

Chapter 4: Off-site Transfers

M Matched chemicals/industries

A All chemicals/industries

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M Matched chemicals/industries, except entries marked: **A** All chemicals/industries

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Transfers across Borders, 1997

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■ Key Findings

- In 1997, North American facilities transferred 443.5 million kg of listed substances to other locations for treatment or disposal. These off-site transfers represent the total for chemicals and industries covered by the matched data set. Half of the total—212.3 million kg—consisted of metals.
- The states and province transferring the largest amounts off-site were Pennsylvania, Texas, Ontario and Ohio. They accounted for one-third of the 1997 total.
- Fifty facilities with the largest North American transfers reported 39 percent of total transfers in 1997.
- The 1997 total for transfers represented a 27 percent increase from 1995. NPRI facilities reported a 31 percent increase and TRI reported a 27 percent increase. Metals also led this expansion: North American transfers of metals rose 49 percent, increasing from 142.4 million kg to 212.3 million kg over the period, representing a 50 percent increase reported by TRI facilities and a 45 percent increase by NPRI facilities.
- All types of transfers increased from 1995 to 1997 in both PRTRs except for NPRI transfers of nonmetals to disposal, which declined 40 percent. A 16 percent increase in TRI transfers of nonmetals to disposal meant an overall North American increase of five percent, from 22.0 million kg to 23.0 million kg, in this category.
- NPRI facilities also sent smaller amounts of known or suspected carcinogens off-site in transfers. NPRI transfers of carcinogenic substances decreased 20 percent from 1995 to 1997, while in TRI such transfers rose by four percent. In 1997, NPRI facilities transferred 7.8 million kg of designated carcinogens, and TRI facilities transferred 59.2 million kg.
- For both NPRI and TRI, the primary metals industry reported the largest transfers in 1997, followed by chemical manufacturing and paper products. Transfers reported by the primary metals industry increased 49 percent in NPRI and 60 percent in TRI, over 1995 levels.
- Although most transfers occur within a country's own borders, Canadian facilities sent 38.7 million kg of all NPRI-listed substances to sites in the United States. This may understate the amount, however, since reporting of transfers to recycling/recovery in NPRI was voluntary for 1997. US facilities transferred 36.1 million kg of all TRI-listed chemicals to Canada and 25.7 million kg to Mexico. Most of the out-of-country transfers went to recycling.

4.1 Introduction

This chapter examines reporting of off-site transfers of PRTR-listed substances in North America. Facilities send—or transfer—PRTR-listed substances in waste to other locations for treatment or disposal. Sites that receive transfers for treatment may be private or public entities. (In NPRI, sewage operations are referred to as municipal sewage treatment plants or MSTP; in TRI, they are called publicly owned treatment works, or POTWs. Tables in this report identify these transfers as “Sewage/POTWs.”) Transfers of the substances sent off-site for recycling or energy recovery are not included in the analyses in this chapter because reporting of such transfers is not mandatory for NPRI facilities.

Off-site transfers of substances in waste include the amounts and locations where the waste is treated or disposed of. The tracking of off-site transfers provides a means of estimating how much of the substances, in addition to on-site releases, is being moved to other locations and where other releases may occur. It does not provide the same level of detail on environmental releases as the tracking of on-site releases does because it is not known how much is released at the off-site locations after treatment.

Taking Stock 1997 tabulates transfers of metals separately. Facilities may send metals off-site in wastestreams to sewage plants or other treatment facilities. However, metals cannot be destroyed, so they may pass through and end up in sludge sent to landfills

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Table 4-1		North American Off-site Transfers, 1997							
M	1997	North America		Canadian NPRI		US TRI		NPRI as % of North American Total	TRI as % of North American Total
		Number		Number		Number			
Total Facilities		20,555		1,430		19,125		7.0	93.0
Total Forms		62,851		4,599		58,252		7.3	92.7
Off-site Transfers		kg	%	kg	%	kg	%		
Treatment (except metals)		101,983,917	23.0	9,925,693	20.0	92,058,224	23.4	9.7	90.3
Sewage/POTWs (except metals)		106,215,580	23.9	5,260,842	10.6	100,954,738	25.6	5.0	95.0
Disposal (except metals)		23,017,618	5.2	2,533,015	5.1	20,484,603	5.2	11.0	89.0
Treatment/Sewage/Disposal of Metals		212,330,902	47.9	31,788,711	64.2	180,542,191	45.8	15.0	85.0
Total Transfers		443,548,017	100.0	49,508,261	100.0	394,039,756	100.0	11.2	88.8

► Canada and US data only, Mexico data not collected for 1997.

or in discharges to surface waters after treatment of the wastestream. The PRTR facility reports what it transferred, but not the ultimate fate of the metal.

This chapter analyzes data for industries and chemicals that must be reported in both the US and Canada (the matched data set), as explained in **Chapter 2**. Mexican data are not available for the 1997 reporting year. The data for off-site transfers for 1997 are presented first; those for the combined North American data are followed by separate sections devoted to NPRI and TRI reporting for 1997 in the matched data set. Then there is a section on the changes in off-site transfers from 1995 to 1997, again looking at the combined North American data, followed by NPRI and TRI separately. Each part first presents geographic data for the

states and provinces; then data on the 50 facilities with the largest reported amounts; data by chemical for substances with the largest amounts, for designated carcinogens and for metals; and finally data by industry sector.

4.2 1997 Off-site Transfers

As noted in **Chapter 3**, 62,851 forms submitted by 20,555 North American facilities appear in the matched data set for 1997. Seven percent of the facilities and forms were from Canada's NPRI (1,430 facilities and 4,599 forms), and 93 percent from the US TRI (19,125 facilities and 58,252 forms—see **Table 4-1**).

Canadian facilities reported 15 percent of the North American transfers of metals to treatment/sewage/disposal.

US facilities reported 95 percent of the transfers of nonmetals to sewage/POTWs. NPRI and TRI percentages of the transfers of nonmetals to treatment and to disposal were more comparable to the overall distribution of 11 percent of transfers by NPRI facilities and 89 percent by TRI facilities.

4.2.1 North American Transfers

Overview

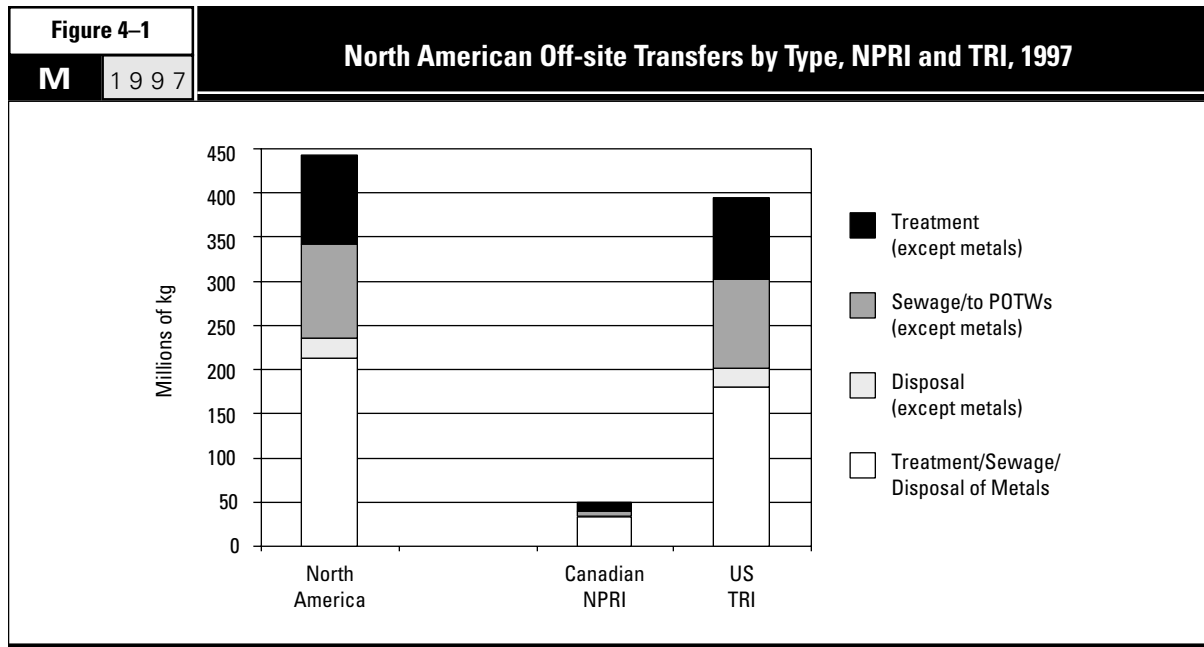
Off-site transfers in North America totaled 443.5 million kg in 1997 for the matched data set. NPRI facilities transferred 49.5 million kg and TRI facilities 394.0 million kg (**Table 4-1**). With seven percent of the facilities and forms, NPRI accounted for 11 percent of total transfers. TRI facilities and forms amounted to 93 percent of the

North American total, while reporting 89 percent of the transfers.

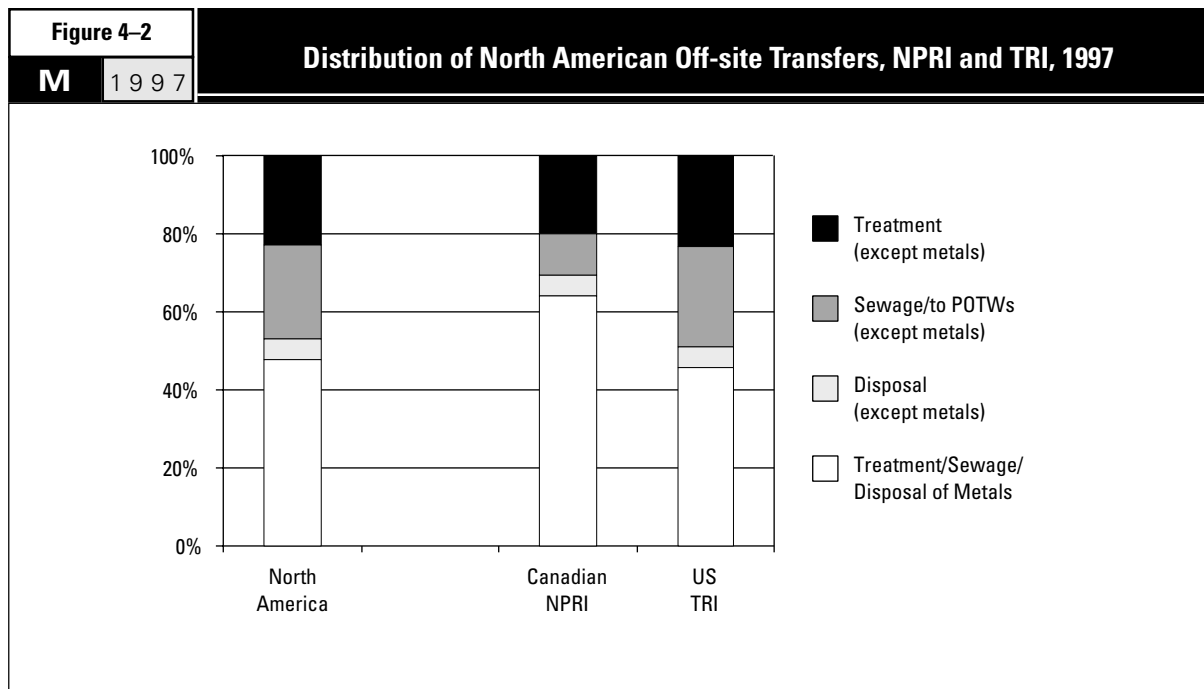
Transfers of metals amounted to 212.3 million kg, the largest transfer category at 48 percent of the North American total. Reported transfers to treatment of nonmetals amounted to 102.0 million kg, 23 percent of all transfers. Transfers to sewage/POTWs (except metals) equaled 106.2 million kg, or 24 percent of North American transfers. Transfers to disposal (again, except metals) totaled 23.0 million kg, which was five percent of all transfers (**Figures 4-1** and **4-2**).

For the various types of transfers, Canadian facilities reported only five percent of the transfers to sewage/POTWs but 15 percent of all transfers of metals, in comparison to 11 percent of all transfers. Correspondingly, US facilities reported a somewhat higher

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► Canada and US data only. Mexico data not collected for 1997.



► Canada and US data only. Mexico data not collected for 1997.

percentage (95 percent) of North American transfers to sewage/POTWs, but a lower percentage (85 percent) of transfers of metals, in comparison to their 89 percent of all North American transfers.

Transfers by State and Province

The largest sources of North American off-site transfers were the states and province of Pennsylvania, Texas, Ontario and Ohio. Pennsylvania facilities transferred a total of 46.1 million kg, with top figures in transfers to treatment (except metals) of 14.8 million kg and transfers of metals to treatment/sewage/disposal of 27.5 million kg (**Table 4-2** and **Maps 4-1** through **4-5**).

Texas facilities sent 37.0 million kg of listed substances off-site, leading in transfers of nonmetals to sewage/POTWs with 20.6 million kg. Texas transferred the second-largest amounts of nonmetals to treatment (7.5 million kg) and disposal (3.2 million kg).

Facilities in Ontario reported transferring 35.4 million kg, and those in Ohio reported transferring 31.8 million kg. Ontario transferred the second-largest amount of metals to treatment/sewage/disposal, totaling 24.4 million kg. Wisconsin led in transfers to disposal with 4.3 million kg, but was eighth on the list of total transfers for North America.

Table 4-2		North American Off-site Transfers, by Province and State, 1997				
M	1997					
Province/State	Treatment (except Metals) (kg)	Sewage/POTWs (except Metals) (kg)	Disposal (except Metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)	
Pennsylvania	14,754,409	2,979,966	875,318	27,518,830	46,128,523	
Texas	7,508,890	20,567,001	3,178,042	5,763,600	37,017,533	
Ontario	5,181,801	4,777,146	1,030,252	24,406,096	35,395,295	
Ohio	6,495,013	6,362,433	1,113,020	17,824,116	31,794,582	
Michigan	6,017,696	5,616,197	411,264	13,989,138	26,034,295	
Indiana	2,731,478	1,198,621	994,486	18,929,129	23,853,714	
Illinois	2,361,308	2,286,279	2,028,190	12,436,769	19,112,546	
Wisconsin	4,045,312	1,704,602	4,280,639	4,851,618	14,882,171	
New Jersey	2,179,750	8,773,025	256,132	1,654,308	12,863,215	
Arkansas	485,950	25,469	490,178	11,858,588	12,860,185	
California	1,535,042	6,814,863	424,013	3,123,495	11,897,413	
Alabama	3,863,262	238,217	746,919	6,468,091	11,316,489	
Virginia	692,507	7,634,204	148,823	2,193,120	10,668,654	
Quebec	2,069,380	458,013	730,484	5,820,587	9,078,464	
South Carolina	3,298,436	1,899,517	104,126	3,548,739	8,850,818	
Georgia	892,746	1,227,579	315,356	6,160,762	8,596,443	
Tennessee	2,503,848	2,201,533	494,092	3,353,757	8,553,230	
Florida	1,651,849	3,338,360	512,854	2,714,103	8,217,166	
New York	2,336,922	1,940,760	304,634	2,982,819	7,565,135	
Oregon	147,776	4,262,042	16,238	2,910,726	7,336,782	
Kentucky	2,478,457	531,233	725,135	3,073,227	6,808,052	
Missouri	3,647,025	816,313	115,078	2,227,988	6,806,404	
Connecticut	4,156,514	447,387	82,641	1,497,925	6,184,467	
Iowa	640,426	3,089,528	84,316	1,826,922	5,641,192	
Minnesota	314,374	3,900,567	55,108	1,044,075	5,314,124	
Massachusetts	2,122,979	2,201,596	100,482	604,037	5,029,094	
North Carolina	1,376,809	534,648	389,132	2,672,442	4,973,031	
Utah	42,091	121,325	94,667	4,324,370	4,582,453	
Nebraska	32,769	154,293	70,332	4,152,825	4,410,219	
Louisiana	3,518,659	183,960	160,075	510,893	4,373,587	
Washington	239,206	1,201,064	548,873	2,257,301	4,246,444	
West Virginia	988,335	1,643,904	383,807	1,205,914	4,221,960	
Maryland	2,374,255	1,069,421	47,879	431,928	3,923,483	
Kansas	1,622,232	524,967	359,579	1,372,433	3,879,211	
Puerto Rico	2,288,045	994,459	115,418	217,640	3,615,562	
Oklahoma	668,668	191,877	30,452	1,619,324	2,510,321	
New Brunswick	1,467,887	0	162,592	467,667	2,098,146	
Arizona	276,071	747,204	4,766	737,376	1,765,417	
Delaware	185,074	1,267,429	1,104	49,209	1,502,816	
Mississippi	489,272	202,934	93,243	446,794	1,232,243	
South Dakota	49,224	1,084,486	158	55,182	1,189,050	
Alberta	570,301	5,274	226,810	364,557	1,166,942	
Colorado	443,467	234,590	184,826	107,346	970,229	
British Columbia	32,833	18,324	294,558	544,694	890,409	
Maine	17,661	51,707	97,150	683,479	849,997	
Montana	5,710	10	356	547,306	553,382	
Rhode Island	122,495	128,951	30,674	218,246	500,366	
Nova Scotia	300,787	0	79,549	92,270	472,606	
New Hampshire	154,860	129,294	6,144	126,906	417,204	
Manitoba	266,510	40	6,112	84,532	357,194	
Idaho	6,631	214,363	1,614	118,132	340,740	
New Mexico	59,113	152,382	2,374	17,595	231,464	
Virgin Islands	135,332	0	3	24,273	159,608	
Vermont	59,167	684	1,475	66,003	127,329	
North Dakota	11,103	59,111	4	15,088	85,306	
Prince Edward Island	34,694	0	0	0	34,694	
Wyoming	24,538	113	825	2,698	28,174	
Saskatchewan	1,500	2,045	2,658	8,308	14,511	
Nevada	3,654	4,270	181	5,435	13,540	
Hawaii	826	0	2,408	24	3,258	
Alaska	988	0	0	145	1,133	
District of Columbia	0	0	0	2	2	
Newfoundland	0	0	0	0	0	
Total	101,983,917	106,215,580	23,017,618	212,330,902	443,548,017	

► Canada and US data only, Mexico data not collected for 1997.

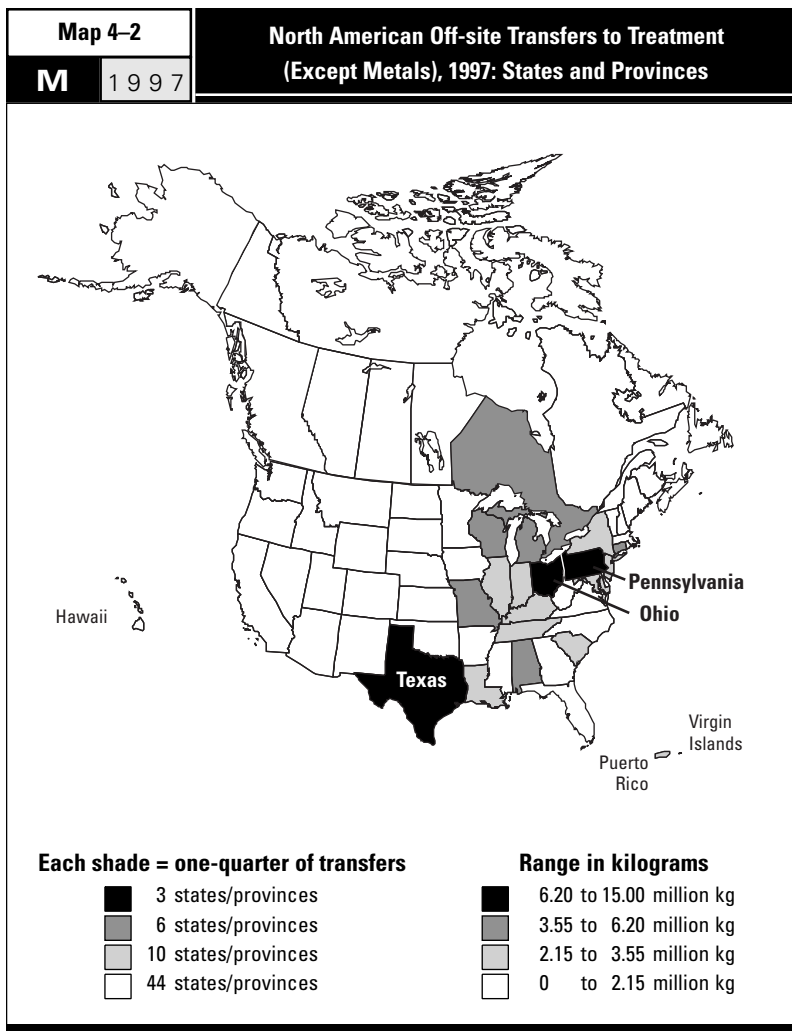
Map 4-1

M 1997

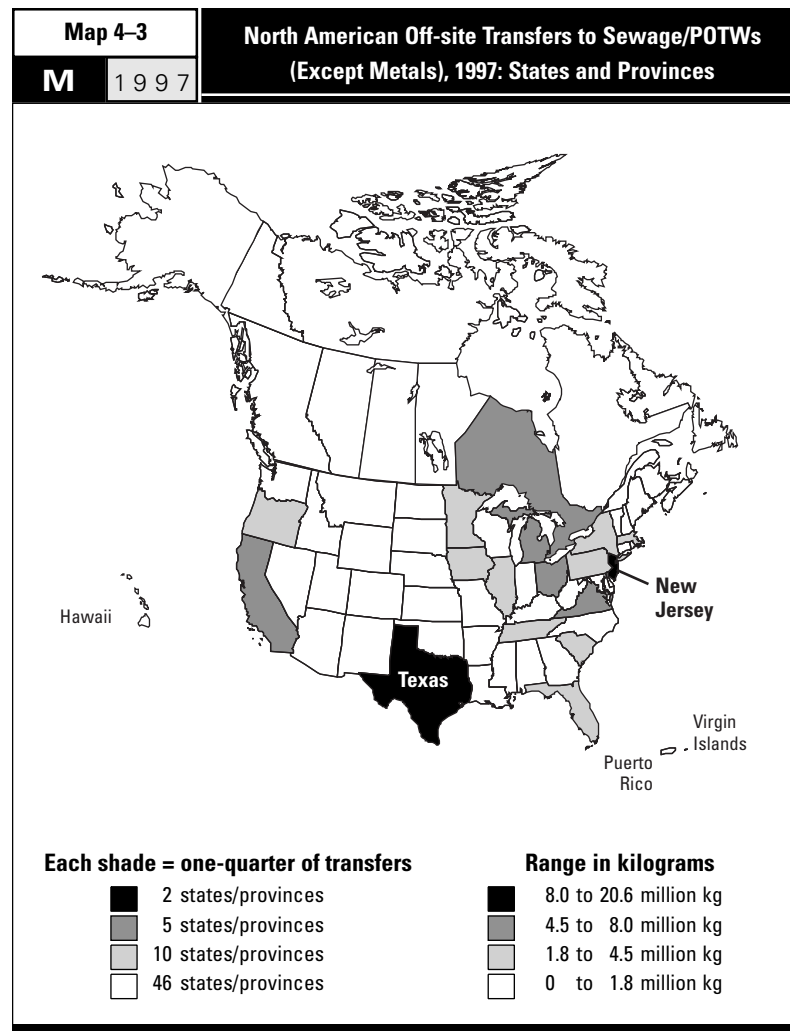
North American Off-site Transfers, 1997: States and Provinces



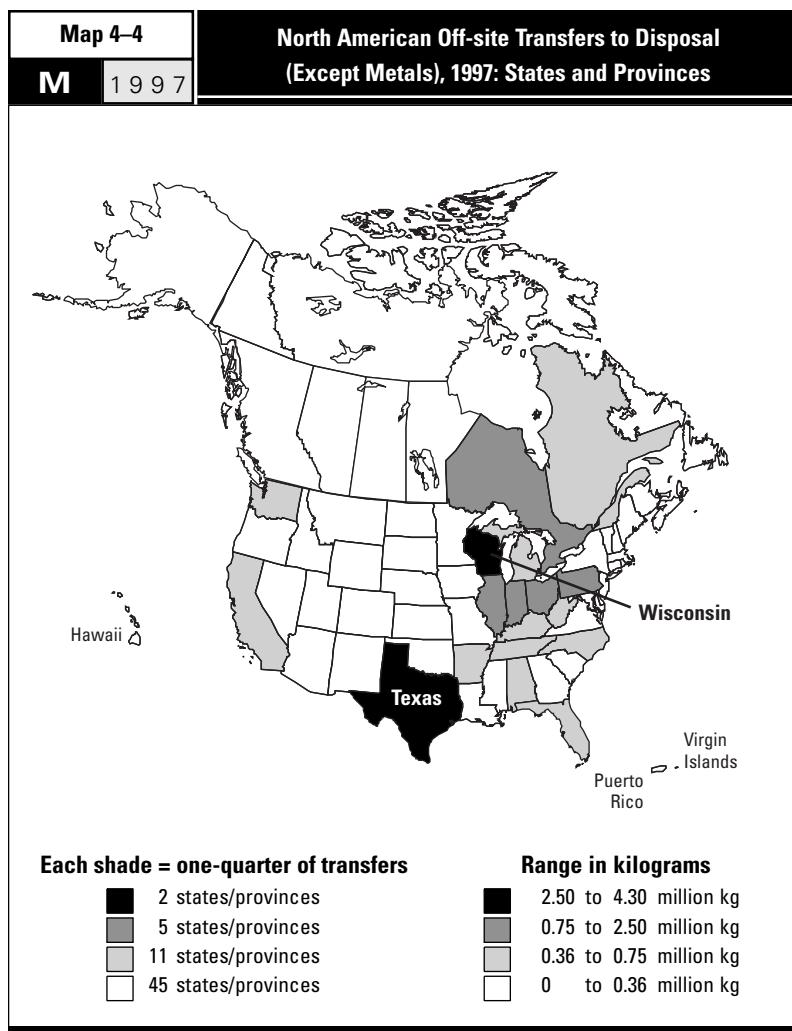
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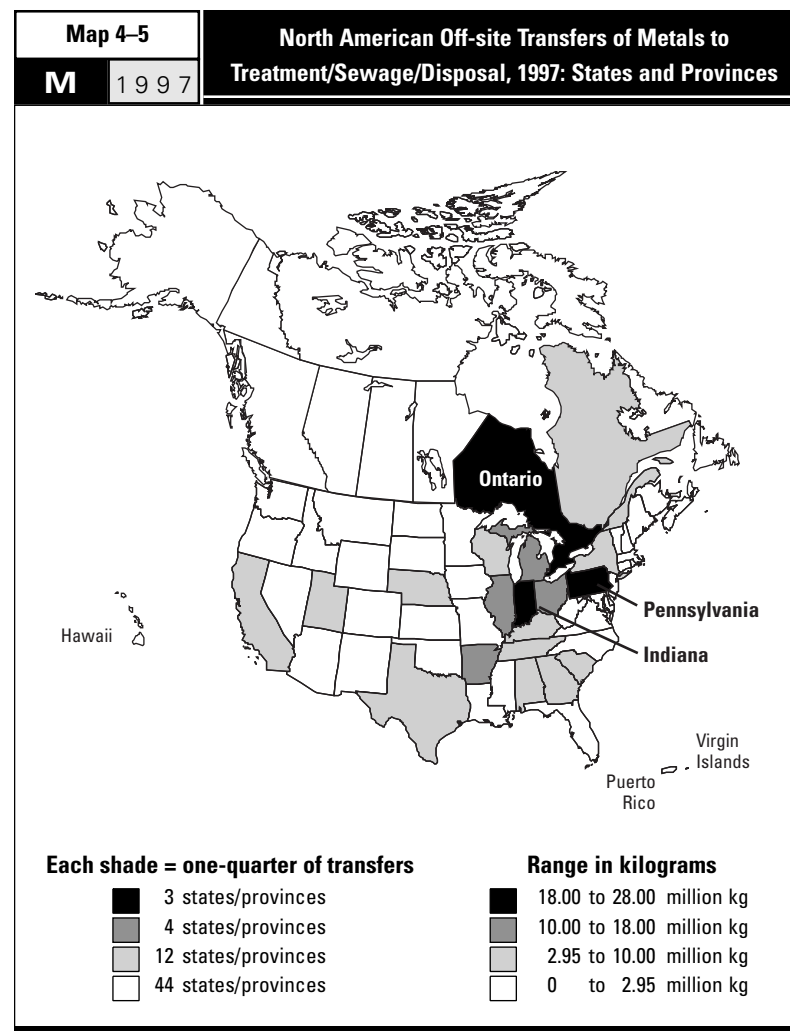
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► Canada and US data only. Mexico data not collected for 1997.

Top Facilities

The 50 North American facilities with the largest off-site transfers for 1997 reported a total of 172.7 million kg. This amounted to 39 percent of the North American total, although the 50 facilities represented only one-quarter of one percent (0.24 percent) of all reporting facilities in the matched data set (Table 4-3 and Figure 4-3).

These 50 facilities transferred 98.7 million kg of metals to sewage/treatment/disposal, which was 47 percent of the North American total for those transfers. They also reported transfers of nonmetals of 28.3 million kg to treatment, 41.2 million kg to sewage/POTWs, and 4.5 million kg to disposal. These amounts represented a substantial portion of North American transfers (28 percent of transfers to treatment, 39 percent for sewage/POTWs, and 20 percent for disposal).

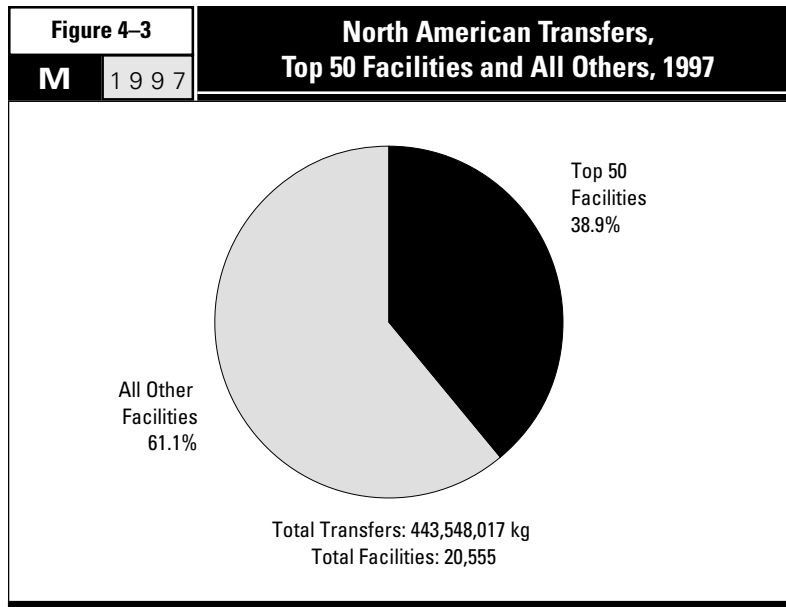
The top 50 facilities transferred a larger proportion of metals (57 percent of their transfers) than did the other North American facilities as a whole (42 percent). They were less likely to make transfers of nonmetals to treatment—16 percent of the top facilities' transfers, versus 27 percent for all other facilities—and to disposal—three percent for the top facilities and seven percent for all others. Transfers to sewage of nonmetals were comparable for the two groups at 24 percent (Figure 4-4).

Table 4-3		The 50 North American Facilities with the Largest Total Off-site Transfers, 1997			
Rank	Facility	City, State/Province	SIC Codes		Number of Forms
			Canada	US	
1	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA		33	9
2	USS Clairton Works, USX Corp.	Clairton, PA		33	19
3	Dofasco Inc.	Hamilton, ON	29	33	18
4	Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena, TX		28	12
5	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR		33	8
6	Steel Dynamics Inc.	Butler, IN		33	7
7	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI		33	7
8	Co-Steel Lasco	Whitby, ON	29	33	6
9	Nucor Steel, Nucor Corp.	Crawfordsville, IN		33	9
10	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX		28	20
11	Regal Ware Inc.	Kewaskum, WI		34	6
12	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	6
13	Nucor Steel	Plymouth, UT		33	7
14	National Steel Corp., Great Lakes Div.	Ecorse, MI		33	18
15	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX		26	8
16	Boise Cascade Corp.	Saint Helens, OR		26	9
17	CPI Kraft Div., Consolidated Papers Inc.	Wisconsin Rapids, WI		26	14
18	Stone Container Corp.	Panama City, FL		26	10
19	USS Mon Valley Works, USX Corp.	Braddock, PA		33	7
20	Hercules Inc.	Hopewell, VA		28	12
21	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR		33	10
22	Cerro Wire & Cable Co. Inc.	Hartselle, AL		33	3
23	Pfizer Inc.	Groton, CT		28	16
24	Penford Prods. Co., Penford Corp.	Cedar Rapids, IA		20	5
25	Potlatch Corp., Minnesota Pulp & Paper Div.	Cloquet, MN		26	8
26	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL		33	6
27	Timken Co., Faircrest Steel Plant	Canton, OH		33	6
28	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA		33	5
29	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL		33	6
30	Pharmacia & Upjohn Co.	Portage, MI		28	25
31	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5
32	FMC Corp.	Baltimore, MD		28	18
33	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL		33	6
34	Aimco Solrec Ltd.	Milton, ON	37	28	6
35	Bar Techs. Inc.	Johnstown, PA		33	6
36	Stone Container Corp.	Hopewell, VA		26	10
37	Southwire Co.	Carrollton, GA		Mult.	37
38	S.D. Warren Co.	Muskegon, MI		26	8
39	Ciba Specialty Chemicals Corp.	McIntosh, AL		28	32
40	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA		33	5
41	ASARCO Inc.	Omaha, NE		33	6
42	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE		28	5
43	Inspec USA Inc., Unit 1, Inspec Group PLC	Galena, KS		28	4
44	Ameristeel Corp.	Charlotte, NC		33	6
45	Ivaco Rolling Mills	L'Orignal, ON	29	33	7
46	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA		28	16
47	Oregon Steel Mills Inc.	Portland, OR		33	7
48	Shepherd Chemical Co.	Cincinnati, OH		28	11
49	International Paper Co., Erie Mill	Erie, PA		26	10
50	Fraser Papers Inc., Noranda Forest Inc.	Edmundston, NB	27	26	9
	Subtotal				516
	% of Total				0.8
	Total				62,851

► Canada and US data only. Mexico data not collected for 1997.

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Major Chemicals Reported (Primary Transfers)*
1	0	0	0	13,855,648	13,855,648	Zinc and compounds (transfers of metals)
2	9,944,975	0	58	0	9,945,033	Ethylene (transfers to treatment)
3	865	123	50	8,168,440	8,169,478	Zinc/Manganese and compounds (transfers of metals)
4	183,178	7,767,699	11	13,156	7,964,044	Nitric acid and nitrate compounds (transfers to sewage)
5	0	0	0	7,543,045	7,543,045	Zinc and compounds (transfers of metals)
6	0	0	0	6,529,560	6,529,560	Zinc and compounds (transfers of metals)
7	0	0	0	6,086,892	6,086,892	Zinc and compounds (transfers of metals)
8	0	0	0	5,799,885	5,799,885	Zinc and compounds (transfers of metals)
9	14,957	0	0	5,609,771	5,624,728	Zinc and compounds (transfers of metals)
10	115,728	3,997,034	195	0	4,112,957	Ethylene glycol (transfers to sewage)
11	0	0	4,078,005	0	4,078,005	Aluminum oxide (transfers to disposal)
12	0	3,732,000	0	224,300	3,956,300	Nitric acid and nitrate compounds (transfers to sewage)
13	0	0	0	3,922,477	3,922,477	Zinc and compounds (transfers of metals)
14	0	10,970	0	3,497,819	3,508,789	Zinc and compounds (transfers of metals)
15	0	3,361,224	0	0	3,361,224	Methanol (transfers to sewage)
16	0	3,327,347	1,280	3,628	3,332,255	Methanol (transfers to sewage)
17	3,202,562	0	0	35,533	3,238,095	Methanol (transfers to treatment)
18	0	3,082,333	0	25,122	3,107,455	Methanol (transfers to sewage)
19	0	0	0	3,090,268	3,090,268	Zinc and compounds (transfers of metals)
20	0	3,022,319	0	0	3,022,319	Nitric acid and nitrate compounds, Ethylene glycol (transfers to sewage)
21	0	0	0	2,957,542	2,957,542	Zinc and compounds (transfers of metals)
22	0	0	0	2,863,172	2,863,172	Copper and compounds (transfers of metals)
23	2,741,916	1,314	839	24,912	2,768,981	Methanol (transfers to treatment)
24	366	2,683,134	0	0	2,683,500	Ethylene glycol (transfers to sewage)
25	0	2,609,198	0	584	2,609,782	Methanol (transfers to sewage)
26	0	0	0	2,498,413	2,498,413	Zinc and compounds (transfers of metals)
27	0	0	0	2,486,113	2,486,113	Zinc and compounds (transfers of metals)
28	0	0	0	2,388,657	2,388,657	Zinc and compounds (transfers of metals)
29	0	0	0	2,384,320	2,384,320	Zinc and compounds (transfers of metals)
30	1,656,263	655,802	6,191	7,301	2,325,557	Dichloromethane (transfers to treatment)
31	0	0	0	2,298,300	2,298,300	Zinc and compounds (transfers of metals)
32	2,165,055	118,141	35	0	2,283,231	Methanol, Toluene (transfers to treatment)
33	0	0	0	2,175,039	2,175,039	Zinc and compounds (transfers of metals)
34	2,028,917	0	0	0	2,028,917	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
35	0	0	884	1,925,941	1,926,825	Zinc and compounds (transfers of metals)
36	0	1,749,070	0	169,932	1,919,002	Methanol (transfers to sewage)
37	1	0	6	1,917,884	1,917,891	Zinc/Lead and compounds (transfers of metals)
38	0	1,857,074	0	0	1,857,074	Methanol (transfers to sewage)
39	1,785,442	0	0	0	1,785,442	Methanol (transfers to treatment)
40	0	0	0	1,758,623	1,758,623	Zinc and compounds (transfers of metals)
41	0	0	0	1,742,791	1,742,791	Lead/Zinc and compounds (transfers of metals)
42	0	0	0	1,723,356	1,723,356	Lead and compounds (transfers of metals)
43	1,415,918	0	280,771	0	1,696,689	Nitric acid and nitrate compounds (transfers to treatment)
44	0	0	0	1,680,432	1,680,432	Zinc and compounds (transfers of metals)
45	0	0	0	1,647,700	1,647,700	Zinc and compounds (transfers of metals)
46	1,619,823	14,265	0	0	1,634,088	Methanol, Carbon tetrachloride, Xylene (transfers to treatment)
47	0	0	0	1,620,869	1,620,869	Zinc and compounds (transfers of metals)
48	0	1,599,768	0	6,546	1,606,314	Nitric acid and nitrate compounds (transfers to sewage)
49	0	1,592,336	1,138	9,670	1,603,144	Methanol (transfers to sewage)
50	1,453,630	0	139,450	0	1,593,080	Methanol (transfers to treatment)
	28,329,596	41,181,151	4,508,913	98,693,641	172,713,301	
	27.8	38.8	19.6	46.5	38.9	
	101,983,917	106,215,580	23,017,618	212,330,902	443,548,017	

* Chemicals accounting for more than 70% of total transfers from the facility.



► Canada and US data only. Mexico data not collected for 1997.

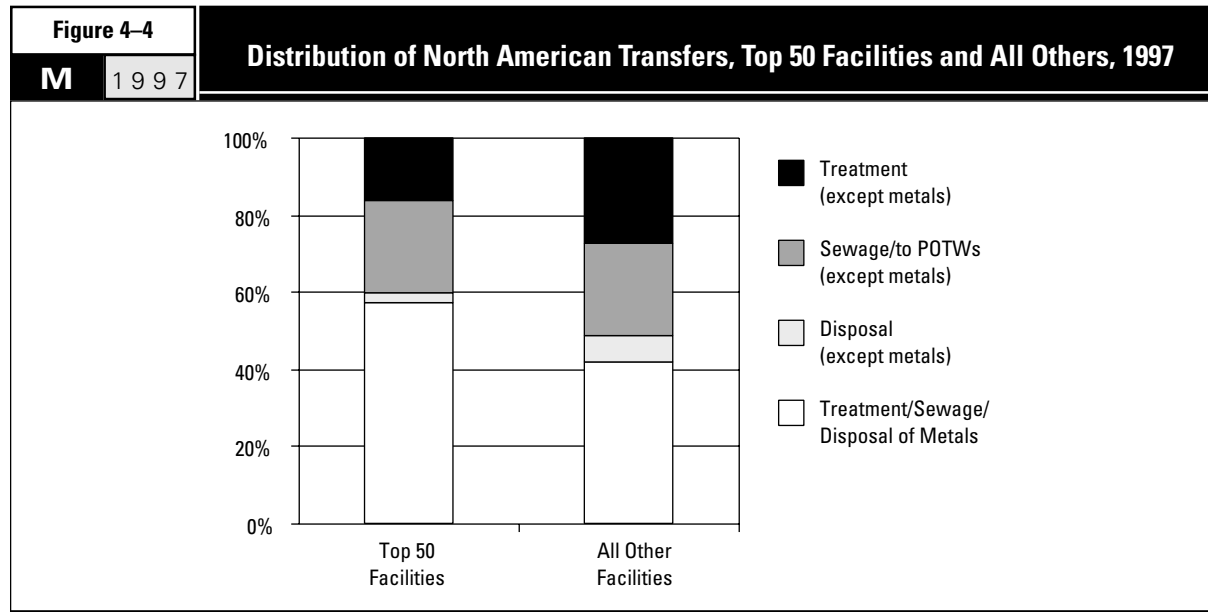
Transfers by Chemical

There are 165 substances on both the TRI and NPRI lists. These are the substances in the matched data set. However, just 25 of these substances represent 92 percent of the total off-site transfers in North America. Of the 165 substances, 48 are known or suspected carcinogens and 15 are metals with their compounds. These groups of substances are considered in more detail in this section.

Top Chemicals

North American facilities transferred 409.0 million kg of the top 25 chemicals, 92 percent of total transfers (443.5 million kg). Half of these total transfers consisted of metals—209.4 million kg. Among the top five, three were metals: zinc, manganese and lead (and their compounds). The other two (methanol and nitric acid and nitrate compounds) had transfers primarily to sewage. The top 25 chemicals accounted for 99 percent of all metals transferred off-site, 94 percent of transfers to sewage/POTWs (except metals) and 80 percent of transfers to both treatment and disposal (except metals). The overall proportion of NPRI to TRI transfers of the top 25 chemicals was 12 percent (from NPRI facilities) to 88 percent (from TRI facilities), very close to the 11 percent to 89 percent division found for all transfers (Table 4-4).

The chemical transferred off-site in the largest amount was zinc and its compounds, with 115.0 million kg. Methanol ranked second, with transfers totaling 63.1 million kg. The majority of the methanol transfers, 40.4 million kg, were to sewage/POTWs. Transfers of third-ranking nitric acid and nitrate



► Canada and US data only. Mexico data not collected for 1997.

