminated with inorganics only
B116	14	16,948	Leachate
B307	97	14,663	Metal scale, filings, or scrap
B102	69	11,952	Aqueous waste w/low other toxic organics
B601	36	11,422	Still bottoms of halogenated solvents or other organic liquids

In both frequency and quantity, the organic liquids comprise the largest sector of hazardous waste generation with B207 by far the most substantial waste form. Inorganic liquids are the second highest waste form, led by B103, spent acid with metals. Apparently numerous respondents felt that the available codes for inorganic solids were inadequate to describe these wastes as shown by the large number or records reported as B319.

3.d. GENERATION BY FORM CODE CATEGORY

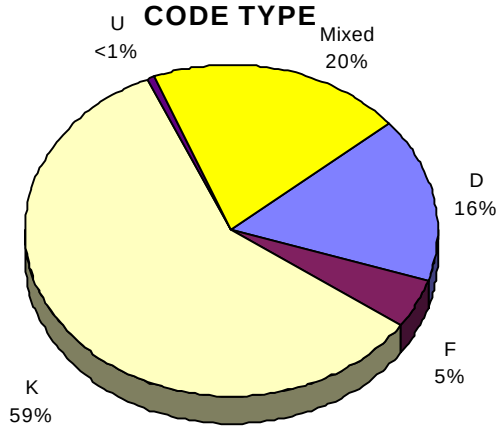


3.e. *Generation by Waste Code Type*

For ease in compilation, waste records of the same type (i.e., all waste codes begin with the same letter) were totaled together. Mixed wastes which carry both characteristic and listed waste codes were grouped as "Mixed". (See section 1.b of the Introduction for waste code category definitions.) Many mixtures are spent solvents that have also been labelled with an ignitability characteristic waste code. The influence of BP Chemicals' hazardous waste generation is clearly seen upon examination of waste code types; K wastes are 59% of the total generated followed by mixtures and characteristic wastes.

Code	Tons
D	305515
F	91088
K	1120754
P	5
U	8636
Mixed	383040

3.e. GENERATION BY WASTE CODE TYPE



3.f. *Generation and Shipment by SIC Code*

Analysis of generation data by Standard Industrial Classification (SIC) Code pinpoints the industry types which produce the majority of the hazardous wastes. The SIC Code is to be reported for each waste record, but most respondents listed the same code for every waste stream on their report. Most of the commercial TSD facilities are using 4953 or 7389 as their SIC Code. There were a total of 288 individual SIC Codes listed on the reports in 1995. **Table 3.f.1** condenses the SIC Codes into categories. The first two digits of the SIC Code group are listed in parentheses after the group's description. The manufacturing sector produces the greatest amount of waste (86%) and has the highest number of records (64%). For comparison purposes, the shipment data is listed in parallel columns. The number of records is larger because the waste may have been shipped to more than one receiving facility. The values are similar in most cases with the exception being the manufacturing sector. This difference is due to the large amount of waste being managed on-site. On page 23, **Table 3.f.2** lists the individual SIC Codes with greater than 10,000 tons generated.

3.f.1. Generation & Shipment by SIC Code Category				
	Generation		Shipment	
Category	# of Records	Tons	# of Records	Tons
Mining				
Coal Mining (12)	11	73	11	73
Nonmetallic Minerals, except fuels (14)	3	20	4	22
Mining Total	*14*	*93*	*15*	*95*
Construction				
General Building Contractors (15)	3	162	3	162
Heavy Construction, Excluding Buildings (16)	40	114	40	134
Special Trade Contractors (17)	14	231	15	231
Construction Total	*57*	*508*	*58*	*527*
Manufacturing				
Food and Kindred Products (20)	97	521	106	519
Textile Mill Products (22)	39	1,490	54	1,490
Apparel and Other Textile Products (23)	15	89	15	89
Lumber and Wood Products (24)	61	30,689	64	30,648
Furniture and Fixtures (25)	24	177	25	173
Paper and Allied Products (26)	140	3,796	150	3,798
Printing and Publishing (27)	81	703	92	697
Chemicals and Allied Products (28)	1858	1,251,355	2205	182,321
Petroleum and Coal Products (29)	84	9,583	92	9,607
Rubber and Misc. Plastic Products (30)	516	9,305	577	9,292
Stone, Clay, and Glass Products (32)	242	3,426	268	3,426
Primary Metal Industries (33)	628	249,420	695	166,336
Fabricated Metal Products (34)	1258	47,464	1312	49,308
Industrial Machinery and Equipment (35)	466	4,291	521	4,221
Electronic and Other Electric Equipment (36)	386	8,243	434	8,213
Transportation Equipment (37)	1054	25,314	1159	25,221
Instruments and Related Products (38)	107	786	134	769
Misc. Manufacturing Industries (39)	30	272	34	271
Manufacturing Total	*6989*	*1,646,404*	*7831*	*495,879*
Transportation and Utilities				
Railroad transportation (40)	22	480	22	480
Local and Interurban Passenger Transit (41)	13	60	13	60
Trucking and Warehousing (42)	51	522	53	522
Water Transportation (44)	3	20	3	20
Transportation by Air (45)	46	987	62	986
Pipelines, Except Natural Gas (46)	8	133	10	133
Transportation Services (47)	5	29	5	29
Electric, Gas, and Sanitary Services (49)	941	159,860	1535	157,834
Transportation and Utilities Total	*1089*	*162,091*	*1703*	*160,063*
Wholesale Trade				
Wholesale Trade, Durable Goods (50)	10	2,777	11	2,777
Wholesale Trade, Nondurable Goods (51)	172	10,913	182	11,010
Wholesale Trade Total	*182*	*13,690*	*193*	*13,787*
Retail Trade				
Building Materials and Garden Supplies (52)	2	9	2	9
General Merchandise Stores (53)	5	5	5	5
Automotive Dealers and Service Stations (55)	64	201	66	201
Retail Trade Total	*71*	*215*	*73*	*215*

3.f.1. Generation & Shipment by SIC Code Category, Continued				
Services				
Personal Services (72)	14	649	17	649
Business Services (73)	194	57,079	461	61,092
Automotive Repair and Services (75)	7	7	7	7
Miscellaneous Repair Services(76)	54	2,193	68	2,188
Amusement and Recreation Services (79)	18	14	20	14
Health Services (80)	60	36	62	36
Educational Services (82)	296	302	339	303
Engineering and Management Services (87)	308	543	311	596
Services Total	*951*	*60,823*	*1285*	*64,885*
Public Administration				
Executive, Legislative, and General (91)	36	17	52	63
Justice, Public Order, and Safety (92)	5	442	5	442
Environmental Quality and Housing (95)	44	6,891	55	7,086
Administration of Economic Programs (96)	34	4,827	37	4,827
National Security and Intl. Affairs (97)	1338	386	1219	371
Public Administration Total	*1457*	*12,563*	*1368*	*12,789*
Nonclassifiable Establishments (9999)	*39*	*12,584*	*42*	*10,422*

3.f.2. SIC Codes With > 10,000 Tons Generated			
Code	**# of Records**	**Tons**	**Description**
2869	350	1,041,669	Industrial Organic Chemicals, nec
3312	222	203,182	Blast Furnaces and Steel Mills
4953	772	158,304	Refuse Systems
2816	16	96,967	Inorganic Pigments
7389	194	57,079	Business Services, nec
2865	82	48,477	Cyclic Crudes and Intermediates
2491	9	28,779	Wood Preserving
2851	247	21,746	Paints and Allied Products
2821	313	21,292	Plastics Materials and Resins
3471	438	20,304	Plating and Polishing
3334	5	15,963	Primary Aluminum
3316	42	13,690	Cold Finishing Of Steel Shapes
9999	39	12,584	Nonclassifiable Establishments
3714	370	10,869	Motor Vehicle Parts and Accessories
3479	193	10,069	Metal Coating and Allied Services

3.g. *Waste Minimization Activity*

If a *new or expanded* waste minimization activity occurred, generators were to list information about this on their report. Old on-going activities were not to be reported unless they had been expanded. A total of 346 sites listed waste minimization activity for 620 waste records, which is 19.5% of the total respondents and 3% of all waste records reported. There were 161 records indicating that 18,846 tons had been recycled and 527 records listing 350,374 tons of source reduction activity, for a total of 369,220 tons (19% of the total generated). (Note: 68 records had values for both types of activity.) This quantity represents the amount that would have been generated as hazardous waste if waste minimization activity had not been conducted. If on-going activities could have been counted, the total minimized would have been greater.

As used in the Annual Report, the term recycling implies use, reuse, or reclamation of a waste, either on-site or off-site, after it has been generated. Source reduction means any practice that: 1) reduces the amount of

any hazardous substance, pollutant, or contaminant entering any waste or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and 2) reduces impact on public health and the environment associated with the release of such substances, pollutants, or contaminants. In short, source reduction is simply taking an action that results in less waste generation.

Through the listing of Activity Codes, report respondents indicated the activities that they conducted to achieve waste minimization. **Table 3.g** lists the frequency of reporting for these codes. Respondents could list up to four codes per record.

3.g. Waste Minimization Activity Codes Reported - 1995

Code	Description	Frequency
W13	Improved maintenance scheduling, recordkeeping, or procedures	135
W52	Modified equipment, layout, or piping	98
W11	Began to segregate types of hazardous waste to make them more amenable to recycling	87
W42	Substituted raw materials	65
W61	Changed to aqueous cleaners (from solvents or other materials)	60
W12	Began to segregate (stopped combining) hazardous waste from non-hazardous waste	58
W02	Off-site recycling began during 1995	48
W19	Other changes in operating practices	47
W14	Changed production schedule to minimize equipment & feedstock changeovers	38
W99	Other source reduction activity	31
W51	Instituted closed-loop recycling	30
W58	Other process modifications	22
W54	Instituted better controls on operating conditions	21
W01	On-site recycling began during 1995	20
W59	Modified stripping/cleaning equipment	17
W81	Changed product specifications	15
W31	Improved storage or stacking procedures	15
W71	Other cleaning and degreasing process modification	13
W21	Instituted procedures to ensure that materials do not stay in inventory beyond shelf-life	11
W36	Implemented inspection or monitoring program of potential spill or leak sources	10
W72	Modified spray systems or equipment	10
W49	Other raw material modifications	9
W73	Substituted coating materials used	9
W32	Improved procedures for loading, unloading, and transfer operations	7
W60	Changed to mechanical stripping/cleaning devices (from solvents or other materials)	6
W82	Modified design or composition	6
W62	Reduced the number of solvents used, to make waste more amenable to recycling	5
W68	Improved rinse equipment operation	4
W41	Increased purity of raw materials	4
W22	Began to test outdated material - continue to use if still effective	3
W53	Changed process catalyst	3
W64	Improved draining procedures	3
W34	Installed secondary containment	3
W83	Modified packaging	3
W23	Eliminated shelf-life requirements for stable materials	2
W74	Improved application techniques	2
W67	Improved rinse equipment design	2
W25	Instituted clearinghouse to exchange materials that would otherwise be discarded	2
W89	Other product modifications	2
W78	Other surface preparation and finishing process modifications	2
W55	Changed from small volume containers to bulk containers to minimize discarding of empty containers	1
W63	Modified containment procedures for cleaning units	1

4. HAZARDOUS WASTE SHIPMENTS

4.a. *Historical Hazardous Waste Shipments*

The new report forms allow distinction of generation from shipment; the total generated and the shipment quantity are recorded in separate sections. Not all waste is shipped the same year it is generated, and some is never shipped because it is managed on-site. Wastes with an Origin Code of 4 (received and transferred without treatment) are accounted for as shipments but not as generation, since the shipper was not the generator. As previously shown in Section 3, the total shipped in 1995 by Annual Report respondents was **759,181 tons**. Unlike generation data, the shipments for 1995 can be directly compared to historical data. **Table 4.a** lists historical shipment tonnages by county for 1991-1995. Data for years prior to 1991 can be obtained from the Data Management Section upon request. The locations of receiving TSD facilities impact county-based shipment statistics.