[continued on page 154]

Table 4-4

The 25 Chemicals with the Largest Transfers in North America, 1997

M 1997

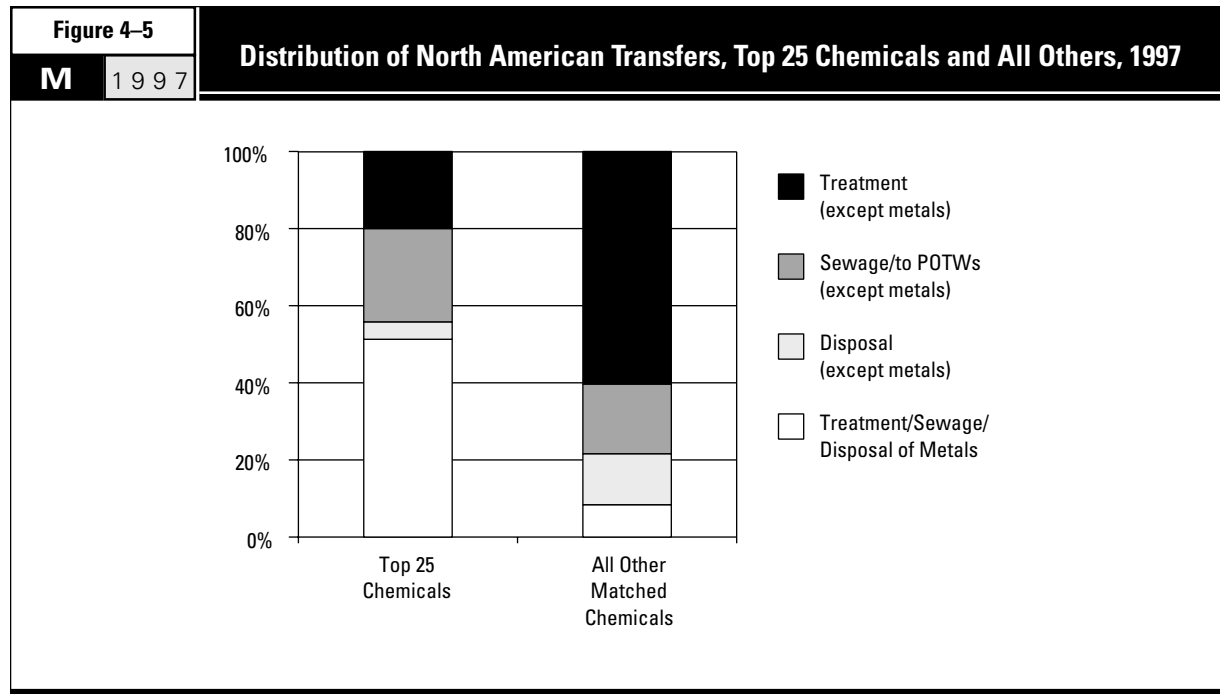
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)	NPRI/TRI as % of Total				
							Treatment (except metals) (%)	Sewage/POTWs (except metals) (%)	Disposal (except metals) (%)	Treatment/Sewage/Disposal of Metals (%)	Total Transfers (%)
	— Zinc (and its compounds)	0	0	0	114,991,258	114,991,258	—/ —	—/ —	—/ —	17.3/ 82.7	17.3/ 82.7
67-56-1	Methanol	22,089,151	40,431,203	604,581	0	63,124,935	11.1/ 88.9	0.7/ 99.3	28.6/ 71.4	—/ —	4.6/ 95.4
	— Nitric acid and nitrate compounds	7,094,569	40,269,593	3,042,652	0	50,406,814	2.6/ 97.4	11.7/ 88.3	4.9/ 95.1	—/ —	10.0/ 90.0
	— Manganese (and its compounds)	0	0	0	33,549,526	33,549,526	—/ —	—/ —	—/ —	14.5/ 85.5	14.5/ 85.5
	— Lead (and its compounds)	0	0	0	20,515,816	20,515,816	—/ —	—/ —	—/ —	14.2/ 85.8	14.2/ 85.8
107-21-1	Ethylene glycol	2,582,275	12,608,652	749,474	0	15,940,401	18.8/ 81.2	0.3/ 99.7	5.4/ 94.6	—/ —	3.5/ 96.5
	— Copper (and its compounds)	0	0	0	14,647,763	14,647,763	—/ —	—/ —	—/ —	7.6/ 92.4	7.6/ 92.4
	— Chromium (and its compounds)	0	0	0	13,717,318	13,717,318	—/ —	—/ —	—/ —	14.5/ 85.5	14.5/ 85.5
108-88-3	Toluene	11,109,484	278,816	684,199	0	12,072,499	20.0/ 80.0	0.5/ 99.5	5.2/ 94.8	—/ —	18.7/ 81.3
74-85-1	Ethylene	9,885,797	186	661	0	9,886,644	0.0/ 100.0	0.0/ 100.0	0.0/ 100.0	—/ —	0.0/ 100.0
1330-20-7	Xylene (mixed isomers)	6,414,014	130,955	360,415	0	6,905,384	26.1/ 73.9	0.3/ 99.7	10.1/ 89.9	—/ —	24.8/ 75.2
75-09-2	Dichloromethane	5,964,978	283,704	96,768	0	6,345,450	4.3/ 95.7	1.4/ 98.6	0.0/ 100.0	—/ —	4.1/ 95.9
	— Nickel (and its compounds)	0	0	0	5,715,443	5,715,443	—/ —	—/ —	—/ —	9.0/ 91.0	9.0/ 91.0
7664-38-2	Phosphoric acid	1,752,584	1,890,804	1,688,942	0	5,332,330	1.4/ 98.6	1.1/ 98.9	26.7/ 73.3	—/ —	9.3/ 90.7
1344-28-1	Aluminum oxide (fibrous forms)	16,967	482	4,842,508	0	4,859,957	0.0/ 100.0	0.0/ 100.0	3.2/ 96.8	—/ —	3.2/ 96.8
75-05-8	Acetonitrile	2,600,165	242,546	1,398,827	0	4,241,538	5.0/ 95.0	0.0/ 100.0	0.0/ 100.0	—/ —	3.1/ 96.9
7429-90-5	Aluminum (fume or dust)	0	0	0	4,069,070	4,069,070	—/ —	—/ —	—/ —	6.3/ 93.7	6.3/ 93.7
78-93-3	Methyl ethyl ketone	3,574,119	280,454	210,095	0	4,064,668	21.8/ 78.2	0.0/ 100.0	8.2/ 91.8	—/ —	19.6/ 80.4
108-95-2	Phenol	1,738,207	1,418,886	568,310	0	3,725,403	8.1/ 91.9	9.3/ 90.7	3.0/ 97.0	—/ —	7.8/ 92.2
100-42-5	Styrene	2,528,944	90,890	785,540	0	3,405,374	10.0/ 90.0	0.1/ 99.9	8.7/ 91.3	—/ —	9.4/ 90.6
1332-21-4	Asbestos (friable)	0	1	3,066,683	0	3,066,684	—/ —	0.0/ 100.0	36.0/ 64.0	—/ —	36.0/ 64.0
71-36-3	n-Butyl alcohol	1,355,023	928,985	90,431	0	2,374,439	27.7/ 72.3	1.2/ 98.8	5.3/ 94.7	—/ —	16.5/ 83.5
	— Antimony (and its compounds)	0	0	0	2,177,176	2,177,176	—/ —	—/ —	—/ —	0.6/ 99.4	0.6/ 99.4
110-82-7	Cyclohexane	2,069,769	5,465	23,421	0	2,098,655	16.0/ 84.0	0.0/ 100.0	0.1/ 99.9	—/ —	15.8/ 84.2
50-00-0	Formaldehyde	446,946	1,116,399	246,375	0	1,809,720	21.8/ 78.2	2.7/ 97.3	71.2/ 28.8	—/ —	16.7/ 83.3
	Subtotal	81,222,992	99,978,021	18,459,882	209,383,370	409,044,265	11.6/ 88.4	5.2/ 94.8	13.1/ 86.9	15.1/ 84.9	11.9/ 88.1
	% of Total	79.6	94.1	80.2	98.6	92.2					
	Total	101,983,917	106,215,580	23,017,618	212,330,902	443,548,017	9.7/ 90.3	5.0/ 95.0	11.0/ 89.0	15.0/ 85.0	11.2/ 88.8

► Canada and US data only. Mexico data not collected for 1997.

compounds to sewage/POTWs amounted to 40.3 million kg of a total of 50.4 million kg transferred.

Metals accounted for 51 percent of all transfers of the top 25 chemicals, compared to nine percent of transfers of all other matched chemicals. Transfers of nonmetals to sewage/POTWs amounted to a somewhat higher percentage of the top 25 chemicals (24 percent) than for all other chemicals (18 percent). In contrast, transfers of nonmetals to treatment amounted to 60 percent of transfers of the chemicals that did not rank in the top 25, compared to 20 percent for the top chemicals. Thirteen percent of transfers of the other chemicals were nonmetals sent to disposal, compared to five percent for the top 25 (Figure 4-5).

(Appendix C presents information on potential health effects of substances with the largest releases and transfers as reported to the North American PRTRs, from the US Agency for Toxic Substances and Disease Registry, US EPA's Office of Pollution Prevention and Toxics and the New Jersey Department of Health and Senior Services. Appendix C also describes uses of these substances.)



► Canada and US data only. Mexico data not collected for 1997.

Carcinogens

North American facilities transferred 67.0 million kg of substances designated as known or suspected carcinogens by the International Agency for Research on Cancer (IARC) <<http://www.iarc.fr/>> or by the US National Toxicological Program (NTP) <<http://ntp-server.niehs.nih.gov/>>. PRTR reports were submitted on all 48 designated carcinogens in the matched data set, amounting to 15 percent of all matched chemicals transferred in 1997 (**Table 4-5**).

Lead and its compounds was transferred in the largest amount (20.5 million kg), followed by chromium and

its compounds (13.7 million kg), and dichloromethane (6.3 million kg transferred to treatment). Of the 67.0 million kg of carcinogens transferred, 42.8 million kg were metals transferred to treatment/sewage/disposal. Twenty percent of all North American transfers of metals reported in 1997 were of carcinogens.

The proportion of metals in carcinogen transfers (64 percent) was substantially larger than that in the transfers of all other chemicals (45 percent metals). Nonmetals sent to sewage/POTWs formed a much smaller proportion of carcinogen transfers—four percent—than of transfers of other

chemicals (28 percent—see **Figure 4-6**).

The seven designated carcinogens with the largest transfers were also among the top 25 chemicals for total transfers: lead (and its compounds), chromium (and its compounds), dichloromethane, nickel (and its compounds), styrene, asbestos and formaldehyde (see **Table 4-4**).

The 50 facilities making the largest transfers of carcinogens transferred 40 percent, or 26.5 million kg, of the total. They also accounted for 44 percent of the transfers of carcinogenic metals off-site to treatment/sewage/disposal (**Figure 4-7** and **Table 4-6**).

Table 4-5		Transfers in North America of Known or Suspected Carcinogens [†] , 1997				
M	1997					
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)
—	Lead (and its compounds)	0	0	0	20,515,816	20,515,816
—	Chromium (and its compounds)	0	0	0	13,717,318	13,717,318
75-09-2	Dichloromethane	5,964,978	283,704	96,768	0	6,345,450
—	Nickel (and its compounds)	0	0	0	5,715,443	5,715,443
100-42-5	Styrene	2,528,944	90,890	785,540	0	3,405,374
1332-21-4	Asbestos (friable)	0	1	3,066,683	0	3,066,684
50-00-0	Formaldehyde	446,946	1,116,399	246,375	0	1,809,720
—	Arsenic (and its compounds)	0	0	0	1,402,372	1,402,372
71-43-2	Benzene	929,472	100,161	43,302	0	1,072,935
107-06-2	1,2-Dichloroethane	812,311	2,398	54,635	0	869,344
67-66-3	Chloroform	672,660	166,450	6,708	0	845,818
—	Cadmium (and its compounds)	0	0	0	807,736	807,736
79-01-6	Trichloroethylene	610,721	12,162	78,834	0	701,717
106-89-8	Epichlorohydrin	593,556	24,220	1,826	0	619,602
117-81-7	Di(2-ethylhexyl) phthalate	104,613	6,637	494,428	0	605,678
—	Cobalt (and its compounds)	0	0	0	596,590	596,590
98-95-3	Nitrobenzene	589,442	85	109	0	589,636
108-05-4	Vinyl acetate	488,677	49,929	14,713	0	553,319
75-07-0	Acetaldehyde	217,882	330,102	2,488	0	550,472
56-23-5	Carbon tetrachloride	526,761	283	8,591	0	535,635
107-13-1	Acrylonitrile	469,201	60,034	2,212	0	531,447
127-18-4	Tetrachloroethylene	505,313	491	7,019	0	512,823
26471-62-5	Toluenediisocyanate (mixed isomers)	412,282	0	17,591	0	429,873
75-56-9	Propylene oxide	4,095	281,607	13,562	0	299,264
123-91-1	1,4-Dioxane	11,522	116,686	138,677	0	266,885
106-99-0	1,3-Butadiene	154,275	304	2,993	0	157,572
79-06-1	Acrylamide	12,827	89,646	11,955	0	114,428
106-46-7	1,4-Dichlorobenzene	89,291	1	530	0	89,822
75-01-4	Vinyl chloride	42,329	121	40,928	0	83,378
140-88-5	Ethyl acrylate	54,308	17,706	2,187	0	74,201
75-21-8	Ethylene oxide	15,379	44,667	23	0	60,069
101-77-9	4,4'-Methylenedianiline	31,365	986	7,603	0	39,954
302-01-2	Hydrazine	6,472	350	13,800	0	20,622
139-13-9	Nitrotriacetic acid	900	7,308	200	0	8,408
62-56-6	Thiourea	4,563	611	1,909	0	7,083
584-84-9	Toluene-2,4-diisocyanate	4,097	115	2,801	0	7,013
96-45-7	Ethylene thiourea	1,891	1	2,565	0	4,457
101-14-4	4,4'-Methylenebis(2-chloroaniline)	3,059	2	0	0	3,061
91-08-7	Toluene-2,6-diisocyanate	812	0	617	0	1,429
77-78-1	Dimethyl sulfate	7	2	1,047	0	1,056
64-67-5	Diethyl sulfate	94	848	0	0	942
95-80-7	2,4-Diaminotoluene	125	0	0	0	125
94-59-7	Safrole	0	113	0	0	113
121-14-2	2,4-Dinitrotoluene	85	0	0	0	85
606-20-2	2,6-Dinitrotoluene	50	0	0	0	50
79-46-9	2-Nitropropane	0	0	11	0	11
90-94-8	Michler's ketone	0	0	0	0	0
96-09-3	Styrene oxide	0	0	0	0	0
	Subtotal	16,311,305	2,805,020	5,169,230	42,755,275	67,040,830
	% of Total	16.0	2.6	22.5	20.1	15.1
	Total for All Matched Chemicals	101,983,917	106,215,580	23,017,618	212,330,902	443,548,017

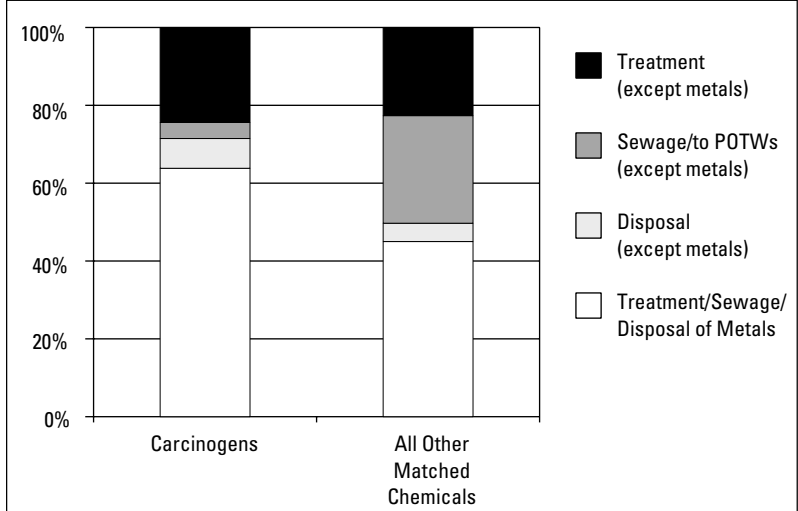
[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total

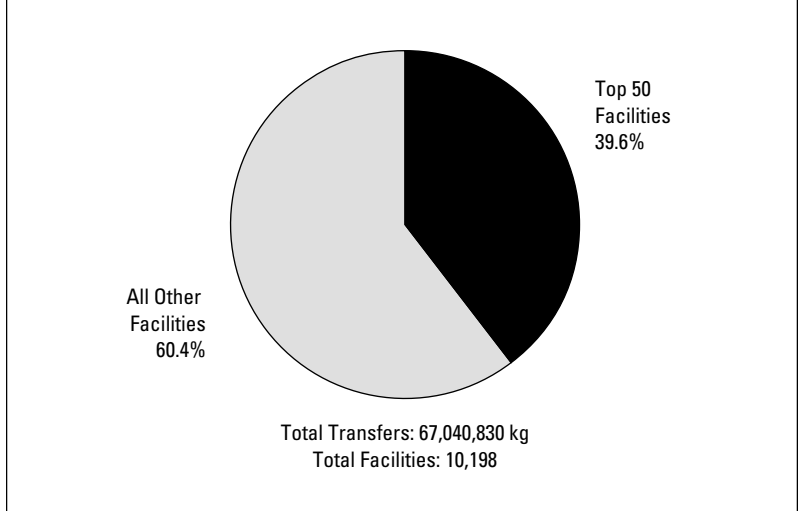
Treatment (except metals) (%)	Sewage/POTWs (except metals) (%)	Disposal (except metals) (%)	Treatment/Sewage/ Disposal of Metals (%)	Total Transfers (%)
— / —	— / —	— / —	14.2 / 85.8	14.2 / 85.8
— / —	— / —	— / —	14.5 / 85.5	14.5 / 85.5
4.3 / 95.7	1.4 / 98.6	0.0 / 100.0	— / —	4.1 / 95.9
— / —	— / —	— / —	9.0 / 91.0	9.0 / 91.0
10.0 / 90.0	0.1 / 99.9	8.7 / 91.3	— / —	9.4 / 90.6
— / —	0.0 / 100.0	36.0 / 64.0	— / —	36.0 / 64.0
21.8 / 78.2	2.7 / 97.3	71.2 / 28.8	— / —	16.7 / 83.3
— / —	— / —	— / —	4.8 / 95.2	4.8 / 95.2
2.3 / 97.7	0.1 / 99.9	14.5 / 85.5	— / —	2.5 / 97.5
0.1 / 99.9	0.0 / 100.0	0.0 / 100.0	— / —	0.1 / 99.9
0.9 / 99.1	0.0 / 100.0	2.0 / 98.0	— / —	0.7 / 99.3
— / —	— / —	— / —	15.3 / 84.7	15.3 / 84.7
6.1 / 93.9	0.0 / 100.0	0.0 / 100.0	— / —	5.3 / 94.7
0.0 / 100.0	0.0 / 100.0	0.2 / 99.8	— / —	0.0 / 100.0
2.1 / 97.9	1.6 / 98.4	8.7 / 91.3	— / —	7.5 / 92.5
— / —	— / —	— / —	1.7 / 98.3	1.7 / 98.3
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.3 / 99.7	2.3 / 97.7	10.7 / 89.3	— / —	0.7 / 99.3
3.2 / 96.8	0.0 / 100.0	0.2 / 99.8	— / —	1.3 / 98.7
2.4 / 97.6	0.0 / 100.0	0.0 / 100.0	— / —	2.3 / 97.7
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
4.9 / 95.1	0.0 / 100.0	0.0 / 100.0	— / —	4.8 / 95.2
1.9 / 98.1	— / —	2.3 / 97.7	— / —	1.9 / 98.1
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
8.2 / 91.8	0.0 / 100.0	0.0 / 100.0	— / —	8.0 / 92.0
20.3 / 79.7	0.1 / 99.9	0.3 / 99.7	— / —	2.3 / 97.7
0.0 / 100.0	0.0 / 100.0	75.5 / 24.5	— / —	0.4 / 99.6
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.1 / 99.9	0.0 / 100.0	0.0 / 100.0	— / —	0.1 / 99.9
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
100.0 / 0.0	24.7 / 75.3	100.0 / 0.0	— / —	34.5 / 65.5
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	— / —	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
— / —	— / —	0.0 / 100.0	— / —	0.0 / 100.0
— / —	— / —	— / —	— / —	— / —
— / —	— / —	— / —	— / —	— / —
4.6 / 95.4	1.3 / 98.7	27.1 / 72.9	13.2 / 86.8	11.6 / 88.4
9.7 / 90.3	5.0 / 95.0	11.0 / 89.0	15.0 / 85.0	11.2 / 88.8

Figure 4-6
M 1997
Distribution of North American Transfers, Known or Suspected Carcinogens[†] and All Others, 1997



[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.
 ➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic. ➤ Canada and US data only. Mexico data not collected for 1997.

Figure 4-7
M 1997
North American Transfers of Known or Suspected Carcinogens[†], Top 50 Facilities and All Others, 1997



[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.
 ➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic. ➤ Canada and US data only. Mexico data not collected for 1997.

Table 4-6		The 50 North American Facilities with the Largest Total Off-site Transfers of Known or Suspected Carcinogens [†] , 1997			
M	1997				
Rank	Facility	City, State/Province	SIC Codes		Number of Forms
			Canada	US	
1	Pharmacia & Upjohn Co.	Portage, MI		28	4
2	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE		28	2
3	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1
4	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA		33	4
5	Quemetco Inc., RSR Corp.	City of Industry, CA		33	3
6	ASARCO Inc.	Omaha, NE		33	2
7	Quemetco Inc., RSR Corp.	Indianapolis, IN		33	3
8	C & D Techs. Inc.	Conyers, GA		36	1
9	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR		33	4
10	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI		33	5
11	Shell Oil Co.	Deer Park, TX		Mult.	17
12	Wagner Brake, Cooper Ind. Inc.	Scottsville, KY		37	1
13	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA		33	3
14	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	2
15	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR		28	2
16	Co-Steel Lasco	Whitby, ON	29	33	3
17	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ		33	4
18	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	New Castle, IN		33	2
19	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO		33	3
20	Shieldalloy Metallurgical, Metallurg Inc.	Newfield, NJ		33	1
21	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	3
22	Reichhold Chemicals Inc.	Jacksonville, FL		28	2
23	Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta, PR		28	1
24	Maynard Steel Casting Co.	Milwaukee, WI		33	2
25	Dow North America, Allyn's Point Plant, Dow Chemical Co.	Gales Ferry, CT		Mult.	3
26	Metalex Products Ltd.	Richmond, BC	29	33	2
27	Southwire Co.	Carrollton, GA		Mult.	16
28	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	3
29	Corning Inc., Fall Brook Plant	Corning, NY		32	1
30	Lacks Ind. Inc., Airlane Plant, Lacks Ents. Inc.	Kentwood, MI		Mult.	3
31	E.I.S. Brake Parts, Cooper Ind. Inc.	Manila, AR		37	1
32	Squibb Mfg. Inc., Bristol-Myers Squibb Co.	Humacao, PR		28	3
33	Nucor Steel	Plymouth, UT		33	2
34	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA		28	4
35	Zinc Corp. of America, Horsehead Ind. Inc.	Bartlesville, OK		33	2
36	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	2
37	Scot Forge Co.	Spring Grove, IL		34	2
38	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	5
39	PPG Ind. Inc.	Lake Charles, LA		28	8
40	Specified Fuels & Chemicals	Channelview, TX		Mult.	2
41	Tonolli Canada Limited	Mississauga, ON	29	33	1
42	Dofasco Inc.	Hamilton, ON	29	33	5
43	Able Electro Polishing	Chicago, IL		34	2
44	Arco Chemical Co.	Westlake, LA		28	3
45	Dow Chemical Co.	Dalton, GA		Mult.	2
46	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL		33	3
47	Arco Chemical Co., Bayport Div., Atlantic Richfield Co.	Pasadena, TX		28	1
48	ASARCO Inc.	East Helena, MT		33	4
49	GE Plastics, GE Co.	Pearlington, MS		28	2
50	Solutia Inc.	Springfield, MA		Mult.	4
Subtotal					161
% of Total					0.9
Total for All Matched Carcinogens					17,071

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Canada and US data only. Mexico data not collected for 1997.

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Major Chemicals Reported (Primary Transfers)*
1	1,629,089	126,005	4,526	69	1,759,689	Dichloromethane (transfers to treatment)
2	0	0	0	1,723,356	1,723,356	Lead and compounds (transfers of metals)
3	0	0	0	1,434,288	1,434,288	Chromium and compounds (transfers of metals)
4	0	0	0	1,061,318	1,061,318	Lead/Nickel/Cadmium and compounds (transfers of metals)
5	0	0	0	934,969	934,969	Lead and compounds (transfers of metals)
6	0	0	0	893,671	893,671	Lead and compounds (transfers of metals)
7	0	0	0	879,880	879,880	Lead and compounds (transfers of metals)
8	0	0	0	810,519	810,519	Lead and compounds (transfers of metals)
9	0	0	0	735,580	735,580	Lead and compounds (transfers of metals)
10	0	0	0	666,122	666,122	Arsenic/Cobalt/Lead and compounds (transfers of metals)
11	559,185	0	327	0	559,512	Epichlorohydrin (transfers to treatment)
12	0	0	557,771	0	557,771	Asbestos (transfers to disposal)
13	0	0	0	545,674	545,674	Lead and compounds (transfers of metals)
14	0	0	0	545,510	545,510	Chromium and compounds (transfers of metals)
15	498,866	38,957	0	0	537,823	Dichloromethane (transfers to treatment)
16	0	0	0	496,278	496,278	Lead and compounds (transfers of metals)
17	0	0	0	478,160	478,160	Arsenic and compounds (transfers of metals)
18	0	0	0	476,191	476,191	Chromium/Nickel and compounds (transfers of metals)
19	0	0	0	475,008	475,008	Lead and compounds (transfers of metals)
20	0	0	0	468,822	468,822	Chromium and compounds (transfers of metals)
21	0	0	0	465,000	465,000	Lead and compounds (transfers of metals)
22	462,390	0	0	0	462,390	Styrene (transfers to treatment)
23	445,533	7,846	0	0	453,379	Dichloromethane (transfers to treatment)
24	0	0	0	436,890	436,890	Chromium and compounds (transfers of metals)
25	427,295	0	0	0	427,295	Styrene (transfers to treatment)
26	0	0	0	421,667	421,667	Lead and compounds (transfers of metals)
27	0	0	0	403,098	403,098	Lead and compounds (transfers of metals)
28	0	0	0	401,290	401,290	Chromium/Nickel and compounds (transfers of metals)
29	0	0	0	392,315	392,315	Lead and compounds (transfers of metals)
30	227	41,905	227	343,889	386,248	Nickel/Chromium and compounds (transfers of metals)
31	0	0	369,932	0	369,932	Asbestos (transfers to disposal)
32	363,883	2	0	0	363,885	Dichloromethane (transfers to treatment)
33	0	0	0	363,053	363,053	Lead and compounds (transfers of metals)
34	346,159	0	0	0	346,159	Carbon tetrachloride (transfers to treatment)
35	0	0	0	335,245	335,245	Cadmium/Lead and compounds (transfers of metals)
36	0	0	0	324,258	324,258	Chromium and compounds (transfers of metals)
37	0	0	0	320,425	320,425	Chromium and compounds (transfers of metals)
38	0	0	0	316,350	316,350	Lead and compounds (transfers of metals)
39	314,750	0	165	0	314,915	1,2-Dichloroethane, Tetrachloroethylene (transfers to treatment)
40	313,851	0	0	0	313,851	Vinyl acetate (transfers to treatment)
41	0	0	0	311,202	311,202	Lead and compounds (transfers of metals)
42	0	63	0	302,700	302,763	Lead/Chromium and compounds (transfers of metals)
43	0	0	0	299,433	299,433	Chromium and compounds (transfers of metals)
44	273,999	0	5,632	10,461	290,092	Toluenediisocyanate (transfers to treatment)
45	285,260	0	567	0	285,827	Styrene (transfers to treatment)
46	0	0	0	283,347	283,347	Lead and compounds (transfers of metals)
47	2,283	272,132	6,851	0	281,266	Propylene oxide (transfers to sewage)
48	0	0	0	279,650	279,650	Lead and compounds (transfers of metals)
49	279,592	0	0	0	279,592	Styrene (transfers to treatment)
50	6,727	264,671	0	0	271,398	Formaldehyde (transfers to sewage)
	6,209,089	751,581	945,998	18,635,688	26,542,356	
	38.1	26.8	18.3	43.6	39.6	
	16,311,305	2,805,020	5,169,230	42,755,275	67,040,830	

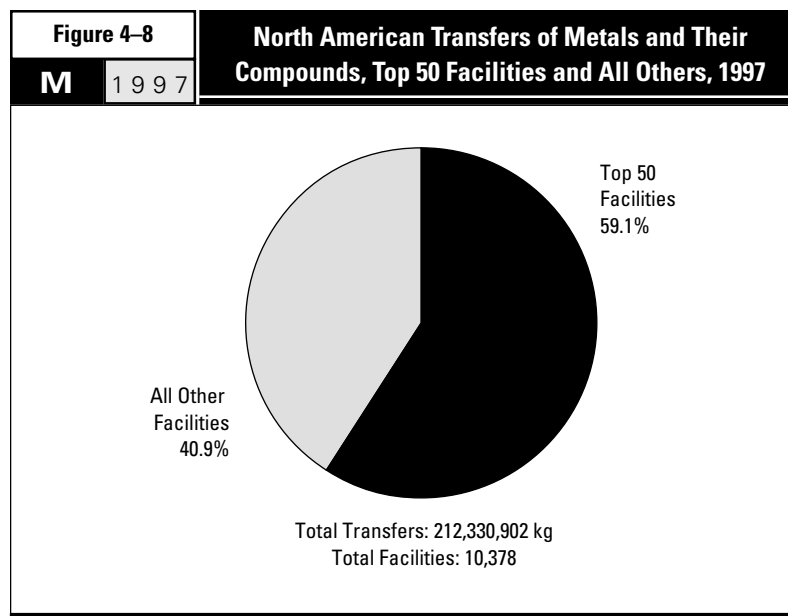
* Chemicals accounting for more than 70% of total transfers of carcinogens from the facility.

Metals

Transfers of metals totaled 212.3 million kg in North America in 1997. Zinc and its compounds was the metal transferred in the largest amounts, totaling 115.0 million kg. This was three times the amount of transfers of manganese and its compounds, which ranked second with 33.5 million kg. With 20.5 million kg, lead and its compounds ranked third. Notably, NPRI facilities (two nonferrous metal refineries in Quebec) reported 62 percent of the North American transfers of selenium (**Table 4-7**). (Selenium is used in photoelectric and photovoltaic cells, xerography, and pigments. It has applications in production of various metal alloys. Other uses include as a fungicide and insecticide and in pharmaceuticals, including veterinary medicines.)

Table 4-7		Transfers in North America of Metals and Their Compounds, 1997	
M	1997		
CAS Number	Chemical	Treatment/Sewage/Disposal of Metals (kg)	NPRI/TRI % of Total (%)
	— Zinc (and its compounds)	114,991,258	17.3 / 82.7
	— Manganese (and its compounds)	33,549,526	14.5 / 85.5
	— Lead (and its compounds)	20,515,816	14.2 / 85.8
	— Copper (and its compounds)	14,647,763	7.6 / 92.4
	— Chromium (and its compounds)	13,717,318	14.5 / 85.5
	— Nickel (and its compounds)	5,715,443	9.0 / 91.0
7429-90-5	Aluminum (fume or dust)	4,069,070	6.3 / 93.7
	— Antimony (and its compounds)	2,177,176	0.6 / 99.4
	— Arsenic (and its compounds)	1,402,372	4.8 / 95.2
	— Cadmium (and its compounds)	807,736	15.3 / 84.7
	— Cobalt (and its compounds)	596,590	1.7 / 98.3
	— Selenium (and its compounds)	48,840	62.2 / 37.8
	— Silver (and its compounds)	44,091	0.6 / 99.4
	— Mercury (and its compounds)	26,534	13.1 / 86.9
7440-62-2	Vanadium (fume or dust)	21,369	7.7 / 92.3
	Subtotal	212,330,902	15.0 / 85.0
	% of Total	100.0	
	Total for All Matched Metals	212,330,902	15.0 / 85.0

► Canada and US data only. Mexico data not collected for 1997.



➤ Canada and US data only. Mexico data not collected for 1997.

The top 50 North American facilities transferred 125.5 million kg, or 59 percent of metals transferred off-site. Among these, the single facility with the largest transfers reported 13.9 million kg of metals, mostly zinc and its compounds. For 32 of the facilities, zinc and its compounds constituted 70 percent or more of the metals transfers (Figure 4-8 and Table 4-8).

Table 4-8		The 50 North American Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds, 1997			
M	1997				
Rank	Facility	City, State	SIC Codes		Number of Forms
			Canada	US	
1	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA		33	9
2	Dofasco Inc.	Hamilton, ON	29	33	6
3	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR		33	7
4	Steel Dynamics Inc.	Butler, IN		33	6
5	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI		33	7
6	Co-Steel Lasco	Whitby, ON	29	33	6
7	Nucor Steel, Nucor Corp.	Crawfordsville, IN		33	6
8	Nucor Steel	Plymouth, UT		33	5
9	National Steel Corp., Great Lakes Div.	Ecorse, MI		33	5
10	USS Mon Valley Works, USX Corp.	Braddock, PA		33	5
11	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR		33	7
12	Cerro Wire & Cable Co. Inc.	Hartselle, AL		33	3
13	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL		33	5
14	Timken Co., Faircrest Steel Plant	Canton, OH		33	6
15	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA		33	5
16	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL		33	5
17	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5
18	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL		33	6
19	Bar Techs. Inc.	Johnstown, PA		33	5
20	Southwire Co.	Carrollton, GA		Mult.	29
21	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA		33	5
22	ASARCO Inc.	Omaha, NE		33	5
23	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE		28	5
24	Ameristeel Corp.	Charlotte, NC		33	6
25	Ivaco Rolling Mills	L'Orignal, ON	29	33	7
26	Oregon Steel Mills Inc.	Portland, OR		33	6
27	Acme Steel Co., Acme Metals Inc.	Riverdale, IL		Mult.	6
28	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	8
29	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6
30	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1
31	Koppel Steel Corp., NS Group Inc.	Koppel, PA		33	5
32	Timken Co., Harrison Steel Plant	Canton, OH		33	7
33	Eveready Battery Co. Inc., Ralston Purina Co.	Marietta, OH		28	1
34	Millennium Inorganic Chemicals, Plant 2, Millennium Chemical	Ashtabula, OH		28	1
35	Roanoke Electric Steel Corp.	Roanoke, VA		33	7
36	Quemetco Inc., RSR Corp.	Indianapolis, IN		33	5
37	Quemetco Inc., RSR Corp.	City of Industry, CA		33	5
38	Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa, AL		33	12
39	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI		33	6
40	Zalev Brothers Limited	Windsor, ON	29	33	8
41	Auburn Steel Co. Inc.	Auburn, NY		33	4
42	Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville, OR		33	5
43	Newport Steel Corp., NS Group Inc.	Wilder, KY		33	7
44	Millennium Inorganic Chemicals, Plant 1, Millennium Chemical	Ashtabula, OH		28	1
45	Kronos Canada, Inc.	Varenes, QC	37	28	2
46	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1
47	Inspec USA Inc., Unit 2, Inspec Group PLC	Galena, KS		28	1
48	C & D Techs. Inc.	Conyers, GA		36	1
49	Ford Motor Co., Cleveland Casting	Brook Park, OH		33	5
50	Ameristeel Corp., WTN Steel Mill	Jackson, TN		33	7
Subtotal					284
% of Total					1.3
Total for All Matched Metals					21,727

► Canada and US data only. Mexico data not collected for 1997.

Rank	Treatment/ Sewage/Disposal of Metals (kg)	Major Chemicals Reported (Primary Transfers)*
1	13,855,648	Zinc and compounds (transfers of metals)
2	8,168,440	Zinc/Manganese and compounds (transfers of metals)
3	7,543,045	Zinc and compounds (transfers of metals)
4	6,529,560	Zinc and compounds (transfers of metals)
5	6,086,892	Zinc and compounds (transfers of metals)
6	5,799,885	Zinc and compounds (transfers of metals)
7	5,609,771	Zinc and compounds (transfers of metals)
8	3,922,477	Zinc and compounds (transfers of metals)
9	3,497,819	Zinc and compounds (transfers of metals)
10	3,090,268	Zinc and compounds (transfers of metals)
11	2,957,542	Zinc and compounds (transfers of metals)
12	2,863,172	Copper and compounds (transfers of metals)
13	2,498,413	Zinc and compounds (transfers of metals)
14	2,486,113	Zinc and compounds (transfers of metals)
15	2,388,657	Zinc and compounds (transfers of metals)
16	2,384,320	Zinc and compounds (transfers of metals)
17	2,298,300	Zinc and compounds (transfers of metals)
18	2,175,039	Zinc and compounds (transfers of metals)
19	1,925,941	Zinc and compounds (transfers of metals)
20	1,917,884	Zinc/Lead and compounds (transfers of metals)
21	1,758,623	Zinc and compounds (transfers of metals)
22	1,742,791	Lead/Zinc and compounds (transfers of metals)
23	1,723,356	Lead and compounds (transfers of metals)
24	1,680,432	Zinc and compounds (transfers of metals)
25	1,647,700	Zinc and compounds (transfers of metals)
26	1,620,869	Zinc and compounds (transfers of metals)
27	1,487,000	Zinc and compounds (transfers of metals)
28	1,481,088	Zinc/Lead and compounds (transfers of metals)
29	1,480,000	Zinc and compounds (transfers of metals)
30	1,434,288	Chromium and compounds (transfers of metals)
31	1,332,607	Zinc and compounds (transfers of metals)
32	1,310,549	Zinc and compounds (transfers of metals)
33	1,306,122	Manganese and compounds (transfers of metals)
34	1,292,517	Manganese and compounds (transfers of metals)
35	1,233,769	Zinc and compounds (transfers of metals)
36	1,221,227	Lead/Antimony and compounds (transfers of metals)
37	1,198,182	Lead and compounds (transfers of metals)
38	1,192,598	Zinc and compounds (transfers of metals)
39	1,158,730	Manganese/Lead/Copper/Cobalt and compounds (transfers of metals)
40	1,104,869	Zinc/Copper and compounds (transfers of metals)
41	1,066,656	Zinc and compounds (transfers of metals)
42	1,060,770	Zinc and compounds (transfers of metals)
43	1,022,314	Zinc and compounds (transfers of metals)
44	997,732	Manganese and compounds (transfers of metals)
45	855,000	Manganese and compounds (transfers of metals)
46	840,570	Zinc and compounds (transfers of metals)
47	811,791	Manganese and compounds (transfers of metals)
48	810,519	Lead and compounds (transfers of metals)
49	804,941	Zinc/Manganese and compounds (transfers of metals)
50	780,190	Zinc and compounds (transfers of metals)
	125,456,986	
	59.1	
	212,330,902	

* Chemicals accounting for more than 70% of total transfers of metals and their compounds from the facility.

Transfers by Industry

Two industries—primary metals and chemicals—together reported 71 percent of all North American transfers off-site (Table 4–9 and Figure 4–9).

The primary metals industry reported the largest amounts, 175.6 million kg, of off-site transfers. Chemical manufacturing ranked second, transferring 139.8 million kg off-site, and the paper products industry ranked third, with 26.8 million kg sent off-site.

The primary metals industry transferred 156.2 million kg of metals to treatment/sewage/disposal, by far the largest metals transfers reported. Chemical manufacturing facilities transferred 65.7 million kg of non-metals to treatment, 50.4 million kg to sewage/POTWs, and 8.1 million to disposal, the largest amounts in all three categories. The paper products industry principally sent transfers of nonmetals to sewage/POTWs (19.0 million kg).

SIC		Transfers in North America by Industry (US SIC Code), 1997					
Rank	Code	Industry	Treatment (except metals) (kg)	Sewage/ POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/ Disposal of Metals (kg)	Total Transfers (kg)
1	33	Primary Metals	13,414,970	4,360,890	1,636,141	156,226,433	175,638,434
2	28	Chemicals	65,711,885	50,404,158	8,067,819	15,584,299	139,768,161
3	26	Paper Products	5,559,695	19,025,967	343,307	1,919,155	26,848,124
4		Multiple Codes 20–39*	4,995,507	5,889,933	1,071,171	9,798,669	21,755,280
5	34	Fabricated Metals Products	2,485,744	1,799,925	5,387,610	9,581,033	19,254,312
6	36	Electronic/Electrical Equipment	1,040,035	4,945,373	857,535	5,135,901	11,978,844
7	20	Food Products	316,771	11,230,432	117,596	144,480	11,809,279
8	37	Transportation Equipment	2,241,763	1,752,275	1,983,190	2,956,354	8,933,582
9	30	Rubber and Plastics Products	1,946,360	803,228	1,146,996	3,333,797	7,230,381
10	29	Petroleum and Coal Products	962,860	2,608,553	1,046,592	895,238	5,513,243
11	32	Stone/Clay/Glass Products	740,767	366,641	512,585	2,713,514	4,333,507
12	35	Industrial Machinery	367,501	1,281,765	133,166	2,092,898	3,875,330
13	38	Measurement/Photographic Instruments	1,070,329	257,568	97,589	181,253	1,606,739
14	22	Textile Mill Products	129,639	1,003,033	90,691	205,920	1,429,283
15	39	Misc. Manufacturing Industries	267,563	298,109	183,166	367,406	1,116,244
16	31	Leather Products	8,358	18,249	115	902,290	929,012
17	25	Furniture and Fixtures	371,617	72,708	103,879	16,838	565,042
18	24	Lumber and Wood Products	84,191	2,349	188,276	181,182	455,998
19	27	Printing and Publishing	268,113	89,503	17,481	63,047	438,144
20	23	Apparel and Other Textile Products	249	4,885	31,947	31,068	68,149
21	21	Tobacco Products	0	36	766	127	929
Total for All Matched Industries			101,983,917	106,215,580	23,017,618	212,330,902	443,548,017

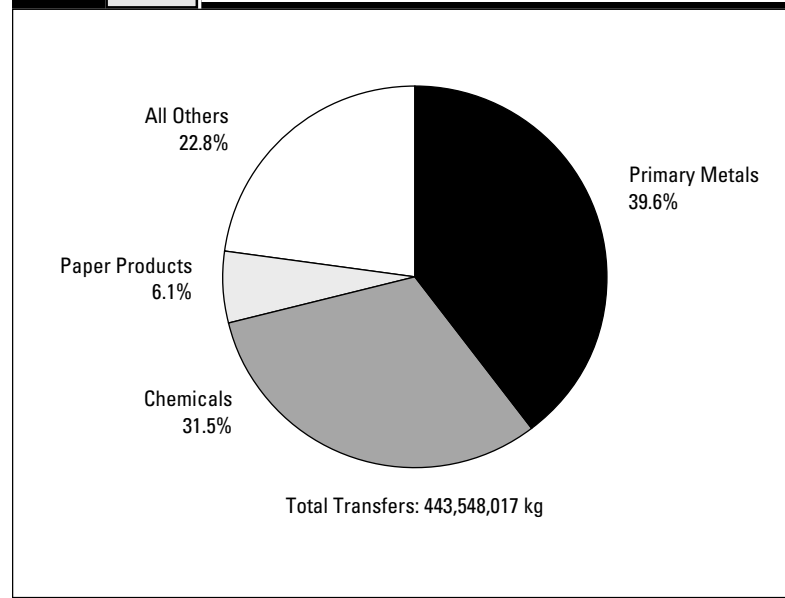
* Multiple SIC codes reported only in US data.
 ► Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total				
Treatment (except metals) (%)	Sewage/POTWs (except metals) (%)	Disposal (except metals) (%)	Treatment/Sewage/ Disposal of Metals (%)	Total Transfers (%)
0.4 / 99.6	2.4 / 97.6	16.8 / 83.2	17.6 / 82.4	15.9 / 84.1
10.1 / 89.9	7.7 / 92.3	8.2 / 91.8	8.0 / 92.0	8.9 / 91.1
28.2 / 71.8	0.0 / 100.0	54.9 / 45.1	15.1 / 84.9	7.6 / 92.4
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
7.0 / 93.0	3.8 / 96.2	6.2 / 93.8	12.3 / 87.7	9.1 / 90.9
0.6 / 99.4	0.4 / 99.6	8.9 / 91.1	3.3 / 96.7	2.3 / 97.7
0.0 / 100.0	6.6 / 93.4	0.0 / 100.0	7.1 / 92.9	6.4 / 93.6
15.8 / 84.2	4.6 / 95.4	2.3 / 97.7	13.5 / 86.5	9.8 / 90.2
20.4 / 79.6	0.0 / 100.0	11.1 / 88.9	12.1 / 87.9	12.8 / 87.2
34.0 / 66.0	9.6 / 90.4	49.5 / 50.5	3.0 / 97.0	20.3 / 79.7
6.1 / 93.9	0.0 / 100.0	0.2 / 99.8	1.7 / 98.3	2.1 / 97.9
8.2 / 91.8	0.0 / 100.0	25.1 / 74.9	18.4 / 81.6	11.6 / 88.4
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.1 / 99.9	0.0 / 100.0
0.4 / 99.6	0.0 / 100.0	30.9 / 69.1	0.1 / 99.9	2.0 / 98.0
13.0 / 87.0	29.2 / 70.8	45.3 / 54.7	25.8 / 74.2	26.8 / 73.2
43.1 / 56.9	0.0 / 100.0	0.0 / 100.0	0.4 / 99.6	0.8 / 99.2
37.0 / 63.0	0.0 / 100.0	0.6 / 99.4	0.0 / 100.0	24.4 / 75.6
1.0 / 99.0	0.0 / 100.0	83.6 / 16.4	26.7 / 73.3	45.3 / 54.7
52.9 / 47.1	0.0 / 100.0	40.0 / 60.0	6.7 / 93.3	34.9 / 65.1
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
— / —	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
9.7 / 90.3	5.0 / 95.0	11.0 / 89.0	15.0 / 85.0	11.2 / 88.8

Figure 4-9

North American Top Three Industries
for Total Transfers, 1997

M 1997



► Canada and US data only. Mexico data not collected for 1997.

4.2.2 NPRI and TRI Transfers

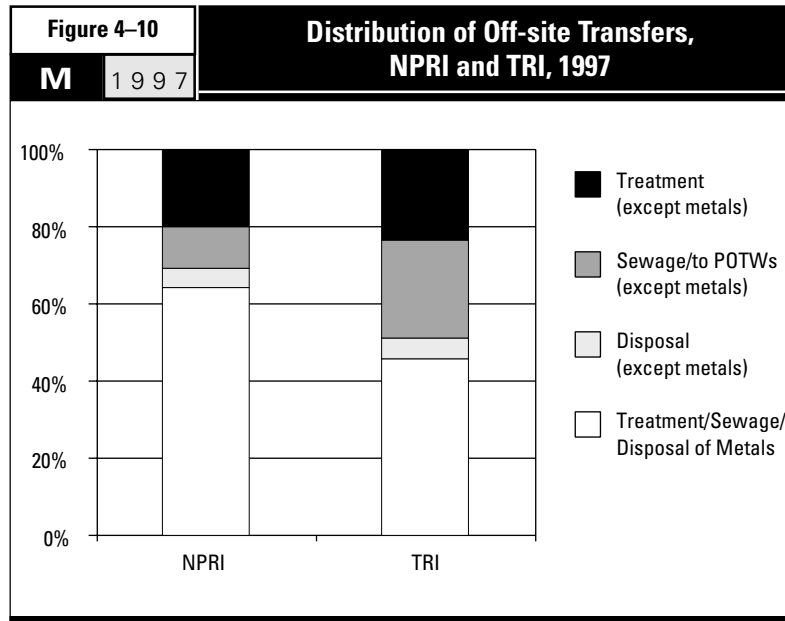
This section compares reporting of off-site transfers by Canadian and US facilities for 1997. It notes significant similarities and differences between the two PRTRs for the matched data set.