4.a Historical Hazardous Waste Shipment Tonnage by County

County	1995	1994	1993	1992	1991
Adams	5	4	54	44	44
Allen	12290	16697	7674	16341	18614
Ashland	514	694	484	562	563
Ashtabula	102380	106684	136347	145430	3935
Athens	977	180	77	25	10
Auglaize	1937	962	1378	1442	1314
Belmont	406	109	160	172	677
Brow n	54	35	40	48	56
Butler	4368	3610	4973	4911	14512
Carroll	79	263	276	202	217
Champaign	599	8241	11065	3860	238
Clark	2373	2002	2286	3005	3092
Clermont	7346	3796	3889	6331	13277
Clinton	1204	862	811	310	315
Columbiana	21953	18150	11012	2482	2042
Coshocton	1170	1036	1529	1049	1191
Craw ford	394	494	420	318	501
Cuyahoga	82937	79863	135316	210765	231768
Darke	6084	6867	5847	4895	5876
Defiance	440	420	489	109	137
Delaw are	3824	12207	4150	4209	4508
Erie	2719	3316	4120	4484	3875
Fairfield	2155	2640	3028	2280	1807
Fayette	135	172	137	106	84
Franklin	14265	16051	27578	20777	23363
Fulton	296	406	2342	439	749
Gallia	16	18	16	12	0
Geauga	1384	1522	1647	1146	5838
Greene	894	821	895	823	1022
Guernsey	1942	2008	2064	433	538
Hamilton	27066	24265	25385	23410	22133
Hancock	376	1316	1067	4606	1080
Hardin	1000	673	1195	913	1264
Harrison	6	0	107	0	0
Henry	115	576	172	30	21
Highland	53	8	14	84	11
Hocking	61	282	157	141	139
Holmes	128	30	188	71	27
Huron	383	1001	1431	451	449

4.a. Historical Hazardous Waste Shipment Tonnage by County, Continued

County	1995	1994	1993	1992	1991
Jackson	444	520	312	323	346
Jefferson	7430	2236	2426	4193	9833
Knox	156	172	197	220	131
Lake	7859	6670	5965	5542	5175
Law rence	530	482	2030	1828	440
Licking	22963	32206	17775	13909	12062
Logan	1042	1130	1395	1464	1270
Lorain	38466	45055	36900	33726	30556
Lucas	51519	39485	30208	31102	39078
Madison	492	426	343	249	327
Mahoning	12963	16057	16484	11515	12488
Marion	8012	8432	4655	6919	7234
Medina	2182	2345	4566	2409	1270
Meigs	0	83	37	0	1
Mercer	305	378	416	505	871
Miami	3693	4323	3650	5100	4329
Monroe	16069	5228	6155	5604	6497
Montgomery	58614	47445	63484	54984	50185
Morgan	2286	1770	1383	985	1531
Morrow	17	15	31	56	33
Muskingum	25830	23156	17428	14928	14031
Noble	518	496	263	254	170
Ottaw a	292	348	257	3112	6216
Paulding	41933	48391	54957	197	120
Perry	90	312	424	84	39
Pickaw ay	7953	6910	7455	11747	10109
Pike	1137	874	546	1295	483
Portage	1785	3382	6486	8372	7534
Preble	392	378	443	667	955
Putnam	4286	4066	3477	3676	4294
Richland	8313	3709	14363	12757	13100
Ross	295	236	272	445	1136
Sandusky	1598	1391	1933	2010	2440
Scioto	831	2265	18552	17242	5046
Seneca	207	371	389	342	516
Shelby	4028	2298	2747	2615	2863
Stark	67222	71996	66586	71883	66450
Summit	8591	9853	13799	6283	5030
Trumbull	11693	14882	13413	18188	15090
Tuscaraw as	16580	7775	7181	6896	5957
Union	2377	2785	2675	3023	3697
Van Wert	713	796	794	769	781
Vinton	10	13	4	6	55
Warren	2039	2757	1935	1581	1541
Washington	2012	4347	1980	2990	5226
Wayne	6177	14830	18088	15382	17378
Williams	492	1052	916	6399	453
Wood	2326	2188	1457	984	1510
Wyandot	94	95	94	80	132
Totals	**761176**	**766685**	**859139**	**863548**	**743287**

4.b. *Top Hazardous Waste Shippers - 1995*

The top 50 hazardous waste shippers are listed in **Table 4.b**; sixteen of these are commercial TSD facilities. The sites in this table are responsible for 73% (556,587 tons) of the waste shipped in 1995. Note that top generators BP Chemicals and Aristech Chemical do not appear on the top shippers list because they manage most of their waste on-site. In the case of Systech Environmental, the "shipment" is actually a transfer of fuel blended waste from Systech to Lafarge's cement kiln which is adjacent to Systech's operation. Prior to 1993, Systech operated the kiln and transfer would not have been indicated on the report.

4.b Top 50 Hazardous Waste Shippers - 1995

Rank	Generator	Location	EPA ID	Tons
1	SCM Chemicals Inc.	Ashtabula	OHD076741149	96,847
2	Systech Environmental Corp.	Paulding	OHD005048947	39,976
3	Republic Engineered Steels	Canton	OHD004228003	34,174
4	Jennison-Wright Site	Toledo	OH0000923441	28,675
5	CWM Resource Recovery Inc.	West Carrollton	OHD093945293	25,896
6	Ross Incineration Services	Grafton	OHD048415665	25,089
7	Armco Inc.	Zanesville	OHD004281598	24,515
8	Safety-Kleen Corp.	Hebron	OHD980587364	21,659
9	Waste Technologies Ind.	East Liverpool	OHD980613541	17,062
10	Ormet Primary Aluminum Corp.	Hannibal	OHD004379970	15,962
11	Spring Grove Resource Recovery	Cincinnati	OHD000816629	14,657
12	Timken Company	Canton	OHD004465100	14,177
13	Envirosafe Services Of Ohio	Oregon	OHD045243706	11,389
14	Hukill Chemical Corporation	Bedford	OHD001926740	10,986
15	Quality Chemicals	Dayton	OHD004855292	9,023
16	Eaglebrook Inc.	Cleveland	OHD000724088	8,390
17	Republic Engineered Steels	Massillon	OHD004227708	7,858
18	Research Oil Company	Cleveland	OHD004178612	7,249
19	CECOS International	Williamsburg	OHD087433744	7,238
20	Perma-Fix of Dayton	Dayton	OHD004274031	7,124
21	North Star Steel Ohio	Youngstown	OHD016077802	7,060
22	BFI Glenwillow Sanitary Landfill	Glenwillow	OHD131726481	6,759
23	Marion Steel Company	Marion	OHD032271975	6,659
24	Dover Chemical Corporation	Dover	OHD004210563	6,652
25	Ecolotec Inc.	Dayton	OHD980700942	6,413
26	Armco Inc.	Mansfield	OHD004157418	6,230
27	Hampshire Chemical Corporation	Lima	OHD987054657	6,090
28	BASF Corporation	Greenville	OHD076796887	5,922
29	Chemtron Corp.	Avon	OHD066060609	5,371
30	PPG Industries	Circleville	OHD004304689	4,688
31	Copperweld Steel Company	Warren	OHD061731857	4,202
32	Environmental Enterprises Inc.	Cincinnati	OHD083377010	4,191
33	Philips Display Components	Ottawa	OHD038703484	4,191
34	Wheeling-Pittsburgh Steel	Yorkville	OHD082964313	4,039
35	Lubrizol Corporation	Painesville	OHD004172623	3,834
37	Timken Company	Wooster	OHD004465167	3,509
38	PPG Industries	Delaware	OHD004347308	3,503
39	PPG Industries	Cleveland	OHD004460143	3,283
40	North East Chemical Corp.	Cleveland	OHD980681571	3,273
41	BP Oil Co. - Toledo Refinery	Oregon	OHD005057542	3,156
42	LTV Steel Co. Inc. - Cleveland East	Cleveland	OHD004218673	3,123

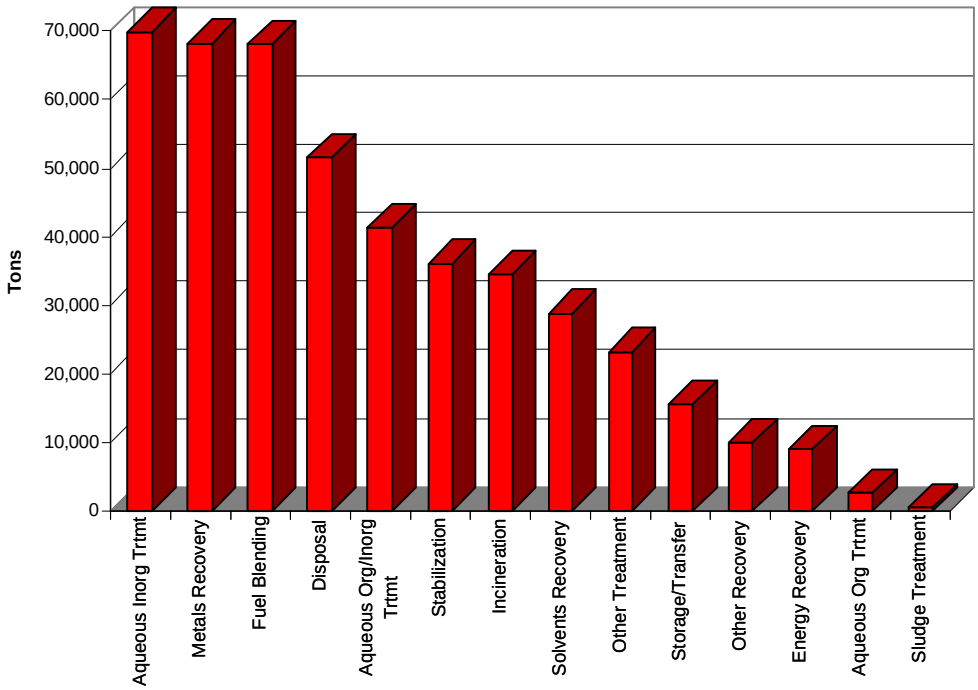
4.b Top 50 Hazardous Waste Shippers - 1995, Continued				
43	AK Steel Corporation	Middletown	OHD004234480	3,098
44	Greer Steel Company	Dover	OHD004461927	3,085
45	Republic Environmental Systems	Bedford	OHD055522429	2,951
46	BP Oil Co. - Lima Refinery	Lima	OHD005051826	2,885
47	Chemical Solvents	Cleveland	OHD980897656	2,842
48	SPS Technologies Inc.	Cleveland	OHD004954343	2,674
49	Wheeling-Pittsburgh Steel	Steubenville	OHD000810382	2,668
50	Nisim Inc.	Euclid	OHD987053006	2,488