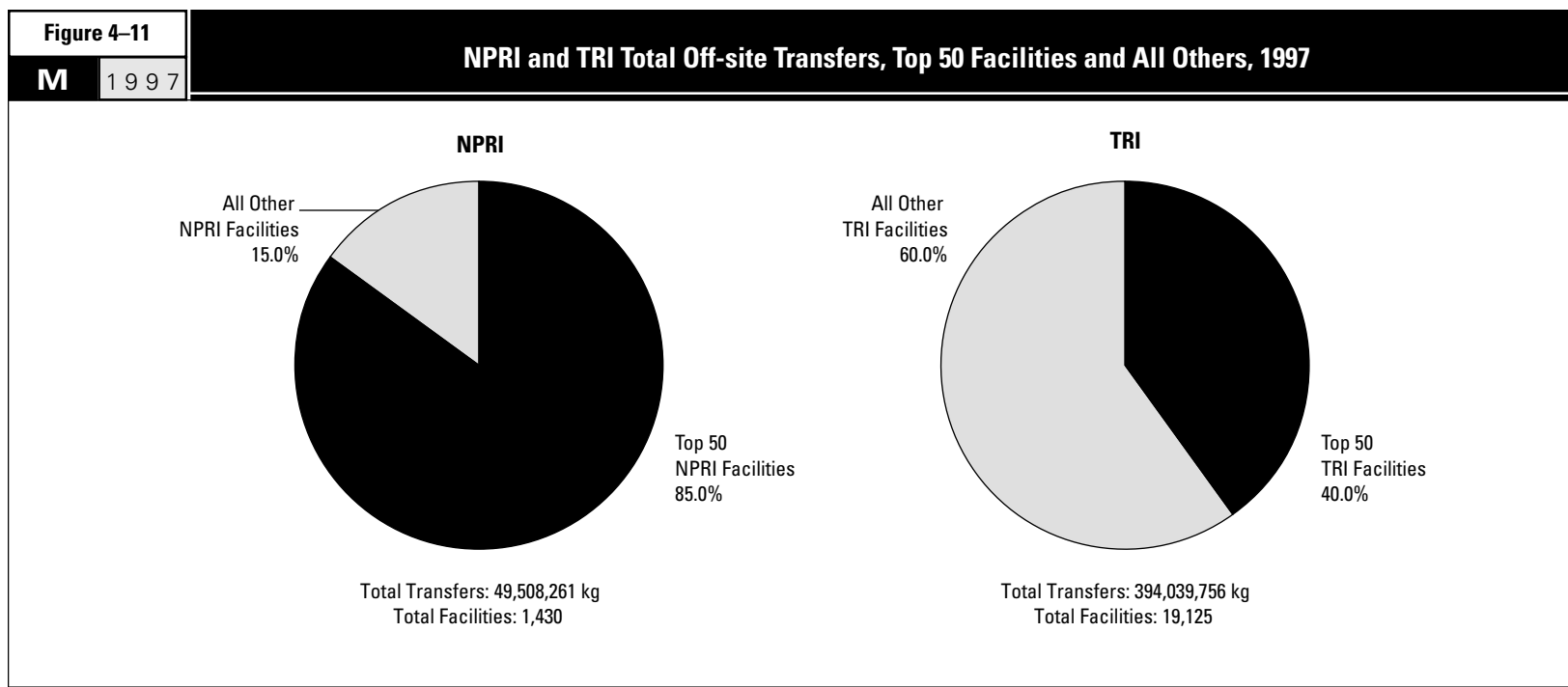
Overview

Transfers of metals outweighed all other transfers in both Canada and the United States. NPRI transfers of metals totaled 31.8 million kg, amounting to 64 percent of 49.5 million kg in total transfers. In TRI, transfers of metals were 180.5 million kg, 46 percent of total transfers reported (394.0 million kg). For nonmetallic substances, NPRI facilities reported sending 9.9 million kg to treatment, 5.3 million kg to sewage/POTWs and 2.5 million kg to disposal. TRI reports showed transfers of 92.1 million kg to treatment, 101.0 million kg to sewage/POTWs and 20.5 million kg to disposal (Table 4-10).

A comparison of the distribution of off-site transfers between NPRI and TRI shows that similar percentages were transfers of nonmetals to treatment (20 percent in NPRI and 23 percent in TRI) and disposal (five percent in both). However, the percentage transferred to sewage/POTWs was 11 percent for NPRI and 26 percent for TRI (Figure 4-10).

Table 4-10		Off-site Transfers, NPRI and TRI, 1997			
M	1997	NPRI		TRI	
		Number		Number	
Total Facilities		1,430		19,125	
Total Forms		4,599		58,252	
		kg	%	kg	%
Treatment (except metals)		9,925,693	20.0	92,058,224	23.4
Sewage/POTWs (except metals)		5,260,842	10.6	100,954,738	25.6
Disposal (except metals)		2,533,015	5.1	20,484,603	5.2
Treatment/Sewage/Disposal of Metals		31,788,711	64.2	180,542,191	45.8
Matched Transfers		49,508,261	100.0	394,039,756	100.0





Top Facilities

The top 50 NPRI facilities reported 85 percent of all off-site transfers, whereas the top 50 TRI facilities reported 40 percent of transfers off-site (**Figure 4-11**). As noted in discussing releases in **Chapter 3**, 50 facilities represented 3.5 percent of all NPRI facilities in the 1997 matched data set. However, this population amounted to just 0.3 percent of all TRI facilities.

The top 50 NPRI facilities transferred a total of 42.1 million kg off-site. Transfers of metals to treatment/sewage/disposal were 28.7 million kg (68 percent). The breakdown for non-metals was 7.5 million kg transferred to treatment (18 percent), 4.5 million kg transferred to sewage/POTWs (11 percent) and 1.4 million kg transferred to disposal (three percent—see **Figure 4-12** and **Table 4-11**).

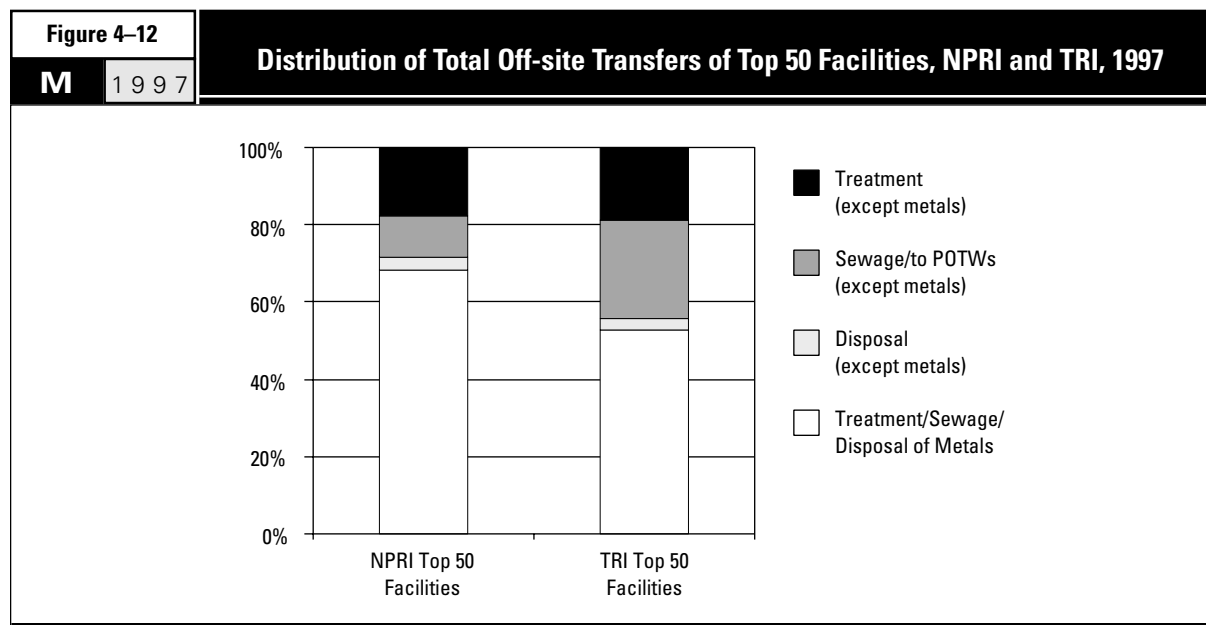


Table 4-11		The 50 NPRI Facilities with the Largest Total Off-site Transfers, 1997			
Rank	Facility	City, Province	SIC Codes		Number of Forms
			Canada	US	
1	Dofasco Inc.	Hamilton, ON	29	33	18
2	Co-Steel Lasco	Whitby, ON	29	33	6
3	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	6
4	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5
5	Aimco Solrec Ltd.	Milton, ON	37	28	6
6	Ivaco Rolling Mills	L'Orignal, ON	29	33	7
7	Fraser Papers Inc., Noranda Forest Inc.	Edmundston, NB	27	26	9
8	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	10
9	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	16
10	Zalev Brothers Limited	Windsor, ON	29	33	8
11	Kronos Canada, Inc.	Varenes, QC	37	28	8
12	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1
13	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28	4
14	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	7
15	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	11
16	Bayer Inc., Bayer AG	Sarnia, ON	37	28	17
17	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	4
18	Metalex Products Ltd.	Richmond, BC	29	33	5
19	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	6
20	Solutia Canada Inc, Produits chimiques	LaSalle, QC	37	28	6
21	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	8
22	Stelco Inc., Hilton Works	Hamilton, ON	29	33	21
23	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	3
24	Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton, AB	37	28	4
25	Tonolli Canada Limited	Mississauga, ON	29	33	1
26	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33	7
27	Inland Technologies Inc., Debert Treatment Centre	Debert, NS	36	29	1
28	Ifastgroupe Inc., Infasco Div.	Marieville, QC	30	34	1
29	Chemrec Inc.	Cowansville, QC	37	28	7
30	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29	8
31	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	2
32	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6
33	DuPont Canada Inc., Ajax Finishes Division	Ajax, ON	37	28	7
34	Freightliner of Canada Ltd., St. Thomas Truck Plant	St. Thomas, ON	32	37	4
35	Agropur coopérative agro-alimentaire, Agropur La Fromagerie	Granby, QC	10	20	4
36	Kraft Canada Inc, Cheese Operations, Philip Morris Companies	Ingleside, ON	10	20	2
37	Schenectady Canada Ltd.	Scarborough, ON	37	28	13
38	PPG Canada Inc., Clarkson Coatings Facility	Mississauga, ON	37	28	13
39	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	18
40	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28	10
41	LDM Technologies Company	Leamington, ON	16	30	7
42	Dow Chemical Canada Inc.	Varenes, QC	16	30	6
43	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	5
44	BASF Canada Inc., Windsor Site	Windsor, ON	37	28	8
45	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	32	37	2
46	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	2
47	Guertin Bros. Coatings & Sealants Ltd.	Winnipeg, MB	37	28	9
48	Stelwire Ltd., Parkdale Works	Hamilton, ON	30	34	6
49	KI Pembroke, Inc., Kreuger International Inc.	Pembroke, ON	26	25	1
50	Coatings 85 Ltd.,	Mississauga, ON	30	34	1
	Subtotal				347
	% of Total				7.5
	Total				4,599

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Major Chemicals Reported (Primary Transfers)*
1	865	123	50	8,168,440	8,169,478	Zinc/Manganese and compounds (transfers of metals)
2	0	0	0	5,799,885	5,799,885	Zinc and compounds (transfers of metals)
3	0	3,732,000	0	224,300	3,956,300	Nitric acid and nitrate compounds (transfers to sewage)
4	0	0	0	2,298,300	2,298,300	Zinc and compounds (transfers of metals)
5	2,028,917	0	0	0	2,028,917	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
6	0	0	0	1,647,700	1,647,700	Zinc and compounds (transfers of metals)
7	1,453,630	0	139,450	0	1,593,080	Methanol (transfers to treatment)
8	0	15,075	241	1,481,088	1,496,404	Zinc/Lead and compounds (transfers of metals)
9	0	0	0	1,480,000	1,480,000	Zinc and compounds (transfers of metals)
10	0	0	0	1,104,869	1,104,869	Zinc/Copper and compounds (transfers of metals)
11	0	0	0	855,000	855,000	Manganese and compounds (transfers of metals)
12	0	0	0	840,570	840,570	Zinc and compounds (transfers of metals)
13	639,700	0	0	0	639,700	Toluene (transfers to treatment)
14	0	1,320	9,520	621,538	632,378	Zinc and compounds (transfers of metals)
15	38,150	0	0	584,310	622,460	Chromium/Nickel/Manganese and compounds (transfers of metals)
16	485,300	0	133,000	0	618,300	Cyclohexane, Acetonitrile (transfers to treatment), Asbestos (transfers to disposal)
17	0	0	0	571,557	571,557	Chromium and compounds (transfers of metals)
18	0	0	0	484,370	484,370	Lead and compounds (transfers of metals)
19	0	0	0	467,400	467,400	Lead/Cadmium and compounds (transfers of metals)
20	425,629	34,999	5,082	0	465,710	n-Butyl alcohol, Xylene (transfers to treatment)
21	0	0	880	362,000	362,880	Zinc/Manganese and compounds (transfers of metals)
22	10,300	71,000	237,300	9,900	328,500	Asbestos (transfers to disposal), Phenol (transfers to sewage)
23	0	0	0	327,898	327,898	Chromium and compounds (transfers of metals)
24	317,039	0	0	0	317,039	Methanol, Dichloromethane (transfers to treatment)
25	0	0	0	311,202	311,202	Lead and compounds (transfers of metals)
26	0	0	0	305,118	305,118	Chromium/Zinc/Manganese and compounds (transfers of metals)
27	296,054	0	0	0	296,054	Ethylene glycol (transfers to treatment)
28	0	0	293,000	0	293,000	Phosphoric acid (transfers to disposal)
29	286,700	0	0	0	286,700	Toluene, Dichloromethane, Xylene (transfers to treatment)
30	0	0	271,000	0	271,000	Asbestos (transfers to disposal)
31	0	248,000	0	0	248,000	Methanol (transfers to sewage)
32	0	0	0	241,888	241,888	Copper/Zinc and compounds (transfers of metals)
33	203,784	0	0	4,122	207,906	Toluene, Xylene (transfers to treatment)
34	204,008	0	0	0	204,008	Toluene (transfers to treatment)
35	0	201,600	0	0	201,600	Nitric acid and nitrate compounds (transfers to sewage)
36	0	201,000	0	0	201,000	Nitric acid and nitrate compounds (transfers to sewage)
37	167,695	0	475	0	168,170	Xylene, Phenol, Cresol (transfers to treatment)
38	151,857	0	0	530	152,387	Xylene (transfers to treatment)
39	0	0	146,560	0	146,560	Phosphoric acid (transfers to disposal)
40	145,965	0	0	0	145,965	Toluene, Methyl ethyl ketone (transfers to treatment)
41	144,300	0	0	0	144,300	Toluene, Methanol (transfers to treatment)
42	142,100	0	1,090	0	143,190	Styrene (transfers to treatment)
43	0	0	0	142,900	142,900	Nickel/Copper and compounds (transfers of metals)
44	140,090	0	0	0	140,090	Methyl ethyl ketone (transfers to treatment)
45	0	0	0	128,300	128,300	Manganese and compounds (transfers of metals)
46	0	0	127,000	0	127,000	Formaldehyde (transfers to disposal)
47	117,969	0	0	8,050	126,019	Xylene (transfers to treatment)
48	0	2,050	1,837	115,551	119,438	Zinc and compounds (transfers of metals)
49	118,500	0	0	0	118,500	Xylene (transfers to treatment)
50	0	0	0	112,972	112,972	Zinc and compounds (transfers of metals)
	7,518,552	4,507,167	1,366,485	28,699,758	42,091,962	
	75.7	85.7	53.9	90.3	85.0	
	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	

* Chemicals accounting for more than 70% of total transfers from the facility.

The top TRI facilities transferred a total of 157.8 million kg off-site. This consisted of 83.5 million kg of metals transferred to treatment/sewage/disposal (53 percent), and for nonmetals, 29.5 million kg transferred to treatment (19 percent), 40.4 million kg transferred to sewage/POTWs (26 percent) and 4.4 million kg transferred to disposal (three percent—see **Figure 4-12** and **Table 4-12**).

NPRI's top facilities thus sent a larger proportion of metals to treatment/sewage/disposal (68 percent of transfers) compared to TRI (53 percent). For nonmetals, the top facilities in TRI made a larger proportion of their transfers to sewage/POTWs (26 percent, versus 11 percent in NPRI).

Table 4-12		The 50 TRI Facilities with the Largest Total Off-site Transfers, 1997		
M	1997			
Rank	Facility	City, State	US SIC Code	Number of Forms
1	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	9
2	USS Clairton Works, USX Corp.	Clairton, PA	33	19
3	Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena, TX	28	12
4	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	8
5	Steel Dynamics Inc.	Butler, IN	33	7
6	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33	7
7	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33	9
8	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28	20
9	Regal Ware Inc.	Kewaskum, WI	34	6
10	Nucor Steel	Plymouth, UT	33	7
11	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	18
12	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26	8
13	Boise Cascade Corp.	Saint Helens, OR	26	9
14	CPI Kraft Div., Consolidated Papers Inc.	Wisconsin Rapids, WI	26	14
15	Stone Container Corp.	Panama City, FL	26	10
16	USS Mon Valley Works, USX Corp.	Braddock, PA	33	7
17	Hercules Inc.	Hopewell, VA	28	12
18	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33	10
19	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3
20	Pfizer Inc.	Groton, CT	28	16
21	Penford Prods. Co., Penford Corp.	Cedar Rapids, IA	20	5
22	Potlatch Corp., Minnesota Pulp & Paper Div.	Cloquet, MN	26	8
23	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33	6
24	Timken Co., Faircrest Steel Plant	Canton, OH	33	6
25	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33	5
26	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	6
27	Pharmacia & Upjohn Co.	Portage, MI	28	25
28	FMC Corp.	Baltimore, MD	28	18
29	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6
30	Bar Techs. Inc.	Johnstown, PA	33	6
31	Stone Container Corp.	Hopewell, VA	26	10
32	Southwire Co.	Carrollton, GA	Mult.	37
33	S.D. Warren Co.	Muskegon, MI	26	8
34	Ciba Specialty Chemicals Corp.	McIntosh, AL	28	32
35	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33	5
36	ASARCO Inc.	Omaha, NE	33	6
37	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	5
38	Inspec USA Inc., Unit 1, Inspec Group PLC	Galena, KS	28	4
39	Ameristeel Corp.	Charlotte, NC	33	6
40	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28	16
41	Oregon Steel Mills Inc.	Portland, OR	33	7
42	Shepherd Chemical Co.	Cincinnati, OH	28	11
43	International Paper Co., Erie Mill	Erie, PA	26	10
44	Armco Inc.	Zanesville, OH	33	7
45	Dow Corning Corp.	Midland, MI	28	24
46	Union Carbide Corp.	Texas City, TX	28	36
47	Warner-Lambert Co., Parke-Davis Div.	Holland, MI	28	12
48	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.	8
49	Gwaltney of Smithfield Ltd., Smithfield Foods Inc.	Smithfield, VA	20	1
50	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	2
	Subtotal			549
	% of Total			0.9
	Total			58,252

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Major Chemicals Reported (Primary Transfers)*
1	0	0	0	13,855,648	13,855,648	Zinc and compounds (transfers of metals)
2	9,944,975	0	58	0	9,945,033	Ethylene (transfers to treatment)
3	183,178	7,767,699	11	13,156	7,964,044	Nitric acid and nitrate compounds (transfers to sewage)
4	0	0	0	7,543,045	7,543,045	Zinc and compounds (transfers of metals)
5	0	0	0	6,529,560	6,529,560	Zinc and compounds (transfers of metals)
6	0	0	0	6,086,892	6,086,892	Zinc and compounds (transfers of metals)
7	14,957	0	0	5,609,771	5,624,728	Zinc and compounds (transfers of metals)
8	115,728	3,997,034	195	0	4,112,957	Ethylene glycol (transfers to sewage)
9	0	0	4,078,005	0	4,078,005	Aluminum oxide (transfers to disposal)
10	0	0	0	3,922,477	3,922,477	Zinc and compounds (transfers of metals)
11	0	10,970	0	3,497,819	3,508,789	Zinc and compounds (transfers of metals)
12	0	3,361,224	0	0	3,361,224	Methanol (transfers to sewage)
13	0	3,327,347	1,280	3,628	3,332,255	Methanol (transfers to sewage)
14	3,202,562	0	0	35,533	3,238,095	Methanol (transfers to treatment)
15	0	3,082,333	0	25,122	3,107,455	Methanol (transfers to sewage)
16	0	0	0	3,090,268	3,090,268	Zinc and compounds (transfers of metals)
17	0	3,022,319	0	0	3,022,319	Nitric acid and nitrate compounds, Ethylene glycol (transfers to sewage)
18	0	0	0	2,957,542	2,957,542	Zinc and compounds (transfers of metals)
19	0	0	0	2,863,172	2,863,172	Copper and compounds (transfers of metals)
20	2,741,916	1,314	839	24,912	2,768,981	Methanol (transfers to treatment)
21	366	2,683,134	0	0	2,683,500	Ethylene glycol (transfers to sewage)
22	0	2,609,198	0	584	2,609,782	Methanol (transfers to sewage)
23	0	0	0	2,498,413	2,498,413	Zinc and compounds (transfers of metals)
24	0	0	0	2,486,113	2,486,113	Zinc and compounds (transfers of metals)
25	0	0	0	2,388,657	2,388,657	Zinc and compounds (transfers of metals)
26	0	0	0	2,384,320	2,384,320	Zinc and compounds (transfers of metals)
27	1,656,263	655,802	6,191	7,301	2,325,557	Dichloromethane (transfers to treatment)
28	2,165,055	118,141	35	0	2,283,231	Methanol, Toluene (transfers to treatment)
29	0	0	0	2,175,039	2,175,039	Zinc and compounds (transfers of metals)
30	0	0	884	1,925,941	1,926,825	Zinc and compounds (transfers of metals)
31	0	1,749,070	0	169,932	1,919,002	Methanol (transfers to sewage)
32	1	0	6	1,917,884	1,917,891	Zinc/Lead and compounds (transfers of metals)
33	0	1,857,074	0	0	1,857,074	Methanol (transfers to sewage)
34	1,785,442	0	0	0	1,785,442	Methanol (transfers to treatment)
35	0	0	0	1,758,623	1,758,623	Zinc and compounds (transfers of metals)
36	0	0	0	1,742,791	1,742,791	Lead/Zinc and compounds (transfers of metals)
37	0	0	0	1,723,356	1,723,356	Lead and compounds (transfers of metals)
38	1,415,918	0	280,771	0	1,696,689	Nitric acid and nitrate compounds (transfers to treatment)
39	0	0	0	1,680,432	1,680,432	Zinc and compounds (transfers of metals)
40	1,619,823	14,265	0	0	1,634,088	Methanol, Carbon tetrachloride, Xylene (transfers to treatment)
41	0	0	0	1,620,869	1,620,869	Zinc and compounds (transfers of metals)
42	0	1,599,768	0	6,546	1,606,314	Nitric acid and nitrate compounds (transfers to sewage)
43	0	1,592,336	1,138	9,670	1,603,144	Methanol (transfers to sewage)
44	1,551,021	0	907	27,687	1,579,615	Nitric acid and nitrate compounds (transfers to treatment)
45	1,575,967	0	68	0	1,576,035	Toluene, Chloromethane, Xylene, Methanol (transfers to treatment)
46	29,930	1,504,204	9,257	7,549	1,550,940	Methanol (transfers to sewage)
47	1,523,581	0	5	0	1,523,586	Toluene, Methanol (transfers to treatment)
48	0	320	1,678	1,487,000	1,488,998	Zinc and compounds (transfers of metals)
49	0	1,435,802	0	0	1,435,802	Nitric acid and nitrate compounds (transfers to sewage)
50	0	0	0	1,434,288	1,434,288	Chromium and compounds (transfers of metals)
	29,526,683	40,389,354	4,381,328	83,511,540	157,808,905	
	32.1	40.0	21.4	46.3	40.0	
	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	

* Chemicals accounting for more than 70% of total transfers from the facility.

Table 4-13

M 1997

NPRI Total Off-site Transfers by All Facilities and by Facilities with Largest Amounts, by Province, 1997

Province	All NPRI Facilities						Top 50 Facilities		Top 50 Facilities as % of All Facilities	
	Number of Facilities	Treatment (except metals) (kg)	Sewage/ POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/ Disposal of Metals (kg)	Total Transfers (kg)	Number of Facilities	Total Transfers (kg)	Facilities (%)	Total Transfers (%)
Alberta	107	570,301	5,274	226,810	364,557	1,166,942	2	558,927	1.9	47.9
British Columbia	77	32,833	18,324	294,558	544,694	890,409	2	755,370	2.6	84.8
Manitoba	44	266,510	40	6,112	84,532	357,194	1	126,019	2.3	35.3
New Brunswick	25	1,467,887	0	162,592	467,667	2,098,146	2	2,060,480	8.0	98.2
Newfoundland	8	0	0	0	0	0	0	0	0.0	—
Nova Scotia	23	300,787	0	79,549	92,270	472,606	1	296,054	4.3	62.6
Ontario	767	5,181,801	4,777,146	1,030,252	24,406,096	35,395,295	30	31,193,984	3.9	88.1
Prince Edward Island	3	34,694	0	0	0	34,694	0	0	0.0	0.0
Quebec	356	2,069,380	458,013	730,484	5,820,587	9,078,464	12	7,101,128	3.4	78.2
Saskatchewan	20	1,500	2,045	2,658	8,308	14,511	0	0	0.0	0.0
Total	1,430	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	50	42,091,962	3.5	85.0

Geographic Distribution of Top Facilities

Thirty of the 50 NPRI facilities with the largest off-site transfers were located in the province of Ontario. They represented four percent of Ontario's facilities but produced 88 percent (31.2 million kg) of the transfers.

Quebec had 12 of the top facilities, representing three percent of Quebec's facilities and 78 percent (7.1 million kg) of its transfers. All but three of the provinces (Newfoundland, Prince Edward Island and Saskatchewan) had at least one of the top facilities (**Table 4-13**).

Six of the 50 TRI facilities reporting the largest transfers were located in Pennsylvania and another six in Michigan. These facilities reported 70 percent (32.1 million kg) of Pennsylvania's transfers and 65 percent (16.9 million kg) of Michigan's. Five facilities in Texas reported 50 percent

(18.4 million kg) of that state's transfers. These facilities represented less than one percent of reporting facilities in Pennsylvania, Michigan and Texas. A total of 22 states held one or more of the 50 TRI facilities with the largest transfers (**Table 4-14**).

Table 4-14

TRI Total Off-site Transfers by All Facilities and by Facilities with Largest Amounts, by State, 1997

M 1997

State	All TRI Facilities					Top 50 Facilities		Top 50 Facilities as % of All Facilities		
	Number of Facilities	Treatment (except metals) (kg)	Sewage/ POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/ Disposal of Metals (kg)	Total Transfers (kg)	Number of Facilities	Total Transfers (kg)	Facilities (%)	Total Transfers (%)
Alabama	461	3,863,262	238,217	746,919	6,468,091	11,316,489	2	4,648,614	0.4	41.1
Alaska	6	988	0	0	145	1,133	0	0	0.0	0.0
Arizona	175	276,071	747,204	4,766	737,376	1,765,417	0	0	0.0	0.0
Arkansas	326	485,950	25,469	490,178	11,858,588	12,860,185	2	10,500,587	0.6	81.7
California	1,154	1,535,042	6,814,863	424,013	3,123,495	11,897,413	0	0	0.0	0.0
Colorado	151	443,467	234,590	184,826	107,346	970,229	0	0	0.0	0.0
Connecticut	278	4,156,514	447,387	82,641	1,497,925	6,184,467	1	2,768,981	0.4	44.8
Delaware	60	185,074	1,267,429	1,104	49,209	1,502,816	0	0	0.0	0.0
District of Columbia	1	0	0	0	2	2	0	0	0.0	0.0
Florida	457	1,651,849	3,338,360	512,854	2,714,103	8,217,166	2	5,282,494	0.4	64.3
Georgia	609	892,746	1,227,579	315,356	6,160,762	8,596,443	2	4,306,548	0.3	50.1
Hawaii	10	826	0	2,408	24	3,258	0	0	0.0	0.0
Idaho	50	6,631	214,363	1,614	118,132	340,740	0	0	0.0	0.0
Illinois	1,166	2,361,308	2,286,279	2,028,190	12,436,769	19,112,546	3	6,371,731	0.3	33.3
Indiana	913	2,731,478	1,198,621	994,486	18,929,129	23,853,714	2	12,154,288	0.2	51.0
Iowa	356	640,426	3,089,528	84,316	1,826,922	5,641,192	1	2,683,500	0.3	47.6
Kansas	245	1,622,232	524,967	359,579	1,372,433	3,879,211	1	1,696,689	0.4	43.7
Kentucky	380	2,478,457	531,233	725,135	3,073,227	6,808,052	0	0	0.0	0.0
Louisiana	261	3,518,659	183,960	160,075	510,893	4,373,587	0	0	0.0	0.0
Maine	75	17,661	51,707	97,150	683,479	849,997	0	0	0.0	0.0
Maryland	165	2,374,255	1,069,421	47,879	431,928	3,923,483	1	2,283,231	0.6	58.2
Massachusetts	422	2,122,979	2,201,596	100,482	604,037	5,029,094	0	0	0.0	0.0
Michigan	786	6,017,696	5,616,197	411,264	13,989,138	26,034,295	6	16,877,933	0.8	64.8
Minnesota	429	314,374	3,900,567	55,108	1,044,075	5,314,124	1	2,609,782	0.2	49.1
Mississippi	264	489,272	202,934	93,243	446,794	1,232,243	0	0	0.0	0.0
Missouri	502	3,647,025	816,313	115,078	2,227,988	6,806,404	0	0	0.0	0.0
Montana	23	5,710	10	356	547,306	553,382	0	0	0.0	0.0
Nebraska	141	32,769	154,293	70,332	4,152,825	4,410,219	2	3,466,147	1.4	78.6
Nevada	43	3,654	4,270	181	5,435	13,540	0	0	0.0	0.0
New Hampshire	97	154,860	129,294	6,144	126,906	417,204	0	0	0.0	0.0
New Jersey	498	2,179,750	8,773,025	256,132	1,654,308	12,863,215	0	0	0.0	0.0
New Mexico	32	59,113	152,382	2,374	17,595	231,464	0	0	0.0	0.0
New York	600	2,336,922	1,940,760	304,634	2,982,819	7,565,135	0	0	0.0	0.0
North Carolina	736	1,376,809	534,648	389,132	2,672,442	4,973,031	1	1,680,432	0.1	33.8
North Dakota	29	11,103	59,111	4	15,088	85,306	0	0	0.0	0.0
Ohio	1,464	6,495,013	6,362,433	1,113,020	17,824,116	31,794,582	3	5,672,042	0.2	17.8
Oklahoma	261	668,668	191,877	30,452	1,619,324	2,510,321	0	0	0.0	0.0
Oregon	227	147,776	4,262,042	16,238	2,910,726	7,336,782	2	4,953,124	0.9	67.5
Pennsylvania	1,120	14,754,409	2,979,966	875,318	27,518,830	46,128,523	6	32,055,006	0.5	69.5
Puerto Rico	134	2,288,045	994,459	115,418	217,640	3,615,562	0	0	0.0	0.0
Rhode Island	116	122,495	128,951	30,674	218,246	500,366	0	0	0.0	0.0
South Carolina	439	3,298,436	1,899,517	104,126	3,548,739	8,850,818	0	0	0.0	0.0
South Dakota	64	49,224	1,084,486	158	55,182	1,189,050	0	0	0.0	0.0
Tennessee	568	2,503,848	2,201,533	494,092	3,353,757	8,553,230	0	0	0.0	0.0
Texas	1,080	7,508,890	20,567,001	3,178,042	5,763,600	37,017,533	5	18,423,453	0.5	49.8
Utah	125	42,091	121,325	94,667	4,324,370	4,582,453	1	3,922,477	0.8	85.6
Vermont	33	59,167	684	1,475	66,003	127,329	0	0	0.0	0.0
Virgin Islands	2	135,332	0	3	24,273	159,608	0	0	0.0	0.0
Virginia	387	692,507	7,634,204	148,823	2,193,120	10,668,654	3	6,377,123	0.8	59.8
Washington	254	239,206	1,201,064	548,873	2,257,301	4,246,444	1	1,758,623	0.4	41.4
West Virginia	125	988,335	1,643,904	383,807	1,205,914	4,221,960	0	0	0.0	0.0
Wisconsin	798	4,045,312	1,704,602	4,280,639	4,851,618	14,882,171	2	7,316,100	0.3	49.2
Wyoming	27	24,538	113	825	2,698	28,174	0	0	0.0	0.0
Total	19,125	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	50	157,808,905	0.3	40.0

Transfers by Chemical
Top Chemicals

The 25 matched chemicals with the largest total off-site transfers constituted 99 percent of all NPRI transfers, with 48.9 million kg. In TRI, the top 25 chemicals constituted 92 percent of the transfers, with 360.6 million kg. Most of the transfers of the top 25 chemicals were to treatment/sewage/disposal of metals—31.7 million kg and 177.8 million kg for NPRI and TRI, respectively. For NPRI, more nonmetals were transferred to treatment (9.5 million kg) than to sewage/POTWs (5.2 million kg—see **Table 4-15**). Conversely, for TRI, transfers of nonmetals consisted of less to treatment (71.5 million kg) than to sewage/POTWs (94.0 million kg—see **Table 4-16**).

Table 4-15		The 25 NPRI Chemicals with the Largest Total Off-site Transfers, 1997						
M	1997							
Rank	CAS Number	Chemical	Treatment (except metals) (kg)	Sewage POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment Sewage/Disposal of Metals (kg)	Total Transfers (kg)	% of Total
1	—	Zinc (and its compounds)	0	0	0	19,888,014	19,888,014	40.2
2	—	Nitric acid and nitrate compounds	187,911	4,725,903	148,877	0	5,062,691	10.2
3	—	Manganese (and its compounds)	0	0	0	4,862,688	4,862,688	9.8
4	—	Lead (and its compounds)	0	0	0	2,915,080	2,915,080	5.9
5	67-56-1	Methanol	2,453,554	280,275	172,734	0	2,906,563	5.9
6	108-88-3	Toluene	2,224,275	1,350	35,368	0	2,260,993	4.6
7	—	Chromium (and its compounds)	0	0	0	1,990,561	1,990,561	4.0
8	1330-20-7	Xylene (mixed isomers)	1,674,174	346	36,433	0	1,710,953	3.5
9	—	Copper (and its compounds)	0	0	0	1,111,567	1,111,567	2.2
10	1332-21-4	Asbestos (friable)	0	0	1,103,142	0	1,103,142	2.2
11	78-93-3	Methyl ethyl ketone	778,614	72	17,260	0	795,946	1.6
12	107-21-1	Ethylene glycol	486,609	38,257	40,333	0	565,199	1.1
13	—	Nickel (and its compounds)	0	0	0	515,592	515,592	1.0
14	7664-38-2	Phosphoric acid	24,734	21,233	450,824	0	496,791	1.0
15	71-36-3	n-Butyl alcohol	375,495	11,102	4,757	0	391,354	0.8
16	110-82-7	Cyclohexane	330,692	0	22	0	330,714	0.7
17	100-42-5	Styrene	253,353	71	68,121	0	321,545	0.6
18	50-00-0	Formaldehyde	97,312	30,054	175,366	0	302,732	0.6
19	108-95-2	Phenol	141,125	132,416	16,786	0	290,327	0.6
20	75-09-2	Dichloromethane	256,008	4,100	0	0	260,108	0.5
21	7429-90-5	Aluminum (fume or dust)	0	0	0	255,416	255,416	0.5
22	1344-28-1	Aluminum oxide (fibrous forms)	0	0	154,020	0	154,020	0.3
23	75-05-8	Acetonitrile	130,000	0	0	0	130,000	0.3
24	—	Cadmium (and its compounds)	0	0	0	123,627	123,627	0.2
25	108-10-1	Methyl isobutyl ketone	105,677	0	2,876	0	108,553	0.2
Subtotal			9,519,533	5,245,179	2,426,919	31,662,545	48,854,176	98.7
% of Total			95.9	99.7	95.8	99.6	98.7	
Total			9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	100.0

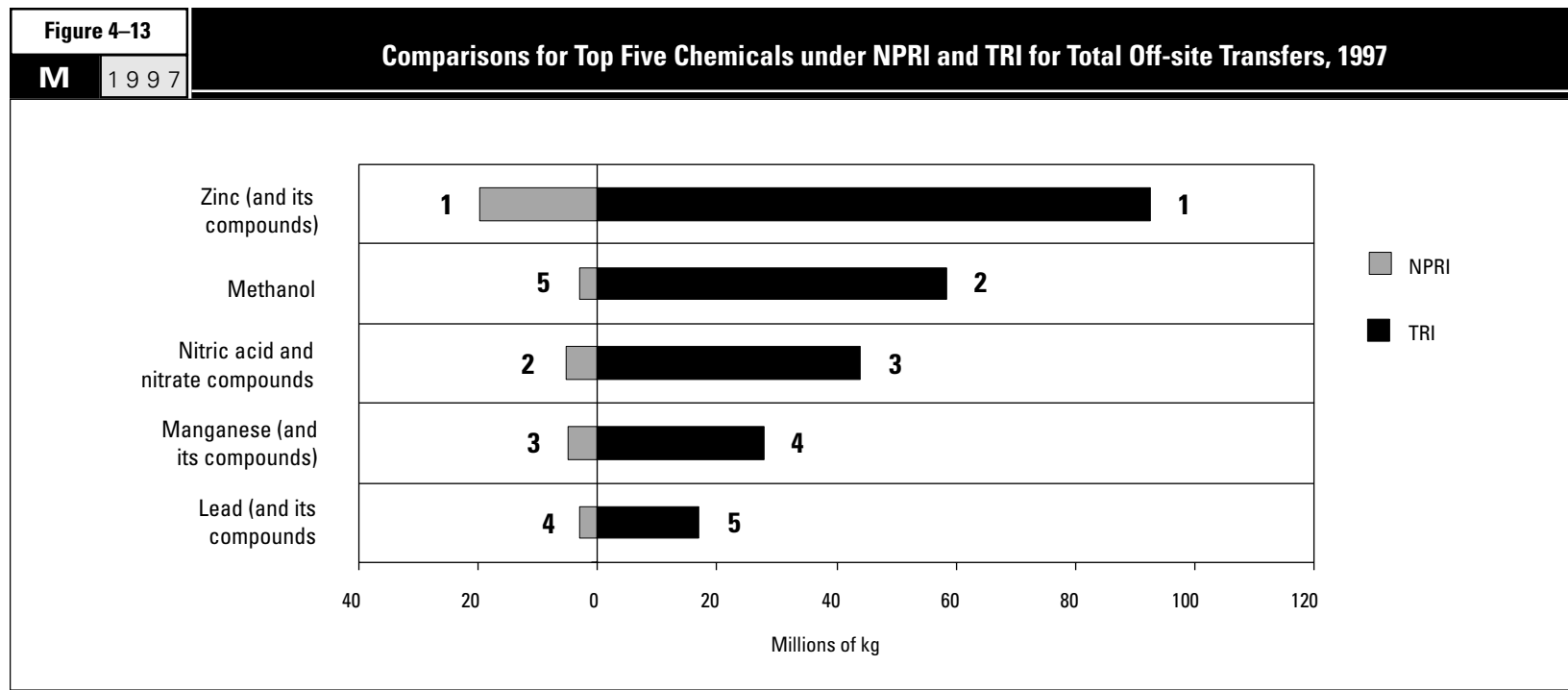
Table 4-16

The 25 TRI Chemicals with the Largest Total Off-site Transfers, 1997

M 1997

Rank	CAS Number	Chemical	Treatment (except metals) (kg)	Sewage POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment Sewage/ Disposal of Metals (kg)	Total Transfers (kg)	% of Total
1	—	Zinc (and its compounds)	0	0	0	95,103,244	95,103,244	24.1
2	67-56-1	Methanol	19,635,597	40,150,928	431,847	0	60,218,372	15.3
3	—	Nitric acid and nitrate compounds	6,906,658	35,543,690	2,893,775	0	45,344,123	11.5
4	—	Manganese (and its compounds)	0	0	0	28,686,838	28,686,838	7.3
5	—	Lead (and its compounds)	0	0	0	17,600,736	17,600,736	4.5
6	107-21-1	Ethylene glycol	2,095,666	12,570,395	709,141	0	15,375,202	3.9
7	—	Copper (and its compounds)	0	0	0	13,536,196	13,536,196	3.4
8	—	Chromium (and its compounds)	0	0	0	11,726,757	11,726,757	3.0
9	74-85-1	Ethylene	9,885,737	186	661	0	9,886,584	2.5
10	108-88-3	Toluene	8,885,209	277,466	648,831	0	9,811,506	2.5
11	75-09-2	Dichloromethane	5,708,970	279,604	96,768	0	6,085,342	1.5
12	—	Nickel (and its compounds)	0	0	0	5,199,851	5,199,851	1.3
13	1330-20-7	Xylene (mixed isomers)	4,739,840	130,609	323,982	0	5,194,431	1.3
14	7664-38-2	Phosphoric acid	1,727,850	1,869,571	1,238,118	0	4,835,539	1.2
15	1344-28-1	Aluminum oxide (fibrous forms)	16,967	482	4,688,488	0	4,705,937	1.2
16	75-05-8	Acetonitrile	2,470,165	242,546	1,398,827	0	4,111,538	1.0
17	7429-90-5	Aluminum (fume or dust)	0	0	0	3,813,654	3,813,654	1.0
18	108-95-2	Phenol	1,597,082	1,286,470	551,524	0	3,435,076	0.9
19	78-93-3	Methyl ethyl ketone	2,795,505	280,382	192,835	0	3,268,722	0.8
20	100-42-5	Styrene	2,275,591	90,819	717,419	0	3,083,829	0.8
21	—	Antimony (and its compounds)	0	0	0	2,164,243	2,164,243	0.5
22	71-36-3	n-Butyl alcohol	979,528	917,883	85,674	0	1,983,085	0.5
23	1332-21-4	Asbestos (friable)	0	1	1,963,541	0	1,963,542	0.5
24	110-82-7	Cyclohexane	1,739,077	5,465	23,399	0	1,767,941	0.4
25	85-44-9	Phthalic anhydride	86,132	309,249	1,337,006	0	1,732,387	0.4
		Subtotal	71,545,574	93,955,746	17,301,836	177,831,519	360,634,675	91.5
		% of Total	77.7	93.1	84.5	98.5	91.5	
		Total	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	100.0

The top chemical transferred in both NPRI and TRI was zinc and its compounds, with 19.9 million kg in NPRI and 95.1 million kg in TRI. Four other substances ranked in the top five in both NPRI and TRI, although not in the same order. Methanol ranked second for TRI, with 60.2 million kg transferred, while it ranked fifth for NPRI, with 2.9 million kg transferred. Transfers of nitric acid and nitrate compounds amounted to 5.1 million kg for NPRI (the second-largest transfer amount) and 45.3 million kg for TRI (the third-largest). Manganese and its compounds was the third-ranking chemical in NPRI for transfers, with 4.9 million kg; it ranked fourth in TRI, with 28.7 million kg. Lead, and its compounds, ranked fourth in NPRI, with 2.9 million kg (just slightly above transfers of methanol), while in TRI, lead and its compounds ranked fifth, with 17.6 million kg (Figure 4-13).



► Numbers indicate rank for transfers in matched data set.

Table 4-17		NPRI Off-site Transfers of Known or Suspected Carcinogens [†] , 1997					
M	1997						
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)	% of Total for Carcinogens
—	Lead (and its compounds)	0	0	0	2,915,080	2,915,080	37.4
—	Chromium (and its compounds)	0	0	0	1,990,561	1,990,561	25.5
1332-21-4	Asbestos (friable)	0	0	1,103,142	0	1,103,142	14.1
—	Nickel (and its compounds)	0	0	0	515,592	515,592	6.6
100-42-5	Styrene	253,353	71	68,121	0	321,545	4.1
50-00-0	Formaldehyde	97,312	30,054	175,366	0	302,732	3.9
75-09-2	Dichloromethane	256,008	4,100	0	0	260,108	3.3
—	Cadmium (and its compounds)	0	0	0	123,627	123,627	1.6
—	Arsenic (and its compounds)	0	0	0	67,092	67,092	0.9
117-81-7	Di(2-ethylhexyl) phthalate	2,170	105	43,165	0	45,440	0.6
79-01-6	Trichloroethylene	37,282	0	0	0	37,282	0.5
71-43-2	Benzene	20,952	66	6,284	0	27,302	0.3
127-18-4	Tetrachloroethylene	24,659	0	0	0	24,659	0.3
106-99-0	1,3-Butadiene	12,620	0	1	0	12,621	0.2
56-23-5	Carbon tetrachloride	12,429	0	0	0	12,429	0.2
—	Cobalt (and its compounds)	0	0	0	10,372	10,372	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	7,911	0	404	0	8,315	0.1
75-07-0	Acetaldehyde	7,070	0	4	0	7,074	0.1
67-66-3	Chloroform	5,742	0	137	0	5,879	0.1
108-05-4	Vinyl acetate	1,402	1,125	1,578	0	4,105	0.1
139-13-9	Nitrilotriacetic acid	900	1,802	200	0	2,902	0.0
79-06-1	Acrylamide	2,600	50	34	0	2,684	0.0
107-06-2	1,2-Dichloroethane	589	0	0	0	589	0.0
106-46-7	1,4-Dichlorobenzene	0	0	400	0	400	0.0
140-88-5	Ethyl acrylate	80	0	0	0	80	0.0
106-89-8	Epichlorohydrin	0	0	3	0	3	0.0
75-01-4	Vinyl chloride	0	0	1	0	1	0.0
	Subtotal	743,079	37,373	1,398,840	5,622,324	7,801,616	100.0
	% of Total	7.5	0.7	55.2	17.7	15.8	
	Total for All Matched Chemicals	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

► A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Carcinogens

NPRI facilities reported transfers of 27 substances designated as known or suspected carcinogens by IARC or NTP, out of 48 such substances in the matched data set. Total transfers of these substances were 7.8 million kg, or 16 percent of all NPRI transfers. TRI facilities reported transferring 46 of the 48 carcinogens, amounting to 59.2 million kg, or 15 percent of total transfers (Tables 4-17 and 4-18).

Lead and its compounds was reported in the largest amounts in both NPRI (2.9 million kg) and TRI (17.6 million kg). Chromium and its compounds ranked second in both systems (2.0 million kg in NPRI and 11.7 million kg in TRI). These two metals accounted for nearly two-thirds of NPRI transfers of carcinogens and one-half of such transfers in TRI. For NPRI facilities, asbestos (1.1 million kg) ranked third for off-site transfers, while in TRI, this ranking was held by dichloromethane (6.1 million kg).

Predominately, carcinogenic substances in transfers were metals. Of the 48 carcinogens in the matched data set, six were metals: arsenic, cadmium, chromium, cobalt, lead, and nickel, with their compounds. NPRI facilities sent 5.6 million kg of carcinogenic metals off-site and TRI facilities sent 37.1 million kg. This was 72 percent of transfers of carcinogens in NPRI and 63 percent of those in TRI. NPRI facilities also reported transferring 1.4 million kg of nonmetallic carcinogens to disposal, equal to 18 percent, while TRI reported transferring more (15.6 million kg, or 26 percent) to treatment (Figure 4-14).