4.c. *Off-Site Management Methods Reported for Shipments - 1995*

Shippers are to list the System Type Code that represents the handling method used by the receiving facility. To assist report respondents with this task, an appendix in the instruction booklet contained a national list of TSD facilities and their handling methods. The list was derived mainly from U.S. EPA's 1993 Biennial Report database and from an appendix in the most recent National Capacity Assurance Plan Assessment. From DHWM's review of the System Type Code data in the shipment section of the report forms, there appeared to be much confusion and misinformation about the series of management methods that were used on the wastes after they left the original generator. The trend in recent years is for a small number of hazardous waste management firms to own a large number of facilities. Waste received at the initial facility is re-routed to a sister facility that can manage that type of material.

Table 4.c on the next page lists the System Type Codes reported for shipments, sorted by the tons amount. The reference table for the codes begins on page 12. Below, a bar chart displays a breakdown by code category. The value of the System Type Code data is reduced because of the prevalence of transfer, with or without preliminary treatment. Information on the final handling method for transfers is presently unavailable from the Annual Report. In some cases, the final handling method can be inferred. For example, fuel blended waste (M061) is shipped by the blender to a energy recovery facility (M051, M052, or M053).

4.c OFF-SITE MANAGEMENT METHODS FOR SHIPMENTS - 1995



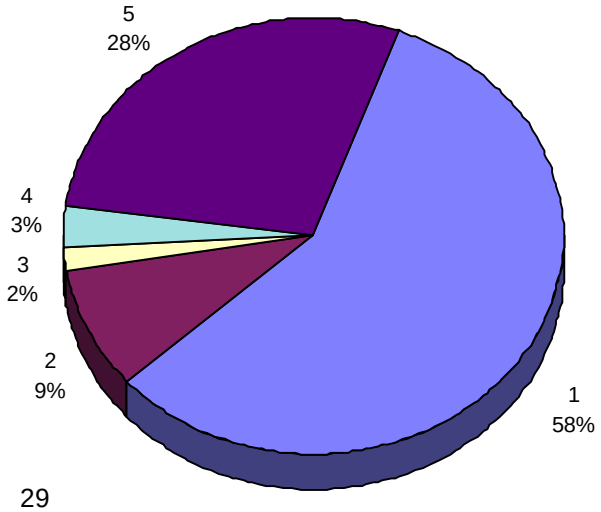
4.c Off-Site Management Methods Reported for Shipments - 1995					
Code	# of Records	Tons	Code	# of Records	Tons
M061	3231	68,040	**M032**	77	666
M011	93	62,381	**M102**	6	267
M077	270	52,594	**M124**	4	211
M134	88	42,526	**M085**	8	203
M111	758	36,022	**M024**	18	199
M094	300	34,724	**M029**	15	169
M041	904	22,719	**M079**	13	132
M125	232	22,090	**M072**	32	116
M022	558	15,612	**M074**	26	109
M141	3325	15,592	**M101**	14	90
M078	23	15,330	**M012**	46	84
M021	374	12,791	**M109**	2	49
M031	10	9,298	**M075**	8	31
M132	358	9,059	**M044**	22	20
M043	889	8,554	**M073**	8	16
M092	69	5,402	**M103**	1	15
M053	28	3,655	**M112**	9	13
M042	92	3,241	**M119**	8	11
M052	38	3,157	**M049**	2	9
M014	97	2,828	**M129**	6	6
M051	128	2,086	**M104**	1	3
M071	68	1,630	**M099**	6	2
M081	10	1,555	**M122**	2	1
M013	15	1,544	**M089**	1	1
M019	25	1,359	**M023**	1	0
M091	3	1,173	**M076**	1	0
M082	16	912	**M039**	1	0
M121	334	883	**M137**	1	0

4.d. ***Shipments by Origin Code - 1995***

Analysis of shipment data by Origin Code can indicate the quantity of waste being reshipped without treatment by receiving TSD facilities (Origin Code 4). Residuals (Origin Code 5) are shipped by both original generators (e.g., wastewater treatment sludges from electroplating) and by TSD facilities. Origin Code 1 is 58% of the shipments but 83% of the waste generated (see Chart 3.a for comparisons). A reference list of Origin Code definitions is on page 11.

Origin Code	# of Records	Tons
1	9697	439,087
2	963	69,785
3	76	12,462
4	1413	23,256
5	526	214,591

4.d SHIPMENTS BY ORIGIN CODE - 1995

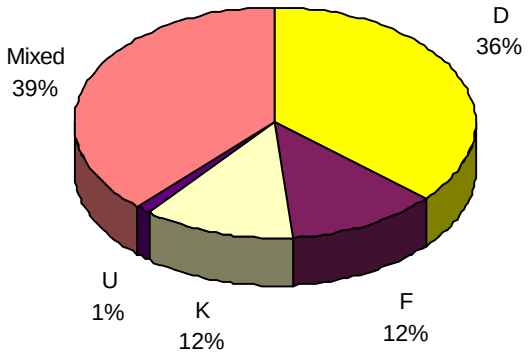


4.e. *Tonnage Shipped by Waste Code Type*

For ease in compilation, waste records of the same type (i.e., all waste codes begin with the same letter) were totaled together. Mixed wastes which carry both characteristic and listed waste codes were grouped as "Mixed". (See section 1.b of the Introduction for waste code category definitions.) Many mixtures are spent solvents that have also been labelled with an ignitability characteristic waste code. See page 21 for a comparison against 1995 generation data.

Code	1995	1994	1993	1992	1991
D	275466	253848	344911	341378	218133
F	92572	96425	74845	50237	50205
K	93595	86061	110689	183245	178072
P	6	9	5	2666	25
U	9098	2359	11722	5551	8497
Mixed	288443	325990	314976	278484	286345
Total	759181	764692	857148	861561	741277

4.e. TONNAGE SHIPPED BY WASTE CODE TYPE - 1995



4.f. *Destination States/Countries for Shipments from Annual Report Respondents*

In 1995, generators shipped waste to Canada and 37 states including Ohio. The hazardous waste management company selected by the generator will have a great impact on where the waste is routed for treatment, storage, or disposal. Waste may initially be received at an Ohio TSD facility but transferred to a second facility in another state. Ownership changes or facility closure also impact the flow of waste. Although Ohio has a wide range of treatment methods available through the various TSD facilities located here, there are specialized facilities in other states that accept wastes which most others cannot. Hazardous waste shipments are considered to be interstate commerce by the federal government and as such cannot be restricted by the states.

A 1991-1995 historical listing of tonnage shipped to receiving states/countries by Annual Report respondents (including waste remaining in Ohio) is in **Table 4.f** on the following page. In past editions of this document, the out-of-state data was listed under the title "Exports".

4.f Destination States/Countries for Shipments from Annual Report Respondents						
State	**# Records (1995)**	**1995**	**1994**	**1993**	**1992**	**1991**
ALABAMA	94	1,026	969	796	2,618	5,299
ARIZONA	1	104	0	43	21	279
ARKANSAS	887	4,580	4,599	3,043	2,434	1,976
CALIFORNIA	34	20	31	19	31	11
CANADA	116	7,401	7,129	8,097	1,880	808
COLORADO	1	3	30	3	2,561	0
CONNECTICUT	93	456	422	364	227	176
DELAWARE	1	21	50	0	<1	1
ENGLAND	0	0	0	229	271	21
FINLAND	0	0	0	15	0	0
FLORIDA	24	31	69	150	75	39
GEORGIA	405	1,080	1,383	1,293	1,147	1,966
IDAHO	0	0	0	36	907	0
ILLINOIS	312	18,664	11,573	10,412	13,868	10,330
INDIANA	1239	59,557	47,980	56,148	65,022	68,458
IOWA	2	42	0	20	0	0
KANSAS	26	2,350	1,330	861	2,216	4,248
KENTUCKY	647	8,444	9,856	8,080	12,222	22,218
LOUISIANA	363	3,984	6,568	21,703	17,951	8,649
MARYLAND	149	1,376	1,245	597	485	306
MASSACHUSETTS	157	299	96	276	541	543
MICHIGAN	1100	90,640	53,363	38,436	34,536	51,953
MINNESOTA	153	142	106	67	84	79
MISSISSIPPI	0	0	733	0	0	0
MISSOURI	48	8,756	9,827	12,187	9,978	8,300
NEBRASKA	31	1,335	663	10	29	56
NEVADA	1	3	1	39	71	119
NEW JERSEY	181	9,759	1,510	1,624	4,491	4,897
NEW YORK	189	13,380	7,521	13,819	14,790	13,176
NORTH CAROLINA	19	11	46	135	514	137
NORTH DAKOTA	0	0	120	0	0	0
OHIO	5422	427,045	491,831	561,138	576,012	448,413
OKLAHOMA	58	5,041	4,567	4,390	2,563	2,635
PENNSYLVANIA	221	80,162	87,863	84,380	54,662	54,185
RHODE ISLAND	3	81	220	133	187	251
SOUTH CAROLINA	135	8,185	5,738	3,814	7,224	5,152
TENNESSEE	320	2,463	4,156	10,479	14,362	11,912
TEXAS	167	1,108	1,663	2,180	7,743	4,130
UTAH	23	858	290	154	287	148
VIRGINIA	3	58	40	629	901	431
WASHINGTON	2	5	9	1	6	22
WEST VIRGINIA	19	29	64	11,291	8,381	9,259
WISCONSIN	29	683	1,029	57	260	716
	12675	*759,181*	*764,690*	*857,148*	*861,558*	*741,299*

4.g. *Top 50 Receiving Facilities for Shipments - 1995*

The top 50 receiving facilities as reported by Ohio's Annual Report respondents are listed on the following page in **Table 4.g.** The list is sorted by quantity. These facilities accepted 93% (707,813 tons) of the reported shipments and accounted for 62% (7,891) of the records.

4.g Top 50 Receiving Facilities for Shipments - 1995					
Rank	**Facility**	**Location**	**EPA ID**	**# of Records**	**Tons**
1	RESERVE ENVIRONMENTAL SERVICES	ASHTABULA	OHD980793384	20	110,936
2	ENVIRITE CORPORATION	CANTON	OHD980568992	244	49,060
3	HORSEHEAD RESOURCE DEVELOPMENT	PALMERTON	PAD002395887	4	47,356
4	WAYNE DISPOSAL	BELLEVILLE	MID048090633	17	46,997
5	CHEMICAL WASTE MANAGEMENT	VICKERY	OHD020273819	86	42,315
6	LAFARGE CORPORATION	PAULDING	OHD987048733	1	39,921
7	ESSROC MATERIALS	LOGANSPORT	IND005081542	18	33,853
8	RESEARCH OIL COMPANY	CLEVELAND	OHD004178612	249	25,515
9	ENVIROSAFE SERVICES OF OHIO	OREGON	OHD045243706	90	24,810
10	CLEAN HARBORS OF CLEVELAND	CLEVELAND	OHD000724153	173	16,206
11	HYDRO SERVICES INC.	LORAIN	OHD987054525	2	15,297
12	PETRO CHEM PROCESSING	DETROIT	MID980615298	345	14,755
13	CHEMICAL WASTE MANAGEMENT	FT. WAYNE	IND078911146	46	14,392
14	MILL SERVICE INC	YUKON	PAD004835146	4	13,640
15	ENVOTECH MANAGEMENT SERVICES	BELLEVILLE	MID000724831	208	13,199
16	CHEMICAL WASTE MANAGEMENT	MODEL CITY	NYD049836679	152	13,071
17	MEDUSA CEMENT COMPANY	WAMPUM	PAD083965897	24	12,503
18	HORSEHEAD RESOURCE DEVELOPMENT	CHICAGO	ILD040891368	15	12,181
19	REPUBLIC ENVIRONMENTAL SYSTEMS	BEDFORD	OHD055522429	170	11,298
20	SYSTECH ENVIRONMENTAL CORP.	PAULDING	OHD005048947	36	10,267
21	WASTE TECHNOLOGIES INDUSTRIES	EAST LIVERPOOL	OHD980613541	88	9,438
22	HUKILL CHEMICAL CORPORATION	BEDFORD	OHD001926740	138	9,438
23	CHEMICAL SOLVENTS INC.	CLEVELAND	OHD980897656	398	7,413
24	PPG INDUSTRIES INC.	CIRCLEVILLE	OHD004304689	48	6,552
25	LAIDLAW ENVIRONMENTAL SERVICES	CORUNNA, ONTARIO	Canada	23	5,942
26	NORTH EAST CHEMICAL CORP.	CLEVELAND	OHD980681571	356	5,927
27	ROSS INCINERATION SERVICES	GRAFTON	OHD048415665	481	5,761
28	LAIDLAW ENVIRONMENTAL SERVICES	HILLARD	OHD081290611	66	5,411
29	GIANT CEMENT COMPANY	HARLEYVILLE	SCD003351699	16	5,391
30	CWM RESOURCE RECOVERY INC.	WEST CARROLLTON	OHD093945293	150	5,390
31	SPRING GROVE RESOURCE RECOVERY	CINCINNATI	OHD000816629	751	5,368
32	SAFETY-KLEEN CORPORATION	CLARKSVILLE	MOD029729688	1	5,292
33	SAFETY-KLEEN CORPORATION	LINDEN	NJD002182897	4	4,894
34	SAFETY-KLEEN CORPORATION	SMITHFIELD	KYD053348108	473	4,883
35	U.S. POLLUTION CONTROL	WAYNOKA	OKD065438376	56	4,831
36	LONE STAR ALTERNATIVE FUELS	GREENCASTLE	IND006419212	5	4,648
37	HERITAGE ENVIRONMENTAL SERVICES	INDIANAPOLIS	IND093219012	982	3,815
38	SAFETY-KLEEN CORPORATION	HEBRON	OHD980587364	399	3,683
39	CHEM-MET SERVICES INC.	WYANDOTTE	MID096963194	268	3,624
40	WCI STEEL INC.	WARREN	OHD060409521	2	3,600
41	MARINE SHALE PROCESSORS	MORGAN	LAD981057706	162	3,496
42	DYNECOL INC.	DETROIT	MID074259565	64	3,416
43	ECOLOTEC INCORPORATED	DAYTON	OHD980700942	108	3,232
44	TIMKEN COMPANY	CANTON	OHD004465100	2	3,198
45	CHEMTRON CORP.	AVON	OHD066060609	637	3,006
46	GAGE PRODUCTS	FERNDALE	MID005338801	6	2,890
47	AMROX	ALLENPORT	PAD000008367	1	2,627
48	E.I. DUPONT DE NEMOURS & CO.	DEEPWATER	NJD002385730	7	2,420
49	RINECO CHEMICAL INDUSTRIES	BENTON	ARD981057870	234	2,370
50	INMETCO	ELLWOOD CITY	PAD087561015	61	2,285

4.h. *Most Frequently Reported Transporters - 1995*

Table 4.h lists the most frequently reported hazardous waste transporters for 1995. The 31 transporters in the table comprised 71% of the records. There were a total of 302 different transporters reported and 64% of these were listed less than 5 times. Some receiving TSD facilities have their own transporter fleet but the EPA Identification (ID) number might be different. Unlike other hazardous waste handlers, ID numbers for transporters are assigned to the headquarters location. A company may have a transfer station in Ohio but use an ID number on manifests based in another state because the headquarters is located there. This can create errors in reporting if the respondent has not thoroughly inspected the manifests before completing the forms.

4.h Most Frequently Reported Transporters (> 40 Records)

# of Records	EPA ID	Transporter
459	ILD984908202	SAFETY-KLEEN CORPORATION
231	ARD981908551	J.B. HUNT SPECIAL COMMODITIES
206	INT190010397	METROPOLITAN ENVIRONMENTAL
205	NYD980769947	HAZMAT ENVIRONMENTAL GROUP
172	MAD039322250	CLEAN HARBORS ENVIRONMENTAL
141	MOD095038998	TRI-STATE MOTOR TRANSIT
130	OHD052937885	CHEMICALS SOLVENTS INC
123	ILD099202681	CHEMICAL WASTE MANAGEMENT
121	OHD066060609	CHEMTRON CORPORATION
117	OHD980568992	ENVIRITE CORPORATION
110	OH0000000539	MIDWEST ENVIRONMENTAL TRANSPORT
104	OHD980614374	ROSS TRANSPORTATION SERVICES
94	OHD009865825	DART TRUCKING CO INC
91	OHD982061350	CHEM FREIGHT INC
83	MID980684088	SOLVENT DISTILLERS INC.
82	OHD987023090	ECO TRON TRANSPORTATION
71	IND058484114	HERITAGE TRANSPORT INC
67	OHD981000557	COUSINS WASTE CONTROL
60	MDD980554653	LAIDLAW ENVIRONMENTAL SERVICES
59	OHD004178612	RESEARCH OIL COMPANY
53	MID021087275	NORTRU INC
51	OH0000953661	TRANS-ENVIRO INC
50	OHD004274031	PERMA-FIX OF DAYTON
49	NYD051809952	BUFFALO FUEL CORP.
49	OH0000553875	SELECT TRANSPORTATION INC
49	OHD987050564	ENVIROSERVE JV
48	OHD001926740	HUKILL CHEMICAL CORPORATION
48	OHD108405531	MIDWEST ENVIRONMENTAL CONTROL
41	MID087478574	GREAT LAKES ENVIRONMENTAL
41	MID985568021	CHEMICAL ANALYTICS
40	DED981110166	MATLACK INC.

5. HISTORICAL HAZARDOUS WASTE MANAGEMENT (TREATMENT, STORAGE, AND DISPOSAL)

Statistics on hazardous waste management by TSD facilities are broken down into two categories, on-site and off-site. **On-site** facilities manage some or all of their wastes at their location. **Off-site** or **"commercial"** receiving facilities accept waste from customers. Both types of facilities report the wastes managed and the method used. Wastes remaining in storage or disposal units as of December 31 are also to be reported.

Facilities managing hazardous waste in exempt units are not required to report this activity in the Annual Report.

Examples of exempt treatment units are elementary neutralization, solvent recovery, and NPDES-regulated wastewater treatment. Although many commercial TSD facilities manage waste in exempt units, most have a storage permit and therefore are required to submit a report listing the wastes received and the management method used.

The capacity at the majority of the receiving TSD facilities is available to the public, but there are a few exceptions. Ohio has two *captive* permitted TSD facilities which receive off-site waste from generators owned by the same parent company: 1) PPG Industries in Circleville, an incinerator; and 2) Delphi Packard Electric Systems in Warren, a storage facility. There are five *limited commercial* TSD facilities which have a selective customer base due to the type of operation they conduct: Ashland Chemical in Dayton, Detrex Corporation in Euclid, Environmental Purification Industries in Toledo, Reserve Environmental Services in Ashtabula, and WCI Steel in Warren.

Currently there are less than 50 TSD permit holders. Numerous facilities have closed formerly permitted units or are in the process of closing them. Because wastes in inactive units are still being "managed" by the facility until Ohio EPA concurs that closure activities are complete, the contents of the unit(s) are to be listed on the Annual Report. Historically this has presented a significant problem in determining the exact amount of waste that was newly generated/managed on-site each year. The 1995 version of the Annual Report contains a section specifically for on-site storage and disposal units which allows differentiation between active and inactive operations through the use of check boxes.