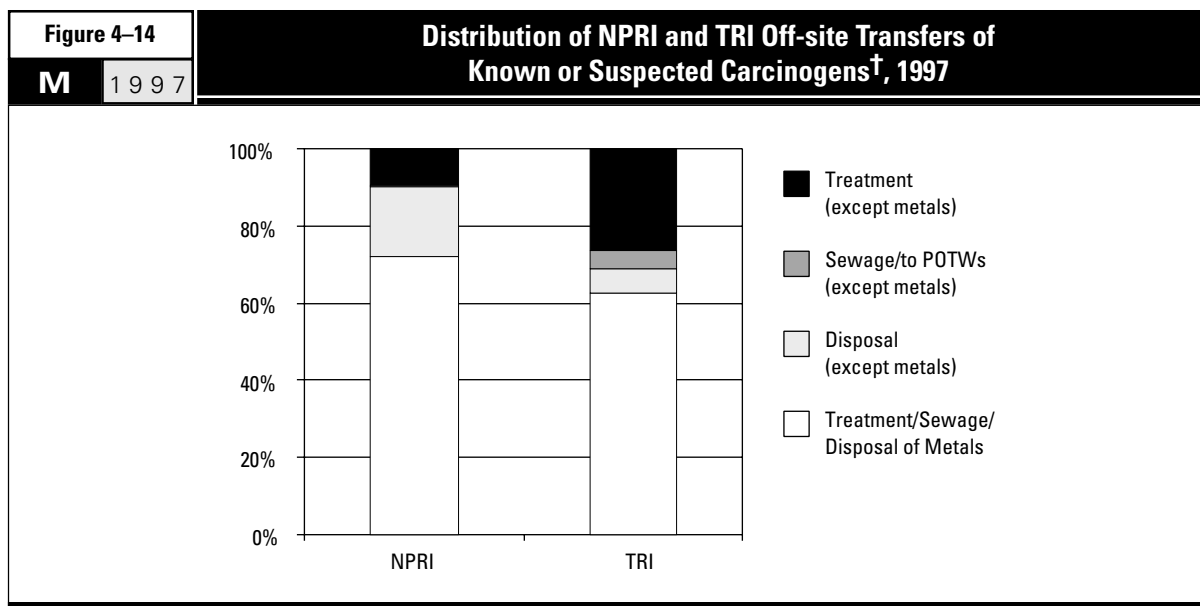
For NPRI, the top 50 facilities reported 90 percent of the total off-site transfers of designated carcinogens, equal to 7.0 million kg. The top nine facilities reported the largest amounts of such transfers for carcinogenic metals (Figure 4-15 and Table 4-19).

The top 50 facilities in TRI reported transferring 43 percent of the total designated carcinogens off-site, equal to 25.2 million kg. The top facility mostly transferred nonmetals to treatment, but the next nine facilities reported transfers of metals designated as carcinogens (Figure 4-15 and Table 4-20).

Table 4-18		TRI Off-site Transfers of Known or Suspected Carcinogens†, 1997					
M	1997						
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)	% of Total for Carcinogens
—	Lead (and its compounds)	0	0	0	17,600,736	17,600,736	29.7
—	Chromium (and its compounds)	0	0	0	11,726,757	11,726,757	19.8
75-09-2	Dichloromethane	5,708,970	279,604	96,768	0	6,085,342	10.3
—	Nickel (and its compounds)	0	0	0	5,199,851	5,199,851	8.8
100-42-5	Styrene	2,275,591	90,819	717,419	0	3,083,829	5.2
1332-21-4	Asbestos (friable)	0	1	1,963,541	0	1,963,542	3.3
50-00-0	Formaldehyde	349,634	1,086,345	71,009	0	1,506,988	2.5
—	Arsenic (and its compounds)	0	0	0	1,335,280	1,335,280	2.3
71-43-2	Benzene	908,520	100,095	37,018	0	1,045,633	1.8
107-06-2	1,2-Dichloroethane	811,722	2,398	54,635	0	868,755	1.5
67-66-3	Chloroform	666,918	166,450	6,571	0	839,939	1.4
—	Cadmium (and its compounds)	0	0	0	684,109	684,109	1.2
79-01-6	Trichloroethylene	573,439	12,162	78,834	0	664,435	1.1
106-89-8	Epichlorohydrin	593,556	24,220	1,823	0	619,599	1.0
98-95-3	Nitrobenzene	589,442	85	109	0	589,636	1.0
—	Cobalt (and its compounds)	0	0	0	586,218	586,218	1.0
117-81-7	Di(2-ethylhexyl) phthalate	102,443	6,532	451,263	0	560,238	0.9
108-05-4	Vinyl acetate	487,275	48,804	13,135	0	549,214	0.9
75-07-0	Acetaldehyde	210,812	330,102	2,484	0	543,398	0.9
107-13-1	Acrylonitrile	469,201	60,034	2,212	0	531,447	0.9
56-23-5	Carbon tetrachloride	514,332	283	8,591	0	523,206	0.9
127-18-4	Tetrachloroethylene	480,654	491	7,019	0	488,164	0.8
26471-62-5	Toluenediisocyanate (mixed isomers)	404,371	0	17,187	0	421,558	0.7
75-56-9	Propylene oxide	4,095	281,607	13,562	0	299,264	0.5
123-91-1	1,4-Dioxane	11,522	116,686	138,677	0	266,885	0.5
106-99-0	1,3-Butadiene	141,655	304	2,992	0	144,951	0.2
79-06-1	Acrylamide	10,227	89,596	11,921	0	111,744	0.2
106-46-7	1,4-Dichlorobenzene	89,291	1	130	0	89,422	0.2
75-01-4	Vinyl chloride	42,329	121	40,927	0	83,377	0.1
140-88-5	Ethyl acrylate	54,228	17,706	2,187	0	74,121	0.1
75-21-8	Ethylene oxide	15,379	44,667	23	0	60,069	0.1
101-77-9	4,4'-Methylenedianiline	31,365	986	7,603	0	39,954	0.1
302-01-2	Hydrazine	6,472	350	13,800	0	20,622	0.0
62-56-6	Thiourea	4,563	611	1,909	0	7,083	0.0
584-84-9	Toluene-2,4-diisocyanate	4,097	115	2,801	0	7,013	0.0
139-13-9	Nitrilotriacetic acid	0	5,506	0	0	5,506	0.0
96-45-7	Ethylene thiourea	1,891	1	2,565	0	4,457	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	3,059	2	0	0	3,061	0.0
91-08-7	Toluene-2,6-diisocyanate	812	0	617	0	1,429	0.0
77-78-1	Dimethyl sulfate	7	2	1,047	0	1,056	0.0
64-67-5	Diethyl sulfate	94	848	0	0	942	0.0
95-80-7	2,4-Diaminotoluene	125	0	0	0	125	0.0
94-59-7	Safrole	0	113	0	0	113	0.0
121-14-2	2,4-Dinitrotoluene	85	0	0	0	85	0.0
606-20-2	2,6-Dinitrotoluene	50	0	0	0	50	0.0
79-46-9	2-Nitropropane	0	0	11	0	11	0.0
	Subtotal	15,568,226	2,767,647	3,770,390	37,132,951	59,239,214	100.0
	% of Total	16.9	2.7	18.4	20.6	15.0	
	Total for All Matched Chemicals	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	

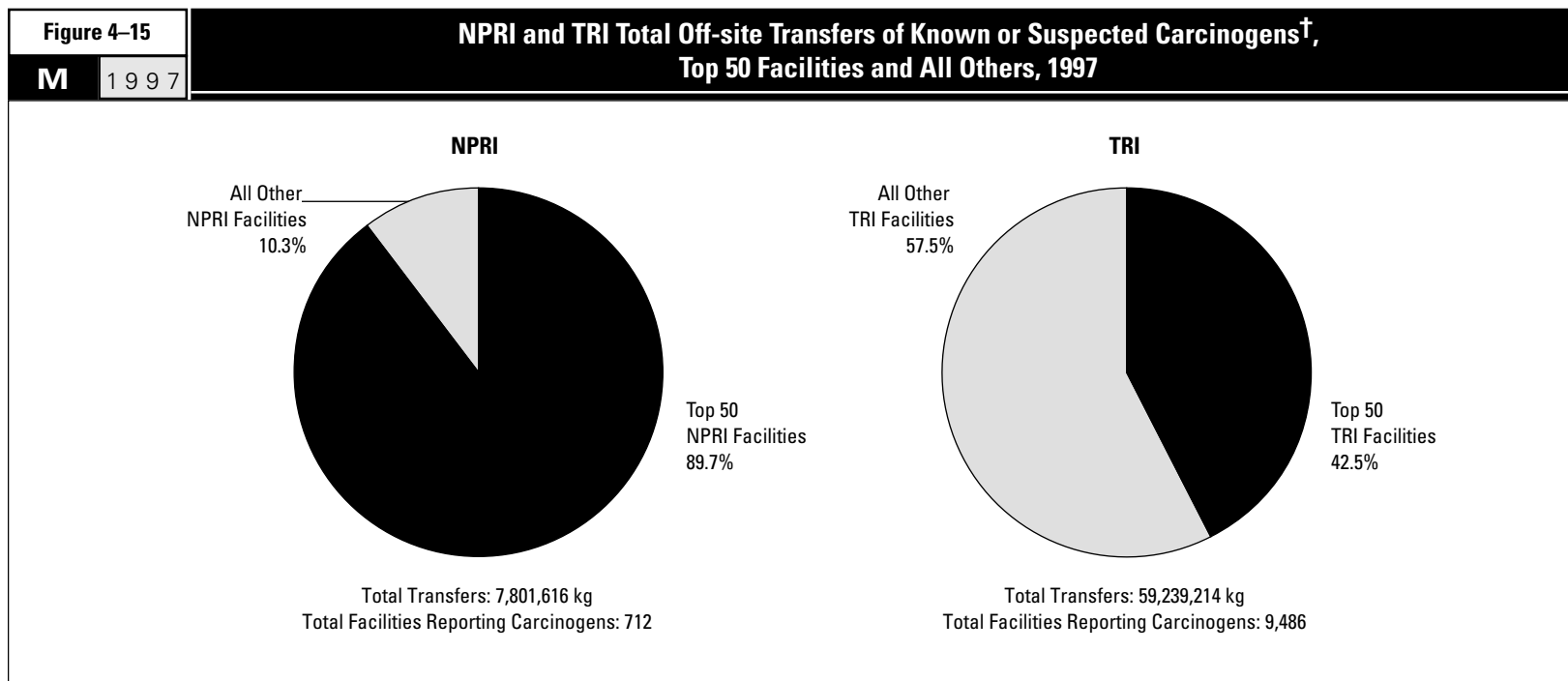
† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.



[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

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[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 4-19		The 50 NPRI Facilities with the Largest Total Off-site Transfers of Known or Suspected Carcinogens [†] , 1997			
M	1997				
Rank	Facility	City, Province	SIC Codes		Number of Forms
			Canada	US	
1	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	2
2	Co-Steel Lasco	Whitby, ON	29	33	3
3	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	3
4	Metalex Products Ltd.	Richmond, BC	29	33	2
5	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	3
6	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	2
7	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	5
8	Tonolli Canada Limited	Mississauga, ON	29	33	1
9	Dofasco Inc.	Hamilton, ON	29	33	5
10	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29	2
11	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6
12	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	2
13	Bayer Inc., Bayer AG	Sarnia, ON	37	28	5
14	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	2
15	Dow Chemical Canada Inc.	Varenes, QC	16	30	2
16	Ivaco Rolling Mills	L'Orignal, ON	29	33	3
17	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33	2
18	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc	Sayabec, QC	25	24	1
19	Chemrec Inc.	Cowansville, QC	37	28	3
20	Celanese Canada Inc.	Edmonton, AB	37	28	6
21	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	1
22	Zalev Brothers Limited	Windsor, ON	29	33	5
23	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	2
24	Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton, AB	37	28	1
25	Fraser Papers Inc., Noranda Forest Inc.	Edmundston, NB	27	26	4
26	Kronos Canada, Inc.	Varenes, QC	37	28	1
27	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34	2
28	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33	1
29	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	37	28	1
30	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	28	13
31	Produits Shell Canada Ltée., Raffinerie de Montréal-est	Montréal-est, QC	36	29	4
32	Kuntz Electroplating Inc.	Kitchener, ON	30	34	2
33	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28	1
34	Marswell Metal Industries Limited	Burlington, ON	30	34	1
35	A.G. Simpson Co Ltd.	Oshawa, ON	32	34	3
36	Bombardier Inc., Bombardier Produits récréatifs	St-Antoine-de-Tilly, QC	39	39	1
37	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	4
38	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	5
39	Kindred Industries, Div. of Emco Ltd.	Midland, ON	30	34	2
40	Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel, QC	30	34	2
41	Solutia Canada Inc, Produits chimiques	LaSalle, QC	37	28	2
42	North American Lumber, Roblin Forest Products	Roblin, MB	25	24	2
43	Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est, QC	29	33	6
44	Niagara Piston, Div. of Court Valve Co. Inc.	Beamsville, ON	32	37	2
45	Dow Chemical Canada Inc.	Sarnia, ON	37	28	17
46	Phytogen Pharmaceuticals Inc., Phytogen Life Sciences Inc.	Delta, BC	37	28	1
47	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	2
48	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	3
49	Garlock of Canada Ltd., Garlock Sealing Technology	Sherbrooke, QC	18	22	1
50	Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan, AB	29	33	2
Subtotal					154
% of Total					13.2
Total					1,166

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Major Chemicals Reported (Primary Transfers)*
1	0	0	0	545,510	545,510	Chromium and compounds (transfers of metals)
2	0	0	0	496,278	496,278	Lead and compounds (transfers of metals)
3	0	0	0	465,000	465,000	Lead and compounds (transfers of metals)
4	0	0	0	421,667	421,667	Lead and compounds (transfers of metals)
5	0	0	0	401,290	401,290	Chromium/Nickel and compounds (transfers of metals)
6	0	0	0	324,258	324,258	Chromium and compounds (transfers of metals)
7	0	0	0	316,350	316,350	Lead and compounds (transfers of metals)
8	0	0	0	311,202	311,202	Lead and compounds (transfers of metals)
9	0	63	0	302,700	302,763	Lead/Chromium and compounds (transfers of metals)
10	0	0	271,000	0	271,000	Asbestos (transfers to disposal)
11	0	0	230,000	400	230,400	Asbestos (transfers to disposal)
12	0	0	0	223,000	223,000	Lead and compounds (transfers of metals)
13	67,300	0	133,000	0	200,300	Asbestos (transfers to disposal), Styrene (transfers to treatment)
14	0	0	0	166,500	166,500	Lead and compounds (transfers of metals)
15	138,383	0	680	0	139,063	Styrene (transfers to treatment)
16	0	0	0	129,110	129,110	Lead and compounds (transfers of metals)
17	0	0	0	128,180	128,180	Chromium and compounds (transfers of metals)
18	0	0	127,000	0	127,000	Formaldehyde (transfers to disposal)
19	105,500	0	0	0	105,500	Dichloromethane, Trichloroethylene (transfers to treatment)
20	0	0	64,033	41,000	105,033	Asbestos (transfers to disposal), Chromium and compounds (transfers of metals)
21	0	0	0	100,000	100,000	Nickel and compounds (transfers of metals)
22	0	0	0	93,029	93,029	Lead/Nickel and compounds (transfers of metals)
23	0	0	0	91,952	91,952	Lead and compounds (transfers of metals)
24	89,214	0	0	0	89,214	Dichloromethane (transfers to treatment)
25	73,930	0	2,850	0	76,780	Formaldehyde (transfers to treatment)
26	0	0	0	75,000	75,000	Chromium and compounds (transfers of metals)
27	0	0	0	74,750	74,750	Chromium/Nickel and compounds (transfers of metals)
28	0	0	0	71,000	71,000	Lead and compounds (transfers of metals)
29	0	0	0	65,600	65,600	Lead and compounds (transfers of metals)
30	1,500	0	62,770	0	64,270	Asbestos (transfers to disposal)
31	1,000	0	37,650	21,500	60,150	Asbestos (transfers to disposal), Nickel and compounds (transfers of metals)
32	0	0	0	54,000	54,000	Chromium and compounds (transfers of metals)
33	51,700	0	0	0	51,700	Dichloromethane (transfers to treatment)
34	0	0	0	50,000	50,000	Lead and compounds (transfers of metals)
35	0	0	0	46,807	46,807	Chromium/Nickel and compounds (transfers of metals)
36	22,965	0	23,276	0	46,241	Styrene (transfers to disposal, treatment)
37	0	0	43,700	48	43,748	Asbestos (transfers to disposal)
38	37	0	43,602	2	43,641	Asbestos (transfers to disposal)
39	0	0	0	41,151	41,151	Nickel/Chromium and compounds (transfers of metals)
40	0	0	0	37,978	37,978	Chromium/Nickel and compounds (transfers of metals)
41	13,119	22,914	688	0	36,721	Formaldehyde (transfers to sewage, treatment)
42	0	0	0	34,090	34,090	Chromium/Arsenic and compounds (transfers of metals)
43	0	0	0	32,848	32,848	Arsenic and compounds (transfers of metals)
44	0	0	0	32,218	32,218	Chromium and compounds (transfers of metals)
45	30,931	0	0	0	30,931	Styrene, Tetrachloroethylene (transfers to treatment)
46	30,340	0	0	0	30,340	Dichloromethane (transfers to treatment)
47	0	0	29,200	0	29,200	Asbestos (transfers to disposal)
48	0	0	0	28,060	28,060	Lead and compounds (transfers of metals)
49	0	0	28,000	0	28,000	Asbestos (transfers to disposal)
50	0	0	0	26,138	26,138	Nickel and compounds (transfers of metals)
	625,919	22,977	1,097,449	5,248,616	6,994,961	
	84.2	61.5	78.5	93.4	89.7	
	743,079	37,373	1,398,840	5,622,324	7,801,616	

* Chemicals accounting for more than 70% of total transfers of carcinogens from the facility.

Table 4-20		The 50 TRI Facilities with the Largest Total Off-site Transfers of Known or Suspected Carcinogens [†] , 1997		
M	1997			
Rank	Facility	City, State	US SIC Code	Number of Forms
1	Pharmacia & Upjohn Co.	Portage, MI	28	4
2	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	2
3	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1
4	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	4
5	Quemetco Inc., RSR Corp.	City of Industry, CA	33	3
6	ASARCO Inc.	Omaha, NE	33	2
7	Quemetco Inc., RSR Corp.	Indianapolis, IN	33	3
8	C & D Techs. Inc.	Conyers, GA	36	1
9	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	4
10	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33	5
11	Shell Oil Co.	Deer Park, TX	Mult.	17
12	Wagner Brake, Cooper Ind. Inc.	Scottsville, KY	37	1
13	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA	33	3
14	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28	2
15	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	4
16	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	New Castle, IN	33	2
17	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO	33	3
18	Shieldalloy Metallurgical, Metallurg Inc.	Newfield, NJ	33	1
19	Reichhold Chemicals Inc.	Jacksonville, FL	28	2
20	Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta, PR	28	1
21	Maynard Steel Casting Co.	Milwaukee, WI	33	2
22	Dow North America, Allyn's Point Plant, Dow Chemical Co.	Gales Ferry, CT	Mult.	3
23	Southwire Co.	Carrollton, GA	Mult.	16
24	Corning Inc., Fall Brook Plant	Corning, NY	32	1
25	Lacks Ind. Inc., Airlane Plant, Lacks Ents. Inc.	Kentwood, MI	Mult.	3
26	E.I.S. Brake Parts, Cooper Ind. Inc.	Manila, AR	37	1
27	Squibb Mfg. Inc., Bristol-Myers Squibb Co.	Humacao, PR	28	3
28	Nucor Steel	Plymouth, UT	33	2
29	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28	4
30	Zinc Corp. of America, Horsehead Ind. Inc.	Bartlesville, OK	33	2
31	Scot Forge Co.	Spring Grove, IL	34	2
32	PPG Ind. Inc.	Lake Charles, LA	28	8
33	Specified Fuels & Chemicals	Channelview, TX	Mult.	2
34	Able Electro Polishing	Chicago, IL	34	2
35	Arco Chemical Co.	Westlake, LA	28	3
36	Dow Chemical Co.	Dalton, GA	Mult.	2
37	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	3
38	Arco Chemical Co., Bayport Div., Atlantic Richfield Co.	Pasadena, TX	28	1
39	ASARCO Inc.	East Helena, MT	33	4
40	GE Plastics, GE Co.	Pearlington, MS	28	2
41	Solutia Inc.	Springfield, MA	Mult.	4
42	Roche Vitamins Inc., Hoffmann-La Roche Inc.	Freeport, TX	28	1
43	Wayne Pigment Corp.	Milwaukee, WI	28	2
44	Thomson Consumer Electronics, Thomson Multimedia S.A.	Circleville, OH	32	2
45	American Video Glass Co.	Mt Pleasant, PA	32	2
46	Union Carbide Corp.	South Charleston, WV	28	7
47	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	3
48	AK Steel Corp., AK Steel Holding	Middletown, OH	33	5
49	Alza Corp.	Vacaville, CA	28	1
50	Occidental Chemical Corp., Occidental Petroleum Corp.	Convent, LA	28	4
	Subtotal			
	% of Total			
	Total			

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Major Chemicals Reported (Primary Transfers)*
1	1,629,089	126,005	4,526	69	1,759,689	Dichloromethane (transfers to treatment)
2	0	0	0	1,723,356	1,723,356	Lead and compounds (transfers of metals)
3	0	0	0	1,434,288	1,434,288	Chromium and compounds (transfers of metals)
4	0	0	0	1,061,318	1,061,318	Lead/Nickel/Cadmium and compounds (transfers of metals)
5	0	0	0	934,969	934,969	Lead and compounds (transfers of metals)
6	0	0	0	893,671	893,671	Lead and compounds (transfers of metals)
7	0	0	0	879,880	879,880	Lead and compounds (transfers of metals)
8	0	0	0	810,519	810,519	Lead and compounds (transfers of metals)
9	0	0	0	735,580	735,580	Lead and compounds (transfers of metals)
10	0	0	0	666,122	666,122	Arsenic/Cobalt/Lead and compounds (transfers of metals)
11	559,185	0	327	0	559,512	Epichlorohydrin (transfers to treatment)
12	0	0	557,771	0	557,771	Asbestos (transfers to disposal)
13	0	0	0	545,674	545,674	Lead and compounds (transfers of metals)
14	498,866	38,957	0	0	537,823	Dichloromethane (transfers to treatment)
15	0	0	0	478,160	478,160	Arsenic and compounds (transfers of metals)
16	0	0	0	476,191	476,191	Chromium/Nickel and compounds (transfers of metals)
17	0	0	0	475,008	475,008	Lead and compounds (transfers of metals)
18	0	0	0	468,822	468,822	Chromium and compounds (transfers of metals)
19	462,390	0	0	0	462,390	Styrene (transfers to treatment)
20	445,533	7,846	0	0	453,379	Dichloromethane (transfers to treatment)
21	0	0	0	436,890	436,890	Chromium and compounds (transfers of metals)
22	427,295	0	0	0	427,295	Styrene (transfers to treatment)
23	0	0	0	403,098	403,098	Lead and compounds (transfers of metals)
24	0	0	0	392,315	392,315	Lead and compounds (transfers of metals)
25	227	41,905	227	343,889	386,248	Nickel/Chromium and compounds (transfers of metals)
26	0	0	369,932	0	369,932	Asbestos (transfers to disposal)
27	363,883	2	0	0	363,885	Dichloromethane (transfers to treatment)
28	0	0	0	363,053	363,053	Lead and compounds (transfers of metals)
29	346,159	0	0	0	346,159	Carbon tetrachloride (transfers to treatment)
30	0	0	0	335,245	335,245	Cadmium/Lead and compounds (transfers of metals)
31	0	0	0	320,425	320,425	Chromium and compounds (transfers of metals)
32	314,750	0	165	0	314,915	1,2-Dichloroethane, Tetrachloroethylene (transfers to treatment)
33	313,851	0	0	0	313,851	Vinyl acetate (transfers to treatment)
34	0	0	0	299,433	299,433	Chromium and compounds (transfers of metals)
35	273,999	0	5,632	10,461	290,092	Toluenediisocyanate (transfers to treatment)
36	285,260	0	567	0	285,827	Styrene (transfers to treatment)
37	0	0	0	283,347	283,347	Lead and compounds (transfers of metals)
38	2,283	272,132	6,851	0	281,266	Propylene oxide (transfers to sewage)
39	0	0	0	279,650	279,650	Lead and compounds (transfers of metals)
40	279,592	0	0	0	279,592	Styrene (transfers to treatment)
41	6,727	264,671	0	0	271,398	Formaldehyde (transfers to sewage)
42	259,521	0	0	0	259,521	Dichloromethane (transfers to treatment)
43	0	0	0	256,702	256,702	Lead and compounds (transfers of metals)
44	0	0	0	247,373	247,373	Lead and compounds (transfers of metals)
45	0	0	0	245,511	245,511	Lead and compounds (transfers of metals)
46	1,307	242,144	0	0	243,451	Formaldehyde (transfers to sewage)
47	0	0	0	240,636	240,636	Lead and compounds (transfers of metals)
48	0	1	816	235,451	236,268	Nickel and compounds (transfers of metals)
49	235,406	0	0	0	235,406	Dichloromethane (transfers to treatment)
50	235,072	0	0	0	235,072	1,2-Dichloroethane (transfers to treatment)
162	6,940,395	993,663	946,814	16,277,106	25,157,978	
1.0	44.6	35.9	25.1	43.8	42.5	
15,905	15,568,226	2,767,647	3,770,390	37,132,951	59,239,214	

* Chemicals accounting for more than 70% of total transfers of carcinogens from the facility.

Metals

As noted throughout this chapter, metals dominated NPRI and TRI transfers. These transfers totaled 31.8 million kg for NPRI and 180.5 million kg for TRI, which were 64 percent and 46 percent of total transfers, respectively (Tables 4-21 and 4-22; see Figure 4-10).

Zinc and its compounds headed both NPRI and TRI lists of metals for total transfers. NPRI facilities reported transferring 19.9 million kg, and TRI facilities, 95.1 million kg. NPRI and TRI transfers of manganese and its compounds equaled 4.9 million kg and 28.7 million kg, respectively. Lead and its compounds was transferred at levels of 2.9 million kg and 17.6 million kg in NPRI and TRI, respectively.

The top 50 NPRI facilities for transfers of metals transferred 30.3 million kg, 95 percent of the total NPRI reported transfers of these substances. The top 50 TRI facilities transferred 108.1 million kg out of a total of 180.5 million kg, or 60 percent (Figure 4-16 and Tables 4-23 and 4-24).

Table 4-21		NPRI Off-site Transfers of Metals and Their Compounds, 1997				
M	1997					
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)
—	Zinc (and its compounds)	0	0	0	19,888,014	19,888,014
—	Manganese (and its compounds)	0	0	0	4,862,688	4,862,688
—	Lead (and its compounds)	0	0	0	2,915,080	2,915,080
—	Chromium (and its compounds)	0	0	0	1,990,561	1,990,561
—	Copper (and its compounds)	0	0	0	1,111,567	1,111,567
—	Nickel (and its compounds)	0	0	0	515,592	515,592
7429-90-5	Aluminum (fume or dust)	0	0	0	255,416	255,416
—	Cadmium (and its compounds)	0	0	0	123,627	123,627
—	Arsenic (and its compounds)	0	0	0	67,092	67,092
—	Selenium (and its compounds)	0	0	0	30,369	30,369
—	Antimony (and its compounds)	0	0	0	12,933	12,933
—	Cobalt (and its compounds)	0	0	0	10,372	10,372
—	Mercury (and its compounds)	0	0	0	3,486	3,486
7440-62-2	Vanadium (fume or dust)	0	0	0	1,645	1,645
—	Silver (and its compounds)	0	0	0	269	269
	Subtotal	0	0	0	31,788,711	31,788,711
	% of Total	0.0	0.0	0.0	100.0	64.2
	Total for All Matched NPRI Chemicals	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261

Table 4-22

TRI Off-site Transfers of Metals and Their Compounds, 1997

M 1997

CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)
—	Zinc (and its compounds)	0	0	0	95,103,244	95,103,244
—	Manganese (and its compounds)	0	0	0	28,686,838	28,686,838
—	Lead (and its compounds)	0	0	0	17,600,736	17,600,736
—	Copper (and its compounds)	0	0	0	13,536,196	13,536,196
—	Chromium (and its compounds)	0	0	0	11,726,757	11,726,757
—	Nickel (and its compounds)	0	0	0	5,199,851	5,199,851
7429-90-5	Aluminum (fume or dust)	0	0	0	3,813,654	3,813,654
—	Antimony (and its compounds)	0	0	0	2,164,243	2,164,243
—	Arsenic (and its compounds)	0	0	0	1,335,280	1,335,280
—	Cadmium (and its compounds)	0	0	0	684,109	684,109
—	Cobalt (and its compounds)	0	0	0	586,218	586,218
—	Silver (and its compounds)	0	0	0	43,822	43,822
—	Mercury (and its compounds)	0	0	0	23,048	23,048
7440-62-2	Vanadium (fume or dust)	0	0	0	19,724	19,724
—	Selenium (and its compounds)	0	0	0	18,471	18,471
	Subtotal	0	0	0	180,542,191	180,542,191
	% of Total	0.0	0.0	0.0	100.0	45.8
	Total for All Matched TRI Chemicals	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756

Figure 4-16

NPRI and TRI Off-site Transfers of Metals and Their Compounds, Top 50 Facilities and All Others, 1997

M 1997

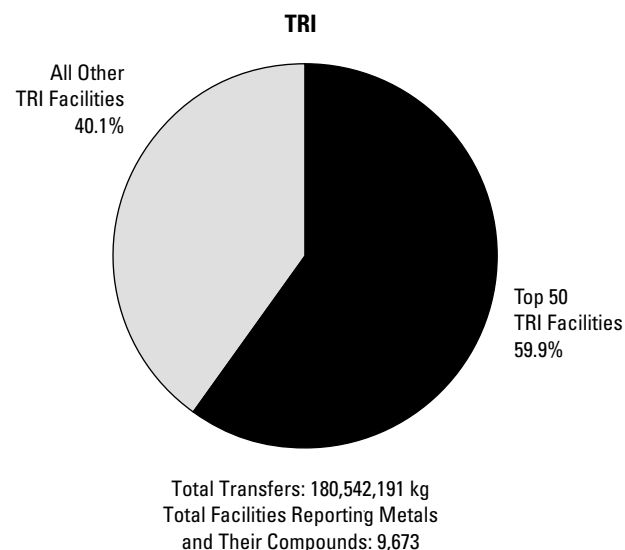
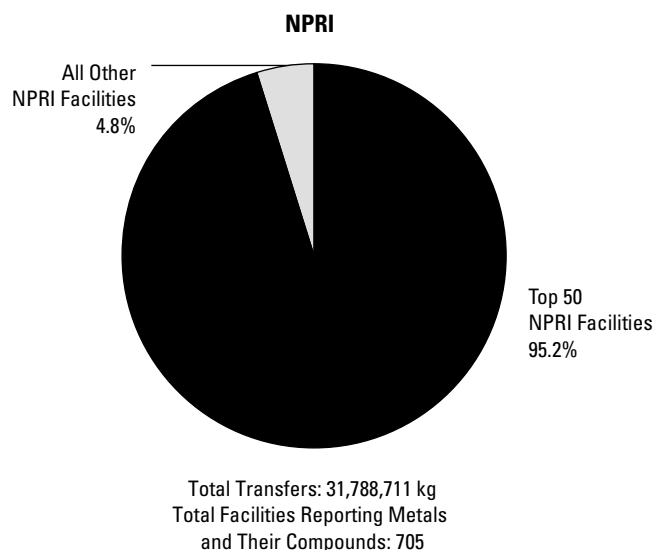


Table 4-23		The 50 NPRI Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds, 1997			
Rank	Facility	City, Province	SIC Codes		Number of Forms
			Canada	US	
1	Dofasco Inc.	Hamilton, ON	29	33	6
2	Co-Steel Lasco	Whitby, ON	29	33	6
3	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5
4	Ivaco Rolling Mills	L'Orignal, ON	29	33	7
5	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	8
6	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6
7	Zalev Brothers Limited	Windsor, ON	29	33	8
8	Kronos Canada, Inc.	Varenes, QC	37	28	2
9	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1
10	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	5
11	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	4
12	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	3
13	Metalex Products Ltd.	Richmond, BC	29	33	5
14	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	5
15	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	5
16	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	3
17	Tonolli Canada Limited	Mississauga, ON	29	33	1
18	Atlas Steels Inc., Atlas Specialty Steels	Wellsand, ON	29	33	6
19	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6
20	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	3
21	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	4
22	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	32	37	2
23	Stelwire Ltd., Parkdale Works	Hamilton, ON	30	34	3
24	Coatings 85 Ltd.,	Mississauga, ON	30	34	1
25	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26	2
26	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34	3
27	Stelfil Ltée, Stelco Inc.	Lachine, QC	30	33	2
28	Metal Koting, Continuous Colour Coat Ltd.	Rexdale, ON	30	34	2
29	Protec Finishing Ltd.	Mississauga, ON	30	34	1
30	Michelin North America (Canada) Inc., Granton, NS Plant	New Glasgow, NS	15	30	2
31	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33	2
32	Cartons St-Laurent Inc.	LaTuque, QC	27	26	2
33	Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est, QC	29	33	9
34	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	37	28	2
35	A.G. Simpson Co Ltd.	Oshawa, ON	32	34	5
36	F & P Manufacturing Inc., American Honda Motor Co. Ltd.	Tottenham, ON	32	34	3
37	Acadian Platers Co. Ltd.	Rexdale, ON	30	34	1
38	Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel, QC	30	34	3
39	Kuntz Electroplating Inc.	Kitchener, ON	30	34	3
40	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26	1
41	Spectra Anodizing Ltd.	Woodbridge, ON	39	39	1
42	Marswell Metal Industries Limited	Burlington, ON	30	34	1
43	Columbia/MBF, Glynwed Steels & Engineering	Mississauga, ON	30	34	2
44	Sivaco Québec	Marieville, QC	30	33	2
45	Kindred Industries, Div. of Emco Ltd.	Midland, ON	30	34	3
46	Michelin North America (Canada) Inc.	Kitchener, ON	15	30	1
47	Celanese Canada Inc.	Edmonton, AB	37	28	1
48	North American Lumber, Roblin Forest Products	Roblin, MB	25	24	3
49	Standard Products (Canada) Limited, Rubber Plant #2	Stratford, ON	15	30	1
50	Ifastgroupe Inc., Galvano	Beloil, QC	30	34	2
Subtotal					165
% of Total					10.7
Total for All NPRI Matched Metals					1,541

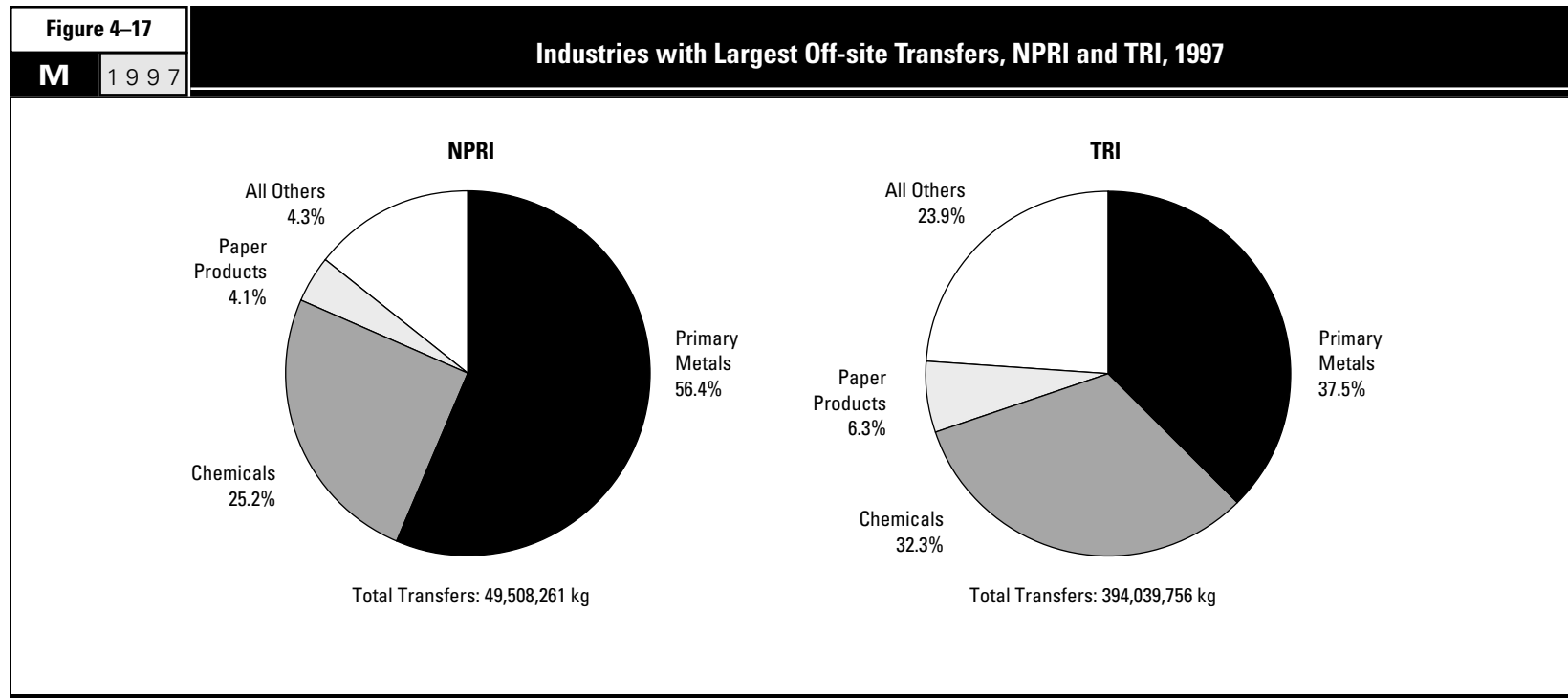
Rank	Treatment/ Sewage/Disposal of Metals (kg)	Major Chemicals Reported (Primary Transfers)*
1	8,168,440	Zinc/Manganese and compounds (transfers of metals)
2	5,799,885	Zinc and compounds (transfers of metals)
3	2,298,300	Zinc and compounds (transfers of metals)
4	1,647,700	Zinc and compounds (transfers of metals)
5	1,481,088	Zinc/Lead and compounds (transfers of metals)
6	1,480,000	Zinc and compounds (transfers of metals)
7	1,104,869	Zinc/Copper and compounds (transfers of metals)
8	855,000	Manganese and compounds (transfers of metals)
9	840,570	Zinc and compounds (transfers of metals)
10	621,538	Zinc and compounds (transfers of metals)
11	584,310	Chromium/Nickel/Manganese and compounds (transfers of metals)
12	571,557	Chromium and compounds (transfers of metals)
13	484,370	Lead and compounds (transfers of metals)
14	467,400	Lead/Cadmium and compounds (transfers of metals)
15	362,000	Zinc/Manganese and compounds (transfers of metals)
16	327,898	Chromium and compounds (transfers of metals)
17	311,202	Lead and compounds (transfers of metals)
18	305,118	Chromium/Zinc/Manganese and compounds (transfers of metals)
19	241,888	Copper/Zinc and compounds (transfers of metals)
20	224,300	Lead and compounds (transfers of metals)
21	142,900	Nickel/Zinc and compounds (transfers of metals)
22	128,300	Manganese and compounds (transfers of metals)
23	115,551	Zinc and compounds (transfers of metals)
24	112,972	Zinc and compounds (transfers of metals)
25	107,600	Aluminum, Manganese and compounds (transfers of metals)
26	91,920	Chromium/Nickel and compounds (transfers of metals)
27	86,507	Zinc and compounds (transfers of metals)
28	80,087	Zinc and compounds (transfers of metals)
29	78,503	Zinc and compounds (transfers of metals)
30	75,441	Zinc and compounds (transfers of metals)
31	72,062	Lead and compounds (transfers of metals)
32	71,666	Manganese and compounds (transfers of metals)
33	68,234	Arsenic/Selenium and compounds (transfers of metals)
34	65,600	Lead and compounds (transfers of metals)
35	64,802	Chromium/Nickel and compounds (transfers of metals)
36	57,300	Zinc and compounds (transfers of metals)
37	55,673	Zinc and compounds (transfers of metals)
38	55,258	Chromium/Manganese and compounds (transfers of metals)
39	54,000	Chromium and compounds (transfers of metals)
40	52,900	Manganese and compounds (transfers of metals)
41	50,000	Aluminum (transfers of metals)
42	50,000	Lead and compounds (transfers of metals)
43	46,706	Zinc and compounds (transfers of metals)
44	46,090	Zinc and compounds (transfers of metals)
45	43,515	Nickel/Chromium and compounds (transfers of metals)
46	41,910	Zinc and compounds (transfers of metals)
47	41,000	Chromium and compounds (transfers of metals)
48	41,000	Chromium/Arsenic and compounds (transfers of metals)
49	39,900	Zinc and compounds (transfers of metals)
50	38,500	Zinc and compounds (transfers of metals)
	30,253,330	
	95.2	
	31,788,711	

* Chemicals accounting for more than 70% of total transfers of metals and their compounds from the facility.

Table 4-24		The 50 TRI Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds, 1997				
M	1997	Rank	Facility	City, State	US SIC Code	Number of Forms
		1	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	9
		2	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	7
		3	Steel Dynamics Inc.	Butler, IN	33	6
		4	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33	7
		5	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33	6
		6	Nucor Steel	Plymouth, UT	33	5
		7	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	5
		8	USS Mon Valley Works, USX Corp.	Braddock, PA	33	5
		9	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33	7
		10	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3
		11	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33	5
		12	Timken Co., Faircrest Steel Plant	Canton, OH	33	6
		13	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33	5
		14	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	5
		15	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6
		16	Bar Techs. Inc.	Johnstown, PA	33	5
		17	Southwire Co.	Carrollton, GA	Mult.	29
		18	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33	5
		19	ASARCO Inc.	Omaha, NE	33	5
		20	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	5
		21	Ameristeel Corp.	Charlotte, NC	33	6
		22	Oregon Steel Mills Inc.	Portland, OR	33	6
		23	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.	6
		24	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1
		25	Koppel Steel Corp., NS Group Inc.	Koppel, PA	33	5
		26	Timken Co., Harrison Steel Plant	Canton, OH	33	7
		27	Eveready Battery Co. Inc., Ralston Purina Co.	Marietta, OH	28	1
		28	Millennium Inorganic Chemicals, Plant 2, Millennium Chemical	Ashtabula, OH	28	1
		29	Roanoke Electric Steel Corp.	Roanoke, VA	33	7
		30	Quemetco Inc., RSR Corp.	Indianapolis, IN	33	5
		31	Quemetco Inc., RSR Corp.	City of Industry, CA	33	5
		32	Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa, AL	33	12
		33	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33	6
		34	Auburn Steel Co. Inc.	Auburn, NY	33	4
		35	Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville, OR	33	5
		36	Newport Steel Corp., NS Group Inc.	Wilder, KY	33	7
		37	Millennium Inorganic Chemicals, Plant 1, Millennium Chemical	Ashtabula, OH	28	1
		38	Inspec USA Inc., Unit 2, Inspec Group PLC	Galena, KS	28	1
		39	C & D Techs. Inc.	Conyers, GA	36	1
		40	Ford Motor Co., Cleveland Casting	Brook Park, OH	33	5
		41	Ameristeel Corp., WTN Steel Mill	Jackson, TN	33	7
		42	Nucor Steel, Nucor Corp.	Huger, SC	33	4
		43	Nucor Steel, Nucor Corp.	Darlington, SC	33	6
		44	Zinc Corp. of America, Horsehead Ind. Inc.	Bartlesville, OK	33	4
		45	ZTT Minerals Inc., Babcock Intl.	Caldwell, TX	33	3
		46	Ipsco Steel Inc., Ipsco Ent's. Inc.	Muscatine, IA	33	6
		47	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA	33	6
		48	Prestolite Wire Corp.	Paragould, AR	Mult.	4
		49	Green River Steel Corp., All Acquisition Corp.	Owensboro, KY	33	4
		50	Algonquin Ind. Inc., Rea Magnet Wire Co.	Guilford, CT	33	1
			Subtotal			273
			% of Total			1.4
			Total for All TRI Matched Metals			20,186

Rank	Treatment/ Sewage/Disposal of Metals (kg)	Major Chemicals Reported (Primary Transfers)*
1	13,855,648	Zinc and compounds (transfers of metals)
2	7,543,045	Zinc and compounds (transfers of metals)
3	6,529,560	Zinc and compounds (transfers of metals)
4	6,086,892	Zinc and compounds (transfers of metals)
5	5,609,771	Zinc and compounds (transfers of metals)
6	3,922,477	Zinc and compounds (transfers of metals)
7	3,497,819	Zinc and compounds (transfers of metals)
8	3,090,268	Zinc and compounds (transfers of metals)
9	2,957,542	Zinc and compounds (transfers of metals)
10	2,863,172	Copper and compounds (transfers of metals)
11	2,498,413	Zinc and compounds (transfers of metals)
12	2,486,113	Zinc and compounds (transfers of metals)
13	2,388,657	Zinc and compounds (transfers of metals)
14	2,384,320	Zinc and compounds (transfers of metals)
15	2,175,039	Zinc and compounds (transfers of metals)
16	1,925,941	Zinc and compounds (transfers of metals)
17	1,917,884	Zinc/Lead and compounds (transfers of metals)
18	1,758,623	Zinc and compounds (transfers of metals)
19	1,742,791	Lead/Zinc and compounds (transfers of metals)
20	1,723,356	Lead and compounds (transfers of metals)
21	1,680,432	Zinc and compounds (transfers of metals)
22	1,620,869	Zinc and compounds (transfers of metals)
23	1,487,000	Zinc and compounds (transfers of metals)
24	1,434,288	Chromium and compounds (transfers of metals)
25	1,332,607	Zinc and compounds (transfers of metals)
26	1,310,549	Zinc and compounds (transfers of metals)
27	1,306,122	Manganese and compounds (transfers of metals)
28	1,292,517	Manganese and compounds (transfers of metals)
29	1,233,769	Zinc and compounds (transfers of metals)
30	1,221,227	Lead/Antimony and compounds (transfers of metals)
31	1,198,182	Lead and compounds (transfers of metals)
32	1,192,598	Zinc and compounds (transfers of metals)
33	1,158,730	Manganese/Lead/Copper/Cobalt and compounds (transfers of metals)
34	1,066,656	Zinc and compounds (transfers of metals)
35	1,060,770	Zinc and compounds (transfers of metals)
36	1,022,314	Zinc and compounds (transfers of metals)
37	997,732	Manganese and compounds (transfers of metals)
38	811,791	Manganese and compounds (transfers of metals)
39	810,519	Lead and compounds (transfers of metals)
40	804,941	Zinc/Manganese and compounds (transfers of metals)
41	780,190	Zinc and compounds (transfers of metals)
42	757,234	Zinc and compounds (transfers of metals)
43	753,082	Zinc and compounds (transfers of metals)
44	731,161	Zinc/Cadmium and compounds (transfers of metals)
45	722,948	Zinc/Lead and compounds (transfers of metals)
46	710,884	Zinc and compounds (transfers of metals)
47	703,568	Lead and compounds (transfers of metals)
48	680,693	Copper and compounds (transfers of metals)
49	651,538	Manganese and compounds (transfers of metals)
50	642,234	Copper and compounds (transfers of metals)
	108,134,476	
	59.9	
	180,542,191	

* Chemicals accounting for more than 70% of total transfers of metals and their compounds from the facility.