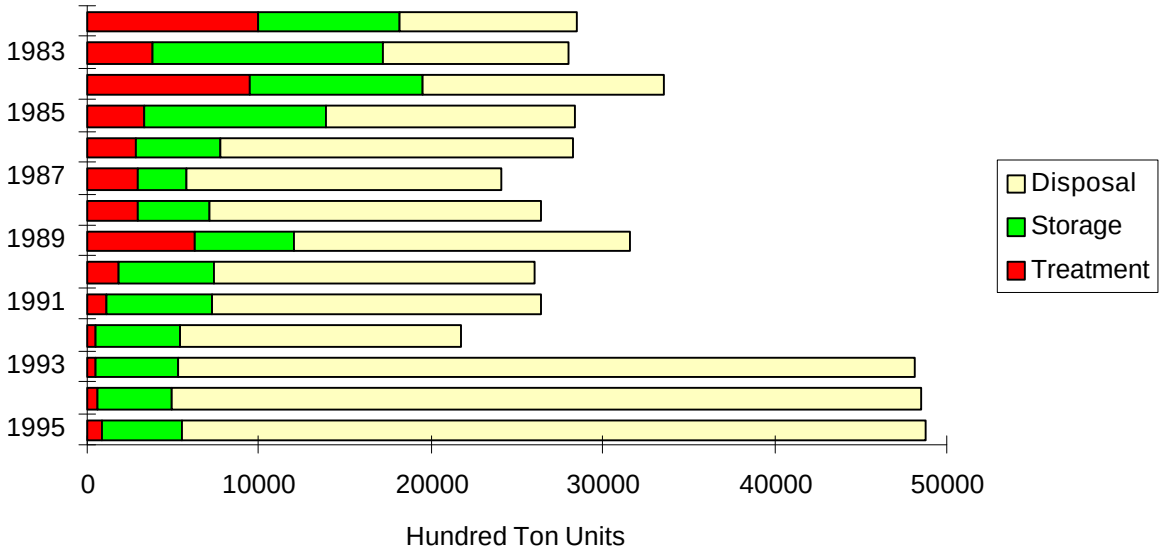
5.a. *Treatment, Storage, and Disposal Totals for On-Site and Off-Site Management*

Historical values for treatment, storage, and disposal management are broken down by category and method in **Table 5.a** and in the charts on the following page**.** In the on-site category for 1995, two-thirds of the disposal quantity and most of the storage is from inactive units. These are examined in more detail in Section 6. The large drop in 1995's commercial storage can be directly tied to the reporting of fuel blending as a treatment rather than as a storage/transfer activity.

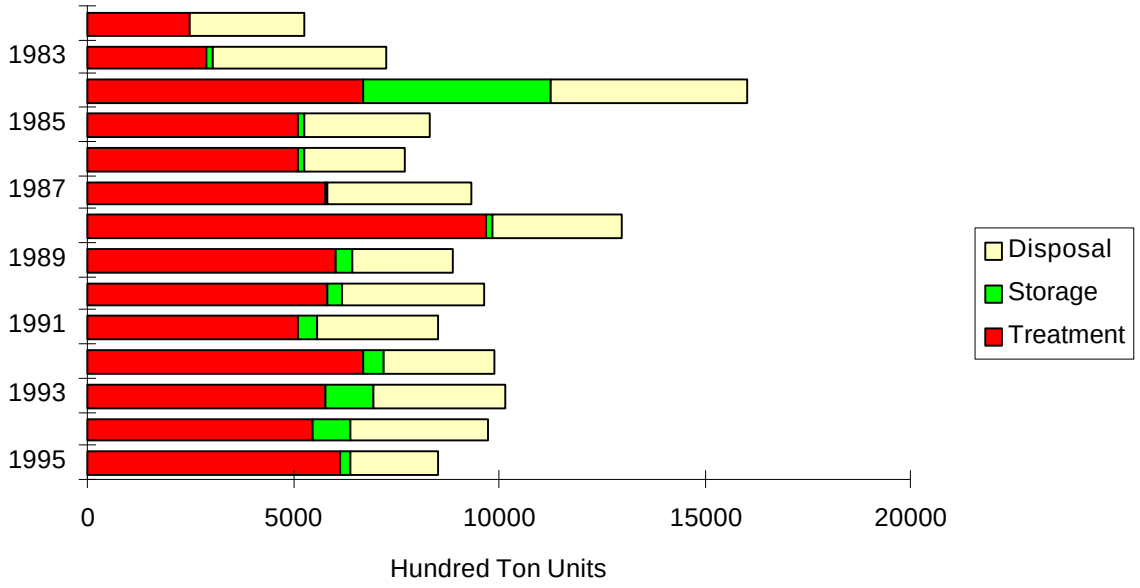
5.a. Treatment, Storage, and Disposal Totals for On-Site and Off-Site Management

	Generated & Managed On-Site				*Received from Off-site*				
	Treatment	*Storage*	*Disposal*	**Total On-Site**	*Treatment*	*Storage*	*Disposal*	**Total Off-Site**	**Total Mgmt.**
1995	83,452	464,153	4,327,328	4,874,933	615,066	24,495	214,465	854,027	5,728,959
1994	65,205	430,840	4,354,440	4,850,485	547,879	93,744	335,369	976,992	5,827,477
1993	55,013	476,918	4,288,174	4,820,105	578,434	115,286	323,540	1,017,260	5,837,365
1992	51,626	488,372	1,633,275	2,173,273	672,406	50,591	266,771	989,768	3,163,041
1991	107,096	621,776	1,916,782	2,645,654	514,610	44,891	294,486	853,987	3,499,641
1990	187,938	550,266	1,865,313	2,603,517	582,076	39,266	341,701	963,043	3,566,560
1989	630,333	567,702	1,965,005	3,163,040	604,436	42,005	241,042	887,483	4,050,523
1988	298,360	417,211	1,922,069	2,637,640	968,659	16,811	316,544	1,302,014	3,939,654
1987	298,984	276,454	1,828,544	2,403,982	577,828	6,772	350,814	935,414	3,339,396
1986	285,283	485,415	2,057,748	2,828,446	510,735	18,509	241,647	770,891	3,599,337
1985	332,125	1,061,293	1,449,311	2,842,729	511,318	18,103	305,070	834,491	3,677,220
1984	940,157	1,018,398	1,390,134	3,348,689	671,848	453,335	478,060	1,603,243	4,951,932
1983	376,142	1,349,728	1,069,152	2,795,022	291,288	10,946	421,860	724,094	3,519,116
1982	1,001,042	818,822	1,034,396	2,854,260	246,345	3,350	277,673	527,368	3,381,628

5.a.1. HISTORICAL ON-SITE WASTE MANAGEMENT METHODS



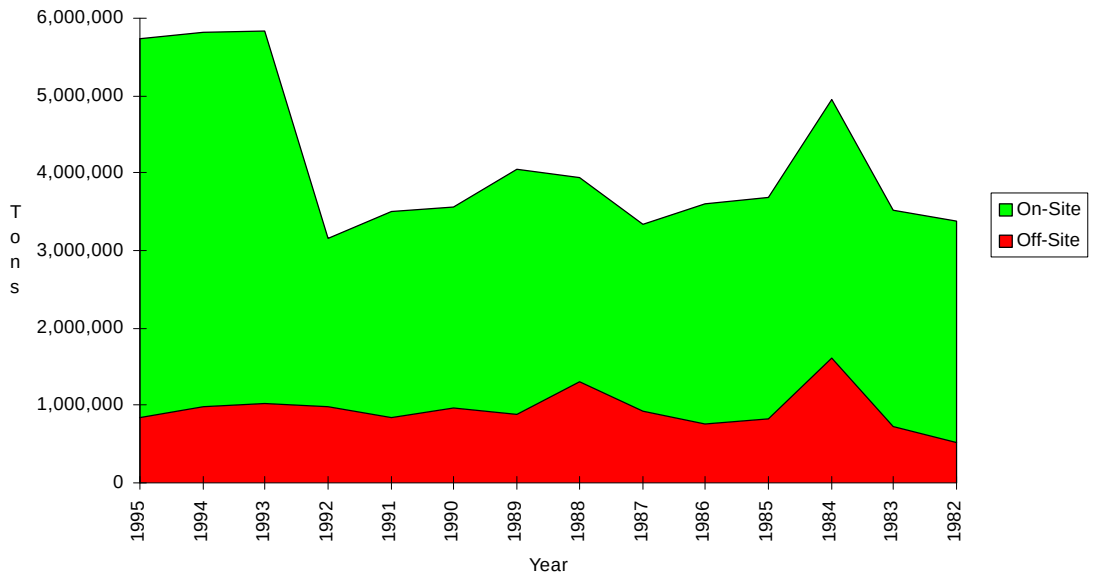
5.a.2. HISTORICAL OFF-SITE WASTE MANAGEMENT METHODS



Inflated on-site disposal values for 1993-1995 are due to the first reporting in 1993 of inactive surface impoundments by Reserve Environmental.

The historical area chart on the next page graphically displays the significant amount of hazardous waste generation and management that is conducted by on-site TSD facilities.

5.a.3. TOTAL TSD MANAGEMENT



5.b. *Treatment, Storage, and Disposal Totals by Management Method*

Because of the report form changes, the codes used to list management methods are now different, which creates difficulty in making direct comparisons. Some of the former Handling Method Codes are not directly comparable to the new System Type Codes. Also, U.S. EPA did not create System Type Codes for any type of storage other than M141, transfer facility storage. The federal Biennial Report forms do not track on-site storage or inactive units that are undergoing closure. Because the amount of waste in these two categories is significant, Ohio EPA decided to continue tracking them using the old Handling Method Codes on Ohio's version of the hazardous waste report. Conversely, a positive change that occurred with adoption of the System Type Codes is the ability to track fuel blending activity. Previously it had been listed as storage and therefore could not be differentiated from storage/transfer.

Table 5.b lists treatment, storage, and disposal methods for both on-site and off-site facilities for the years 1991-1995 regardless of whether a unit was active or inactive. Fluctuations within a management method may not indicate a true change in its use but rather changes in the codes or wastes reported by particular sites.

5.b. Treatment, Storage, and Disposal Totals by Management Method							
	Handling Method Code	**System Type Code**	**1995**	**1994**	**1993**	**1992**	**1991**
DISPOSAL							
Underground Injection	D79	M134	1,192,634	991,923	1,035,968	1,074,220	1,256,971
Landfill	D80	M132	223,358	326,371	204,246	137,833	199,057
Land Treatment	D81	M131	30,745	30,745	30,745	30,745	30,745
Surface Impoundment (to close as a landfill)	D83	M133	3,095,057	3,340,769	3,340,756	657,247	724,494
Total Disposal			4,541,793	4,689,808	4,611,715	1,900,045	2,211,267

5.b. Treatment, Storage, and Disposal Totals by Management Method, Continued

STORAGE			1995	1994	1993	1992	1991
Container	S01		9,927	35,140	46,172	35,887	35,939
Tank	S02		2,992	78,171	92,255	43,803	33,348
Waste Pile	S03		115,000	119,623	119,200	130,063	124,022
Surface Impoundment	S04		334,834	283,110	326,036	320,345	465,349
Other Storage/Drip Pad	S05		0	<1	8,542	8,865	8,009
Other Storage	S99		1,400	8,540	*This category w as S05 prior to 1994.		
Storage/Transfer		M141	27,680				
Total Storage			491,832	524,584	592,205	538,963	666,667
THERMAL TREATMENT							
Liquid Injection Incineration	T06			26,188	27,611	26,529	34,850
Rotary Kiln Incineration	T07			61,364	40,012	38,486	31,030
Multiple Hearth Incin.	T09			0	0	0	1
Cement Kiln	T16		*See T81	*See T81	54,831	58,956	60,327
Other	T18	M125	15	16,095	53,034	43,673	44,582
Incineration		M041-43	117,970				
Total Thermal			117,984	103,647	175,488	167,644	170,790
CHEMICAL TREATMENT							
Absorption Field	T21	M082	333	0	0	0	0
Chemical Fixation	T21	M111	42,053	29,927	27,502	16,977	17344
Chemical Oxidation	T22	M075	2	7	23	19	7
Chemical Precipitation	T23	M071 72, 74, 77	157,075	84,709	84,203	74,159	82500
Chemical Reduction	T24			231	337	176	121
Cyanide Destruction	T27	M073	80	101	149	165	83
Ion Exchange	T30	M078	226	<1	0	0	0
Neutralization	T31	M121	1,436	115,615	146,059	153,848	80387
Ozonation	T32			<1	0	0	0
Other	T34	M125	40,979	<1	36	935	1020
Wet Air Oxidation		M093	19				
Total Chemical			242,204	230,590	258,309	246,279	181,462
PHYSICAL TREATMENT							
Clarification	T36			8,580	0	0	0
Coagulation	T37			0	0	<1	0
Decanting	T38			76	8	3,225	4,382
Encapsulation	T39			588	458	257	137
Filtration (Phase Separation)	T40	M124	642	44	23	388	2,209
Flocculation	T41			2,043	1	48	0
Flotation	T42	M094	43,382	53,024	49,882	48,752	55,024
Thickening	T45			0	1	0	0
Ultra Filtration	T46			76	149	1,124	1,926
Other, Phys. Separation	T47	M101, M125	3,119	689	8,590	9,196	8
Activated Carbon	T49	M092, M103	10,666	1,152	3,341	7,632	10,716
Blending	T50	M125	476	33,472	31,121	126,360	93,657
Catalysis	T51			<1	19	0	0
Distillation	T54	M021	16,501	588	609	1,610	509
Solvent Recovery	T63	M022, 24	43,396	89,982	102,247	110,853	100,878
Stripping	T64			208	3,201	662	9
Fuel Blending		M061	128,551				
Total Physical			246,734	190,522	199,650	310,107	269,455

5.b. Treatment, Storage, and Disposal Totals by Management Method, Continued

BIOLOGICAL TREATMENT			1995	1994	1993	1992	1991
Activated Sludge	T67			0	0	0	0
Aerobic Tank	T69			0	0	0	0
Waste Stabilization Pond	T76			0	0	0	0
Other	T77	M081	6,005	<1	0	0	0
Total Biological			6,005	<1	0	0	0
BOILER & INDUSTRIAL FURNACES							
Boiler	T80			39,943			
Cement Kiln	T81			48,340			
Energy Recovery		M051, 53	88,868				
Total BIF			88,868	88,283			
MISCELLANEOUS (Subpart X)							
Open Burning/Detonation	X01	M125	55	40			
Thermal Unit	X03	M125	0.28	<1			
Total Miscellaneous			56	40			
OTHER RECOVERY							
Other Metals Recovery for Reuse		M014	60				
Acid Regeneration	T18	M031	3,727				
Total Other Recovery			3,787				
TOTAL MANAGEMENT			**5,739,264**	**5,827,474**	**5,837,366**	**3,163,038**	**3,499,641**
**See a past version of this document for values prior to 1991.							

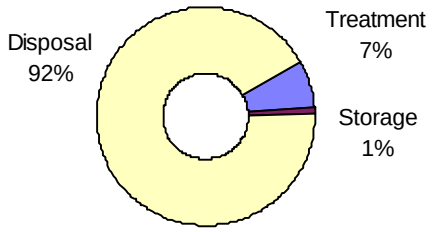
6. ON-SITE MANAGEMENT OF HAZARDOUS WASTE - 1995

6.a. *Active versus Inactive Management in On-Site Units*

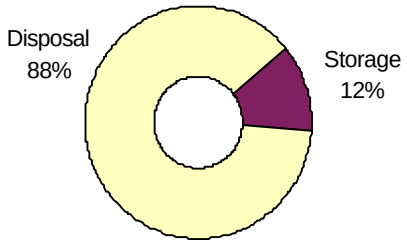
The two charts below compare the management methods used in active and inactive on-site units in 1995. Disposal dominates both. Active disposal is primarily underground injection while inactive disposal is mostly surface impoundments that are to be closed as landfills.

	Treatment	Storage	Disposal	Total
Active	83,452	11,674	1,084,879	1,180,004
Inactive	0	452,479	3,242,449	3,694,928

6.a.1. Management Categories for Active On-Site Units



6.a.2. Management Categories for Inactive On-Site Units



6.b. *Management Method Summary for Active On-Site Units*

The tonnage quantity and management methods used in active units are listed in **Table 6.b.** A reference list of System Type Codes begins on page 12 and storage Handling Method Codes are described in Table 5.b.

6.b. Management Methods for Active On-Site Units			
Treatment			
M014	0.33	**M077**	3,443
M041	16,331	**M081**	6,005
M042	3,376	**M111**	1,903
M043	777	**M121**	18
M051	49,309	**M124**	488
M053	72	**M125**	70
M061	1,659		
Storage		**Disposal**	
S01	8,817	**M132**	248
S02	2,856	**M133**	0.60
		M134	1,084,630

6.c. *List of On-Site TSD Facilities*

The sites listed in **Table 6.c** conducted RCRA-regulated on-site management during 1995. The Handling Method Codes and/or System Types Codes are given for the units reported. Storage codes other than S01 and S02 as well as all "D" method codes represent inactive units. S01 and S02 units may be either active or inactive. All System Type Codes represent active units.

6.c. List of On-Site TSD Facilities			
Facility	**Location**	**EPA ID**	**Method Codes**
A.J. Weigand Inc.	Bolivar	OHT400013082	S04
AK Steel Corporation	Middletown	OHD004234480	M134
American Steel Foundries - Sebring	Alliance	OHD017497587	D80
Amoco Performance Products	Marietta	OHD981529688	M081
Aristech Chemical Corporation	Haverhill	OHD005108477	S02,M051
Austin Powder Company	McArthur	OHD004293775	M125
Aztec Peroxides Inc.	Elyria	OHD046202602	S01,M041
Bayer Corporation - Polymers Div.	Addyston	OHD004233003	S01,S02,M051
Bicron Div. of SGNICC	Solon	OHD070762596	S01
BP Chemicals Inc.	Lima	OHD042157644	S01,S02,S04,M041,M134
BP Oil Co. - Lima Refinery	Lima	OHD005051826	D81,D83,S04
BP Oil Co. - Toledo Refinery	Oregon	OHD005057542	S04,M061
Browning-Ferris Industries	East Palestine	OHD980795264	D83,M133
Brush Wellman Inc.	Elmore	OHD004212999	S01
CECOS International	Williamsburg	OHD087433744	M077
Chemical Waste Management Inc.	Vickery	OHD020273819	M134
Chemtron Corporation	Avon	OHD066060609	S01,S02
Clow Water Systems Company	Coshocton	OHD004294849	D83
Copperweld Steel Company	Warren	OHD061731857	D80
CWM Resource Recovery Inc.	West Carrollton	OHD093945293	S01,S02
Cytec Industries Inc.	Marietta	OHD004341509	S04
Delphi Chassis Systems	Dayton	OHD060928561	S01
Delphi Chassis Systems Div.	Kettering	OHD004255410	S01
Delphi Chassis Systems, Needmore	Dayton	OHD045557766	S01
Delphi Chassis Systems, Vandalia	Vandalia	OHD052151701	S01
Delphi Harrison Thermal Systems	Moraine	OHD000817577	S04
Delphi Packard Electric Systems	Warren	OHD000817346	S01,S02

6.c. List of On-Site TSD Facilities, Continued

Environmental Enterprises Inc.	Cincinnati	OHD083377010	S01,M111
Envirosafe Services of Ohio Inc.	Oregon	OHD045243706	S01,M132
GE Aircraft Engines	Cincinnati	OHD000817312	S01
Hilton Davis Co.	Cincinnati	OHD004240313	S04
Honda of America Mfg. Inc.	Marysville	OHD092162585	S01
Hukill Chemical Corporation	Bedford	OHD001926740	S01,S02
I. Schumann & Co.	Oakwood Village	OHD004199204	S03,S04
Klor Kleen Inc.	Cincinnati	OHD980821862	S01
Lubrizol Corporation	Wickliffe	OHD004172565	S02,M124
Lubrizol Corporation	Painesville	OHD004172623	S02,M041-43
Merrell Pharmaceuticals Inc.	Cincinnati	OHD004254702	S01
Morgan Matroc Inc. Electro Ceramics Div.	Bedford	OHD052324290	S99
Moyno Industrial Products	Springfield	OHD079435897	S01
Occidental Chemical Corporation	Ashtabula	OHD003913308	S01
PPG Industries Inc.	Barberton	OHD004198917	S01
PPG Industries Inc.	Circleville	OHD004304689	S01,S02,M041-43,M051,M053
PPG Industries Inc.	Cleveland	OHD004460143	S01,S02
Ranco Inc.	Delaware	OHD004288288	S04
Republic Engineered Steels	Canton	OHD004228003	S03
Reserve Environmental Services	Ashtabula	OHD980793384	D83
RMI Titanium Company Extrusion Plant	Ashtabula	OHD980683544	S01
RMI Titanium Company Sodium Plant	Ashtabula	OHD000810242	M125
Ross Incineration Services Inc.	Grafton	OHD048415665	S01,S02,S04,M041,M043
Safety-Kleen Corporation	Hebron	OHD980587364	M061
Shell Chemical Company	Belpre	OHD004343117	M051
Stark Ceramics Inc.	East Canton	OHD004461711	S04
Stolle Products Landfill	Sidney	OH0000188409	D80
Thomas Steel Strip Corp.	Warren	OHD077755213	D83
US Ceramic Tile Co.	East Sparta	OHD077752566	D83
US DOE - Portsmouth	Piketon	OH7890008983	S01
US DOE Fernald Env Mgmt Project	Fernald	OH6890008976	S01,S02,M014,M077,M111,M121
US DOE Mound Facility	Miamisburg	OH6890008994	S01,M125
Waste Technologies Industries	East Liverpool	OHD980613541	M041,M043
WCI Steel Inc.	Warren	OHD060409521	S02,M031
Wright Patterson Air Force Base	Fairborn	OH7571724312	S01

7. OFF-SITE MANAGEMENT OF HAZARDOUS WASTE

Data in this section covers Ohio TSD facilities that commercially accepted waste from off-site customers. Statistics compiled in U.S. EPA's National Biennial Reports published since 1987 show that Ohio is the #1 importing state, meaning that Ohio accepts more hazardous waste from outside its borders than any other state. A final version of the national data for 1995 should be available from U.S. EPA in the fall of 1997. Access U.S. EPA's Web page for more information on the Biennial Report (www.epa.gov).