Transfers by Industry

In the matched data set for 1997, the primary metals industry dominated NPRI reporting of off-site transfers and also led all industries; this was true to a lesser extent in TRI. In NPRI, the primary metals industry was responsible for 56 percent of the total transfers. Chemical manufacturing followed with 25 percent. TRI's primary metals industry was responsible for 38 percent of the total transfers, followed by chemical manufacturing with 32 percent. Ranking third, the paper products industry accounted for a much smaller

proportion of transfers in both PRTRs: four percent in NPRI and six percent in TRI (**Figure 4-17**).

Primary metals industry transfers totaled 27.9 million kg in NPRI and 147.7 million kg in TRI. The chemical-manufacturing industry reported transfers of 12.5 million kg in NPRI and 127.3 million kg in TRI. The amounts transferred by the paper products industry were 2.0 million kg in NPRI and 24.8 million kg in TRI (**Tables 4-25 and 4-26**).

Facilities in the primary metals industry reported the largest transfers

of metals to sewage/treatment/disposal for both NPRI (27.5 million kg) and TRI (128.7 million kg). The chemical manufacturing industry transferred the largest amounts of nonmetals to treatment: in NPRI (6.7 million kg) and in TRI (59.1 million kg). In TRI, the chemical manufacturing industry also transferred 46.5 million kg of nonmetals to sewage/POTWs. In NPRI, the paper products industry transferred mostly to treatment (1.6 million kg), but in TRI, this industry transferred principally to sewage/POTWs (19.0 million kg).

Table 4-25

NPRI Off-site Transfers by Industry (US SIC Code), 1997

M 1997

Rank	US SIC Code	Industry	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)	% of Total
1	33	Primary Metals	55,311	106,091	274,780	27,483,585	27,919,767	56.4
2	28	Chemicals	6,650,935	3,904,071	657,751	1,246,406	12,459,163	25.2
3	26	Paper Products	1,567,966	1,332	188,434	290,715	2,048,447	4.1
4	34	Fabricated Metals Products	173,355	68,059	334,585	1,174,867	1,750,866	3.5
5	29	Petroleum and Coal Products	327,606	249,849	517,590	26,585	1,121,630	2.3
6	30	Rubber and Plastics Products	397,158	105	127,437	402,344	927,044	1.9
7	37	Transportation Equipment	353,452	80,345	45,976	400,033	879,806	1.8
8	20	Food Products	0	742,466	0	10,297	752,763	1.5
9	35	Industrial Machinery	30,234	0	33,402	384,907	448,543	0.9
10	39	Misc. Manufacturing Industries	34,705	87,193	82,941	94,609	299,448	0.6
11	36	Electronic/Electrical Equipment	6,140	21,310	76,163	170,616	274,229	0.6
12	24	Lumber and Wood Products	843	0	157,358	48,319	206,520	0.4
13	27	Printing and Publishing	141,702	0	7,000	4,254	152,956	0.3
14	25	Furniture and Fixtures	137,316	0	674	0	137,990	0.3
15	32	Stone/Clay/Glass Products	44,850	21	924	47,257	93,052	0.2
16	22	Textile Mill Products	520	0	28,000	240	28,760	0.1
17	31	Leather Products	3,600	0	0	3,427	7,027	0.0
18	38	Measurement/Photographic Instruments	0	0	0	250	250	0.0
19	23	Apparel and Other Textile Products	0	0	0	0	0	0.0
Total			9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	100.0

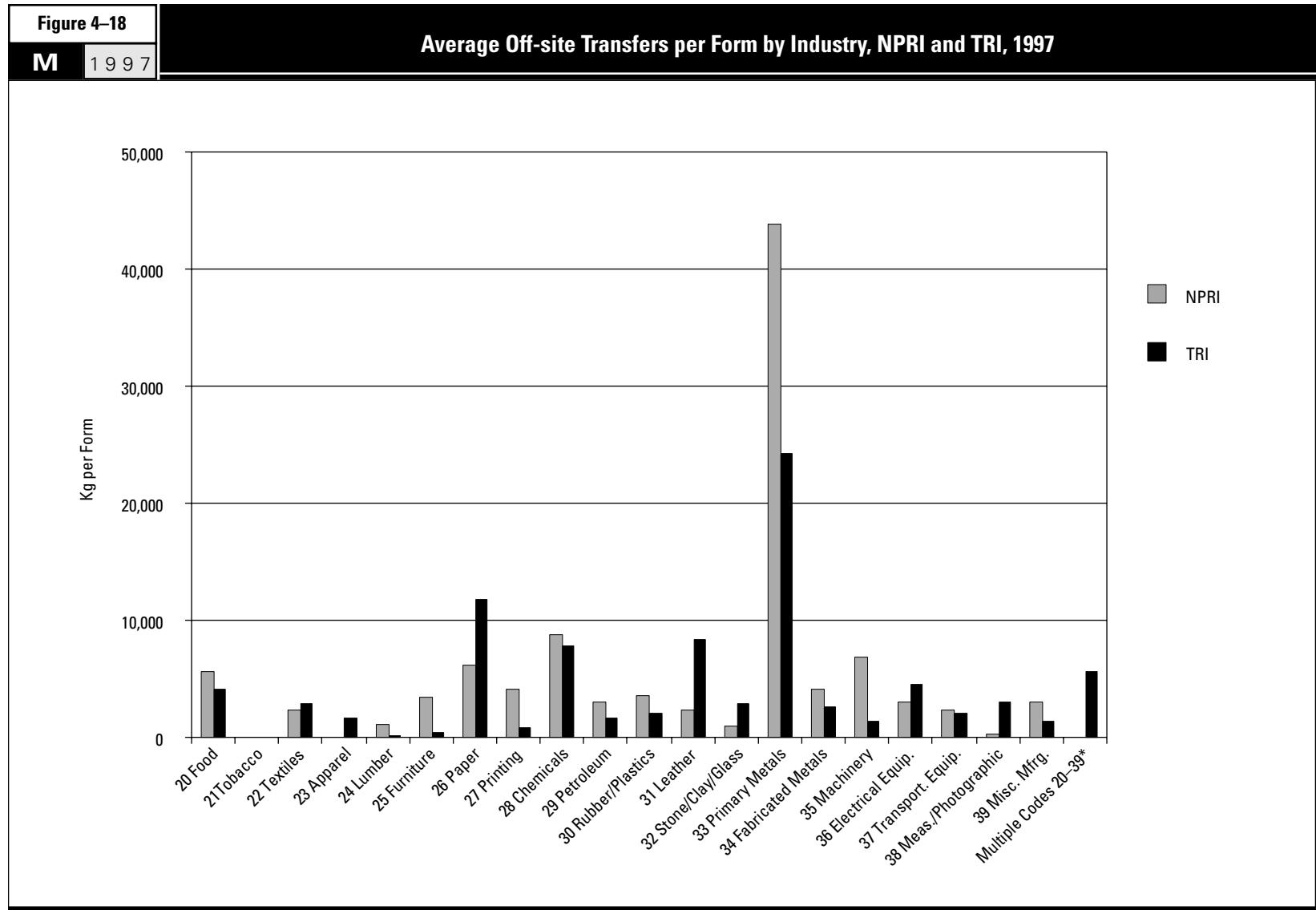
Table 4-26			TRI Off-site Transfers by Industry (US SIC Code), 1997					
M			1997					
Rank	US SIC Code	Industry	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/ Disposal of Metals (kg)	Total Transfers (kg)	% of Total
1	33	Primary Metals	13,359,659	4,254,799	1,361,361	128,742,848	147,718,667	37.5
2	28	Chemicals	59,060,950	46,500,087	7,410,068	14,337,893	127,308,998	32.3
3	26	Paper Products	3,991,729	19,024,635	154,873	1,628,440	24,799,677	6.3
4		Multiple Codes 20-39	4,995,507	5,889,933	1,071,171	9,798,669	21,755,280	5.5
5	34	Fabricated Metals Products	2,312,389	1,731,866	5,053,025	8,406,166	17,503,446	4.4
6	36	Electronic/Electrical Equipment	1,033,895	4,924,063	781,372	4,965,285	11,704,615	3.0
7	20	Food Products	316,771	10,487,966	117,596	134,183	11,056,516	2.8
8	37	Transportation Equipment	1,888,311	1,671,930	1,937,214	2,556,321	8,053,776	2.0
9	30	Rubber and Plastics Products	1,549,202	803,123	1,019,559	2,931,453	6,303,337	1.6
10	29	Petroleum and Coal Products	635,254	2,358,704	529,002	868,653	4,391,613	1.1
11	32	Stone/Clay/Glass Products	695,917	366,620	511,661	2,666,257	4,240,455	1.1
12	35	Industrial Machinery	337,267	1,281,765	99,764	1,707,991	3,426,787	0.9
13	38	Measurement/Photographic Instruments	1,070,329	257,568	97,589	181,003	1,606,489	0.4
14	22	Textile Mill Products	129,119	1,003,033	62,691	205,680	1,400,523	0.4
15	31	Leather Products	4,758	18,249	115	898,863	921,985	0.2
16	39	Misc. Manufacturing Industries	232,858	210,916	100,225	272,797	816,796	0.2
17	25	Furniture and Fixtures	234,301	72,708	103,205	16,838	427,052	0.1
18	27	Printing and Publishing	126,411	89,503	10,481	58,793	285,188	0.1
19	24	Lumber and Wood Products	83,348	2,349	30,918	132,863	249,478	0.1
20	23	Apparel and Other Textile Products	249	4,885	31,947	31,068	68,149	0.0
21	21	Tobacco Products	0	36	766	127	929	0.0
Total			92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	100.0

Table 4-27		Average Off-site Transfers per Form, by Industry (US SIC Code), NPRI and TRI, 1997			
M		1997			
Rank	US SIC Code	Industry	NPRI (kg/form)	TRI (kg/form)	Ratio of Average per Form (NPRI/TRI)
1	25	Furniture and Fixtures	3,366	430	7.8
2	24	Lumber and Wood Products	1,076	162	6.6
3	27	Printing and Publishing	4,134	775	5.3
4	35	Industrial Machinery	6,796	1,396	4.9
5	39	Misc. Manufacturing Industries	3,025	1,335	2.3
6	29	Petroleum and Coal Products	3,073	1,626	1.9
7	33	Primary Metals	43,830	24,272	1.8
8	30	Rubber and Plastics Products	3,525	2,100	1.7
9	34	Fabricated Metals Products	4,169	2,626	1.6
10	20	Food Products	5,618	4,095	1.4
11	37	Transportation Equipment	2,340	2,097	1.1
12	28	Chemicals	8,719	7,874	1.1
13	22	Textile Mill Products	2,397	2,870	0.8
14	36	Electronic/Electrical Equipment	2,981	4,579	0.7
15	26	Paper Products	6,226	11,843	0.5
16	32	Stone/Clay/Glass Products	912	2,926	0.3
17	31	Leather Products	2,342	8,382	0.3
18	38	Measurement/Photographic Instruments	250	3,078	0.1
19	23	Apparel and Other Textile Products	0	1,704	0.0
	21	Tobacco Products	—	33	—
		Multiple Codes 20-39*	—	5,665	—
		Total	10,765	6,764	1.6

Average Transfers

In 1997, transfers in NPRI averaged one and one-half times the average in TRI, per reporting form. NPRI facilities reported an average of 10,765 kg per form, compared to 6,764 in TRI. Twelve industry sectors reported larger averages in NPRI than in TRI, including the two largest, primary metals and chemical manufacturing. Canadian producers of primary metals in the matched data set averaged nearly twice the transfers per form as their US counterparts (Table 4-27 and Figure 4-18).

* Multiple SIC codes reported only in TRI data.



* Multiple SIC codes reported only in TRI data.

Table 4-28		Average Off-site Transfers per Form, NPRI and TRI, 1997								
M	1997	NPRI			TRI					
		Number	Forms/Facility		Number	Forms/Facility				
		kg	kg/form	kg/facility	kg	kg/form	kg/facility	Ratio of Average per Form (NPRI/TRI)	Ratio of Average per Facility (NPRI/TRI)	
Total Facilities		1,430		3.2	19,125		3.0			
Total Forms		4,599			58,252					
Treatment (except metals)		9,925,693	2,158	6,941	92,058,224	1,580	4,814	1.4	1.4	
Sewage/POTWs (except metals)		5,260,842	1,144	3,679	100,954,738	1,733	5,279	0.7	0.7	
Disposal (except metals)		2,533,015	551	1,771	20,484,603	352	1,071	1.6	1.7	
Treatment/Sewage/Disposal of Metals		31,788,711	6,912	22,230	180,542,191	3,099	9,440	2.2	2.4	
Matched Transfers		49,508,261	10,765	34,621	394,039,756	6,764	20,603	1.6	1.7	

Average amounts per facility showed a comparable difference, with NPRI facilities sending matched substances off-site at 1.7 times the average for TRI facilities. These amounts were 34,621 kg per NPRI facility and 20,603 kg per TRI facility. The bulk of the Canada-US difference was attributable to transfers of metals. When sending metals off-site to treatment/sewage/disposal, NPRI facilities averaged more than twice the TRI average: 22,230 kg for each facility, compared to 9,440 kg for TRI facilities. Similarly, NPRI facilities reported greater average

transfer amounts of metals per form (6,912 kg) than TRI facilities (3,099 kg—see **Table 4-28**).

Transfers of nonmetals to treatment and to disposal were also reported at higher average amounts per form and per facility in NPRI than in TRI. Only in transfers to sewage/POTWs did TRI facilities send larger amounts off-site on average, per reporting form and per facility.

Differences in the average transfers per form in NPRI and TRI can arise from various factors, including different types of industry, different production

capacity of facilities, different levels of pollution prevention and controls under different regulatory requirements, and different methods used to estimate amounts of the substances in the waste transferred. Some PRTR information, such as industry mix, can be examined to explore this difference between NPRI and TRI. Other factors that may influence facility averages—such as regulatory requirements—extend beyond information supplied in NPRI and TRI and cannot be examined using PRTR data.

4.3 Changes in Transfers, 1995–1997

As noted in **Chapter 3**, NPRI's reporting facilities and forms increased by 10 percent from 1995 to 1997, while TRI's numbers decreased by four percent (**Table 4–29**). In these years, the chemicals and industries covered by NPRI and TRI did not change, as discussed in **Chapter 2**. This section of *Taking Stock 1997* assesses changes in amounts of transfers reported over this period, using the 1997 matched data set.

4.3.1 Overview

Except for transfers of metals, North American transfers decreased from 1995 to 1996, just as releases did. In the following year, however, all types of transfers rose. **Chapter 7** shows in more detail why transfers rose for the primary metals industry, which had the largest increase in transfers.

Overall, transfers reported to North American PRTRs increased 27 percent, from 348.5 million kg in 1995 to 443.5 million kg in 1997. They rose 31 percent in NPRI and 27 percent in TRI. As shown in **Chapter 3**, releases, on the other hand, declined by nine percent, including a 13 percent reduction reported to NPRI and an eight

Table 4–29		North American Off-site Transfers, 1995–1997				
M	1997					
		North America				
		1995	1996	1997	Change 1995–1997	
		Number	Number	Number	Number	%
Total Facilities		21,308	20,914	20,555	-753	-3.5
Total Forms		64,918	63,275	62,851	-2,067	-3.2
Off-site Transfers						
Treatment (except metals)		88,579,464	85,286,158	101,983,917	13,404,453	15.1
Sewage/To POTWs (except metals)		95,567,178	92,406,429	106,215,580	10,648,402	11.1
Disposal (except metals)		21,957,451	18,835,581	23,017,618	1,060,167	4.8
Treatment/Sewage/Disposal of Metals		142,393,601	161,601,777	212,330,902	69,937,301	49.1
Total Transfers		348,497,694	358,129,945	443,548,017	95,050,323	27.3

► Canada and US data only, Mexico data not collected for 1997.

percent reduction reported to TRI (**Table 4–29** and **Figure 4–19**).

Transfers of metals to treatment/sewage/disposal increased 49 percent, from 142.4 million kg in 1995 to 212.3 million kg in 1997. NPRI and TRI showed comparable increases, across the three years, in transfers of metals. The North American decrease from 1995 to 1996 in all three types of nonmetal transfers, with sharp increases in 1997, reflected the pattern in TRI. Except for disposal of nonmetals, NPRI transfers increased in both 1996 and

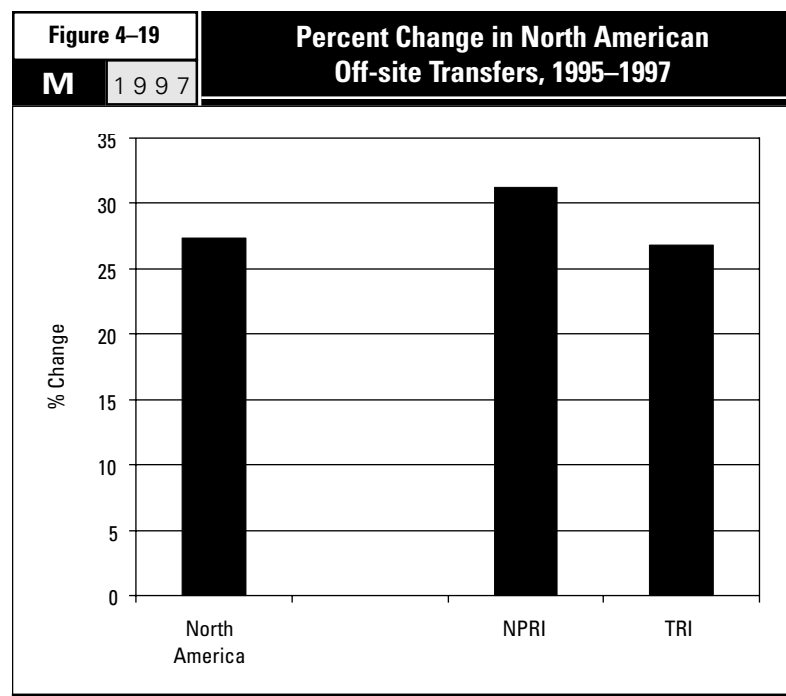
1997. The result was increases in all North American transfer types for the 1995–1997 period.

North American transfers of nonmetals to treatment increased 15 percent, or 13.4 million kg, from 1995 to 1997. Similarly, transfers of nonmetals to sewage/POTWs rose 11 percent, or 10.6 million kg. Both types of transfers exceeded 100 million kg in 1997. The reduction in NPRI transfers of nonmetals to disposal partly offset the increase in TRI, leaving a five-percent North American increase in this cate-

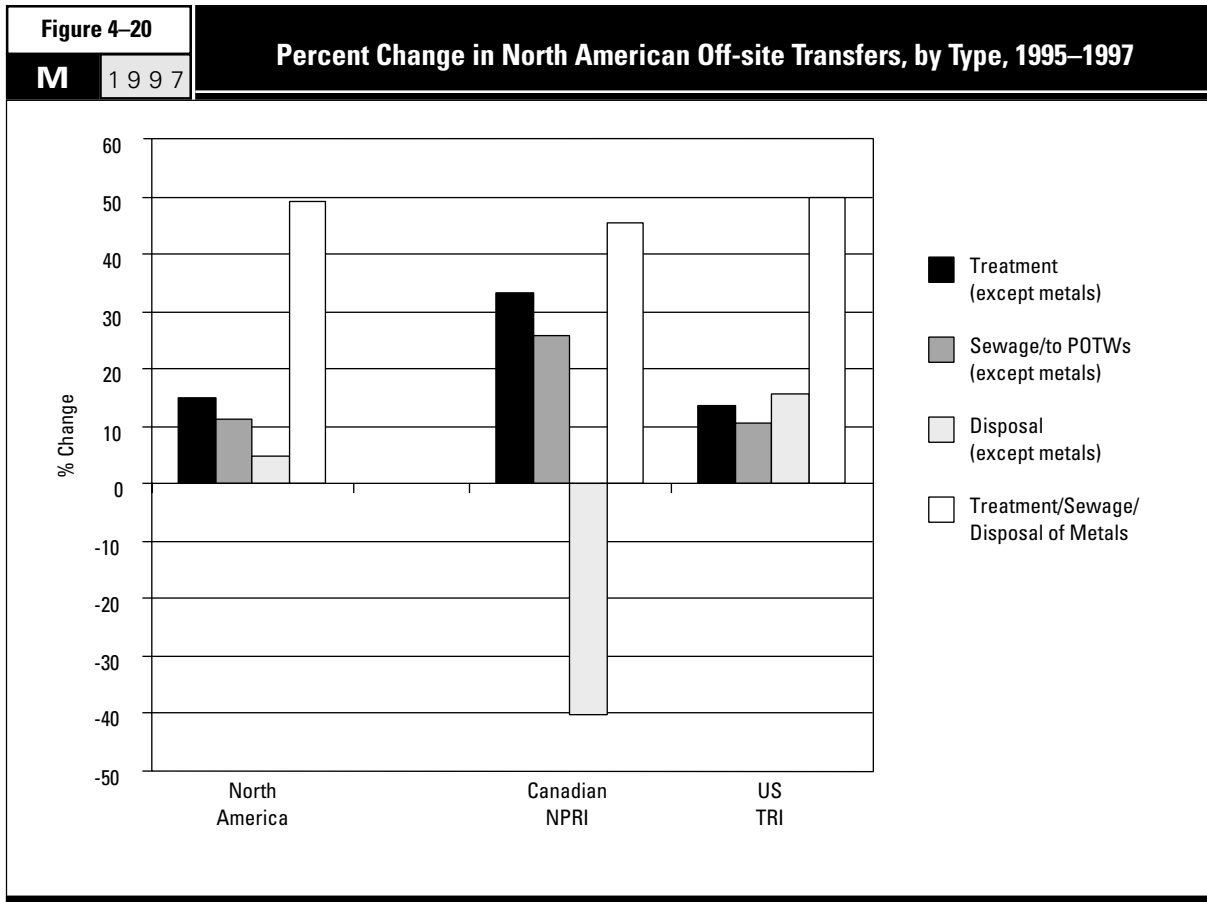
gory. The 1.1-million-kg increase brought transfers to disposal to 23.0 million kg in 1997.

From 1995 to 1997, NPRI facilities reported a 33 percent increase in transfers of nonmetals to treatment and a 26 percent increase to sewage/POTWs. TRI facilities reported increases of 14 percent and 11 percent, respectively, in these categories. For treatment/sewage/disposal of metals, NPRI showed a 45 percent increase and TRI a 50 percent increase in transfers (**Figure 4–20**).

Canadian NPRI					US TRI				
1995	1996	1997	Change 1995–1997		1995	1996	1997	Change 1995–1997	
Number	Number	Number	Number	%	Number	Number	Number	Number	%
1,302	1,355	1,430	128	9.8	20,006	19,559	19,125	-881	-4.4
4,164	4,314	4,599	435	10.4	60,754	58,961	58,252	-2,502	-4.1
7,456,650	9,140,966	9,925,693	2,469,043	33.1	81,122,814	76,145,192	92,058,224	10,935,410	13.5
4,177,909	4,893,811	5,260,842	1,082,933	25.9	91,389,269	87,512,618	100,954,738	9,565,469	10.5
4,242,480	2,282,803	2,533,015	-1,709,465	-40.3	17,714,971	16,552,778	20,484,603	2,769,632	15.6
21,871,665	25,199,373	31,788,711	9,917,046	45.3	120,521,936	136,402,404	180,542,191	60,020,255	49.8
37,748,704	41,516,953	49,508,261	11,759,557	31.2	310,748,990	316,612,992	394,039,756	83,290,766	26.8



► Canada and US data only, Mexico data not collected for 1995–1997.



► Canada and US data only, Mexico data not collected for 1995-1997.

Table 4-30		NPRI Off-site Transfers by Province, 1995–1997 (Ordered by Total 1997 Transfers)				
M	1997	Total Transfers			Change 1995–1997	
Province	1995 (kg)	1996 (kg)	1997 (kg)	kg	%	
Ontario	25,229,798	30,056,026	35,395,295	10,165,497	40.3	
Quebec	6,664,921	8,207,681	9,078,464	2,413,543	36.2	
New Brunswick	1,558,561	1,575,434	2,098,146	539,585	34.6	
Alberta	1,231,830	533,278	1,166,942	-64,888	-5.3	
British Columbia	2,659,847	561,021	890,409	-1,769,438	-66.5	
Nova Scotia	107,917	322,177	472,606	364,689	337.9	
Manitoba	289,145	245,373	357,194	68,049	23.5	
Prince Edward Island	400	0	34,694	34,294	8573.5	
Saskatchewan	6,257	15,955	14,511	8,254	131.9	
Newfoundland	28	8	0	-28	-100.0	
Total	37,748,704	41,516,953	49,508,261	11,759,557	31.2	

4.3.2 Changes in Transfers by State and Province

From 1995 to 1997, seven Canadian provinces reported increases in transfers, including the three provinces with the largest overall transfers. Ontario transfers of substances in the matched data set increased by 10.2 million kg, from 25.2 million kg to 35.4 million kg. This amounted to an increase of 40 percent. Quebec reported an increase of 2.4 million kg, from 6.7 million kg to 9.1 million kg, or 36 percent. New Brunswick transfers rose 35 percent, from 1.6 million kg to 2.1 million kg, a change of 539,585 kg (Table 4-30).

Facilities in Alberta and British Columbia, which ranked fourth and fifth for total transfers, reported the largest reductions. In Alberta, transfers declined 64,888 kg (five percent), and in British Columbia, they declined 1.8 million kg (67 percent).

In TRI reporting on substances in the matched data set, Pennsylvania, with the largest transfers in 1997, showed an increase from 34.5 million kg in 1995 to 46.1 million kg in 1997, despite a drop to 30.6 million kg in 1996. This 34 percent increase moved Pennsylvania ahead of Texas for total transfers. This was the largest absolute increase (11.6 million kg) among US states. Ranking second for total transfers in 1997, Texas facilities transferred 37.2 million kg in 1995 and 37.0 million kg in 1997, showing a slight decrease, but actually showing an increase from a 1996 figure of 29.8 million kg. Ohio's total rose from 25.3 million in 1995 to 31.8 million in 1997, a 26 percent increase for the state with the third-largest total transfers (**Table 4-31**).

Increases in transfers were recorded in 37 states and territories. Behind Pennsylvania, Arkansas had the second-largest increase, from 1.7 million kg to 12.9 million kg, or 11.1 million kg. Transfers declined in 16 states and territories (including the District of Columbia). Three states had decreases of more than one million kg each: North Carolina, from 7.3 million kg to 5.0 million kg; Arizona, from 3.1 million kg to 1.8 million kg; and Mississippi, from 2.3 million kg to 1.2 million kg.

From 1995 to 1997, transfers more than doubled in 11 states and provinces (**Map 4-6**).

Table 4-31		TRI Off-site Transfers by State, 1995-1997 (Ordered by Total 1997 Transfers)				
M	1997	Total Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
Pennsylvania		34,486,170	30,646,700	46,128,523	11,642,353	33.8
Texas		37,239,679	29,830,567	37,017,533	-222,146	-0.6
Ohio		25,285,553	26,199,048	31,794,582	6,509,029	25.7
Michigan		24,369,024	27,451,932	26,034,295	1,665,271	6.8
Indiana		16,481,625	19,018,843	23,853,714	7,372,089	44.7
Illinois		14,057,811	12,803,718	19,112,546	5,054,735	36.0
Wisconsin		10,492,770	14,451,690	14,882,171	4,389,401	41.8
New Jersey		13,519,904	11,537,538	12,863,215	-656,689	-4.9
Arkansas		1,713,939	3,668,923	12,860,185	11,146,246	650.3
California		11,228,782	9,928,290	11,897,413	668,631	6.0
Alabama		8,204,893	8,759,278	11,316,489	3,111,596	37.9
Virginia		7,018,035	7,962,468	10,668,654	3,650,619	52.0
South Carolina		5,132,118	7,088,075	8,850,818	3,718,700	72.5
Georgia		3,722,592	4,457,574	8,596,443	4,873,851	130.9
Tennessee		6,900,860	9,797,589	8,553,230	1,652,370	23.9
Florida		5,009,425	7,983,000	8,217,166	3,207,741	64.0
New York		6,933,373	6,722,414	7,565,135	631,762	9.1
Oregon		6,709,624	6,533,595	7,336,782	627,158	9.3
Kentucky		5,265,774	4,856,770	6,808,052	1,542,278	29.3
Missouri		6,212,336	6,617,047	6,806,404	594,068	9.6
Connecticut		3,835,532	3,363,808	6,184,467	2,348,935	61.2
Iowa		4,842,852	4,711,437	5,641,192	798,340	16.5
Minnesota		4,196,965	4,403,419	5,314,124	1,117,159	26.6
Massachusetts		5,521,475	4,666,297	5,029,094	-492,381	-8.9
North Carolina		7,330,472	6,015,110	4,973,031	-2,357,441	-32.2
Utah		626,564	2,488,911	4,582,453	3,955,889	631.4
Nebraska		1,902,096	1,890,671	4,410,219	2,508,123	131.9
Louisiana		3,253,330	3,745,148	4,373,587	1,120,257	34.4
Washington		1,604,528	1,803,108	4,246,444	2,641,916	164.7
West Virginia		4,595,199	3,433,678	4,221,960	-373,239	-8.1
Maryland		2,926,201	3,277,593	3,923,483	997,282	34.1
Kansas		3,835,432	3,881,814	3,879,211	43,779	1.1
Puerto Rico		3,740,016	3,429,612	3,615,562	-124,454	-3.3
Oklahoma		1,815,935	2,095,669	2,510,321	694,386	38.2
Arizona		3,059,071	4,078,787	1,765,417	-1,293,654	-42.3
Delaware		1,472,524	1,606,538	1,502,816	30,292	2.1
Mississippi		2,345,718	1,532,578	1,232,243	-1,113,475	-47.5
South Dakota		265,990	628,661	1,189,050	923,060	347.0
Colorado		753,819	859,817	970,229	216,410	28.7
Maine		958,961	691,659	849,997	-108,964	-11.4
Montana		24,646	24,779	553,382	528,736	2145.3
Rhode Island		570,220	380,644	500,366	-69,854	-12.3
New Hampshire		290,379	434,974	417,204	126,825	43.7
Idaho		210,677	225,227	340,740	130,063	61.7
New Mexico		167,438	209,397	231,464	64,026	38.2
Virgin Islands		86,683	171,183	159,608	72,925	84.1
Vermont		140,501	122,559	127,329	-13,172	-9.4
North Dakota		270,237	59,277	85,306	-184,931	-68.4
Wyoming		4,232	15,190	28,174	23,942	565.7
Nevada		36,883	46,680	13,540	-23,343	-63.3
Hawaii		77,264	3,532	3,258	-74,006	-95.8
Alaska		2,747	60	1,133	-1,614	-58.8
District of Columbia		116	116	2	-114	-98.3
Total		310,748,990	316,612,992	394,039,756	83,290,766	26.8

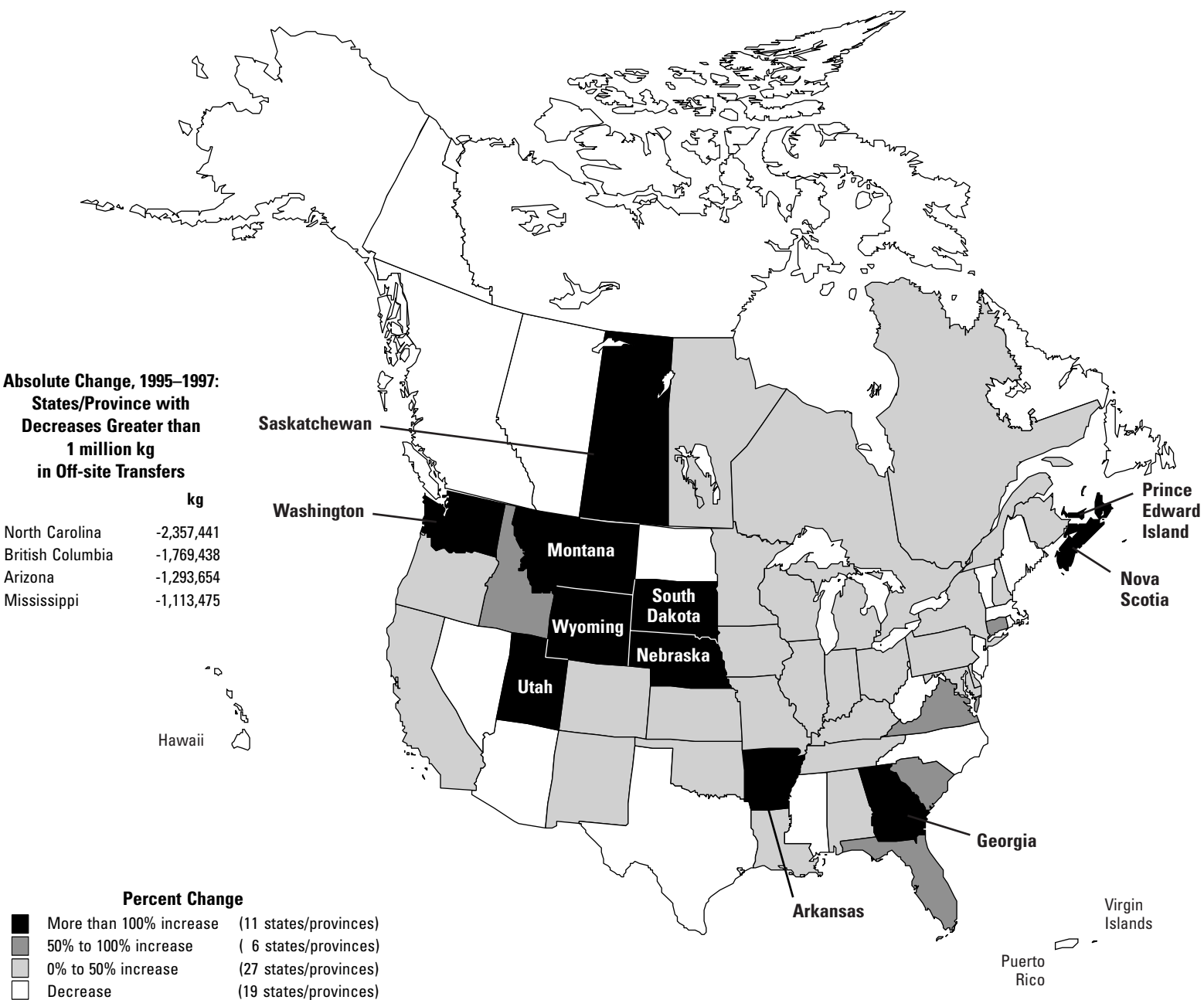
Map 4-6

M 1997

Percent Change in North American Total Off-site Transfers, 1995-1997

**Absolute Change, 1995-1997:
States/Province with
Decreases Greater than
1 million kg
in Off-site Transfers**

	kg
North Carolina	-2,357,441
British Columbia	-1,769,438
Arizona	-1,293,654
Mississippi	-1,113,475



► Canada and US data only. Mexico data not collected for 1995-1997.

4.3.3 NPRI and TRI Facilities with Largest Changes

A few facilities accounted for large changes in off-site transfers from 1995 to 1997. For NPRI, while the overall change from 1995 to 1997 was a net increase of 11.8 million kg in the matched data set, 50 NPRI facilities reported increases totaling 18.2 million kg and 50 reported decreases of 8.1 million kg. For TRI, the overall change from 1995 to 1997 was a net increase of 83.3 million kg, and the 50 TRI facilities with the largest increases reported a total increase of 89.4 million kg; the 50 with the largest decreases reported a total decrease of 39.9 million kg. Year-to-year changes can result from many factors, including changes in production levels, efforts at pollution

prevention, different techniques used to estimate reported amounts, and one-time remedial efforts to clean-up wastes or spills.

NPRI Facilities with Largest Decreases/Increases

In NPRI, transfers in 1997 by the 50 facilities with the largest decreases over this two-year period were half their 1995 level, but the transfer amounts of the 50 facilities with the largest increases more than doubled (a 121 percent increase—see **Figure 4–21**).

The NPRI facilities with the largest reductions in total transfers from 1995 to 1997 reported 16.0 million kg in 1995 and 7.9 million kg in 1997. The number of forms they submitted remained fairly steady, declining only slightly from 238 in 1995 to 229 in

1997. Six of the facilities reported in 1995 but submitted no reports for chemicals in the matched data set in 1997 (**Table 4–32**).

For NPRI facilities with the largest increases, the number of submitted forms expanded from 284 in 1995 to 330 in 1997, while total transfers rose from 15.1 million kg to 33.3 million kg. Seven of these facilities did not report for chemicals in the matched data set in 1995 but did so in 1997 (**Table 4–33**).

TRI Facilities with Largest Decreases/Increases

In TRI, transfers by the 50 facilities with large reductions decreased by about half, comparable to NPRI reporting, but transfers by the 50 facilities with the largest increases rose much

more dramatically—nearly 500 percent—than in NPRI (**Figure 4–21**).

The 50 TRI facilities with the largest reductions in off-site transfers reported a decrease from 87.0 million kg in 1995 to 47.0 million kg in 1997. The number of forms submitted decreased from 522 to 496. Only two of the facilities filed no reports in 1997 for chemicals in the matched data set (**Table 4–34**).

Transfers by the 50 TRI facilities with the largest increases rose from 18.7 million kg in 1995 to 108.1 million kg in 1997. These facilities submitted 369 forms in 1995 and 441 in 1997. Six did not report any chemical from the matched data set in 1995 but did so in 1997 (**Table 4–35**).

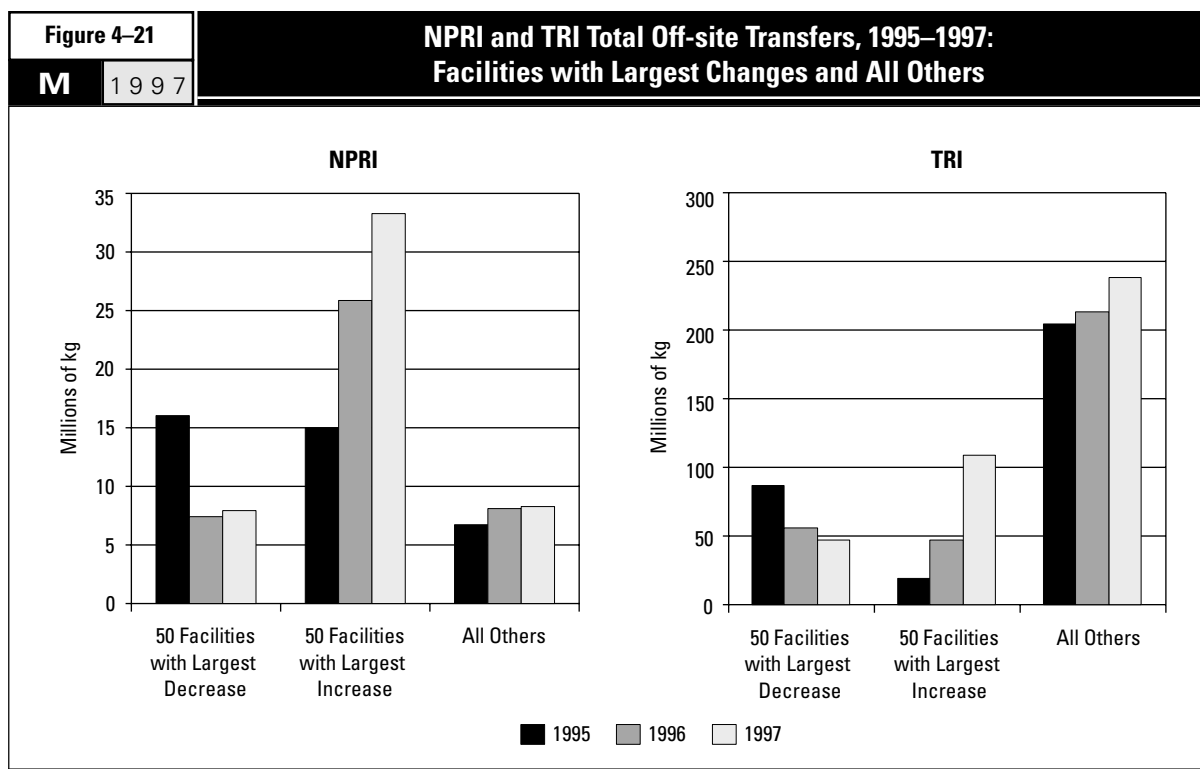


Table 4-32		NPRI Facilities with Largest Decrease in Off-site Transfers, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	CXY Chemicals LP, Canadian Occidental Petroleum	Nanaimo, BC	37	28
2	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33
3	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28
4	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33
5	Oakside Chemicals Limited, Oakside Investments Limited	London, ON	37	28
6	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33
7	Ford Motor Company, Ontario Truck	Oakville, ON	32	37
8	Co-Steel Lasco	Whitby, ON	29	33
9	Western Co-Operative Fertilizers Limited	Calgary, AB	37	28
10	BASF Canada Inc., Windsor Site	Windsor, ON	37	28
11	Versatech Industries, Apex Metals Inc.	Kitchener, ON	32	34
12	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34
13	Owens-Corning Canada Inc., Guelph Glass Plant	Guelph, ON	35	32
14	Cooper Automotive Products., Wagner Div., Cooper Industries	Stratford, ON	32	37
15	BASF Canada Inc., Sarnia Site	Sarnia, ON	37	28
16	Magotteaux Inc., Magotteaux Canada	Magog, QC	30	39
17	Oxy Durez Holding Company Inc., Occidental Petroleum Corp.	Fort Erie, ON	37	28
18	Chevron Canada Limited, Chevron Corp.	Burnaby, BC	36	29
19	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29
20	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33
21	M.B. Paper, Alberni Specialties Division, MacMillan Bloedel	Port Alberni, BC	27	26
22	Boler Group, Hendrickson Spring	Stratford, ON	32	34
23	Consumers Packaging Inc., Consumers Glass (Brampton)	Brampton, ON	35	32
24	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28
25	Duracell Canada Inc., Duracell Inc.	Mississauga, ON	33	36
26	A.P. Green Refractories (Canada) Ltd., A.P. Green Industries	Smithville, ON	35	32
27	Decor Products International, Kleco Corporation	Midland, ON	29	33
28	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
29	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26
30	UCP Paints	Baie d'Urfé, QC	37	28
31	Chemprox chimie Inc., Elf Atochem S.A.	Bécancour, QC	37	28
32	Agropur coopérative agro-alimentaire, Agropur La Fromagerie	Granby, QC	10	20
33	Centrifugal Coaters Inc.	Oakville, ON	30	34
34	Creanova Canada, Leaside Facility, Creanova America Inc.	Toronto, ON	37	28
35	General Motors of Canada Limited, Ste Therese Assembly Plant	Boisbriand, QC	32	37
36	PPG Canada Inc., Clarkson Coatings Facility	Mississauga, ON	37	28
37	Griffin Canada Inc., Amsted Industries	Winnipeg, MB	29	33
38	Sico Inc., Sico #2 Longueuil	Longueuil, QC	37	28
39	PCI Chemicals Canada Inc, Pioneer Companies Inc.	Cornwall, ON	37	28
40	Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel, QC	30	34
41	Filpac Inc, Transformateur de pellicules d'emballage, Bunzl Distrib.	Terrebonne, QC	16	26
42	Ethyl Canada Inc., Ethyl Corp.	Corunna, ON	37	28
43	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-de-Valleyfield, QC	29	33
44	Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock, ON	29	33
45	Aries Flexographics Ltd.	Mississauga, ON	28	27
46	A.G. Simpson Co Ltd.	Oshawa, ON	32	34
47	Kenworth du Canada, Paccar Inc.	Ste-Thérèse, QC	32	37
48	CXY Chemicals Canada LP, Canadian Occidental Petroleum Ltd	North Vancouver, BC	37	28
49	Waltec Forgings Incorporated, EMCO Limited	Wallaceburg, ON	30	30
50	DuPont Canada Inc., Ajax Finishes Division	Ajax, ON	37	28
Total				

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Decreases (Primary Transfers with Decreases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	2	1,988,000	**	**	2	272	-1,987,728	Asbestos (transfers to disposal)
2	3	1,485,964	4	906,005	4	571,557	-914,407	Chromium and compounds (transfers of metals)
3	4	588,390	6	0	5	0	-588,390	Vinyl acetate (transfers to treatment)
4	7	411,095	7	51,862	7	22,452	-388,643	Zinc and compounds (transfers of metals)
5	5	322,740	5	0	**	**	-322,740	Xylene (transfers to treatment)
6	6	305,238	3	52,000	2	0	-305,238	Zinc and compounds (transfers of metals)
7	8	271,194	10	41,061	9	6,653	-264,541	Toluene (transfers to treatment)
8	6	6,030,824	6	3,578,510	6	5,799,885	-230,939	Lead and compounds (transfers of metals)
9	1	154,000	1	26,800	1	0	-154,000	Asbestos (transfers to disposal)
10	7	281,483	7	309,530	8	140,090	-141,393	Methyl ethyl ketone, Xylene (transfers to treatment)
11	3	136,000	3	0	3	0	-136,000	Zinc and compounds (transfers of metals)
12	4	209,781	4	209,462	3	91,920	-117,861	Chromium/Zinc/Nickel and compounds (transfers of metals)
13	1	117,320	2	4,720	1	0	-117,320	Zinc and compounds (transfers of metals)
14	1	105,840	1	44,286	**	**	-105,840	Asbestos (transfers to disposal)
15	2	104,600	**	**	**	**	-104,600	1,3-Butadiene, Styrene (transfers to treatment)
16	4	98,650	4	0	4	0	-98,650	Chromium and compounds (transfers of metals)
17	2	167,684	2	183,319	3	69,618	-98,066	Phenol (transfers to treatment)
18	13	92,500	13	37,800	13	5,722	-86,778	Phosphoric acid (transfers to disposal)
19	23	126,328	22	19,138	23	44,279	-82,049	Asbestos (transfers to disposal)
20	10	88,365	9	47,187	9	7,163	-81,202	Aluminum (transfers of metals)
21	2	97,200	3	11,540	4	16,330	-80,870	Asbestos (transfers to disposal)
22	2	81,000	4	30,560	4	7,056	-73,944	Zinc and compounds (transfers of metals)
23	1	72,300	1	4,000	1	0	-72,300	Chromium and compounds (transfers of metals)
24	7	81,532	7	37,500	7	9,660	-71,872	Asbestos (transfers to disposal)
25	2	87,094	2	52,700	2	15,273	-71,821	Manganese and compounds (transfers of metals)
26	4	91,339	3	30,601	2	20,141	-71,198	Chromium and compounds (transfers of metals)
27	2	70,990	2	80,000	**	**	-70,990	Nitric acid and nitrate compounds, Phosphoric acid (transfers to sewage)
28	4	67,364	4	110,477	**	**	-67,364	Lead and compounds (transfers of metals)
29	4	99,700	4	38,000	5	34,000	-65,700	Manganese and compounds (transfers of metals)
30	1	62,680	**	**	3	0	-62,680	Xylene (transfers to treatment)
31	2	108,000	3	39,000	3	45,500	-62,500	1,2,4-Trimethylbenzene (transfers to treatment)
32	4	264,000	4	172,000	4	201,600	-62,400	Nitric acid and nitrate compounds (transfers to sewage)
33	3	60,820	3	54,900	4	0	-60,820	Xylene, Methyl ethyl ketone (transfers to treatment)
34	3	61,452	8	1,481	4	1,374	-60,078	Toluene (transfers to treatment)
35	9	77,618	9	25,319	8	17,922	-59,696	Xylene, Methyl isobutyl ketone (transfers to treatment)
36	13	209,956	12	104,586	13	152,387	-57,569	Xylene (transfers to treatment)
37	1	69,480	1	13,600	1	13,600	-55,880	Manganese and compounds (transfers of metals)
38	8	78,990	9	76,130	9	24,490	-54,500	Toluene, Methyl ethyl ketone (transfers to treatment)
39	4	51,926	2	6,229	4	0	-51,926	Asbestos (transfers to disposal)
40	3	119,800	4	201,154	4	69,408	-50,392	Manganese and compounds (transfers of metals)
41	1	116,000	1	138,000	1	66,000	-50,000	Methanol (transfers to treatment)
42	9	131,250	6	101,200	7	81,260	-49,990	Nitric acid and nitrate compounds (transfers to disposal)
43	9	70,200	9	29,885	9	20,633	-49,567	Zinc/Selenium and compounds (transfers of metals)
44	1	69,500	1	60,877	1	21,036	-48,464	Manganese and compounds (transfers of metals)
45	2	48,050	2	48,050	2	0	-48,050	Tetrachloroethylene, n-Butyl alcohol (transfers to treatment)
46	7	114,103	9	163,990	8	66,152	-47,951	Nickel and compounds (transfers of metals)
47	2	45,010	**	**	**	**	-45,010	Toluene (transfers to treatment)
48	3	48,000	4	48,400	4	4,900	-43,100	Asbestos (transfers to disposal)
49	5	91,526	5	91,526	5	52,250	-39,276	Nitric acid and nitrate compounds (transfers to sewage)
50	8	243,610	7	180,610	7	207,906	-35,704	Xylene (transfers to treatment)
	238	15,976,486	238	7,463,995	229	7,908,489	-8,067,997	

* Chemicals accounting for more than 70% of decrease in total transfers from the facility.

** Indicates facility did not report any matched chemicals that year.

Table 4-33		NPRI Facilities with Largest Increase in Off-site Transfers, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Dofasco Inc.	Hamilton, ON	29	33
2	Aimco Solrec Ltd.	Milton, ON	37	28
3	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33
4	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33
5	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28
6	Metalex Products Ltd.	Richmond, BC	29	33
7	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33
8	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33
9	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28
10	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
11	Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton, AB	37	28
12	Inland Technologies Inc., Debert Treatment Centre	Debert, NS	36	29
13	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33
14	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29
15	Zalev Brothers Limited	Windsor, ON	29	33
16	Bayer Inc., Bayer AG	Sarnia, ON	37	28
17	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29
18	Kronos Canada, Inc.	Varenes, QC	37	28
19	Kraft Canada Inc, Cheese Operations, Philip Morris Companies	Ingleside, ON	10	20
20	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
21	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28
22	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24
23	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	30	37
24	KI Pembroke, Inc., Kreuger International Inc.	Pembroke, ON	26	25
25	Ivaco Rolling Mills	L'Orignal, ON	29	33
26	Solutia Canada Inc, Produits chimiques	LaSalle, QC	16	30
27	Parmalat Canada	Victoriaville, QC	10	20
28	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33
29	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28
30	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
31	Dow Chemical Canada Inc.	Varenes, QC	16	30
32	Tonolli Canada Limited	Mississauga, ON	29	33
33	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28
34	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26
35	Stelco Inc., Hilton Works	Hamilton, ON	29	33
36	Ifastgroupe Inc., Infasco Div.	Marieville, QC	30	34
37	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28
38	Cartons St-Laurent Inc.	LaTuque, QC	27	26
39	Celanese Canada Inc.	Edmonton, AB	37	28
40	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33
41	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	29	33
42	Apotex Fermentation Inc., Apotex Pharmaceutical Holdings Inc	Winnipeg, MB	37	28
43	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
44	Morbern Incorporated	Cornwall, ON	16	30
45	Maritime Steel and Foundries Limited	New Glasgow, NS	39	39
46	Metal Koting, Continuous Colour Coat Ltd.	Rexdale, ON	30	34
47	LDM Technologies Company	Leamington, ON	16	30
48	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26
49	Schenectady Canada Ltd.	Scarborough, ON	37	28
50	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33
Total				

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Increases (Primary Transfers with Increases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	18	1,931,285	18	2,546,892	18	8,169,478	6,238,193	Zinc and compounds (transfers of metals)
2	**	**	6	2,100,316	6	2,028,917	2,028,917	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
3	19	0	19	3,814,700	16	1,480,000	1,480,000	Zinc and compounds (transfers of metals)
4	1	0	1	0	1	840,570	840,570	Zinc and compounds (transfers of metals)
5	6	3,336,100	6	4,099,400	6	3,956,300	620,200	Nitric acid and nitrate compounds (transfers to sewage)
6	4	0	5	257,210	5	484,370	484,370	Lead and compounds (transfers of metals)
7	5	0	5	0	6	467,400	467,400	Lead/Cadmium and compounds (transfers of metals)
8	5	1,864,400	5	3,054,700	5	2,298,300	433,900	Zinc/Manganese and compounds (transfers of metals)
9	5	306,300	5	572,400	4	639,700	333,400	Toluene (transfers to treatment)
10	3	210	3	550	3	327,898	327,898	Chromium and compounds (transfers of metals)
11	5	0	5	0	4	317,039	317,039	Methanol, Dichloromethane (transfers to treatment)
12	**	**	1	181,328	1	296,054	296,054	Ethylene glycol (transfers to treatment)
13	7	347,570	7	787,420	7	632,378	284,808	Zinc and compounds (transfers of metals)
14	6	0	8	90,000	8	271,000	271,000	Asbestos (transfers to disposal)
15	7	849,840	7	877,606	8	1,104,869	255,029	Zinc/Copper and compounds (transfers of metals)
16	15	381,350	16	400,240	17	618,300	236,950	Cyclohexane (transfers to treatment)
17	1	22,000	2	15,000	2	248,000	226,000	Methanol (transfers to sewage)
18	8	633,000	8	836,000	8	855,000	222,000	Manganese and compounds (transfers of metals)
19	1	0	2	0	2	201,000	201,000	Nitric acid and nitrate compounds (transfers to sewage)
20	11	453,070	11	513,110	11	622,460	169,390	Chromium/Nickel and compounds (transfers of metals)
21	**	**	**	**	10	145,965	145,965	Toluene, Methyl ethyl ketone (transfers to treatment)
22	2	0	2	0	2	127,000	127,000	Formaldehyde (transfers to disposal)
23	2	1,388	2	121,540	2	128,300	126,912	Manganese and compounds (transfers of metals)
24	1	0	1	0	1	118,500	118,500	Xylene (transfers to treatment)
25	5	1,532,610	7	1,559,360	7	1,647,700	115,090	Manganese and compounds, Aluminum, Lead and compounds (transfers of metals)
26	8	356,748	8	456,085	6	465,710	108,962	n-Butyl alcohol (transfers to treatment)
27	**	**	**	**	2	108,856	108,856	Nitric acid and nitrate compounds (transfers to sewage)
28	5	44,300	5	44,300	5	142,900	98,600	Nickel and compounds (transfers of metals)
29	11	0	15	55,010	15	93,313	93,313	Toluene, Methanol (transfers to treatment)
30	5	216,300	5	362,101	7	305,118	88,818	Aluminum, Zinc/Copper and compounds (transfers of metals)
31	4	56,295	4	57,794	6	143,190	86,895	Styrene (transfers to treatment)
32	1	226,980	1	376,450	1	311,202	84,222	Lead and compounds (transfers of metals)
33	**	**	10	22,314	4	81,600	81,600	Nitric acid and nitrate compounds (transfers to treatment)
34	3	33,000	4	76,000	4	107,600	74,600	Aluminum (transfers of metals)
35	21	255,380	21	397,640	21	328,500	73,120	Asbestos (transfers to disposal)
36	1	220,000	1	276,110	1	293,000	73,000	Phosphoric acid (transfers to disposal)
37	22	74,841	23	75,798	18	146,560	71,719	Phosphoric acid (transfers to disposal)
38	4	944	8	80,841	8	71,673	70,729	Manganese and compounds (transfers of metals)
39	10	35,658	10	48,855	11	105,384	69,726	Asbestos (transfers to disposal)
40	3	2,813	3	111,156	3	72,062	69,249	Lead and compounds (transfers of metals)
41	2	0	2	0	2	65,600	65,600	Lead and compounds (transfers of metals)
42	**	**	**	**	2	65,024	65,024	Methanol, Toluene (transfers to treatment)
43	6	179,183	6	68,720	6	241,888	62,705	Copper and compounds (transfers of metals)
44	3	0	3	0	3	60,000	60,000	Methyl ethyl ketone, Toluene (transfers to treatment)
45	**	**	8	66,000	2	59,555	59,555	Aluminum oxide (transfers to disposal)
46	8	36,461	8	43,230	8	93,712	57,251	Zinc and compounds (transfers of metals)
47	6	91,190	5	55,360	7	144,300	53,110	Methanol (transfers to treatment)
48	5	0	5	38,600	5	52,900	52,900	Manganese and compounds (transfers of metals)
49	13	117,043	13	123,986	13	168,170	51,127	Cresol, Phenol (transfers to treatment)
50	6	1,445,895	10	1,269,608	10	1,496,404	50,509	Zinc and compounds (transfers of metals)
	284	15,052,154	330	25,933,730	330	33,250,719	18,198,565	

* Chemicals accounting for more than 70% of increase in total transfers from the facility.

** Indicates facility did not report any matched chemicals that year.

Table 4-34		TRI Facilities with Largest Decrease in Off-site Transfers, 1995-1997					
M 1997							
Rank	Facility	City, State	US SIC Code	1995		1996	
				Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)
1	Millennium Petrochemical Inc., Millennium Chemicals Inc.	La Porte, TX	28	22	4,142,623	22	404,462
2	DuPont Cape Fear	Leland, NC	28	21	3,588,734	19	559,548
3	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	15	6,128,351	17	6,357,178
4	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	10	15,729,385	9	10,473,482
5	PD Glycol, Occidental Petroleum Corp.	Beaumont, TX	28	6	1,748,908	6	200,470
6	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	9	2,010,436	9	3,033,529
7	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33	7	1,228,394	7	387,751
8	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33	4	1,268,007	5	127,741
9	DuPont	Louisville, KY	28	10	872,295	8	28,040
10	Teva Pharmaceuticals USA, Teva Pharmaceutical Ind. Ltd.	Mexico, MO	28	5	866,173	5	1,328,257
11	Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena, TX	28	10	8,805,712	12	8,401,166
12	Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood, MS	33	5	840,229	6	0
13	Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle, IN	33	5	1,074,889	5	256,673
14	Merck & Co. Inc.	Rahway, NJ	28	17	1,068,131	17	387,280
15	Olin Brass Indianapolis, Olin Corp.	Indianapolis, IN	33	8	717,081	8	1,771
16	Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta, PR	28	6	1,248,708	6	754,468
17	Mallinckrodt Inc.	Saint Louis, MO	28	19	2,135,210	19	1,607,981
18	Solutia Inc.	Springfield, MA	Mult.	19	2,104,123	17	1,512,541
19	OSI Specialties Inc., Witco Corp.	Friendly, WV	28	17	1,042,030	17	437,295
20	Chemical Solvents Inc., Denison Facility	Cleveland, OH	28	13	681,994	12	0
21	Cargill Corn Milling, Cargill Inc.	Cedar Rapids, IA	20	2	681,573	**	**
22	Avesta Sheffield East Inc., Avesta Sheffield N.A. Inc.	Baltimore, MD	33	5	724,203	5	241,384
23	Merichem-Sasol USA LLC	Houston, TX	28	12	671,885	12	149,389
24	GB Biosciences Corp.	Houston, TX	28	13	779,305	10	221,468
25	Slater Steels, Ft. Wayne Spec. Alloys Div.	Fort Wayne, IN	33	7	641,865	7	102,431
26	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3	3,415,766	3	3,439,996
27	Armstrong World Indl. Inc.	Lancaster, PA	39	9	554,379	7	152,612
28	Solutia Inc.	Cahokia, IL	28	16	679,006	13	230,199
29	GE Co., Super Abrasives	Worthington, OH	Mult.	5	865,784	4	559,779
30	Honda of America Mfg. Inc., American Honda Motor Co. Inc.	Anna, OH	37	14	499,855	11	141,328
31	DuPont	Circleville, OH	28	3	625,627	12	50,365
32	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Leechburg, PA	33	6	503,619	6	147,666
33	Armco Inc.	Zanesville, OH	33	7	2,027,447	7	1,992,248
34	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33	4	2,927,800	4	2,351,083
35	Talley Metals Tech. Inc., Talley Ind. Inc.	Hartsville, SC	33	7	433,560	7	6,732
36	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26	8	3,783,492	8	2,185,668
37	Nucor Steel - Texas, Nucor Corp.	Jewett, TX	33	7	501,185	8	196,306
38	Lukens Steel Co., Lukens Inc.	Coatesville, PA	33	8	545,335	8	327,414
39	Essex Group Inc.	Lithonia, GA	33	3	403,260	3	96
40	Polaroid Corp.	Waltham, MA	38	13	647,601	12	363,671
41	Chicago Specialties Inc., PMC Inc.	Chicago, IL	28	13	485,538	9	221,108
42	DuPont	Victoria, TX	28	29	733,239	29	478,514
43	Uniroyal Chemical Co. Inc., Crompton & Knowles Corp.	Geismar, LA	28	20	393,359	20	184,876
44	Newport Steel Corp., NS Group Inc.	Wilder, KY	33	8	1,384,942	7	852,880
45	Borden Chemical Inc., Borden Inc.	Forest Park, IL	28	7	661,622	7	826,414
46	Imco Recycling of Ohio Inc., Imco Recycling Inc.	Uhrichsville, OH	33	6	762,612	6	414,318
47	North American Royalties Inc., Wheland Fndy. Div.	Chattanooga, TN	33	9	770,057	8	515,231
48	Warner-Lambert Co., Parke-Davis Div.	Holland, MI	28	11	1,839,011	12	2,784,585
49	Elf Atochem N.A. Inc.	Crosby, TX	28	5	309,429	4	1,138
50	Exxon Chemical, Baton Rouge Chemical Plant, Exxon Corp.	Baton Rouge, LA	28	34	398,077	34	73,981
Total				522	86,951,846	509	55,472,513

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

** Indicates facility did not report any matched chemicals that year.

Rank	1997		Change 95-97		Major Chemicals Reported with Decreases (Primary Transfers with Decreases)*
	Number of Forms	Total Transfers (kg)	Total Transfers (kg)		
1	21	485,572	-3,657,051		Vinyl acetate (transfers to treatment)
2	19	101,290	-3,487,444		Ethylene glycol (transfers to treatment)
3	18	3,508,789	-2,619,562		Zinc and compounds (transfers of metals)
4	9	13,855,648	-1,873,737		Lead and compounds (transfers of metals)
5	6	158,086	-1,590,822		Ethylene glycol (transfers to treatment)
6	9	560,926	-1,449,510		Lead/Zinc and compounds (transfers of metals)
7	**	**	-1,228,394		Chromium and compounds (transfers of metals)
8	5	111,984	-1,156,023		Chromium and compounds (transfers of metals)
9	6	8,783	-863,512		Toluene (transfers to treatment)
10	5	6,809	-859,364		Toluene (transfers to treatment)
11	12	7,964,044	-841,668		Nitric acid and nitrate compounds, Dinitrotoluene (transfers to sewage)
12	5	0	-840,229		Lead/Manganese and compounds (transfers of metals)
13	5	265,510	-809,379		Chromium and compounds (transfers of metals)
14	15	305,380	-762,751		Methanol (transfers to sewage)
15	7	1,209	-715,872		Copper/Chromium and compounds (transfers of metals)
16	5	540,726	-707,982		Methanol (transfers to treatment)
17	20	1,428,703	-706,507		Methanol (transfers to sewage), 1,1,2-Trichloroethane (transfers to treatment)
18	17	1,398,152	-705,971		Formaldehyde, Methanol, n-Butyl alcohol (transfers to sewage)
19	18	342,599	-699,431		Methanol, Toluene (transfers to treatment)
20	8	0	-681,994		Dichloromethane, Methyl ethyl ketone, Methyl isobutyl ketone, Styrene, Toluene (transfers to treatment)
21	**	**	-681,573		Ethylene glycol (transfers to sewage)
22	5	43,743	-680,460		Nitric acid and nitrate compounds (transfers to treatment, disposal)
23	12	2,713	-669,172		Naphthalene, Xylene (transfers to treatment)
24	9	115,775	-663,530		Methanol (transfers to disposal), Xylene (transfers to treatment)
25	8	47,432	-594,433		Chromium and compounds (transfers of metals)
26	3	2,863,172	-552,594		Copper and compounds (transfers of metals)
27	7	4,849	-549,530		Di(2-ethylhexyl) phthalate (transfers to disposal)
28	13	159,203	-519,803		4-Nitrophenol (transfers to treatment), o-Xylene, Methyl ethyl ketone (transfers to sewage)
29	4	361,466	-504,318		Nitric acid and nitrate compounds (transfers to sewage)
30	11	4,584	-495,271		Zinc and compounds (transfers of metals)
31	14	161,101	-464,526		Ethylene glycol (transfers to treatment)
32	6	45,037	-458,582		Nitric acid and nitrate compounds (transfers to treatment)
33	7	1,579,615	-447,832		Nitric acid and nitrate compounds, Hydrogen fluoride (transfers to disposal)
34	6	2,498,413	-429,387		Zinc and compounds (transfers of metals)
35	7	9,874	-423,686		Nitric acid and nitrate compounds, Hydrogen fluoride (transfers to disposal), Chromium and compounds (transfers of metals)
36	8	3,361,224	-422,268		Methanol (transfers to sewage)
37	7	84,801	-416,384		Zinc and compounds (transfers of metals)
38	8	137,177	-408,158		Nitric acid and nitrate compounds, Hydrogen fluoride (transfers to treatment)
39	3	99	-403,161		Copper and compounds (transfers of metals)
40	10	245,242	-402,359		Methanol, Toluene (transfers to treatment)
41	10	83,867	-401,671		p-Cresol (transfers to sewage)
42	29	345,615	-387,624		Cresol (transfers to treatment)
43	19	7,104	-386,255		Toluene, N-Nitrosodiphenylamine (transfers to treatment)
44	7	1,022,314	-362,628		Zinc and compounds (transfers of metals)
45	7	305,806	-355,816		Methanol (transfers to sewage)
46	7	431,969	-330,643		Aluminum (transfers of metals)
47	8	446,754	-323,303		Zinc/Manganese and compounds (transfers of metals)
48	12	1,523,586	-315,425		Toluene (transfers to treatment)
49	4	2	-309,427		tert-Butyl alcohol (transfers to treatment)
50	35	93,265	-304,812		Methanol (transfers to treatment, disposal)
	496	47,030,012	-39,921,834		

* Chemicals accounting for more than 70% of decrease in total transfers from the facility.

** Indicates facility did not report any matched chemicals that year.

Table 4-35		TRI Facilities with Largest Increase in Off-site Transfers, 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	USS Clairton Works, USX Corp.	Clairton, PA	33
2	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33
3	Steel Dynamics Inc.	Butler, IN	33
4	Nucor Steel	Plymouth, UT	33
5	Regal Ware Inc.	Kewaskum, WI	34
6	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33
7	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28
8	Timken Co., Faircrest Steel Plant	Canton, OH	33
9	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33
10	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33
11	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33
12	USS Mon Valley Works, USX Corp.	Braddock, PA	33
13	FMC Corp.	Baltimore, MD	28
14	Bar Techs. Inc.	Johnstown, PA	33
15	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33
16	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28
17	Ameristeel Corp.	Charlotte, NC	33
18	Southwire Co.	Carrrollton, GA	Mult.
19	Gwaltney of Smithfield Ltd., Smithfield Foods Inc.	Smithfield, VA	20
20	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
21	GNI Chemicals Corp. Inc., GNI Group Inc.	Deer Park, TX	28
22	Timken Co., Harrison Steel Plant	Canton, OH	33
23	Koppers Ind. Inc.	Cicero, IL	28
24	Roanoke Electric Steel Corp.	Roanoke, VA	33
25	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28
26	Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa, AL	33
27	Koppel Steel Corp., NS Group Inc.	Koppel, PA	33
28	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.
29	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33
30	Auburn Steel Co. Inc.	Auburn, NY	33
31	Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville, OR	33
32	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33
33	Millennium Inorganic Chemicals, Plant 1, Millennium Chemicals	Ashtabula, OH	28
34	Pharmacia & Upjohn Co.	Portage, MI	28
35	Davisco Lake Norden Food Ingredient Co., Davisco Foods Intl.	Lake Norden, SD	20
36	Shell Chemical Co., Shell Oil Co.	Belpre, OH	Mult.
37	C & D Techs. Inc.	Conyers, GA	36
38	Pfizer Inc.	Groton, CT	28
39	Tippecanoe Labs., Eli Lilly & Co.	Shadeland, IN	28
40	Squibb Mfg. Inc., Bristol-Myers Squibb Co.	Humacao, PR	28
41	Ameristeel Corp., WTN Steel Mill	Jackson, TN	33
42	Nipa Hardwicke Inc., BTP PLC	Rock Hill, SC	28
43	Potlatch Corp., Minnesota Pulp & Paper Div.	Cloquet, MN	26
44	Nucor Steel, Nucor Corp.	Huger, SC	33
45	Nucor Steel, Nucor Corp.	Darlington, SC	33
46	Demunno/Kerdoon, World Oil Corp.	Compton, CA	29
47	Ipsco Steel Inc., Ipsco Ent's. Inc.	Muscatine, IA	33
48	DDE - Louisville Plant, DuPont Dow Elastomers LLC	Louisville, KY	28
49	Stone Container Corp.	Panama City, FL	26
50	Prestolite Wire Corp.	Paragould, AR	Mult.
Total			

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Increases (Primary Transfers with Increases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	18	962,639	20	506,024	19	9,945,033	8,982,394	Ethylene (transfers to treatment)
2	8	37,750	7	2,097,304	8	7,543,045	7,505,295	Zinc and compounds (transfers of metals)
3	1	5,161	3	1,982,278	7	6,529,560	6,524,399	Zinc and compounds (transfers of metals)
4	8	164,581	9	1,893,349	7	3,922,477	3,757,896	Zinc and compounds (transfers of metals)
5	6	538,390	6	3,646,259	6	4,078,005	3,539,615	Aluminum oxide (transfers to disposal)
6	9	8	9	10	10	2,957,542	2,957,534	Zinc and compounds (transfers of metals)
7	20	1,321,499	20	257,134	20	4,112,957	2,791,458	Ethylene glycol (transfers to sewage)
8	7	22,879	7	703,221	6	2,486,113	2,463,234	Zinc and compounds (transfers of metals)
9	6	0	5	0	5	2,388,657	2,388,657	Zinc and compounds (transfers of metals)
10	5	0	4	0	6	2,384,320	2,384,320	Zinc and compounds (transfers of metals)
11	6	0	6	3,512,206	6	2,175,039	2,175,039	Zinc and compounds (transfers of metals)
12	6	1,018,552	7	3,260,882	7	3,090,268	2,071,716	Zinc and compounds (transfers of metals)
13	14	244,485	16	1,159,788	18	2,283,231	2,038,746	Methanol, Toluene (transfers to treatment)
14	**	**	5	376,327	6	1,926,825	1,926,825	Zinc and compounds (transfers of metals)
15	5	0	5	0	5	1,758,623	1,758,623	Zinc and compounds (transfers of metals)
16	5	18,141	5	0	5	1,723,356	1,705,215	Lead and compounds (transfers of metals)
17	6	0	6	1,430,806	6	1,680,432	1,680,432	Zinc and compounds (transfers of metals)
18	19	349,766	30	1,180,378	37	1,917,891	1,568,125	Zinc and compounds (transfers of metals)
19	2	0	2	555,556	1	1,435,802	1,435,802	Nitric acid and nitrate compounds (transfers to sewage)
20	2	40,867	2	27,279	2	1,434,288	1,393,421	Chromium and compounds (transfers of metals)
21	**	**	1	244,666	9	1,350,989	1,350,989	Acetonitrile (transfers to disposal)
22	7	27,152	7	521,606	7	1,310,549	1,283,397	Zinc and compounds (transfers of metals)
23	9	45,870	10	49,925	9	1,304,542	1,258,672	Phthalic anhydride (transfers to disposal)
24	7	0	7	203,898	7	1,233,769	1,233,769	Zinc and compounds (transfers of metals)
25	8	407,719	9	879,587	16	1,634,088	1,226,369	Methanol, Carbon tetrachloride, Xylene (transfers to treatment)
26	7	0	12	60,237	12	1,192,598	1,192,598	Zinc and compounds (transfers of metals)
27	4	140,624	6	1,047,587	6	1,332,607	1,191,983	Zinc and compounds (transfers of metals)
28	12	319,810	12	401,860	8	1,488,998	1,169,188	Zinc and compounds (transfers of metals)
29	**	**	10	277,106	9	1,164,263	1,164,263	Manganese/Arsenic/Cobalt/Copper and compounds (transfers of metals)
30	4	20	4	296,171	4	1,066,656	1,066,636	Zinc and compounds (transfers of metals)
31	5	0	5	400,290	5	1,060,770	1,060,770	Zinc and compounds (transfers of metals)
32	8	5,071,785	7	5,933,560	7	6,086,892	1,015,107	Zinc/Manganese and compounds (transfers of metals)
33	4	0	5	816,327	5	997,732	997,732	Manganese and compounds (transfers of metals)
34	26	1,445,782	23	2,349,414	25	2,325,557	879,775	Dichloromethane, Methanol (transfers to sewage)
35	3	106,570	3	427,858	3	958,986	852,416	Nitric acid and nitrate compounds (transfers to sewage)
36	10	140,737	10	339,816	10	962,064	821,327	Cyclohexane (transfers to treatment)
37	1	116	1	431,778	1	810,519	810,403	Lead and compounds (transfers of metals)
38	22	1,965,288	21	1,833,756	16	2,768,981	803,693	Methanol (transfers to treatment)
39	18	6,689	18	202,427	20	809,341	802,652	Acetonitrile, Methanol, Dichloromethane (transfers to treatment)
40	13	5,677	13	67,061	12	804,592	798,915	Dichloromethane, Methanol, Acetonitrile (transfers to treatment)
41	7	0	7	1,601,937	7	780,190	780,190	Zinc and compounds (transfers of metals)
42	6	52,960	7	2,462	6	828,964	776,004	Methanol (transfers to treatment)
43	8	1,839,875	7	2,007,964	8	2,609,782	769,907	Methanol (transfers to sewage)
44	**	**	3	103,514	4	757,234	757,234	Zinc and compounds (transfers of metals)
45	9	18,948	7	1,645,527	6	753,082	734,134	Zinc and compounds (transfers of metals)
46	4	0	3	4	5	725,632	725,632	Ethylene glycol (transfers to sewage)
47	**	**	**	**	6	710,884	710,884	Zinc and compounds (transfers of metals)
48	**	**	6	735,572	6	705,614	705,614	Toluene (transfers to treatment)
49	9	2,403,174	10	2,268,046	10	3,107,455	704,281	Methanol (transfers to sewage)
50	5	3,627	5	231	5	680,829	677,202	Copper and compounds (transfers of metals)
	369	18,727,141	413	47,738,988	441	108,097,623	89,370,482	

* Chemicals accounting for more than 70% of increase in total transfers from the facility.

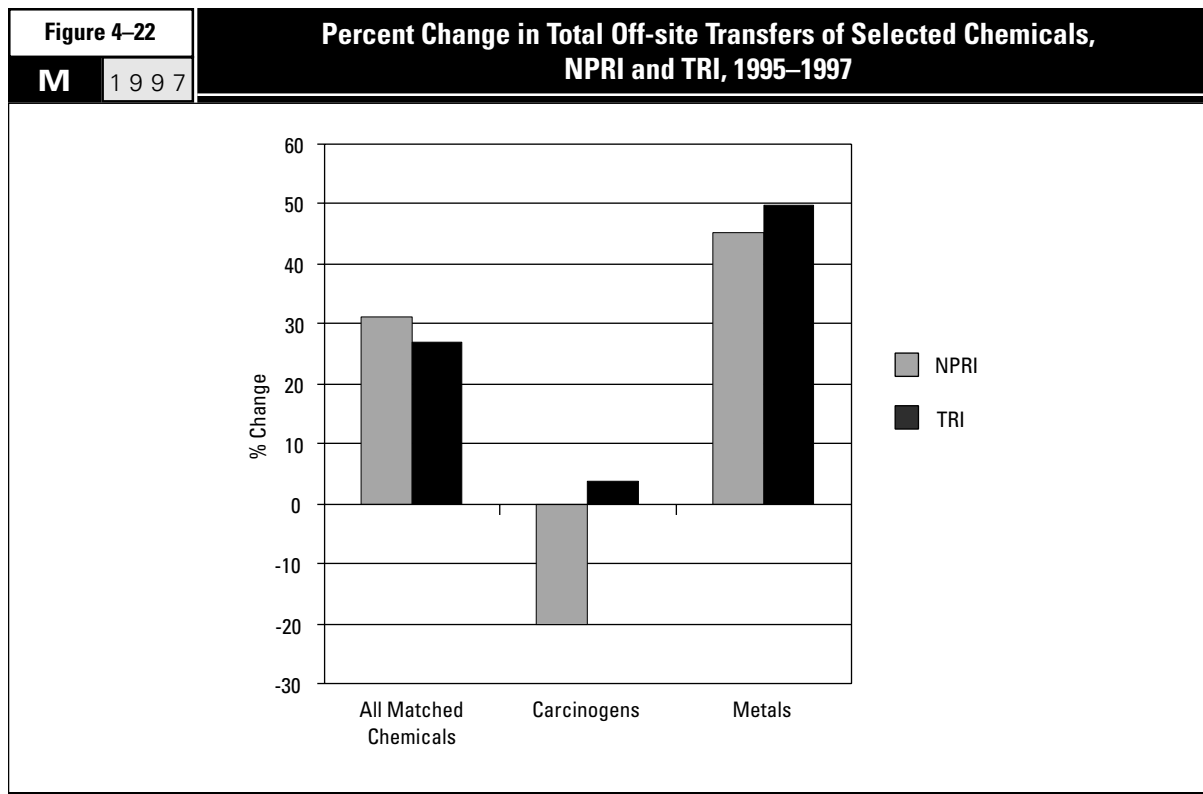
** Indicates facility did not report any matched chemicals that year.

4.3.4 Changes in Transfers by Chemical

Transfers of all chemicals in the matched data set increased from 1995 to 1997 in both NPRI (by 31 percent) and TRI (by 27 percent). Transfers of metals increased more substantially—45 percent in NPRI and 50 percent in TRI. For carcinogens, however, NPRI facilities reported a significant decrease in transfers (20 percent), while TRI facilities reported a slight increase (four percent)—see **Figure 4-22**.

NPRI Chemicals with Largest Decreases/Increases

NPRI facilities reported a reduction in asbestos transfers from 3.3 million kg in 1995 to 1.1 million kg in 1997, a reduction of 66 percent. This was the largest absolute reduction—2.1 million kg—by NPRI facilities for any substance in the matched data set. NPRI transfers of two substances decreased by nearly 600,000 kg each: transfers of chromium and its compounds decreased from 2.6 million kg to 2.0 million kg, or 23 percent, and vinyl acetate transfers decreased from 593,405 kg to 4,105 kg, a 99 percent reduction (**Table 4-36**). (Vinyl acetate is principally used in production of polyvinyl acetate, which has applications in adhesives, water-based paints, textile finishing, paper coatings, and inks, and of polyvinyl alcohol, which is also used in textile finishing and adhesives.)



- Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.
- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Table 4-36		The 10 Chemicals with the Largest Decrease in NPRI Off-site Transfers, 1995–1997				
M		1997				
CAS Number	Chemical	Total Transfers			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
1332-21-4	Asbestos (friable)	3,252,048	917,016	1,103,142	-2,148,906	-66.1
—	Chromium (and its compounds)	2,582,334	2,253,689	1,990,561	-591,773	-22.9
108-05-4	Vinyl acetate	593,405	6,573	4,105	-589,300	-99.3
71-43-2	Benzene	129,271	74,771	27,302	-101,969	-78.9
95-63-6	1,2,4-Trimethylbenzene	117,852	29,602	49,669	-68,183	-57.9
106-99-0	1,3-Butadiene	60,049	5,076	12,621	-47,428	-79.0
127-18-4	Tetrachloroethylene	70,001	66,721	24,659	-45,342	-64.8
107-13-1	Acrylonitrile	34,599	17,476	0	-34,599	-100.0
109-86-4	2-Methoxyethanol	33,900	0	0	-33,900	-100.0
75-35-4	Vinylidene chloride	21,000	0	7	-20,993	-100.0

Table 4-37		The 10 Chemicals with the Largest Increase in NPRI Off-site Transfers, 1995–1997				
M		1997				
CAS Number	Chemical	Total Transfers			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Zinc (and its compounds)	12,628,134	12,517,382	19,888,014	7,259,880	57.5
—	Manganese (and its compounds)	3,336,686	6,588,350	4,862,688	1,526,002	45.7
—	Nitric acid and nitrate compounds	4,089,462	4,756,110	5,062,691	973,229	23.8
108-88-3	Toluene	1,327,801	1,754,049	2,260,993	933,192	70.3
—	Lead (and its compounds)	2,018,723	2,255,620	2,915,080	896,357	44.4
67-56-1	Methanol	2,094,442	2,296,668	2,906,563	812,121	38.8
1330-20-7	Xylene (mixed isomers)	1,290,854	2,029,678	1,710,953	420,099	32.5
—	Copper (and its compounds)	712,814	753,461	1,111,567	398,753	55.9
78-93-3	Methyl ethyl ketone	420,782	828,690	795,946	375,164	89.2
107-21-1	Ethylene glycol	331,338	521,874	565,199	233,861	70.6

The chemical with the largest absolute increase in NPRI transfers was zinc and its compounds, which rose from 12.6 million kg in 1995 to 19.9 million kg in 1997, a change of 7.3 million kg, or 58 percent. Zinc and its compounds was also the substance with the largest total transfers throughout the 1995–1997 period. Ranking as the second-largest increase, transfers of manganese and its compounds rose overall from 1995 (3.3 million kg) to 1997 (4.9 million kg), with a peak in 1996 of 6.6 million kg. This 1.5-million-kg increase amounted to 46 percent. Nitric acid and nitrate compounds had the third largest increase, from 4.1 million kg to 5.1 million kg, amounting to a 24 percent rise (Table 4–37).

Seven of the 10 substances with the largest reductions in NPRI transfers were carcinogens: asbestos, acrylonitrile, benzene, 1,3-butadiene, chromium and its compounds (which are also metals), tetrachloroethylene, and vinyl acetate. Among the 10 substances with the largest increases in NPRI transfers were four metals: copper, lead, manganese and zinc (and their compounds); lead and its compounds is also designated as carcinogenic. Carcinogens and metals are discussed in the following sections of this chapter.

TRI Chemicals with Largest Decreases/Increases

The largest reduction of transfers reported by TRI facilities was for vinyl acetate, with a 3.6 million kg reduction, from 4.1 million kg to 549,214 kg, or 87 percent. Ethylene glycol transfers decreased 1.2 million kg. For this substance, transfers dropped from 16.6 million kg in 1995 to 11.2 million kg in 1996, but increased to 15.4 million kg in 1997, for an overall reduction of seven percent. Vinyl acetate and ethylene glycol were the only chemicals with reductions of more than one million kg.

The third-ranking chemical for TRI reductions was di(2-ethylhexyl) phthalate, which decreased from 1.5 million kg to 560,238 kg (**Table 4-38**). (Di(2-ethylhexyl) phthalate is primarily used as a plasticizer in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products such as teething rings and pacifiers, soft toys and balls, shower curtains, raincoats, and numerous other commercial products. It is used in adhesives, polymeric coatings, paper and paperboard components, and defoaming agents.)

TRI facilities reported their largest transfer increase for zinc and its compounds, the 54.3 million kg reported in 1995 growing to 95.1 million kg in 1997. This amounted to an increase of 40.8 million kg, or 75 percent. Transfers reported for manganese and its compounds increased by 10.4 million kg, from 18.3 million kg to 28.7 million kg, an increase of 57 percent, while those for ethylene increased by 8.9 million kg from 1995 to 1997 (1.0 million kg to 9.9 million kg), an increase of 929 percent. Transfers increased by more than 1.5 million kg each for all

Table 4-38		The 10 Chemicals with the Largest Decrease in TRI Off-site Transfers, 1995-1997				
M	1997	Total Transfers			Change 1995-1997	
CAS Number	Chemical	1995 (kg)	1996 (kg)	1997 (kg)	kg	%
108-05-4	Vinyl acetate	4,163,126	962,109	549,214	-3,613,912	-86.8
107-21-1	Ethylene glycol	16,559,058	11,224,621	15,375,202	-1,183,856	-7.1
117-81-7	Di(2-ethylhexyl) phthalate	1,496,385	913,695	560,238	-936,147	-62.6
—	Chromium (and its compounds)	12,608,261	9,413,292	11,726,757	-881,504	-7.0
127-18-4	Tetrachloroethylene	1,030,786	579,024	488,164	-542,622	-52.6
7664-39-3	Hydrogen fluoride	1,752,723	1,342,365	1,347,742	-404,981	-23.1
1319-77-3	Cresol (mixed isomers)	548,090	161,576	149,245	-398,845	-72.8
106-44-5	p-Cresol	448,833	191,456	72,396	-376,437	-83.9
108-88-3	Toluene	10,152,675	10,624,381	9,811,506	-341,169	-3.4
108-95-2	Phenol	3,769,246	3,566,141	3,435,076	-334,170	-8.9

Table 4-39		The 10 Chemicals with the Largest Increase in TRI Off-site Transfers, 1995-1997				
M	1997	Total Transfers			Change 1995-1997	
CAS Number	Chemical	1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Zinc (and its compounds)	54,343,410	68,222,175	95,103,244	40,759,834	75.0
—	Manganese (and its compounds)	18,324,872	22,196,707	28,686,838	10,361,966	56.5
74-85-1	Ethylene	960,675	505,890	9,886,584	8,925,909	929.1
—	Lead (and its compounds)	11,969,865	13,990,333	17,600,736	5,630,871	47.0
—	Nitric acid and nitrate compounds	39,839,929	40,100,249	45,344,123	5,504,194	13.8
67-56-1	Methanol	56,144,722	54,666,546	60,218,372	4,073,650	7.3
1344-28-1	Aluminum oxide (fibrous forms)	1,304,526	4,195,559	4,705,937	3,401,411	260.7
—	Copper (and its compounds)	11,320,647	10,310,181	13,536,196	2,215,549	19.6
75-05-8	Acetonitrile	2,317,796	2,349,502	4,111,538	1,793,742	77.4
7664-38-2	Phosphoric acid	3,299,203	3,175,366	4,835,539	1,536,336	46.6

of the 10 chemicals with the largest TRI transfers (**Table 4-39**).

Four of the substances with the largest reductions in TRI transfers were carcinogens: chromium and its compounds (also a metal), di(2-ethylhexyl) phthalate, tetrachloroethylene and vinyl

acetate. Three substances with large increases in TRI transfers were metals: lead, manganese and zinc (and their compounds). Lead and its compounds is also a designated carcinogen. These groups are discussed in the following sections of this chapter.

Table 4-40		Change in NPRI Off-site Transfers of Known or Suspected Carcinogens [†] , 1995-1997				
M	1997	Total Transfers			Change 1995-1997	
CAS Number	Chemical	1995 (kg)	1996 (kg)	1997 (kg)	kg	%
1332-21-4	Asbestos (friable)	3,252,048	917,016	1,103,142	-2,148,906	-66.1
—	Chromium (and its compounds)	2,582,334	2,253,689	1,990,561	-591,773	-22.9
108-05-4	Vinyl acetate	593,405	6,573	4,105	-589,300	-99.3
71-43-2	Benzene	129,271	74,771	27,302	-101,969	-78.9
106-99-0	1,3-Butadiene	60,049	5,076	12,621	-47,428	-79.0
127-18-4	Tetrachloroethylene	70,001	66,721	24,659	-45,342	-64.8
107-13-1	Acrylonitrile	34,599	17,476	0	-34,599	-100.0
56-23-5	Carbon tetrachloride	13,090	7,384	12,429	-661	-5.0
584-84-9	Toluene-2,4-diisocyanate	100	500	0	-100	-100.0
75-01-4	Vinyl chloride	59	1	1	-58	-98.3
91-08-7	Toluene-2,6-diisocyanate	0	1	0	0	—
79-46-9	2-Nitropropane	0	0	0	0	—
62-56-6	Thiourea	0	0	0	0	—
77-78-1	Dimethyl sulfate	0	0	0	0	—
101-14-4	4,4'-Methylenebis(2-chloroaniline)	0	0	0	0	—
101-77-9	4,4'-Methylenedianiline	0	0	0	0	—
121-14-2	2,4-Dinitrotoluene	0	0	0	0	—
302-01-2	Hydrazine	0	0	0	0	—
96-09-3	Styrene oxide	0	0	0	0	—
123-91-1	1,4-Dioxane	0	0	0	0	—
75-56-9	Propylene oxide	0	0	0	0	—
106-46-7	1,4-Dichlorobenzene	400	400	400	0	0.0
75-21-8	Ethylene oxide	0	0	0	0	—
106-89-8	Epichlorohydrin	0	0	3	3	—
140-88-5	Ethyl acrylate	0	160	80	80	—
75-07-0	Acetaldehyde	6,663	6,640	7,074	411	6.2
107-06-2	1,2-Dichloroethane	51	160	589	538	1,054.9
139-13-9	Nitrilotriacetic acid	2,034	1,559	2,902	868	42.7
26471-62-5	Toluenediisocyanate (mixed isomers)	7,092	8,032	8,315	1,223	17.2
—	Cobalt (and its compounds)	8,876	10,857	10,372	1,496	16.9
67-66-3	Chloroform	3,418	4,256	5,879	2,461	72.0
79-06-1	Acrylamide	148	137	2,684	2,536	1,713.5
117-81-7	Di(2-ethylhexyl) phthalate	42,235	42,477	45,440	3,205	7.6
79-01-6	Trichloroethylene	28,256	24,993	37,282	9,026	31.9
—	Arsenic (and its compounds)	16,308	47,685	67,092	50,784	311.4
50-00-0	Formaldehyde	234,020	302,764	302,732	68,712	29.4
100-42-5	Styrene	230,447	255,105	321,545	91,098	39.5
—	Cadmium (and its compounds)	16,121	2,783	123,627	107,506	666.9
—	Nickel (and its compounds)	369,361	498,703	515,592	146,231	39.6
75-09-2	Dichloromethane	67,341	90,322	260,108	192,767	286.3
—	Lead (and its compounds)	2,018,723	2,255,620	2,915,080	896,357	44.4
	Subtotal	9,786,450	6,901,861	7,801,616	-1,984,834	-20.3
	% of Total	25.9	16.6	15.8		
	Total for Matched NPRI Chemicals	37,748,704	41,516,953	49,508,261	11,759,557	31.2

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

► A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Carcinogens

NPRI transfers of substances designated as known or suspected carcinogens decreased by 20 percent in the matched data set from 1995 to 1997 (from 9.8 million kg to 7.8 million kg), although this included an increase from 1996 (6.9 million kg). The overall reduction contrasted with a 31 percent increase for matched NPRI chemicals. NPRI transfers declined for 10 carcinogens and rose for 18 (Table 4-40).

Among known or suspected carcinogens, asbestos, chromium and its compounds, and vinyl acetate had the largest reductions in NPRI transfers. These were the same substances that showed the largest overall reductions (see Table 4-36).

NPRI facilities reported increasing transfers of four carcinogens by more than 100,000 kg each from 1995 to 1997. These were lead and its compounds (from 2.0 million kg to 2.9 million kg), dichloromethane (from 67,341 kg to 260,108 kg), nickel and its compounds (from 369,361 kg to 515,592 kg), and cadmium and its compounds (from 16,121 kg to 123,627 kg). Of these, only lead was among the top 10 chemicals for increases, ranking fifth (see Table 4-37).

TRI transfers of substances designated as known or suspected carcinogens increased by four percent from 1995 to 1997 (57.2 million kg to 59.2 million kg), although from 1996 (50.8 million kg) there was a much larger increase. The overall four percent increase for 1995 to 1997 contrasts with a 27 percent increase for matched TRI chemicals. Transfers increased for 26 carcinogens and decreased for 20 (Table 4-41).

The largest TRI reductions in transfers of known or suspected carcinogens were for vinyl acetate (from 4.2 million kg to 549,214 kg), di(2-ethylhexyl) phthalate (1.5 million kg to 560,238 kg) and chromium and its compounds (from 12.6 million kg to 11.7 million kg). These three carcinogens were in the top four chemicals for TRI reductions in transfers from 1995 to 1997 (see Table 4-38).