7.a. *Facilities Reporting Waste Receipts in 1995*

Table 7.a is a listing of the commercial TSD facilities which reported accepting waste from off-site in 1995, sorted by quantity received. The percentage imported from out-of-state generators is also shown. Overall, 56% of the waste accepted by the facilities listed in Table 7.a is imported. Lafarge Corporation's cement kiln management of 39,488 tons is not listed because their only "customer" is Systech; they do not accept waste from off-site generators.

A few of the facilities are not technically required to submit receipt data because none of the management unit(s) require a RCRA TSD permit. The facilities submitting receipt data voluntarily are: Dayton Water

Systems, Laidlaw Environmental Systems, and Reserve Environmental Services. Clean Harbors of Cleveland is a commercial TSD facility but only submits reports as a large quantity generator. Their handling method is wastewater treatment, which doesn't require a RCRA permit. Therefore Ohio EPA has no Annual Report data on their waste receipts.

The only captive permitted TSD facility that receives off-site waste for treatment is PPG Industries' incinerator at Circleville. PPG incinerated 17,112 tons in 1995 and 62% of that was imported. All of the waste is from sites owned by PPG.

7.a. Waste Receipts at Commercial TSD Facilities

Facility	Location	EPA ID	Tons Received	% Imported
Envirosafe Services of Ohio	Oregon	OHD045243706	119,479	76
Reserve Environmental Services	Ashtabula	OHD980793384	109,012	<1
Chemical Waste Management	Vickery	OHD020273819	108,004	60
Envirite Corporation	Canton	OHD980568992	85,219	42
Research Oil Company	Cleveland	OHD004178612	71,002	66
Waste Technologies Industries	East Liverpool	OHD980613541	47,074	81
Safety-Kleen Corporation	Hebron	OHD980587364	42,487	83
Systech Environmental Corp.	Paulding	OHD005048947	39,130	62
Ross Incineration Services	Grafton	OHD048415665	33,299	81
Republic Environmental Systems	Bedford	OHD055522429	29,043	59
CWM Resource Recovery Inc.	West Carrollton	OHD093945293	24,949	82
Hukill Chemical Corporation	Bedford	OHD001926740	16,858	50
North East Chemical Corp.	Cleveland	OHD980681571	14,307	53
Laidlaw Environmental Services	HIlliard	OHD081290611	10,150	39
Chemical Solvents Inc.	Cleveland	OHD980897656	9,772	24
Spring Grove Resource Recovery	Cincinnati	OHD000816629	9,161	79
Ecolotec Inc. (Republic)	Dayton	OHD980700942	7,122	52
Environmental Enterprises Inc.	Cincinnati	OHD083377010	6,529	79
Perma-Fix of Dayton	Dayton	OHD004274031	6,375	62
Chemtron Corporation	Avon	OHD066060609	5,277	26
WCI Steel Inc.	Warren	OHD060409521	3,727	4
Environmental Purification Industries	Toledo	OHD986983237	2,574	84
Klor Kleen	Cincinnati	OHD980821862	146	53
Dayton Water Systems	Dayton	OHD061614673	58	12
Detrex Corporation-EC & ES Division	Euclid	OHD080158702	41	39
Ashland Chemical Company	Dayton	OHD074700311	1.8	73
Chemical Solvents Inc.	Cleveland	OHD052937885	0.08	0

7.b. *Management Methods Reported by Commercial TSD Facilities - 1995*

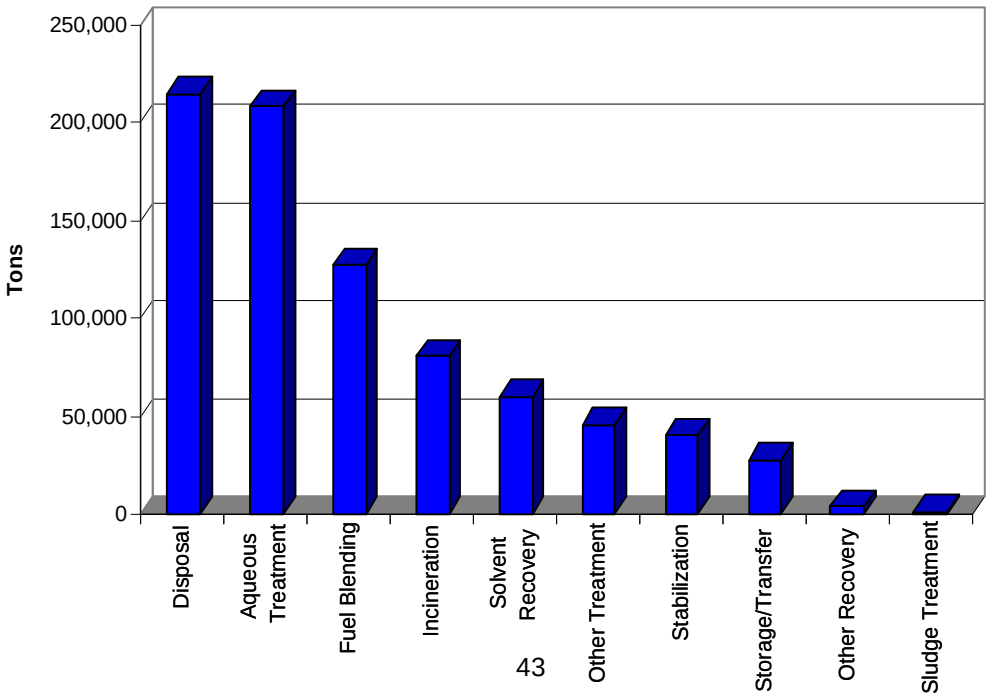
There is a considerable range of management methods available at Ohio's commercial TSD facilities. Some specialize in only one method while others offer several that are tailored to best manage a particular type of waste. Except for the disposal facilities, most have reported acting as a storage/transfer facility for some of the wastes they receive. **Table 7.b** is an alphabetical listing of the commercial TSD facilities and the management methods they reported for waste receipts in 1995. A bar chart on page 43 represents the amount managed by System Type Code category.

7.b. Management Methods Reported by Commercial TSD Facilities			
Facility	**System Type Code**	**Description**	**Tons**
Ashland Chemical Company	**M141**	Storage/Transfer	15
Chemical Solvents (Denison)	**M022**	Thin film evaporation	3,586
	M061	Fuel blending	4,572
	M141	Storage/Transfer	1,614
Chemical Solvents (Jennings)	**M141**	Storage/Transfer	0.08
Chemical Waste Management	**M134**	Underground injection	108,004
Chemtron Corporation	**M014**	Acid leaching mercury recovery	3
	M022	Thin film evaporation	304
	M024	Steam stripping of solvents	239
	M061	Fuel blending	188
	M141	Storage/Transfer	4,544
CWM Resource Recovery Inc.	**M021**	Fractionation/distillation	1,544
	M022	Thin film evaporation	398
	M061	Fuel blending	22,326
	M141	Storage/Transfer	681
Dayton Water Systems	**M014**	Metals recovery for reuse	58
Detrex Corporation-EC & ES Division	**M141**	Storage/Transfer	41
Ecolotec Inc. (Republic)	**M061**	Fuel blending	1,255
	M103	Absorption/adsorption	516
	M111	Chemical fixation	3,289
	M121	Neutralization only	192
	M125	Other treatment	1
	M141	Storage/Transfer	1,869
Envirite Corporation	**M071**	Chrome reduct/chemical precip.	258
	M077	Chemical precipitation	43,772
	M125	Chem trtmt of lead-bearing waste	40,975
	M141	Storage/Transfer	214
Environmental Enterprises Inc.	**M061**	Fuel blending	2,422
	M071	Chrome reduct/chemical precip.	243
	M072	Cyanide destr/chemical precip.	3
	M073	Cyanide destruction only	80
	M074	Chem oxidation/chem precip.	0.24
	M075	Chemical oxidation only	2
	M077	Chemical precipitation	105
	M078	Other (Oxidation/reduction)	223
	M082	Carbon adsorption	163
	M093	Wet air oxidation	19
	M101	Sludge dewatering	0.03
	M111	Chemical fixation	425
	M121	Neutralization only	1,225
	M124	Phase separation	154
	M125	Other (Blending)	476
	M141	Storage/Transfer	988
Environmental Purification Industries	**M125**	Sludge drier, grinds & dries	2,574
Envirosafe Services of Ohio	**M111**	Chemical fixation	13,018
	M132	Landfill	106,461
Hukill Chemical Corporation	**M021**	Fractionation/distillation	2,366
	M022	Thin film evaporation	9,051
	M061	Fuel blending	5,290
	M121	Neutralization only	0.32
	M141	Storage/Transfer	151

7.b. Management Methods Reported by Commercial TSD Facilities, Continued

Klor Kleen	**M141**	Storage/Transfer	146
Laidlaw Environmental Services	**M092**	Chem precip/carbon adsorption	10,150
North East Chemical Corp.	**M061**	Fuel blending	11,915
	M141	Storage/Transfer	2,393
Perma-Fix of Dayton	**M061**	Fuel blending	5,925
	M077	Chemical precipitation	239
	M141	Storage/Transfer	210
Republic Environmental Systems	**M111**	Chemical fixation	22,889
	M141	Storage/Transfer	6,154
Research Oil Company	**M061**	Fuel blending	26,945
	M094	Chem precip of both org & inorg	43,382
	M101	Sludge dewatering	545
	M141	Storage/Transfer	479
Reserve Environmental Services	**M077**	Chemical precipitation	109,012
Ross Incineration Services	**M041**	Incineration - liquids	21,817
	M043	Incineration - solids	11,482
Safety-Kleen Corporation	**M021**	Fractionation/distillation	12,592
	M022	Thin film evaporation	29,819
	M061	Fuel blending	77
	M081	Biological treatment	0.17
Spring Grove Resource Recovery	**M061**	Fuel blending	6,848
	M077	Chemical precipitation	0.23
	M082	Carbon adsorption	169
	M111	Chemical fixation	529
	M141	Storage/Transfer	8,157
Systech Environmental Corp.	**M061**	Fuel blending	39,130
Waste Technologies Industries	**M041**	Incineration - liquids	25,943
	M042	Incineration - sludges	641
	M043	Incineration - solids	20,490
WCI Steel Inc.	**M031**	Acid regeneration	3,727

7.b. Management Categories Reported by Commercial TSD Facilities - 1995



7.c. *Sources of Hazardous Waste Shipped to Ohio TSD Facilities - 1991 through 1995*

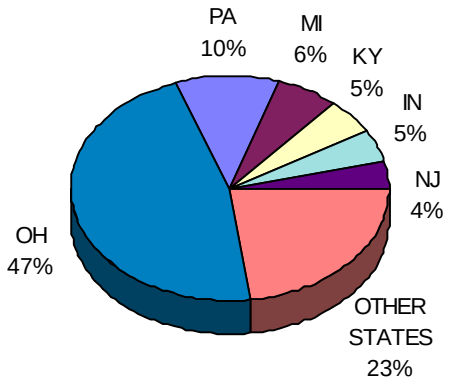
Table 7.c and **Chart 7.c.1** summarize the waste tonnage reported by Ohio's receiving TSD facilities, sorted by the originating state/country. In past versions of this document, this table was referred to as "Imports". For comparison purposes, the amount received from Ohio generators is now listed. The top states which exported to Ohio in 1995 were Pennsylvania, Michigan, Kentucky, Indiana, and New Jersey. Historical waste receipts by origin (imported from out-of-state versus Ohio generated) are shown in **Chart 7.c.2** on the next page.