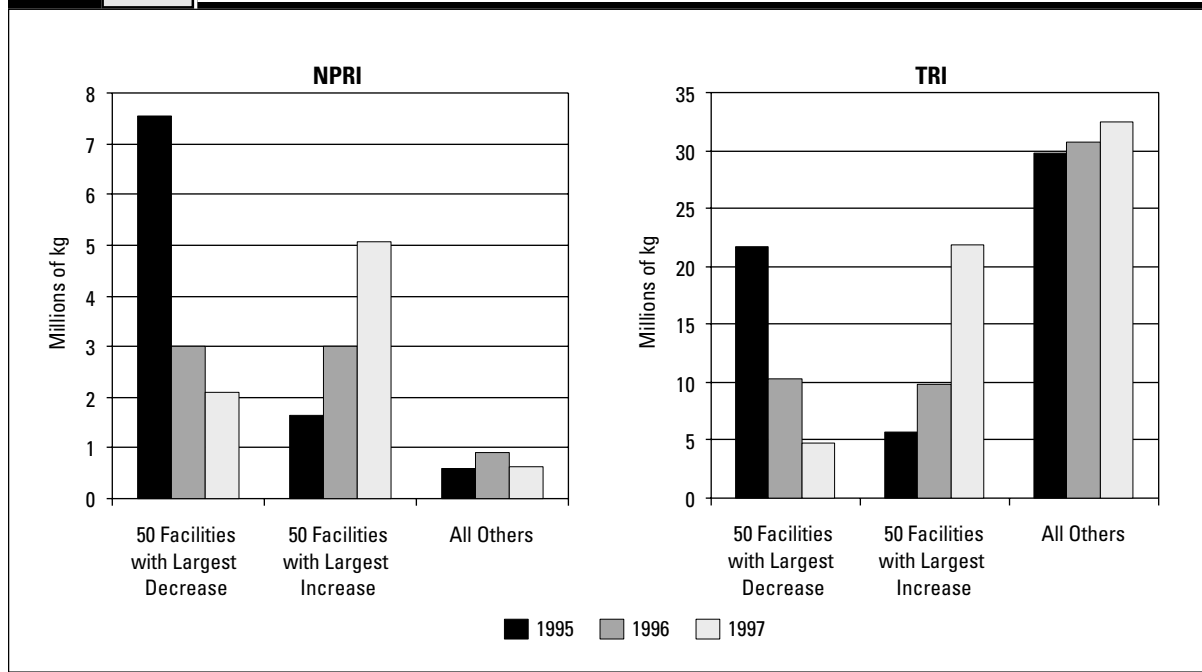
One carcinogen (lead and its compounds) showed an increase of more than 1 million kg in transfers reported to TRI. Transfers of lead increased by 5.6 million kg (47 percent), from 12.0 million kg to 17.6 million kg. The next largest increases occurred in transfers of dichloromethane and nickel: from 5.3 million kg to 6.1 million kg for dichloromethane and from 4.5 million kg to 5.2 million kg for nickel and its compounds. These were both 15 percent increases. Again, only lead and its compounds appeared among the chemicals with the largest TRI increases in transfers, where it ranked fourth (see Table 4-39).

Table 4-41		Change in TRI Off-site Transfers of Known or Suspected Carcinogens [†] , 1995-1997				
CAS Number	Chemical	Total Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
108-05-4	Vinyl acetate	4,163,126	962,109	549,214	-3,613,912	-86.8
117-81-7	Di(2-ethylhexyl) phthalate	1,496,385	913,695	560,238	-936,147	-62.6
—	Chromium (and its compounds)	12,608,261	9,413,292	11,726,757	-881,504	-7.0
127-18-4	Tetrachloroethylene	1,030,786	579,024	488,164	-542,622	-52.6
75-07-0	Acetaldehyde	785,957	299,728	543,398	-242,559	-30.9
1332-21-4	Asbestos (friable)	2,204,497	1,884,416	1,963,542	-240,955	-10.9
—	Cadmium (and its compounds)	885,217	531,695	684,109	-201,108	-22.7
106-46-7	1,4-Dichlorobenzene	283,812	230,923	89,422	-194,390	-68.5
67-66-3	Chloroform	938,445	1,113,784	839,939	-98,506	-10.5
123-91-1	1,4-Dioxane	305,118	345,829	266,885	-38,233	-12.5
107-06-2	1,2-Dichloroethane	902,431	464,332	868,755	-33,676	-3.7
95-80-7	2,4-Diaminotoluene	13,503	127	125	-13,378	-99.1
96-45-7	Ethylene thiourea	11,768	4,679	4,457	-7,311	-62.1
101-77-9	4,4'-Methylenedianiline	47,054	34,832	39,954	-7,100	-15.1
100-42-5	Styrene	3,090,052	2,188,923	3,083,829	-6,223	-0.2
101-14-4	4,4'-Methylenebis(2-chloroaniline)	4,849	5,129	3,061	-1,788	-36.9
64-67-5	Diethyl sulfate	2,442	2,651	942	-1,500	-61.4
62-56-6	Thiourea	7,683	6,311	7,083	-600	-7.8
121-14-2	2,4-Dinitrotoluene	670	0	85	-585	-87.3
606-20-2	2,6-Dinitrotoluene	54	12	50	-4	-7.4
90-94-8	Michler's ketone	0	0	0	0	—
96-09-3	Styrene oxide	0	0	0	0	—
79-46-9	2-Nitropropane	0	5,654	11	11	—
94-59-7	Safrole	2	61	113	111	5,550.0
91-08-7	Toluene-2,6-diisocyanate	715	5,465	1,429	714	99.9
77-78-1	Dimethyl sulfate	1	2	1,056	1,055	105,500.0
584-84-9	Toluene-2,4-diisocyanate	5,544	7,418	7,013	1,469	26.5
139-13-9	Nitrilotriacetic acid	849	8,163	5,506	4,657	548.5
302-01-2	Hydrazine	12,951	10,991	20,622	7,671	59.2
79-06-1	Acrylamide	100,672	182,153	111,744	11,072	11.0
75-21-8	Ethylene oxide	37,011	54,571	60,069	23,058	62.3
140-88-5	Ethyl acrylate	47,563	174,969	74,121	26,558	55.8
50-00-0	Formaldehyde	1,475,176	1,326,200	1,506,988	31,812	2.2
107-13-1	Acrylonitrile	493,147	501,899	531,447	38,300	7.8
75-01-4	Vinyl chloride	33,974	35,252	83,377	49,403	145.4
—	Arsenic (and its compounds)	1,265,081	1,407,262	1,335,280	70,199	5.5
106-99-0	1,3-Butadiene	46,083	44,205	144,951	98,868	214.5
71-43-2	Benzene	937,524	806,507	1,045,633	108,109	11.5
75-56-9	Propylene oxide	179,802	162,484	299,264	119,462	66.4
79-01-6	Trichloroethylene	509,113	797,113	664,435	155,322	30.5
106-89-8	Epichlorohydrin	456,594	661,800	619,599	163,005	35.7
56-23-5	Carbon tetrachloride	338,859	728,678	523,206	184,347	54.4
98-95-3	Nitrobenzene	285,069	273,605	589,636	304,567	106.8
26471-62-5	Toluenediisocyanate (mixed isomers)	108,488	264,712	421,558	313,070	288.6
—	Cobalt (and its compounds)	271,073	382,658	586,218	315,145	116.3
—	Nickel (and its compounds)	4,506,004	4,258,168	5,199,851	693,847	15.4
75-09-2	Dichloromethane	5,295,058	5,722,613	6,085,342	790,284	14.9
—	Lead (and its compounds)	11,969,865	13,990,333	17,600,736	5,630,871	47.0
	Subtotal	57,158,328	50,794,427	59,239,214	2,080,886	3.6
	% of Total	18.4	16.0	15.0		
	Total for Matched TRI Chemicals	310,748,990	316,612,992	394,039,756	83,290,766	26.8

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Figure 4-23

**NPRI and TRI Total Off-site Transfers of Known or Suspected Carcinogens[†], 1995–1997:
Facilities with Largest Changes and All Others**
M 1997


[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

NPRI Facilities with Largest Decreases/Increases

NPRI's exceptional reduction in transfers of carcinogens reflects the influence of the 50 facilities making the largest decreases, which substantially outweighed the effect of the 50 facilities with the largest increases. Transfers of carcinogens by all other NPRI facilities resulted in little net change (Figure 4-23).

For the top 50 NPRI facilities reporting decreases, transfers of known or suspected carcinogens totaled 7.5 million kg in 1995 and 2.1 million kg in 1997—a decrease of 5.4 million kg. Six of these facilities submitted forms for carcinogens in the matched data set in 1995 but not in 1997 (Table 4-42).

The 50 NPRI facilities with the largest increases transferred 1.6 million kg in 1995 and 5.1 million kg in 1997, an increase of 3.4 million kg. Seven of these facilities did not submit forms for carcinogens in the matched data set in 1995 (Table 4-43).

Table 4-42		NPRI Facilities with Largest Decrease in Off-site Transfers of Known or Suspected Carcinogens [†] , 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	CXY Chemicals LP, Canadian Occidental Petroleum	Nanaimo, BC	37	28
2	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33
3	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28
4	Co-Steel Lasco	Whitby, ON	29	33
5	Western Co-Operative Fertilizers Limited	Calgary, AB	37	28
6	Cooper Automotive Products., Wagner Div., Cooper Industries	Stratford, ON	32	37
7	BASF Canada Inc., Sarnia Site	Sarnia, ON	37	28
8	Magotteaux Inc., Magotteaux Canada	Magog, QC	30	39
9	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33
10	Solutia Canada Inc, Produits chimiques	LaSalle, QC	16	30
11	M.B. Paper, Alberni Specialties Division, MacMillan Bloedel	Port Alberni, BC	27	26
12	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29
13	Bayer Inc., Bayer AG	Sarnia, ON	37	28
14	Consumers Packaging Inc., Consumers Glass (Brampton)	Brampton, ON	35	32
15	A.P. Green Refractories (Canada) Ltd., A.P. Green Industries	Smithville, ON	35	32
16	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34
17	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28
18	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
19	A.G. Simpson Co Ltd.	Oshawa, ON	32	34
20	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33
21	PCI Chemicals Canada Inc, Pioneer Companies Inc.	Cornwall, ON	37	28
22	CXY Chemicals Canada LP, Canadian Occidental Petroleum Ltd	North Vancouver, BC	37	28
23	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33
24	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28
25	Petro-Canada, Mississauga Lubricant Center	Mississauga, ON	36	29
26	Uniboard Canada Inc., Division Mont-Laurier	Mont-Laurier, QC	25	24
27	Aries Flexographics Ltd.	Mississauga, ON	28	27
28	Vitafoam Products Canada Ltd., Vita-Toronto	Downsview, ON	16	30
29	GE Lighting, Canada, Oakville Lamp Plant	Oakville, ON	33	36
30	Imperial Oil, IOL Strathcona Refinery	Edmonton, AB	36	29
31	Uniboard Canada Inc., Unires	Val-d'Or, QC	37	28
32	Sherritt International Corporation	Fort Saskatchewan, AB	37	28
33	Valeo Engine Cooling Limited, Automotive Division	Stratford, ON	32	35
34	Graham Products Ltd.	Inglewood, ON	16	30
35	Owens-Corning Canada Inc.	Edmonton, AB	35	32
36	Graphic Packaging Canada Corporation, Winnipeg Facility	Winnipeg, MB	28	27
37	Terra International (Canada), Terra Nitrogen (Courtright)	Courtright, ON	37	28
38	Milplex Circuit (Canada) Inc.	Scarborough, ON	33	36
39	Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel, QC	30	34
40	MAAX Inc., Division fibre de verre moderne - usine 4	Tring-Jonction, QC	37	28
41	Norcast Division de Tritech Precision Inc., fonderie Norcast	Mont-Joli, QC	30	34
42	Consumers Packaging Inc., Consumers Glass (Scoudouc)	Scoudouc, NB	35	32
43	Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est, QC	29	33
44	Accuflex Industrial Hose Ltd., Kuriyama Corporation	Guelph, ON	16	30
45	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
46	Tamis CAE Inc., CAE Inc.	Lennoxville, QC	30	34
47	Kronos Canada, Inc.	Varenes, QC	37	28
48	Frank Fair Industries Ltd., Motor Coach Industries Ltd.	Winnipeg, MB	32	30
49	Reichhold Limited, Weston Plant	Weston, ON	37	28
50	LPB Poles Inc., Bell Canada	Masson-Angers, QC	25	24
Total				

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Decreases (Primary Transfers with Decreases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	1	1,988,000	**	**	1	272	-1,987,728	Asbestos (transfers to disposal)
2	1	1,400,778	2	888,042	2	545,510	-855,268	Chromium and compounds (transfers of metals)
3	1	588,390	1	0	1	0	-588,390	Vinyl acetate (transfers to treatment)
4	3	663,911	3	397,208	3	496,278	-167,633	Lead and compounds (transfers of metals)
5	1	154,000	1	26,800	1	0	-154,000	Asbestos (transfers to disposal)
6	1	105,840	1	44,286	**	**	-105,840	Asbestos (transfers to disposal)
7	2	104,600	**	**	**	**	-104,600	1,3-Butadiene, Styrene (transfers to treatment)
8	2	94,770	2	0	2	0	-94,770	Chromium and compounds (transfers of metals)
9	1	88,005	1	7,710	1	1,410	-86,595	Lead and compounds (transfers of metals)
10	4	122,902	4	77,847	2	36,721	-86,181	Styrene, Acrylonitrile (transfers to treatment)
11	1	97,200	1	11,540	1	16,330	-80,870	Asbestos (transfers to disposal)
12	5	123,033	5	17,073	5	43,641	-79,392	Asbestos (transfers to disposal)
13	5	278,500	5	104,500	5	200,300	-78,200	Benzene (transfers to treatment)
14	1	72,300	1	4,000	1	0	-72,300	Chromium and compounds (transfers of metals)
15	2	87,732	1	30,601	1	20,141	-67,591	Chromium and compounds (transfers of metals)
16	2	140,811	2	140,811	2	74,750	-66,061	Chromium/Nickel and compounds (transfers of metals)
17	3	69,300	3	29,000	3	5,100	-64,200	Asbestos (transfers to disposal)
18	2	61,634	2	106,657	**	**	-61,634	Lead and compounds (transfers of metals)
19	2	101,853	3	127,520	3	46,807	-55,046	Nickel and compounds (transfers of metals)
20	2	48,250	**	**	**	**	-48,250	Lead/Chromium and compounds (transfers of metals)
21	3	43,776	1	84	**	**	-43,776	Asbestos (transfers to disposal)
22	1	48,000	2	48,400	2	4,900	-43,100	Asbestos (transfers to disposal)
23	3	356,188	5	268,691	5	316,350	-39,838	Lead and compounds (transfers of metals)
24	5	39,366	5	61,330	4	2,560	-36,806	Asbestos (transfers to disposal)
25	3	45,000	2	19,000	2	15,740	-29,260	Asbestos (transfers to disposal)
26	1	39,100	1	32,520	1	10,120	-28,980	Formaldehyde (transfers to treatment)
27	1	28,830	1	28,830	1	0	-28,830	Tetrachloroethylene (transfers to treatment)
28	2	25,600	3	0	3	0	-25,600	Dichloromethane (transfers to treatment)
29	2	34,490	2	18,370	2	11,704	-22,786	Lead and compounds (transfers of metals)
30	4	32,100	3	2,764	4	10,122	-21,978	Asbestos (transfers to disposal)
31	1	38,240	1	105,000	1	18,376	-19,864	Formaldehyde (transfers to treatment)
32	3	15,960	3	5,930	3	1,060	-14,900	Nickel and compounds (transfers of metals)
33	1	32,406	1	50,125	1	18,102	-14,304	Lead and compounds (transfers of metals)
34	1	24,700	1	11,877	1	10,485	-14,215	Styrene (transfers to disposal)
35	2	13,517	1	88	1	62	-13,455	Chromium and compounds (transfers of metals)
36	1	16,000	1	13,000	1	4,000	-12,000	Tetrachloroethylene (transfers to treatment)
37	2	12,000	2	6,200	1	0	-12,000	Asbestos (transfers to disposal)
38	1	12,000	1	13,000	**	**	-12,000	Trichloroethylene (transfers to treatment)
39	2	49,800	2	135,060	2	37,978	-11,822	Chromium/Nickel and compounds (transfers of metals)
40	1	13,600	1	2,250	1	2,250	-11,350	Styrene (transfers to treatment)
41	2	14,218	2	3,548	2	3,328	-10,890	Chromium and compounds (transfers of metals)
42	1	10,500	1	0	1	0	-10,500	Chromium and compounds (transfers of metals)
43	7	42,824	7	42,788	6	32,848	-9,976	Asbestos (transfers to disposal)
44	1	11,338	1	1,541	1	1,764	-9,574	Di(2-ethylhexyl) phthalate (transfers to disposal)
45	3	26,642	3	9,877	3	17,233	-9,409	Lead/Nickel and compounds (transfers of metals)
46	2	11,535	2	15,300	2	3,200	-8,335	Chromium and compounds (transfers of metals)
47	1	83,000	1	82,000	1	75,000	-8,000	Chromium and compounds (transfers of metals)
48	1	10,306	1	3,184	1	3,184	-7,122	Styrene (transfers to treatment)
49	3	7,630	3	1,647	3	1,280	-6,350	Styrene, Vinyl acetate (transfers to treatment)
50	2	6,106	2	620	2	423	-5,683	Chromium/Arsenic and compounds (transfers of metals)
	105	7,536,581	100	2,996,619	92	2,089,329	-5,447,252	

* Chemicals accounting for more than 70% of decrease in total transfers of carcinogens from the facility.

** Indicates facility did not report any matched carcinogens that year.

Table 4-43		NPRI Facilities with Largest Increase in Off-site Transfers of Known or Suspected Carcinogens [†] , 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33
2	Metalex Products Ltd.	Richmond, BC	29	33
3	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
4	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29
5	Dofasco Inc.	Hamilton, ON	29	33
6	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
7	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24
8	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33
9	Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton, AB	37	28
10	Stelco Inc., Hilton Works	Hamilton, ON	29	33
11	Tonolli Canada Limited	Mississauga, ON	29	33
12	Dow Chemical Canada Inc.	Varenes, QC	16	30
13	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33
14	Celanese Canada Inc.	Edmonton, AB	37	28
15	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	29	33
16	Marswell Metal Industries Limited	Burlington, ON	30	34
17	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28
18	Bombardier Inc., Bombardier Produits récréatifs	St-Antoine-de-Tilly, QC	16	30
19	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33
20	Chemrec Inc.	Cowansville, QC	37	28
21	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28
22	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33
23	North American Lumber, Roblin Forest Products	Roblin, MB	25	24
24	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29
25	Phytogen Pharmaceuticals Inc., Phytogen Life Sciences Inc.	Delta, BC	37	28
26	Garlock of Canada Ltd., Garlock Sealing Technology	Sherbrooke, QC	18	22
27	Zalev Brothers Limited	Windsor, ON	29	33
28	Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan, AB	29	33
29	Petro-Canada, Edmonton Refinery	Edmonton, AB	36	29
30	Produits Shell Canada Ltee., Raffinerie de Montréal-est	Montréal-est, QC	36	29
31	Ivaco Rolling Mills	L'Orignal, ON	29	33
32	Dow Chemical Canada Inc.	Sarnia, ON	37	28
33	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29
34	Baycoat Ltd., Baycoat R.S.N.	Hamilton, ON	30	34
35	Imperial Oil, IOL Dartmouth Refinery	Dartmouth, NS	36	29
36	Budd Plastics, Limited	Cobourg, ON	16	30
37	Cytec Canada Inc., Welland Plant	Niagara Falls, ON	37	28
38	Long Manufacturing Ltd., Echlin Inc.	Oakville, ON	32	37
39	Kindred Industries, Div. of Emco Ltd.	Midland, ON	30	34
40	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	30	37
41	Niagara Piston, Div. of Court Valve Co. Inc.	Beamsville, ON	32	37
42	Flakeboard Company Limited	St. Stephen, NB	25	24
43	Maple Manufacturing Inc., St. Catharines Machine Products Co	Smithville, ON	32	37
44	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37
45	Industries Rehau, Incorporated, Baie d'Urfé Facility	Baie d'Urfé, QC	16	30
46	Gates Canada Inc, Hose Manufacturing	Brantford, ON	15	30
47	Ethyl Canada Inc., Ethyl Corp.	Corunna, ON	37	28
48	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
49	A.G. Simpson Co. Ltd.	Cambridge, ON	30	34
50	MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction, QC	16	30
Total				

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Increases (Primary Transfers with Increases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	3	0	3	0	3	465,000	465,000	Lead and compounds (transfers of metals)
2	2	0	2	213,670	2	421,667	421,667	Lead and compounds (transfers of metals)
3	2	170	2	400	2	324,258	324,088	Chromium and compounds (transfers of metals)
4	1	0	2	90,000	2	271,000	271,000	Asbestos (transfers to disposal)
5	5	110,468	5	109,259	5	302,763	192,295	Lead and compounds (transfers of metals)
6	3	233,090	3	355,270	3	401,290	168,200	Chromium/Nickel and compounds (transfers of metals)
7	1	0	1	0	1	127,000	127,000	Formaldehyde (transfers to disposal)
8	1	1,400	1	1,400	1	100,000	98,600	Nickel and compounds (transfers of metals)
9	1	0	1	0	1	89,214	89,214	Dichloromethane (transfers to treatment)
10	6	145,380	6	238,340	6	230,400	85,020	Asbestos (transfers to disposal)
11	1	226,980	1	376,450	1	311,202	84,222	Lead and compounds (transfers of metals)
12	2	56,295	2	57,794	2	139,063	82,768	Styrene (transfers to treatment)
13	1	405	1	110,000	1	71,000	70,595	Lead and compounds (transfers of metals)
14	5	35,041	5	48,061	6	105,033	69,992	Asbestos (transfers to disposal)
15	1	0	1	0	1	65,600	65,600	Lead and compounds (transfers of metals)
16	1	1	1	1	1	50,000	49,999	Lead and compounds (transfers of metals)
17	1	5,000	1	27,800	1	51,700	46,700	Dichloromethane (transfers to treatment)
18	1	0	1	0	1	46,241	46,241	Styrene (transfers to disposal, treatment)
19	2	122,700	2	194,500	2	166,500	43,800	Lead and compounds (transfers of metals)
20	3	62,900	3	55,900	3	105,500	42,600	Dichloromethane (transfers to treatment)
21	2	185,000	2	228,000	2	223,000	38,000	Lead and compounds (transfers of metals)
22	2	56,130	2	125,670	2	91,952	35,822	Lead and compounds (transfers of metals)
23	**	**	**	**	2	34,090	34,090	Chromium/Arsenic and compounds (transfers of metals)
24	5	12,253	4	31,610	4	43,748	31,495	Asbestos (transfers to disposal)
25	**	**	1	16,500	1	30,340	30,340	Dichloromethane (transfers to treatment)
26	**	**	**	**	1	28,000	28,000	Asbestos (transfers to disposal)
27	4	66,440	4	68,612	5	93,029	26,589	Lead/Chromium and compounds (transfers of metals)
28	**	**	2	31,010	2	26,138	26,138	Nickel and compounds (transfers of metals)
29	1	0	2	33,700	4	25,797	25,797	Asbestos (transfers to disposal)
30	3	36,260	3	36,100	4	60,150	23,890	Nickel and compounds (transfers of metals)
31	3	108,010	3	132,440	3	129,110	21,100	Lead and compounds (transfers of metals)
32	8	9,867	8	72,416	17	30,931	21,064	Styrene, Tetrachloroethylene (transfers to treatment)
33	2	0	2	0	3	19,720	19,720	Asbestos (transfers to disposal)
34	2	2,932	1	19,260	1	21,000	18,068	Chromium and compounds (transfers of metals)
35	1	230	1	18	2	17,686	17,456	Asbestos (transfers to disposal)
36	1	4	1	33,065	1	16,804	16,800	Styrene (transfers to disposal)
37	1	0	1	0	2	15,395	15,395	Asbestos (transfers to disposal)
38	1	1,607	1	20,550	1	16,460	14,853	Nickel and compounds (transfers of metals)
39	2	26,635	2	26,460	2	41,151	14,516	Nickel/Chromium and compounds (transfers of metals)
40	1	230	1	13,030	1	13,190	12,960	Chromium and compounds (transfers of metals)
41	2	20,380	2	21,060	2	32,218	11,838	Chromium and compounds (transfers of metals)
42	1	500	1	12,109	1	12,109	11,609	Formaldehyde (transfers to disposal)
43	**	**	**	**	2	11,384	11,384	Chromium/Nickel and compounds (transfers of metals)
44	**	**	**	**	2	11,218	11,218	Chromium and compounds (transfers of metals)
45	1	0	1	0	2	9,900	9,900	Di(2-ethylhexyl) phthalate (transfers to disposal)
46	1	52	2	2,869	2	9,078	9,026	Di(2-ethylhexyl) phthalate (transfers to disposal)
47	4	250	3	1,200	4	9,260	9,010	Lead and compounds (transfers of metals)
48	2	119,300	2	192,501	2	128,180	8,880	Chromium and compounds (transfers of metals)
49	2	249	3	356	3	7,765	7,516	Nickel/Chromium and compounds (transfers of metals)
50	**	**	1	6,750	1	6,750	6,750	Styrene (transfers to disposal)
95	95	1,646,159	100	3,004,131	126	5,059,984	3,413,825	

* Chemicals accounting for more than 70% of increase in total transfers of carcinogens from the facility.

** Indicates facility did not report any matched carcinogens that year.

TRI Facilities with Largest Decreases/Increases

In contrast to NPRI, changes in transfers of carcinogens by TRI facilities with the largest increases and the largest decreases from 1995 to 1997 approximately offset each other. At the same time, transfers of these substances by all other TRI facilities increased moderately (Figure 4-23).

The top 50 TRI facilities reporting decreases transferred 21.7 million kg in 1995 and 4.8 million kg in 1997, a difference of 16.9 million kg. Five of these facilities submitted forms for carcinogens in the matched data set in 1995 but not in 1997 (Table 4-44).

The 50 TRI facilities with the largest increases in total transfers show 5.7 million kg in 1995 and 21.9 million kg in 1997, an increase of 16.2 million kg. Seven of these facilities did not submit forms for carcinogens in the matched data set in 1995 (Table 4-45).

Table 4-44		TRI Facilities with Largest Decrease in Off-site Transfers of Known or Suspected Carcinogens [†] , 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	Millennium Petrochemical Inc., Millennium Chemicals Inc.	La Porte, TX	28
2	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33
3	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33
4	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33
5	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
6	Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle, IN	33
7	Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood, MS	33
8	Armstrong World Indl. Inc.	Lancaster, PA	39
9	Slater Steels, Ft. Wayne Spec. Alloys Div.	Fort Wayne, IN	33
10	PD Glycol, Occidental Petroleum Corp.	Beaumont, TX	28
11	Chemical Solvents Inc., Denison Facility	Cleveland, OH	28
12	Quin-T Corp.	Erie, PA	26
13	Solutia Inc.	Springfield, MA	Multi.
14	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Vernon, CA	33
15	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Brackenridge, PA	33
16	Gates Rubber Co.	Iola, KS	30
17	Olin Brass Indianapolis, Olin Corp.	Indianapolis, IN	33
18	Fortron Ind., Hoechst Celanese - Agent	Wilmington, NC	28
19	Corhart Refractories Corp.	Buckhannon, WV	32
20	Chevron Chemical Co., Polythylene Plant, Chevron Corp.	Orange, TX	28
21	IBM	Endicott, NY	36
22	Lubrizol Corp., Bayport Facility	Pasadena, TX	28
23	Philips Display Components Co., North American Philips Corp.	Ottawa, OH	36
24	Bristol-Myers Barceloneta Inc., Bristol-Myers Squibb Co.	Barceloneta, PR	28
25	Arco Chemical Co., Atlantic Richfield Co.	South Charleston, WV	28
26	ISP Chemicals Inc., International Specialty Prods.	Calvert City, KY	28
27	Quality Automotive Co., U.S. Automotive Mfg.	Tappahannock, VA	37
28	Exide Corp., General Battery	Muncie, IN	33
29	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA	33
30	Cookson Pigments Inc., Cookson America Inc.	Newark, NJ	28
31	GB Biosciences Corp.	Houston, TX	28
32	Cambridge Ind. Inc.	Marion, IN	30
33	Zinc Corp. of America, Horsehead Ind. Inc.	Bartlesville, OK	33
34	IBM	Hopewell Junction, NY	36
35	Bremen Techs., Plant 1	Bremen, IN	37
36	Albright & Wilson Americas, Albright & Wilson PLC	Charleston, SC	28
37	Brake Parts Inc., Echlin Inc.	Fredericksburg, VA	37
38	Mirror Ind., Finley Investments Inc.	Houston, TX	34
39	Union Carbide Corp.	Texas City, TX	28
40	Cox Creek Refining Co.	Baltimore, MD	33
41	Berridge Mfg. Co.	Houston, TX	34
42	Bayer Corp. Baytown	Baytown, TX	28
43	Talley Metals Tech. Inc., Talley Ind. Inc.	Hartsville, SC	33
44	Gulf Coast Recycling Inc.	Tampa, FL	33
45	AI Tech Specialty Steel Corp.	Dunkirk, NY	33
46	Kodak, Colorado Div., Eastman Kodak Co.	Windsor, CO	38
47	J & L Fiber Services Inc., Precision Cast Parts Corp.	Waukesha, WI	33
48	Marine Shale Processors Inc.	Amelia, LA	Multi.
49	Cambridge Ind. Inc.	Centralia, IL	37
50	Alza Corp.	Vacaville, CA	28
Total			

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995		1996		1997		Change 95-97 Total Transfers (kg)	Major Chemicals Reported with Decreases (Primary Transfers with Decreases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)		
1	6	3,474,222	5	0	5	0	-3,474,222	Vinyl acetate (transfers to treatment)
2	4	2,519,653	4	1,265,686	4	1,061,318	-1,458,335	Lead and compounds (transfers of metals)
3	2	1,249,518	2	104,379	2	62,029	-1,187,489	Chromium and compounds (transfers of metals)
4	3	1,124,603	4	382,397	**	**	-1,124,603	Chromium and compounds (transfers of metals)
5	4	1,397,915	4	2,593,811	4	478,160	-919,755	Lead and compounds (transfers of metals)
6	2	849,182	2	45,887	2	49,344	-799,838	Chromium and compounds (transfers of metals)
7	3	604,370	2	0	3	0	-604,370	Lead and compounds (transfers of metals)
8	2	550,022	1	149,416	1	0	-550,022	Di(2-ethylhexyl) phthalate (transfers to disposal)
9	2	569,071	2	19,547	2	27,209	-541,862	Chromium and compounds (transfers of metals)
10	2	359,906	2	8,844	2	9,879	-350,027	Acetaldehyde (transfers to treatment)
11	4	279,176	4	0	3	0	-279,176	Dichloromethane, Styrene (transfers to treatment)
12	1	261,111	1	258,843	**	**	-261,111	Asbestos (transfers to disposal)
13	5	522,696	4	374,314	4	271,398	-251,298	Formaldehyde (transfers to sewage)
14	2	383,721	2	400,628	2	134,000	-249,721	Lead and compounds (transfers of metals)
15	3	303,991	3	141,157	4	65,850	-238,141	Chromium/Nickel and compounds (transfers of metals)
16	2	237,766	2	15,025	2	12,079	-225,687	Di(2-ethylhexyl) phthalate (transfers to disposal)
17	3	204,857	3	288	2	126	-204,731	Chromium and compounds (transfers of metals)
18	1	226,035	1	174,403	1	35,150	-190,885	1,4-Dichlorobenzene (transfers to treatment)
19	1	249,327	1	61,061	1	66,516	-182,811	Chromium and compounds (transfers of metals)
20	1	219,774	1	0	1	38,367	-181,407	Vinyl acetate (transfers to treatment)
21	2	253,699	2	125,399	2	72,737	-180,962	Tetrachloroethylene (transfers to treatment)
22	4	186,458	4	166,301	4	13,648	-172,810	Acrylonitrile (transfers to treatment)
23	3	196,666	3	28,299	2	26,644	-170,022	Lead and compounds (transfers of metals)
24	1	280,725	1	332,541	1	118,486	-162,239	Dichloromethane (transfers to treatment)
25	5	297,641	5	49,084	5	139,842	-157,799	Styrene (transfers to treatment)
26	6	268,123	6	126,213	6	115,026	-153,097	Benzene (transfers to treatment)
27	1	226,630	1	70,182	1	81,148	-145,482	Asbestos (transfers to disposal)
28	2	335,015	2	243,051	2	190,603	-144,412	Lead and compounds (transfers of metals)
29	3	689,774	3	1,031,388	3	545,674	-144,100	Lead and compounds (transfers of metals)
30	2	151,047	2	66,784	2	7,477	-143,570	Lead and compounds (transfers of metals)
31	2	231,460	3	155,827	2	88,234	-143,226	Arsenic and compounds (transfers of metals)
32	2	142,630	**	**	2	590	-142,040	Styrene (transfers to disposal)
33	2	471,991	2	327,192	2	335,245	-136,746	Cadmium and compounds (transfers of metals)
34	2	141,497	1	37,234	1	6,516	-134,981	Tetrachloroethylene (transfers to treatment)
35	1	127,000	1	33,810	1	0	-127,000	Styrene (transfers to disposal)
36	4	346,025	5	149,936	5	222,623	-123,402	1,2-Dichloroethane (transfers to treatment)
37	1	111,058	1	117,615	1	0	-111,058	Asbestos (transfers to disposal)
38	1	113,968	1	63,401	1	3,311	-110,657	Chromium and compounds (transfers of metals)
39	13	165,315	11	93,523	10	69,766	-95,549	Acetaldehyde, Vinyl acetate (transfers to sewage)
40	2	92,971	**	**	**	**	-92,971	Nickel and compounds (transfers of metals)
41	1	92,305	1	0	**	**	-92,305	Chromium and compounds (transfers of metals)
42	11	149,660	11	313,197	10	58,372	-91,288	Dichloromethane (transfers to treatment)
43	3	92,332	3	1,339	3	1,315	-91,017	Chromium/Nickel and compounds (transfers of metals)
44	2	227,847	2	195,465	2	139,156	-88,691	Lead and compounds (transfers of metals)
45	2	92,804	2	185,293	2	4,673	-88,131	Chromium/Nickel and compounds (transfers of metals)
46	2	87,528	1	0	1	0	-87,528	1,2-Dichloroethane (transfers to treatment)
47	2	85,350	2	0	2	0	-85,350	Chromium and compounds (transfers of metals)
48	16	84,770	12	0	**	**	-84,770	Lead and compounds (transfers of metals)
49	3	83,116	3	5,479	2	138	-82,978	Styrene (transfers to disposal)
50	1	314,558	1	341,297	1	235,406	-79,152	Dichloromethane (transfers to treatment)
	155	21,726,879	142	10,255,536	121	4,788,055	-16,938,824	

* Chemicals accounting for more than 70% of decrease in total transfers of carcinogens from the facility.

** Indicates facility did not report any matched carcinogens that year.

Table 4-45		TRI Facilities with Largest Increase in Off-site Transfers of Known or Suspected Carcinogens [†] , 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28
2	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
3	C & D Techs. Inc.	Conyers, GA	36
4	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33
5	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33
6	Pharmacia & Upjohn Co.	Portage, MI	28
7	ASARCO Inc.	Omaha, NE	33
8	Reichhold Chemicals Inc.	Jacksonville, FL	28
9	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO	33
10	Wagner Brake, Cooper Ind. Inc.	Scottsville, KY	37
11	Squibb Mfg. Inc., Bristol-Myers Squibb Co.	Humacao, PR	28
12	Nucor Steel	Plymouth, UT	33
13	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28
14	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28
15	Lacks Ind. Inc., Airlane Plant, Lacks Ent. Inc.	Kentwood, MI	Mult.
16	Scot Forge Co.	Spring Grove, IL	34
17	Arco Chemical Co.	Westlake, LA	28
18	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33
19	Able Electro Polishing	Chicago, IL	34
20	ASARCO Inc.	East Helena, MT	33
21	Quemetco Inc., RSR Corp.	Indianapolis, IN	33
22	Wayne Pigment Corp.	Milwaukee, WI	28
23	American Video Glass Co.	Mt Pleasant, PA	32
24	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33
25	Quemetco Inc., RSR Corp.	City of Industry, CA	33
26	Arco Chemical Co., Bayport Div., Atlantic Richfield Co.	Pasadena, TX	28
27	Union Carbide Corp.	South Charleston, WV	28
28	ZTT Minerals Inc., Babcock Intl.	Caldwell, TX	33
29	Southwire Co.	Carrollton, GA	Mult.
30	Hydrite Chemical Co.	Cottage Grove, WI	28
31	BASF Corp.	Geismar, LA	28
32	Steel Dynamics Inc.	Butler, IN	33
33	Shell Oil Co.	Deer Park, TX	Mult.
34	Timken Co., Faircrest Steel Plant	Canton, OH	33
35	Specified Fuels & Chemicals	Channelview, TX	Mult.
36	Medusa-Crescent Inc., Medusa Corp.	Wampum, PA	32
37	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28
38	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Columbus, GA	Mult.
39	Roanoke Electric Steel Corp.	Roanoke, VA	33
40	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33
41	Occidental Chemical Corp., Occidental Petroleum Corp.	Convent, LA	28
42	AK Steel Corp., AK Steel Holding	Middletown, OH	33
43	Tippecanoe Labs., Eli Lilly & Co.	Shadeland, IN	28
44	PPG Ind. Inc.	Lake Charles, LA	28
45	Dow North America, Allyn's Point Plant, Dow Chemical Co.	Gales Ferry, CT	Mult.
46	Shieldalloy Metallurgical, Metallurg Inc.	Newfield, NJ	33
47	Maynard Steel Casting Co.	Milwaukee, WI	33
48	Chevron Chemical Co., Chevron Corp.	Port Arthur, TX	28
49	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33
50	Ameristeel Corp.	Charlotte, NC	33
Total			

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Increases (Primary Transfers with Increases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	2	18,141	2	0	2	1,723,356	1,705,215	Lead and compounds (transfers of metals)
2	1	40,867	1	27,279	1	1,434,288	1,393,421	Chromium and compounds (transfers of metals)
3	1	116	1	431,778	1	810,519	810,403	Lead and compounds (transfers of metals)
4	4	3,335	3	248,621	4	735,580	732,245	Lead and compounds (transfers of metals)
5	**	**	6	83,002	5	666,122	666,122	Arsenic/Cobalt/Lead and compounds (transfers of metals)
6	5	1,255,136	4	1,861,506	4	1,759,689	504,553	Dichloromethane (transfers to treatment)
7	2	436,597	2	397,779	2	893,671	457,074	Lead and compounds (transfers of metals)
8	2	5,370	2	0	2	462,390	457,020	Styrene (transfers to treatment)
9	2	21,216	2	120,624	3	475,008	453,792	Lead and compounds (transfers of metals)
10	1	136,893	1	133,630	1	557,771	420,878	Asbestos (transfers to disposal)
11	3	260	4	60,333	3	363,885	363,625	Dichloromethane (transfers to treatment)
12	3	14,040	4	166,505	2	363,053	349,013	Lead and compounds (transfers of metals)
13	**	**	1	497,742	4	346,159	346,159	Carbon tetrachloride (transfers to treatment)
14	2	211,655	2	371,020	2	537,823	326,168	Dichloromethane (transfers to treatment)
15	3	63,601	3	50,338	3	386,248	322,647	Nickel/Chromium and compounds (transfers of metals)
16	2	0	2	0	2	320,425	320,425	Chromium and compounds (transfers of metals)
17	**	**	**	**	3	290,092	290,092	Toluenediisocyanate (transfers to treatment)
18	3	0	2	0	3	283,347	283,347	Lead and compounds (transfers of metals)
19	2	18,701	2	293,991	2	299,433	280,732	Chromium and compounds (transfers of metals)
20	4	121	4	6	4	279,650	279,529	Lead and compounds (transfers of metals)
21	3	615,461	3	743,366	3	879,880	264,419	Lead/Chromium and compounds (transfers of metals)
22	2	453	2	458	2	256,702	256,249	Lead and compounds (transfers of metals)
23	**	**	**	**	2	245,511	245,511	Lead and compounds (transfers of metals)
24	3	0	3	168,028	3	240,636	240,636	Lead and compounds (transfers of metals)
25	3	701,642	3	847,238	3	934,969	233,327	Lead and compounds (transfers of metals)
26	1	65,515	1	75,938	1	281,266	215,751	Propylene oxide (transfers to sewage)
27	6	35,572	6	20,887	7	243,451	207,879	Formaldehyde (transfers to sewage)
28	1	17,345	1	5,140	1	224,203	206,858	Lead and compounds (transfers of metals)
29	8	198,793	14	496,891	16	403,098	204,305	Lead and compounds (transfers of metals)
30	4	1,267	4	476,259	5	201,930	200,663	Trichloroethylene, Dichloromethane (transfers to treatment)
31	11	24,120	12	20,620	12	222,324	198,204	Nitrobenzene (transfers to treatment)
32	**	**	2	141,059	3	194,014	194,014	Lead and compounds (transfers of metals)
33	10	368,047	17	635,109	17	559,512	191,465	Epichlorohydrin (transfers to treatment)
34	3	6,898	3	65,819	2	194,367	187,469	Lead and compounds (transfers of metals)
35	2	133,610	2	208,617	2	313,851	180,241	Vinyl acetate (transfers to treatment)
36	**	**	9	916	11	179,842	179,842	Benzene (transfers to treatment)
37	6	41,677	6	19,321	6	220,163	178,486	Acetaldehyde (transfers to sewage)
38	**	**	**	**	2	176,129	176,129	Lead and compounds (transfers of metals)
39	3	0	3	28,276	3	152,284	152,284	Lead and compounds (transfers of metals)
40	3	0	3	0	3	151,547	151,547	Lead and compounds (transfers of metals)
41	2	84,068	2	183	4	235,072	151,004	1,2-Dichloroethane (transfers to treatment)
42	4	86,868	7	263,718	5	236,268	149,400	Nickel and compounds (transfers of metals)
43	3	2,199	3	81,314	4	148,639	146,440	Dichloromethane (transfers to treatment)
44	8	170,994	8	136,498	8	314,915	143,921	1,2-Dichloroethane, Tetrachloroethylene (transfers to treatment)
45	3	285,178	3	174,198	3	427,295	142,117	Styrene (transfers to treatment)
46	2	329,977	1	0	1	468,822	138,845	Chromium and compounds (transfers of metals)
47	2	301,186	2	301,186	2	436,890	135,704	Chromium and compounds (transfers of metals)
48	4	10	4	401	4	134,247	134,237	Benzene (transfers to treatment)
49	4	5	4	4	4	130,285	130,280	Lead and compounds (transfers of metals)
50	3	0	3	91,287	3	129,083	129,083	Lead and compounds (transfers of metals)
	146	5,696,934	179	9,746,885	195	21,925,704	16,228,770	

* Chemicals accounting for more than 70% of increase in total transfers of carcinogens from the facility.

** Indicates facility did not report any matched carcinogens that year.

Metals

NPRI facilities reported an increase in total transfers of metals and their compounds, from 21.9 million kg in 1995 to 31.8 million kg in 1997, an increase of 9.9 million kg, or 45 percent (Table 4-46).

As already mentioned, the largest increase in NPRI transfers was for zinc and its compounds, followed by manganese and its compounds. Among all matched chemicals, zinc and its compounds also had the largest NPRI transfers (see Tables 4-15 and 4-37). Manganese and its compounds ranked third for total transfers in NPRI. NPRI facilities reported increases for 12 of the 15 metals in the matched data set.

The three metals with reductions in NPRI transfers from 1995 to 1997 were chromium and its compounds (2.6 million kg to 2.0 million kg), mercury and its compounds (19,259 kg to 3,486 kg) and vanadium (2,552 kg to 1,645 kg). (As noted in Chapter 3, mercury is used in making chlorine gas and caustic soda and in thermometers, batteries, mercury lamps, and other products. Mercuric salts are used in ointments. Mercury is also a catalyst for the production of vinyl chloride monomer, urethane foam, and anthraquinone. Vanadium compounds are a constituent of a specialty steel used principally in automobile parts. Vanadium is also used in rubber, plastics and ceramics production.)

Table 4-46		Change in NPRI Off-site Transfers of Metals and Their Compounds, 1995-1997				
M	1997	Total Transfers			Change 1995-1997	
CAS Number	Chemical	1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Chromium (and its compounds)	2,582,334	2,253,689	1,990,561	-591,773	-22.9
—	Mercury (and its compounds)	19,259	9,613	3,486	-15,773	-81.9
7440-62-2	Vanadium (fume or dust)	2,552	1	1,645	-907	-35.5
—	Silver (and its compounds)	126	229	269	143	113.5
—	Selenium (and its compounds)	29,698	34,533	30,369	671	2.3
—	Cobalt (and its compounds)	8,876	10,857	10,372	1,496	16.9
—	Antimony (and its compounds)	3,054	8,234	12,933	9,879	323.5
—	Arsenic (and its compounds)	16,308	47,685	67,092	50,784	311.4
—	Cadmium (and its compounds)	16,121	2,783	123,627	107,506	666.9
7429-90-5	Aluminum (fume or dust)	127,619	218,233	255,416	127,797	100.1
—	Nickel (and its compounds)	369,361	498,703	515,592	146,231	39.6
—	Copper (and its compounds)	712,814	753,461	1,111,567	398,753	55.9
—	Lead (and its compounds)	2,018,723	2,255,620	2,915,080	896,357	44.4
—	Manganese (and its compounds)	3,336,686	6,588,350	4,862,688	1,526,002	45.7
—	Zinc (and its compounds)	12,628,134	12,517,382	19,888,014	7,259,880	57.5
	Subtotal	21,871,665	25,199,373	31,788,711	9,917,046	45.3
	% of Total	57.9	60.7	64.2		
	Total for Matched NPRI Chemicals	37,748,704	41,516,953	49,508,261	11,759,557	31.2

dium is also used in rubber, plastics and ceramics production.)

TRI facilities reported a 50 percent increase in total transfers of metals and their compounds, from 120.5 million kg in 1995 to 180.5 million kg in 1997 (Table 4-47). Among these, as mentioned above, zinc and its compounds had not only the largest increase among

metals, but also the largest transfers in 1997 and the largest increase among all matched chemicals (see Tables 4-16 and 4-39). Also, similarly to the pattern in NPRI, TRI facilities reported the second-largest increase in transfers of metals for manganese and its compounds, from 18.3 million kg in 1995 to 28.7 million kg in 1997. Manganese

ranked fourth for total TRI transfers in 1997 and second for increases among matched chemicals.