7.c. Sources of Hazardous Waste Shipped to Ohio TSD Facilities - 1991 through 1995

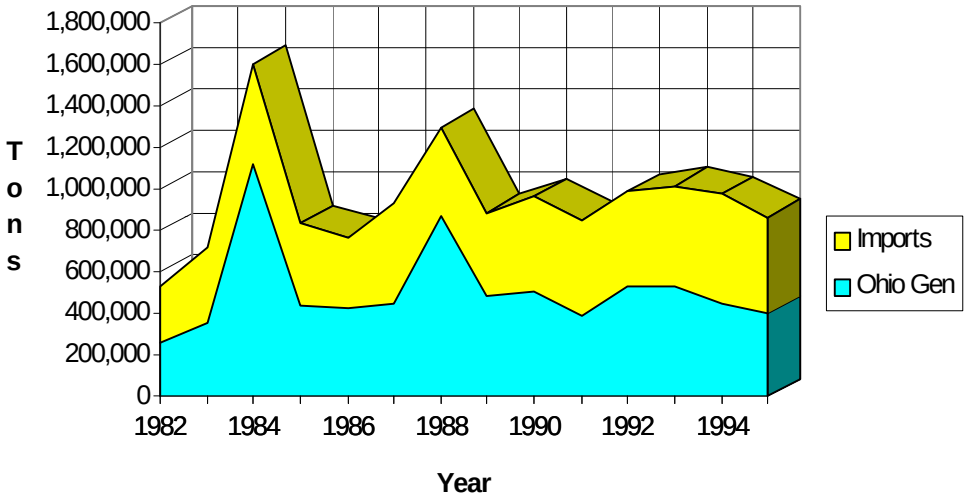
State	# Records (1995)	1995	1994	1993	1992	1991
ALABAMA	163	2,498	1,416	1,601	2,590	3,611
ALASKA	0	0	0	8	0	0
ARIZONA	24	159	81	19	0	4
ARKANSAS	34	3,599	2,548	159	355	58
CALIFORNIA	318	906	1,163	3,000	2,299	203
CANADA	77	15,510	12,890	11,145	9,467	9,785
COLORADO	23	42	28	22	6	55
CONNECTICUT	967	6,435	10,218	22,348	11,278	6,565
DELAWARE	80	1,672	7,791	942	480	2,956
DISTRICT OF COLUMBIA	206	88	92	85	18	44
FLORIDA	624	4,349	3,506	3,611	4,358	1,333
GEORGIA	518	9,193	6,587	3,865	3,434	2,179
HAWAII	8	14	68	121	127	174
IDAHO	6	33	1	0	<1	986
ILLINOIS	1677	28,010	24,911	29,187	21,436	18,227
INDIANA	2628	39,747	76,881	50,005	53,034	75,942
IOWA	434	2,134	2,004	1,871	1,434	876
KANSAS	83	413	872	2,408	810	1,578
KENTUCKY	1697	43,391	24,399	15,209	16,437	15,384
LOUISIANA	227	374	404	73	38	2,764
MAINE	32	134	783	324	395	1,180
MARYLAND	1024	11,422	4,575	3,685	10,890	3,279
MASSACHUSETTS	531	5,698	6,357	5,953	11,614	12,177
MEXICO	0	0	191	0	0	0
MICHIGAN	2590	55,920	68,726	100,591	71,451	75,856
MINNESOTA	115	2,071	7,946	915	1,078	663
MISSISSIPPI	56	561	1,030	972	604	819
MISSOURI	243	2,435	3,613	1,420	2,491	1,854
MONTANA	4	2	1	0	0	0
NEBRASKA	36	248	421	239	289	5,118
NEVADA	12	12	65	26	28	28
NEW HAMPSHIRE	87	230	39	200	73	124
NEW JERSEY	1210	34,821	33,671	49,980	30,701	37,166
NEW YORK	2856	19,516	22,548	18,140	29,876	27,712
NORTH CAROLINA	1001	4,287	4,355	3,297	3,395	2,560
NORTH DAKOTA	1	0.40	1	1	1	226
OHIO	18417	401,233	450,225	527,414	528,559	395,710
OKLAHOMA	259	788	900	233	76	51
OREGON	16	50	85	188	6	52
PENNSYLVANIA	6147	90,772	108,216	93,383	112,415	102,958
PUERTO RICO	129	590	193	678	264	100
RHODE ISLAND	147	8,209	4,579	1,196	1,055	1,614
SOUTH CAROLINA	425	4,228	5,274	5,444	4,518	1,161
SOUTH DAKOTA	0	0	<1	<1	19	0

7.c. Sources of Hazardous Waste Shipped to Ohio TSD Facilities, Continued						
State	**# Records (1995)**	**1995**	**1994**	**1993**	**1992**	**1991**
TENNESSEE	315	1,852	2,716	2,586	3,384	3,126
TEXAS	275	2,947	1,392	663	764	1,301
UTAH	5	3	1	18	21	27
VERMONT	98	385	547	9,972	924	592
VIRGIN ISLANDS	2	1	0	0	0	0
VIRGINIA	945	6,425	16,456	10,978	14,610	4,271
WASHINGTON	18	583	1,152	375	46	9
WEST VIRGINIA	1637	25,745	27,140	22,682	23,305	22,478
WISCONSIN	300	24,591	27,934	10,028	9,315	9,051
WYOMING	7	4	0	0	0	0
	48734	**866,325**	**978,986**	**1,019,253**	**991,760**	**855,978**

7.c.1. STATES SHIPPING TO OHIO TSD FACILITIES - 1995



7.c.2. HISTORICAL WASTE RECEIPTS BY ORIGIN

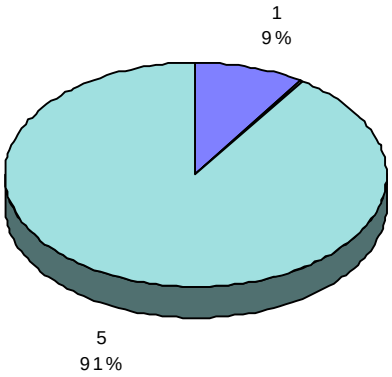


7.d. *Generation and Shipment by Ohio's Receiving TSD Facilities - 1995*

Most of the hazardous wastes generated at Ohio's commercial TSD facilites are residuals from treatment, recycling, or disposal as shown in **Chart 7.d.1** at right. Commercial TSD facilities reported generation of 221,610 tons of hazardous waste in 1995, 91% of which were residuals. See Section 3.b. for more information on residual generation and management.

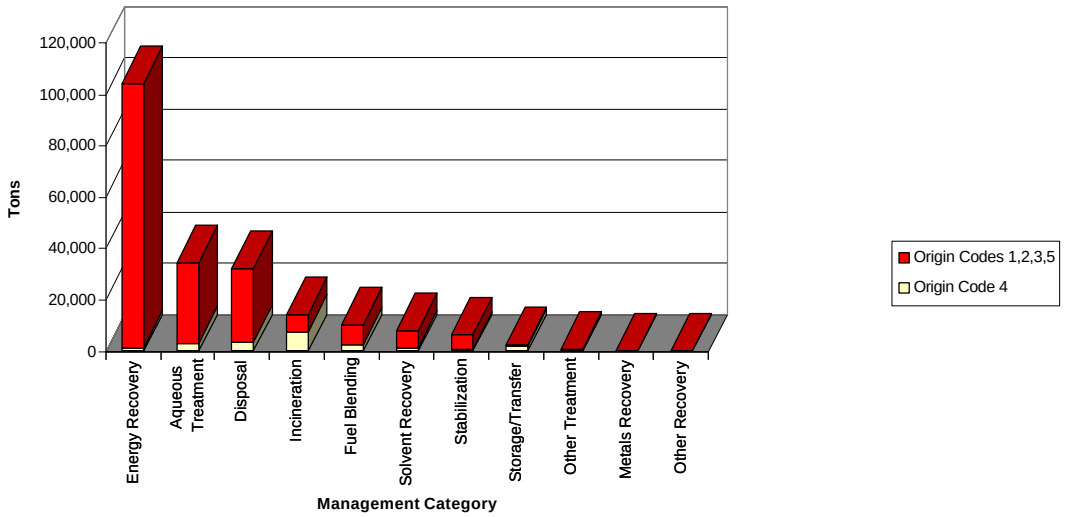
Origin Code	Tons
1	20,134
2	425
3	91
5	200,959

7.d.1. GENERATION BY ORIGIN CODE AT COMMERCIAL TSD FACILITIES IN OHIO



Receiving TSD facilities shipped 213,671 tons in 1995, 11% of which was Origin Code 4 waste (stored and then transferred without treatment). **Table 7.d** at right summarizes shipments by Origin Code (4 versus 1,2,3 and 5) and management category. Origin Code 5 comprises the majority of the shipments in the column containing that data. Nearly half of the shipments (49%) went to an energy recovery facility. The bar chart below compares total tons shipped by management method based on the data in Table 7.d.

7.d. Shipments from Receiving TSD Facilities by Management Category & Origin Code - 1995

Management Category	Origin Code 4	Origin Codes 1,2,3,5	All Origin Codes
Energy Recovery	1,166	103,273	104,438
Aqueous Treatment	3,205	31,499	34,704
Disposal	3,833	28,595	32,429
Incineration	7,665	6,697	14,361
Fuel Blending	2,299	8,032	10,331
Solvent Recovery	1,156	7,134	8,290
Stabilization	1,031	5,380	6,412
Storage/Transfer	2,241	305	2,546
Other Treatment	247	688	935
Metals Recovery	144	201	344
Other Recovery	69	80	149

7.d.2. Shipments from Receiving TSD Facilities by Origin Code - 1995