For metals, TRI facilities made their largest reductions in transfers in chromium and its compounds (from 12.6 million kg to 11.7 million kg) and in cadmium and its compounds (from 885,217 kg to 684,109 kg).

Table 4-47

Change in TRI Off-site Transfers of Metals and Their Compounds, 1995-1997

M 1997

CAS Number	Chemical	Total Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Chromium (and its compounds)	12,608,261	9,413,292	11,726,757	-881,504	-7.0
—	Cadmium (and its compounds)	885,217	531,695	684,109	-201,108	-22.7
—	Mercury (and its compounds)	102,360	19,459	23,048	-79,312	-77.5
—	Selenium (and its compounds)	57,658	49,083	18,471	-39,187	-68.0
7440-62-2	Vanadium (fume or dust)	13,052	11,134	19,724	6,672	51.1
—	Silver (and its compounds)	18,983	32,003	43,822	24,839	130.8
—	Arsenic (and its compounds)	1,265,081	1,407,262	1,335,280	70,199	5.5
—	Antimony (and its compounds)	1,922,062	2,482,071	2,164,243	242,181	12.6
—	Cobalt (and its compounds)	271,073	382,658	586,218	315,145	116.3
—	Nickel (and its compounds)	4,506,004	4,258,168	5,199,851	693,847	15.4
7429-90-5	Aluminum (fume or dust)	2,913,391	3,096,183	3,813,654	900,263	30.9
—	Copper (and its compounds)	11,320,647	10,310,181	13,536,196	2,215,549	19.6
—	Lead (and its compounds)	11,969,865	13,990,333	17,600,736	5,630,871	47.0
—	Manganese (and its compounds)	18,324,872	22,196,707	28,686,838	10,361,966	56.5
—	Zinc (and its compounds)	54,343,410	68,222,175	95,103,244	40,759,834	75.0
	Subtotal	120,521,936	136,402,404	180,542,191	60,020,255	49.8
	% of Total	38.8	43.1	45.8		
	Total for Matched TRI Chemicals	310,748,990	316,612,992	394,039,756	83,290,766	26.8

NPRI Facilities with Largest Decreases/Increases

In NPRI, the facilities with the largest increases and decreases from 1995 to 1997 in transfers of metals reported comparable amounts in 1995. Taken together, the largest increases were four times larger than the largest reductions. Other NPRI facilities, as a group, registered a small increase across the period (Figure 4-24).

NPRI facilities with the largest decreases in transfers of metals and their compounds reported total transfers in 1995 of 10.8 million kg and in 1997 of 7.3 million kg. This was a decrease of 3.5 million kg overall. Seven of the top 50 facilities reported metals transfers in 1995 but not in 1997 (Table 4-48).

Total transfers of metals and their compounds for the top 50 NPRI facilities more than doubled over the period, from 10.3 million kg in 1995 to 23.3 million kg in 1997, an increase of 13.0 million kg. Six of the facilities did not report such transfers in 1995 but did so in 1997 (Table 4-49).

Figure 4-24

NPRI and TRI Total Off-site Transfers of Metals and Their Compounds, 1995-1997: Facilities with Largest Changes and All Others

M 1997

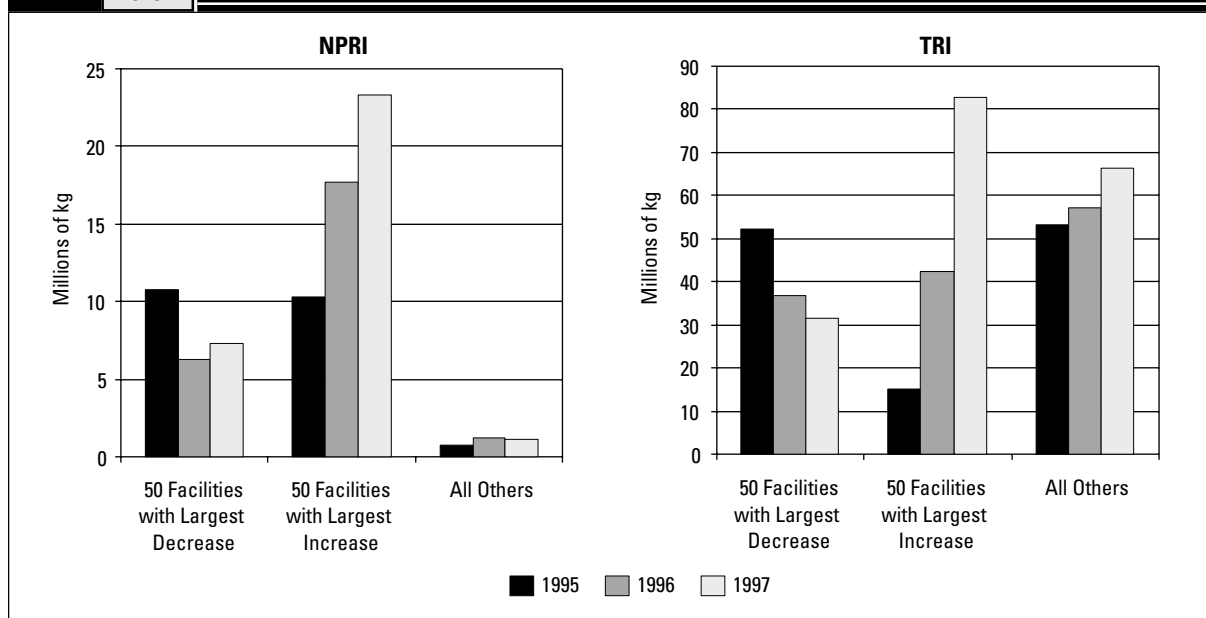


Table 4-48		NPRI Facilities with Largest Decrease in Off-site Transfers of Metals and Their Compounds, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33
2	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33
3	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33
4	Co-Steel Lasco	Whitby, ON	29	33
5	Versatech Industries, Apex Metals Inc.	Kitchener, ON	32	34
6	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34
7	Owens-Corning Canada Inc., Guelph Glass Plant	Guelph, ON	35	32
8	Magotteaux Inc., Magotteaux Canada	Magog, QC	30	39
9	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33
10	Boler Group, Hendrickson Spring	Stratford, ON	32	34
11	Consumers Packaging Inc., Consumers Glass (Brampton)	Brampton, ON	35	32
12	Duracell Canada Inc., Duracell Inc.	Mississauga, ON	33	36
13	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
14	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26
15	Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel, QC	30	34
16	A.P. Green Refractories (Canada) Ltd., A.P. Green Industries	Smithville, ON	35	32
17	Griffin Canada Inc., Amsted Industries	Winnipeg, MB	29	33
18	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-de-Valleyfield,	29	33
19	Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock, ON	29	33
20	A.G. Simpson Co Ltd.	Oshawa, ON	32	34
21	Stelco Inc., Hilton Works	Hamilton, ON	29	33
22	Michelin North America (Canada) Inc., Waterville Plant	Cambridge Station, NS	15	30
23	Eveready Division, Ralston Purina Canada	Walkerton, ON	33	36
24	GE Lighting, Canada, Oakville Lamp Plant	Oakville, ON	33	36
25	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33
26	Johnson Matthey Limited, Precious Metals Division	Brampton, ON	39	33
27	Standard Products (Canada) Limited, Rubber Plant #2	Stratford, ON	15	30
28	Valeo Engine Cooling Limited, Automotive Division	Stratford, ON	32	35
29	Sherritt International Corporation	Fort Saskatchewan, AB	37	28
30	Stelpipe Ltd, Steel Tube Manufacturing	Welland, ON	29	33
31	Goodyear Tire & Rubber Company, Goodyear Canada Inc.	Napanee, ON	15	30
32	Owens-Corning Canada Inc.	Edmonton, AB	35	32
33	General Motors of Canada Limited, London Diesel Division	London, ON	32	37
34	Prototype Circuits Inc, Plant 1	Scarborough, ON	33	36
35	Norcast Division de Trittech Precision Inc., fonderie Norcast	Mont-Joli, QC	30	34
36	Consumers Packaging Inc., Consumers Glass (Scoudouc)	Scoudouc, NB	35	32
37	Aluminerie de Bécancour Inc., Reynolds Metal Company	Ville de Bécancour, QC	29	33
38	ICI Canada Inc, ICI Forest Products, Cornwall Works	Cornwall, ON	37	28
39	Standard Products (Canada) Limited, Rubber Plant #4	Mitchell, ON	15	30
40	Tamis CAE Inc., CAE Inc.	Lennoxville, QC	30	34
41	Belden Canada Inc., Cobourg Facility	Cobourg, ON	29	33
42	Stelfil Ltée, Stelco Inc.	Lachine, QC	30	33
43	LPB Poles Inc., Bell Canada	Masson-Angers, QC	25	24
44	Goodyear Canada Inc., Goodyear Tire and Rubber Co.	Québec, QC	15	30
45	Bundy of Canada, Division of John Crane Inc.	Bramalea, ON	32	37
46	Hilan Corporation, Hilan Wood Preservers	Kemptville, ON	25	24
47	Horton CBI Limited, CBI Industries Inc.	Fort Erie, ON	30	34
48	Circtronics a Division of Gandalf Canada Ltd.	Nepean, ON	33	36
49	Creanova Canada, Leaside Facility, Creanova America Inc.	Toronto, ON	37	28
50	Owens-Corning Canada Inc., Owens Corning Fiberglas Corp.	Candiac, QC	35	32
Total				

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Decreases (Primary Transfers with Decreases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	2	1,485,964	3	906,005	3	571,557	-914,407	Chromium and compounds (transfers of metals)
2	2	398,035	2	36,760	2	6,450	-391,585	Zinc and compounds (transfers of metals)
3	6	305,238	3	52,000	2	0	-305,238	Zinc and compounds (transfers of metals)
4	6	6,030,824	6	3,578,510	6	5,799,885	-230,939	Lead and compounds (transfers of metals)
5	3	136,000	3	0	3	0	-136,000	Zinc and compounds (transfers of metals)
6	4	209,781	4	209,462	3	91,920	-117,861	Chromium/Zinc/Nickel and compounds (transfers of metals)
7	1	117,320	1	4,720	**	**	-117,320	Zinc and compounds (transfers of metals)
8	4	98,650	4	0	4	0	-98,650	Chromium and compounds (transfers of metals)
9	7	88,365	7	47,187	7	7,163	-81,202	Aluminum (transfers of metals)
10	1	81,000	1	30,560	1	7,056	-73,944	Zinc and compounds (transfers of metals)
11	1	72,300	1	4,000	1	0	-72,300	Chromium and compounds (transfers of metals)
12	2	87,094	2	52,700	2	15,273	-71,821	Manganese and compounds (transfers of metals)
13	2	67,364	2	110,477	**	**	-67,364	Lead and compounds (transfers of metals)
14	1	99,700	1	38,000	1	34,000	-65,700	Manganese and compounds (transfers of metals)
15	3	119,800	3	191,540	3	55,258	-64,542	Manganese and compounds (transfers of metals)
16	1	77,632	1	30,601	1	20,141	-57,491	Chromium and compounds (transfers of metals)
17	1	69,480	1	13,600	1	13,600	-55,880	Manganese and compounds (transfers of metals)
18	8	70,200	8	29,885	8	20,633	-49,567	Zinc/Selenium and compounds (transfers of metals)
19	1	69,500	1	60,877	1	21,036	-48,464	Manganese and compounds (transfers of metals)
20	4	112,523	5	154,560	5	64,802	-47,721	Nickel and compounds (transfers of metals)
21	8	54,580	8	29,740	8	9,900	-44,680	Zinc and compounds (transfers of metals)
22	6	40,069	2	7,362	2	6,778	-33,291	Zinc and compounds (transfers of metals)
23	2	39,548	2	36,812	2	8,794	-30,754	Zinc and compounds (transfers of metals)
24	3	39,533	3	22,265	3	14,461	-25,072	Lead and compounds (transfers of metals)
25	5	386,200	5	383,900	5	362,000	-24,200	Zinc/Manganese and compounds (transfers of metals)
26	3	18,618	3	0	3	0	-18,618	Copper and compounds (transfers of metals)
27	1	58,149	1	45,300	1	39,900	-18,249	Zinc and compounds (transfers of metals)
28	3	36,740	3	54,850	3	21,511	-15,229	Lead and compounds (transfers of metals)
29	4	16,370	4	8,710	4	1,540	-14,830	Nickel and compounds (transfers of metals)
30	2	15,130	2	2,741	2	718	-14,412	Zinc and compounds (transfers of metals)
31	1	14,000	1	17,150	**	**	-14,000	Zinc and compounds (transfers of metals)
32	1	13,398	**	**	**	**	-13,398	Chromium and compounds (transfers of metals)
33	4	14,524	4	5,837	4	1,301	-13,223	Manganese/Copper and compounds (transfers of metals)
34	1	25,000	1	6,773	1	12,375	-12,625	Copper and compounds (transfers of metals)
35	4	16,657	4	5,674	4	6,007	-10,650	Chromium and compounds (transfers of metals)
36	1	10,500	1	0	1	0	-10,500	Chromium and compounds (transfers of metals)
37	1	9,300	1	12,000	1	0	-9,300	Manganese and compounds (transfers of metals)
38	3	9,259	1	4,626	**	**	-9,259	Mercury and compounds (transfers of metals)
39	1	10,937	1	1,400	1	2,100	-8,837	Zinc and compounds (transfers of metals)
40	3	11,682	3	15,300	3	3,200	-8,482	Chromium and compounds (transfers of metals)
41	2	15,444	2	4,474	3	7,530	-7,914	Copper and compounds (transfers of metals)
42	2	93,438	2	60,724	2	86,507	-6,931	Zinc/Lead and compounds (transfers of metals)
43	3	7,417	3	787	3	599	-6,818	Chromium/Arsenic and compounds (transfers of metals)
44	1	6,990	1	0	1	1,300	-5,690	Zinc and compounds (transfers of metals)
45	2	11,220	2	9,634	2	6,004	-5,216	Zinc and compounds (transfers of metals)
46	3	5,142	3	2,248	3	0	-5,142	Chromium/Arsenic and compounds (transfers of metals)
47	3	4,917	**	**	**	**	-4,917	Manganese/Nickel and compounds (transfers of metals)
48	1	4,695	1	3,346	**	**	-4,695	Copper and compounds (transfers of metals)
49	1	5,633	6	1,314	2	1,289	-4,344	Lead and compounds (transfers of metals)
50	1	10,300	1	9,100	1	6,500	-3,800	Chromium and compounds (transfers of metals)
	136	10,802,160	130	6,303,511	119	7,329,088	-3,473,072	

* Chemicals accounting for more than 70% of decrease in total transfers of metals from the facility.

** Indicates facility did not report any matched metals that year.

Table 4-49		NPRI Facilities with Largest Increase in Off-site Transfers of Metals and Their Compounds, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Dofasco Inc.	Hamilton, ON	29	33
2	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33
3	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33
4	Metalex Products Ltd.	Richmond, BC	29	33
5	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33
6	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33
7	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
8	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33
9	Zalev Brothers Limited	Windsor, ON	29	33
10	Kronos Canada, Inc.	Varenes, QC	37	28
11	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
12	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	30	37
13	Ivaco Rolling Mills	L'Orignal, ON	29	33
14	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33
15	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
16	Tonolli Canada Limited	Mississauga, ON	29	33
17	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26
18	Cartons St-Laurent Inc.	LaTuque, QC	27	26
19	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33
20	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
21	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	29	33
22	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26
23	Spectra Anodizing Ltd.	Woodbridge, ON	39	39
24	Marswell Metal Industries Limited	Burlington, ON	30	34
25	Protec Finishing Ltd.	Mississauga, ON	30	34
26	Metal Koting, Continuous Colour Coat Ltd.	Rexdale, ON	30	34
27	Stelwire Ltd., Parkdale Works	Hamilton, ON	30	33
28	North American Lumber, Roblin Forest Products	Roblin, MB	25	24
29	Michelin North America (Canada) Inc.	Kitchener, ON	15	30
30	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28
31	A.G. Simpson Co. Ltd.	Cambridge, ON	30	34
32	Coatings 85 Ltd.	Mississauga, ON	30	34
33	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37
34	Acadian Platers Co. Ltd.	Rexdale, ON	30	34
35	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33
36	Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour, QC	29	33
37	Columbia/MBF, Glynwed Steels & Engineering	Mississauga, ON	30	34
38	Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est, QC	29	33
39	Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan, AB	29	33
40	Michelin North America (Canada) Inc., Granton, NS Plant	New Glasgow, NS	15	30
41	Produits Shell Canada Ltée, Raffinerie de Montréal-est	Montréal-est, QC	36	29
42	Westaim Corporation, Fort Saskatchewan Site	Fort Saskatchewan, AB	39	39
43	Electro Finition	LaSalle, QC	30	34
44	Motor Coach Industries, Fort Garry Plants 4&5, MCIL Holdings	Winnipeg, MB	32	37
45	Société canadienne de métaux Reynolds, Reynolds Metals Co.	Baie-Comeau, QC	29	33
46	F & P Manufacturing Inc., American Honda Motor Co. Ltd.	Tottenham, ON	32	34
47	Baycoat Ltd., Baycoat R.S.N.	Hamilton, ON	30	34
48	Gates Canada Inc, Belt Manufacturing	Brantford, ON	15	30
49	Wabash Alloys, Wabash Alloys Ontario	Toronto, ON	29	33
50	Kindred Industries, Div. of Emco Ltd.	Midland, ON	30	34
Total				

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Increases (Primary Transfers with Increases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	6	1,931,258	6	2,540,853	6	8,168,440	6,237,182	Zinc and compounds (transfers of metals)
2	6	0	7	3,814,700	6	1,480,000	1,480,000	Zinc and compounds (transfers of metals)
3	1	0	1	0	1	840,570	840,570	Zinc and compounds (transfers of metals)
4	4	0	5	257,210	5	484,370	484,370	Lead and compounds (transfers of metals)
5	5	0	5	0	5	467,400	467,400	Lead/Cadmium and compounds (transfers of metals)
6	5	1,864,400	5	3,054,700	5	2,298,300	433,900	Zinc/Manganese and compounds (transfers of metals)
7	3	210	3	550	3	327,898	327,888	Chromium and compounds (transfers of metals)
8	5	342,150	5	764,570	5	621,538	279,388	Zinc and compounds (transfers of metals)
9	7	849,840	7	877,606	8	1,104,869	255,029	Zinc/Copper and compounds (transfers of metals)
10	2	633,000	2	836,000	2	855,000	222,000	Manganese and compounds (transfers of metals)
11	4	362,590	4	474,430	4	584,310	221,720	Chromium/Nickel and compounds (transfers of metals)
12	2	1,388	2	121,540	2	128,300	126,912	Manganese and compounds (transfers of metals)
13	5	1,532,610	7	1,559,360	7	1,647,700	115,090	Manganese/Lead and compounds, Aluminum (transfers of metals)
14	4	44,300	4	44,300	4	142,900	98,600	Nickel and compounds (transfers of metals)
15	4	216,300	4	362,101	6	305,118	88,818	Aluminum, Zinc/Copper and compounds (transfers of metals)
16	1	226,980	1	376,450	1	311,202	84,222	Lead and compounds (transfers of metals)
17	2	33,000	2	76,000	2	107,600	74,600	Aluminum (transfers of metals)
18	**	**	2	80,834	2	71,666	71,666	Manganese and compounds (transfers of metals)
19	2	2,813	2	111,156	2	72,062	69,249	Lead and compounds (transfers of metals)
20	5	173,130	5	65,858	6	241,888	68,758	Copper and compounds (transfers of metals)
21	2	0	2	0	2	65,600	65,600	Lead and compounds (transfers of metals)
22	**	**	1	38,600	1	52,900	52,900	Manganese and compounds (transfers of metals)
23	1	0	1	0	1	50,000	50,000	Aluminum (transfers of metals)
24	1	1	1	1	1	50,000	49,999	Lead and compounds (transfers of metals)
25	1	32,920	1	58,501	1	78,503	45,583	Zinc and compounds (transfers of metals)
26	2	35,970	2	41,700	2	80,087	44,117	Zinc and compounds (transfers of metals)
27	3	73,717	3	113,981	3	115,551	41,834	Zinc and compounds (transfers of metals)
28	**	**	**	**	3	41,000	41,000	Chromium/Arsenic and compounds (transfers of metals)
29	2	2,286	2	20,800	1	41,910	39,624	Zinc and compounds (transfers of metals)
30	3	186,100	3	229,400	3	224,300	38,200	Lead and compounds (transfers of metals)
31	4	395	5	1,402	5	37,618	37,223	Zinc and compounds (transfers of metals)
32	1	76,500	1	74,800	1	112,972	36,472	Zinc and compounds (transfers of metals)
33	**	**	**	**	3	36,400	36,400	Copper/Zinc and compounds (transfers of metals)
34	1	19,640	1	29,001	1	55,673	36,033	Zinc and compounds (transfers of metals)
35	5	1,445,515	8	1,257,736	8	1,481,088	35,573	Zinc and compounds (transfers of metals)
36	2	0	2	37,000	2	32,000	32,000	Manganese and compounds (transfers of metals)
37	2	15,722	2	27,305	2	46,706	30,984	Zinc and compounds (transfers of metals)
38	9	40,835	9	75,261	9	68,234	27,399	Arsenic/Selenium and compounds (transfers of metals)
39	**	**	4	31,830	4	26,865	26,865	Nickel and compounds (transfers of metals)
40	2	50,535	2	51,101	2	75,441	24,906	Zinc and compounds (transfers of metals)
41	2	0	2	0	4	23,100	23,100	Nickel and compounds (transfers of metals)
42	**	**	3	370	3	22,070	22,070	Copper and compounds (transfers of metals)
43	1	0	1	17,630	1	20,630	20,630	Zinc and compounds (transfers of metals)
44	2	800	2	668	3	19,575	18,775	Copper and compounds (transfers of metals)
45	3	1,500	3	39,956	3	20,163	18,663	Manganese and compounds (transfers of metals)
46	1	39,166	1	38,682	3	57,300	18,134	Zinc and compounds (transfers of metals)
47	2	2,932	1	19,260	1	21,000	18,068	Chromium and compounds (transfers of metals)
48	1	15,526	1	13,188	1	32,274	16,748	Zinc and compounds (transfers of metals)
49	4	10,868	4	38,174	4	26,589	15,721	Aluminum (transfers of metals)
50	3	28,164	3	27,980	3	43,515	15,351	Nickel/Chromium and compounds (transfers of metals)
	133	10,293,061	150	17,702,545	163	23,320,195	13,027,134	

* Chemicals accounting for more than 70% of increase in total transfers of metals from the facility.

** Indicates facility did not report any matched metals that year.

TRI Facilities with Largest Decreases/Increases

In TRI, increases by the 50 facilities with largest increases in transfers of metals were three times larger than the reductions of those with the largest decreases. At the same time, all other TRI facilities showed a moderate increase in these transfers (Figure 4-24).

Transfers of elemental metals and their compounds by the 50 TRI facilities reporting the largest reductions were 52.4 million kg in 1995 and 31.7 million kg in 1997, a decrease of 20.7 million kg. Three of the facilities that reported transfers in 1995 did not do so in 1997 (Table 4-50).

Comparable transfers by the TRI facilities with the largest increases rose from 15.0 million kg in 1995 to 82.7 million kg in 1997, an increase of 67.7 million kg. Seven of these facilities reported transfers in 1997 but not in 1995 (Table 4-51).

Table 4-50		TRI Facilities with Largest Decrease in Off-site Transfers of Metals and Their Compounds, 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	National Steel Corp., Great Lakes Div.	Ecorse, MI	33
2	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33
3	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
4	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33
5	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33
6	Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood, MS	33
7	Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle, IN	33
8	Olin Brass Indianapolis, Olin Corp.	Indianapolis, IN	33
9	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33
10	Slater Steels, Ft. Wayne Spec. Alloys Div.	Fort Wayne, IN	33
11	Honda of America Mfg. Inc., American Honda Motor Co. Inc.	Anna, OH	37
12	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33
13	Nucor Steel - Texas, Nucor Corp.	Jewett, TX	33
14	Essex Group Inc.	Lithonia, GA	33
15	Newport Steel Corp., NS Group Inc.	Wilder, KY	33
16	Imco Recycling of Ohio Inc., Imco Recycling Inc.	Uhrichsville, OH	33
17	North American Royalties Inc., Wheland Fndy. Div.	Chattanooga, TN	33
18	Franklin Bronze & Alloy Co.	Franklin, PA	33
19	Rhone-Poulenc Basic Chemicals, Rhone-Poulenc Inc.	Martinez, CA	28
20	Northwestern Steel & Wire Co.	Sterling, IL	33
21	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Brackenridge, PA	33
22	Lenzing Fibers Corp.	Lowland, TN	28
23	Wheeling-Pittsburgh Steel Corp., Wheeling-Pittsburgh Corp.	Mingo Junction, OH	33
24	ABC Rail Prods. Corp.	Calera, AL	33
25	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Vernon, CA	33
26	U.S. Pipe & Fndy. Co., Walter Ind. Inc.	Union City, CA	33
27	Cox Creek Refining Co.	Baltimore, MD	33
28	S.D. Warren Co.	Westbrook, ME	26
29	Neenah Fndy. Co., Neenah Corp.	Neenah, WI	33
30	Wheeling-Pittsburgh Steel Corp., Wheeling-Pittsburgh Corp.	Martins Ferry, OH	33
31	Johnstown Wire Techs. Inc.	Johnstown, PA	33
32	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA	33
33	Corhart Refractories Corp.	Buckhannon, WV	32
34	Anzon Inc., Cookson America Inc.	Philadelphia, PA	28
35	Philips Display Components Co., North American Philips Corp.	Ottawa, OH	36
36	ASARCO Inc.	El Paso, TX	33
37	Racine Steel Castings Div., BR Holdings Ltd.	Racine, WI	33
38	Millennium Petrochemical Inc., Millennium Chemicals Inc.	La Porte, TX	28
39	Exide Corp., General Battery	Muncie, IN	33
40	Oregon Steel Mills Inc.	Portland, OR	Mult.
41	Gaston Copper Recycling Corp., Southwire Co.	Gaston, SC	33
42	Cookson Pigments Inc., Cookson America Inc.	Newark, NJ	28
43	Magotteaux Corp., Magotteaux Intl.	Pulaski, TN	33
44	Fort Wayne Fndy. Pontiac Inc., Cole Pattern & Eng. Co. Inc.	Fort Wayne, IN	33
45	Talley Metals Tech. Inc., Talley Ind. Inc.	Hartsville, SC	33
46	Shieldalloy Metallurgical, Metallurg Inc.	Cambridge, OH	33
47	Witt Co., Muncie Galvanizing Div.	Muncie, IN	34
48	GB Biosciences Corp.	Houston, TX	28
49	North American Rayon Corp., North American Corp.	Elizabethton, TN	28
50	Zinc Corp. of America, Horsehead Ind. Inc.	Bartlesville, OK	33
Total			

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Decreases (Primary Transfers with Decreases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	3	6,103,309	4	6,346,480	5	3,497,819	-2,605,490	Zinc and compounds (transfers of metals)
2	10	15,729,385	9	10,473,482	9	13,855,648	-1,873,737	Lead and compounds (transfers of metals)
3	8	2,010,436	8	3,033,529	8	560,926	-1,449,510	Lead/Zinc and compounds (transfers of metals)
4	4	1,167,570	5	387,736	**	**	-1,167,570	Chromium and compounds (transfers of metals)
5	4	1,268,007	4	127,741	4	111,984	-1,156,023	Chromium and compounds (transfers of metals)
6	5	840,229	6	0	5	0	-840,229	Lead/Manganese and compounds (transfers of metals)
7	3	851,385	3	48,092	3	51,575	-799,810	Chromium and compounds (transfers of metals)
8	7	717,081	7	1,771	6	1,209	-715,872	Copper/Chromium and compounds (transfers of metals)
9	3	3,415,766	3	3,439,996	3	2,863,172	-552,594	Copper and compounds (transfers of metals)
10	4	571,570	4	21,252	4	30,670	-540,900	Chromium and compounds (transfers of metals)
11	5	495,806	4	141,328	5	4,085	-491,721	Zinc and compounds (transfers of metals)
12	3	2,927,800	3	2,351,083	5	2,498,413	-429,387	Zinc and compounds (transfers of metals)
13	7	501,185	7	196,306	7	84,801	-416,384	Zinc and compounds (transfers of metals)
14	3	403,260	3	96	3	99	-403,161	Copper and compounds (transfers of metals)
15	8	1,384,942	7	852,880	7	1,022,314	-362,628	Zinc and compounds (transfers of metals)
16	6	762,612	6	414,318	7	431,969	-330,643	Aluminum (transfers of metals)
17	6	757,761	6	514,648	6	446,282	-311,479	Zinc/Manganese and compounds (transfers of metals)
18	3	636,735	2	389,116	2	331,972	-304,763	Zinc/Copper and compounds (transfers of metals)
19	1	296,912	1	3,073	1	1,669	-295,243	Zinc and compounds (transfers of metals)
20	4	311,564	4	65,170	4	30,658	-280,906	Zinc and compounds (transfers of metals)
21	7	354,331	7	178,482	8	86,260	-268,071	Chromium/Nickel and compounds (transfers of metals)
22	2	263,039	2	0	2	0	-263,039	Zinc and compounds (transfers of metals)
23	3	304,971	3	212,893	3	46,440	-258,531	Manganese and compounds (transfers of metals)
24	2	855,588	2	576,478	2	600,011	-255,577	Manganese and compounds (transfers of metals)
25	3	383,871	3	411,262	3	138,272	-245,599	Lead and compounds (transfers of metals)
26	3	411,972	3	199,681	3	171,409	-240,563	Zinc and compounds (transfers of metals)
27	3	240,363	**	**	**	**	-240,363	Copper/Nickel and compounds (transfers of metals)
28	2	245,250	2	12,289	2	7,058	-238,192	Zinc and compounds (transfers of metals)
29	3	632,316	3	645,467	3	410,780	-221,536	Manganese and compounds (transfers of metals)
30	2	235,705	2	231,238	1	34,590	-201,115	Zinc and compounds (transfers of metals)
31	4	247,732	4	67,007	4	49,559	-198,173	Zinc and compounds (transfers of metals)
32	6	889,729	6	1,220,971	6	703,568	-186,161	Lead/Zinc and compounds (transfers of metals)
33	1	249,327	1	61,061	1	66,516	-182,811	Chromium and compounds (transfers of metals)
34	4	168,461	2	84,173	0	0	-168,461	Zinc and compounds (transfers of metals)
35	3	202,517	3	30,660	3	35,374	-167,143	Lead and compounds (transfers of metals)
36	6	176,733	6	85,050	6	11,881	-164,852	Zinc/Copper/Lead and compounds (transfers of metals)
37	2	267,574	2	181,408	2	108,846	-158,728	Manganese and compounds (transfers of metals)
38	4	642,194	2	385,462	2	485,572	-156,622	Zinc and compounds (transfers of metals)
39	3	362,431	3	263,203	3	206,362	-156,069	Lead and compounds (transfers of metals)
40	7	1,776,756	6	1,932,099	6	1,620,869	-155,887	Zinc and compounds, Aluminum (transfers of metals)
41	7	153,848	**	**	**	**	-153,848	Zinc/Copper and compounds (transfers of metals)
42	5	153,437	5	68,040	5	7,857	-145,580	Lead and compounds (transfers of metals)
43	7	224,450	5	85,232	5	80,866	-143,584	Aluminum (transfers of metals)
44	3	202,724	4	89,887	4	74,804	-127,920	Aluminum (transfers of metals)
45	5	129,150	5	1,793	5	1,590	-127,560	Chromium/Nickel/Manganese and compounds (transfers of metals)
46	7	181,905	6	127,700	6	63,672	-118,233	Zinc and compounds (transfers of metals)
47	4	122,857	4	164,629	4	7,796	-115,061	Zinc and compounds (transfers of metals)
48	1	191,361	2	133,147	1	77,112	-114,249	Arsenic and compounds (transfers of metals)
49	1	113,492	1	39	1	0	-113,492	Zinc and compounds (transfers of metals)
50	5	842,355	5	667,570	4	731,161	-111,194	Cadmium and compounds (transfers of metals)
	212	52,379,754	195	36,925,018	189	31,653,490	-20,726,264	

* Chemicals accounting for more than 70% of decrease in total transfers of metals from the facility.

** Indicates facility did not report any matched metals that year.

Table 4-51		TRI Facilities with Largest Increase in Off-site Transfers of Metals and Their Compounds, 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33
2	Steel Dynamics Inc.	Butler, IN	33
3	Nucor Steel	Plymouth, UT	33
4	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33
5	Timken Co., Faircrest Steel Plant	Canton, OH	33
6	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33
7	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33
8	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33
9	USS Mon Valley Works, USX Corp.	Braddock, PA	33
10	Bar Techs. Inc.	Johnstown, PA	33
11	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33
12	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28
13	Ameristeel Corp.	Charlotte, NC	33
14	Southwire Co.	Carrollton, GA	Mult.
15	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
16	Timken Co., Harrison Steel Plant	Canton, OH	33
17	Roanoke Electric Steel Corp.	Roanoke, VA	33
18	Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa, AL	33
19	Koppel Steel Corp., NS Group Inc.	Koppel, PA	33
20	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.
21	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33
22	Auburn Steel Co. Inc.	Auburn, NY	33
23	Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville, OR	33
24	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33
25	Millennium Inorganic Chemicals, Plant 1, Millennium Chemicals	Ashtabula, OH	28
26	C & D Techs. Inc.	Conyers, GA	36
27	Ameristeel Corp., WTN Steel Mill	Jackson, TN	33
28	Nucor Steel, Nucor Corp.	Huger, SC	33
29	Nucor Steel, Nucor Corp.	Darlington, SC	33
30	Ipsco Steel Inc., Ipsco Ents. Inc.	Muscataine, IA	33
31	Prestolite Wire Corp.	Paragould, AR	Mult.
32	Green River Steel Corp., All Acquisition Corp.	Owensboro, KY	33
33	Algonquin Ind. Inc., Rea Magnet Wire Co.	Guilford, CT	33
34	Mueller Co., Plant #4, Tyco Intl. (US) Inc.	Decatur, IL	33
35	ZTT Minerals Inc., Babcock Intl.	Caldwell, TX	33
36	Armco Inc.	Dover, OH	33
37	Austeel Lemont Co. Inc.	Lemont, IL	33
38	ASARCO Inc.	East Helena, MT	33
39	Frog Switch & Mfg. Co.	Carlisle, PA	33
40	Lacks Ind. Inc., Airlane Plant, Lacks Ents. Inc.	Kentwood, MI	Mult.
41	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO	33
42	Owen Electric Steel Co. of SC, Commercial Metals Co.	Cayce, SC	33
43	Copperweld Steel Co., SBQ Ltd.	Warren, OH	33
44	Structural Metals Inc., Commercial Metals Co.	Seguin, TX	33
45	Ameristeel Corp., Knoxville Mill Div.	Knoxville, TN	33
46	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33
47	Quemetco Inc., RSR Corp.	Indianapolis, IN	33
48	Union Camp Corp.	Franklin, VA	Mult.
49	ASARCO Inc.	Omaha, NE	33
50	Charter Mfg. Co. Inc., Charter Steel Div.	Saukville, WI	33
Total			

► Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Increases (Primary Transfers with Increases)*
	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Number of Forms	Total Transfers (kg)	Total Transfers (kg)	
1	6	37,750	6	2,097,304	7	7,543,045	7,505,295	Zinc and compounds (transfers of metals)
2	1	5,161	3	1,982,278	6	6,529,560	6,524,399	Zinc and compounds (transfers of metals)
3	6	164,581	7	1,893,349	5	3,922,477	3,757,896	Zinc and compounds (transfers of metals)
4	7	8	7	10	7	2,957,542	2,957,534	Zinc and compounds (transfers of metals)
5	7	22,879	7	703,221	6	2,486,113	2,463,234	Zinc and compounds (transfers of metals)
6	5	0	5	0	5	2,388,657	2,388,657	Zinc and compounds (transfers of metals)
7	5	0	4	0	5	2,384,320	2,384,320	Zinc and compounds (transfers of metals)
8	6	0	6	3,512,206	6	2,175,039	2,175,039	Zinc and compounds (transfers of metals)
9	4	1,018,552	5	3,260,882	5	3,090,268	2,071,716	Zinc and compounds (transfers of metals)
10	**	**	4	376,191	5	1,925,941	1,925,941	Zinc and compounds (transfers of metals)
11	5	0	5	0	5	1,758,623	1,758,623	Zinc and compounds (transfers of metals)
12	5	18,141	5	0	5	1,723,356	1,705,215	Lead and compounds (transfers of metals)
13	6	0	6	1,430,806	6	1,680,432	1,680,432	Zinc and compounds (transfers of metals)
14	17	349,765	27	1,180,378	29	1,917,884	1,568,119	Zinc and compounds (transfers of metals)
15	1	40,867	1	27,279	1	1,434,288	1,393,421	Chromium and compounds (transfers of metals)
16	7	27,152	7	521,606	7	1,310,549	1,283,397	Zinc and compounds (transfers of metals)
17	7	0	7	203,898	7	1,233,769	1,233,769	Zinc and compounds (transfers of metals)
18	7	0	12	60,237	12	1,192,598	1,192,598	Zinc and compounds (transfers of metals)
19	3	140,624	5	1,047,587	5	1,332,607	1,191,983	Zinc and compounds (transfers of metals)
20	7	308,132	7	390,943	6	1,487,000	1,178,868	Zinc and compounds (transfers of metals)
21	**	**	6	12,254	6	1,158,730	1,158,730	Manganese/Arsenic/Cobalt/Copper and compounds (transfers of metals)
22	4	20	4	296,171	4	1,066,656	1,066,636	Zinc and compounds (transfers of metals)
23	5	0	5	400,290	5	1,060,770	1,060,770	Zinc and compounds (transfers of metals)
24	7	5,071,785	7	5,933,560	7	6,086,892	1,015,107	Zinc/Manganese and compounds (transfers of metals)
25	**	**	1	816,327	1	997,732	997,732	Manganese and compounds (transfers of metals)
26	1	116	1	431,778	1	810,519	810,403	Lead and compounds (transfers of metals)
27	7	0	7	1,601,937	7	780,190	780,190	Zinc and compounds (transfers of metals)
28	**	**	3	103,514	4	757,234	757,234	Zinc and compounds (transfers of metals)
29	9	18,948	7	1,645,527	6	753,082	734,134	Zinc and compounds (transfers of metals)
30	**	**	**	**	6	710,884	710,884	Zinc and compounds (transfers of metals)
31	4	3,514	4	226	4	680,693	677,179	Copper and compounds (transfers of metals)
32	4	702	4	570	4	651,538	650,836	Manganese and compounds (transfers of metals)
33	1	5	1	2	1	642,234	642,229	Copper and compounds (transfers of metals)
34	2	684	2	4	4	640,804	640,120	Zinc/Copper and compounds (transfers of metals)
35	3	87,646	3	68,950	3	722,948	635,302	Zinc/Lead and compounds (transfers of metals)
36	**	**	**	**	2	600,888	600,888	Zinc and compounds (transfers of metals)
37	4	0	5	161,166	5	562,110	562,110	Zinc and compounds (transfers of metals)
38	9	179	9	15	9	547,191	547,012	Lead/Copper/Arsenic and compounds (transfers of metals)
39	2	44,872	2	760,620	2	583,890	539,018	Manganese and compounds (transfers of metals)
40	3	43,751	3	38,707	3	574,226	530,475	Copper/Nickel and compounds (transfers of metals)
41	4	69,677	3	145,923	4	570,306	500,629	Lead and compounds (transfers of metals)
42	6	5,891	6	95,026	6	479,220	473,329	Zinc and compounds (transfers of metals)
43	5	1,139	5	1,133	5	466,530	465,391	Zinc and compounds (transfers of metals)
44	5	14,939	5	3,248	5	462,521	447,582	Zinc and compounds (transfers of metals)
45	6	0	6	579,178	6	417,079	417,079	Zinc and compounds (transfers of metals)
46	6	5,203,893	6	7,659,422	6	5,609,771	405,878	Zinc/Manganese and compounds (transfers of metals)
47	5	823,850	6	1,234,371	5	1,221,227	397,377	Antimony/Lead and compounds (transfers of metals)
48	**	**	1	0	4	384,808	384,808	Manganese and compounds (transfers of metals)
49	5	1,370,070	5	1,329,902	5	1,742,791	372,721	Lead and compounds (transfers of metals)
50	4	118,935	5	422,236	5	481,049	362,114	Zinc and compounds (transfers of metals)
	223	15,014,228	258	42,430,232	275	82,698,581	67,684,353	

* Chemicals accounting for more than 70% of increase in total transfers of metals from the facility.

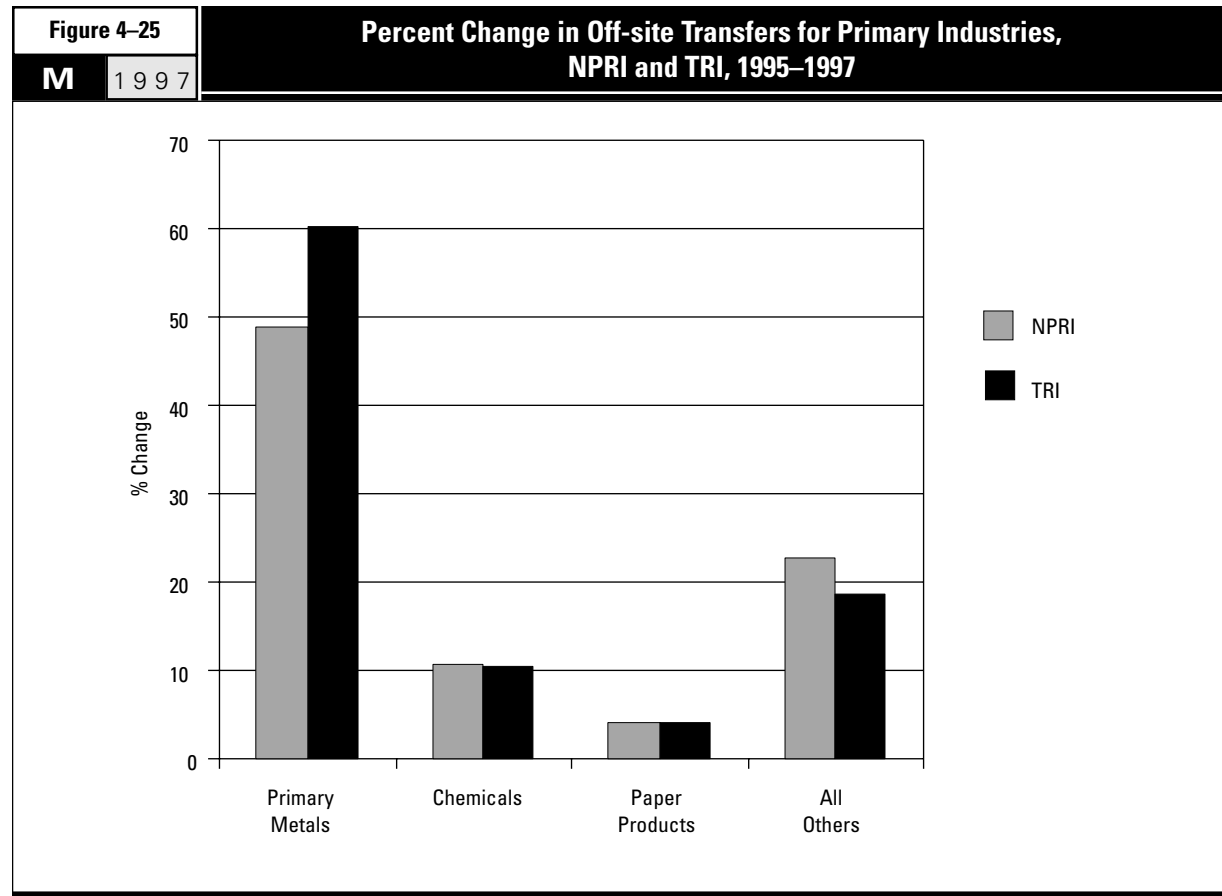
** Indicates facility did not report any matched metals that year.

4.3.5 Changes in Transfers by Industry

The three industries with the largest transfers off-site for NPRI and TRI all increased their transfer amounts from 1995 to 1997. Increases for the primary metals industry were significant. This sector's transfers increased 49 percent in NPRI and 60 percent in TRI (**Figure 4-25**). (**Chapter 7** more closely examines the primary metals industry and its reporting to NPRI and TRI.)

The primary metals industry (US SIC code 33) reported the largest transfers in NPRI for all three years, rising from 18.8 million kg in 1995 to 27.9 million kg in 1997. Ranking second for transfers throughout the period, as well as second for increases, the chemical manufacturing sector (US SIC code 28) reported transfers of 11.3 million in 1995 and 12.5 million in 1997. The third-largest increase occurred in the petroleum and coal products industry (US SIC code 29), from 399,149 kg in 1995 to 1.1 million kg in 1997; this industry climbed from ninth to fifth for total transfers. Thirteen Canadian industries reported increased transfers from 1995 to 1997 (**Table 4-52**).

The largest NPRI reduction in transfers occurred in the stone/clay/glass industry (US SIC code 32), from 384,957 kg to 93,052 kg, followed by rubber and plastics (US SIC code 30), from 1.1 million kg to 927,044 kg, and electronics and electrical equipment



(US SIC code 36), from 408,568 kg to 274,229 kg.

In TRI, the increased transfers reported by the primary metals industry (US SIC code 33) brought that sector from second place for total transfers in 1995 to first in 1997. The primary metals industry reported 92.2 million kg in 1995 and 147.7 million kg in 1997. With a much smaller increase,

chemical manufacturing (US SIC code 28) stepped down from first for total transfers in 1995 (with 115.3 million kg) to second in 1997 (127.3 million kg). The fabricated metals sector (US SIC code 34) reported TRI's third-largest increase in transfers, from 11.5 million kg to 17.5 million kg. It ranked fifth for total transfers in all three years. Eighteen industry groups

reported increased transfers in TRI (**Table 4-53**).

TRI industries with reductions were miscellaneous manufacturing (US SIC code 39), dropping from 1.4 million kg to 816,796 kg, instruments (US SIC code 38), from 2.2 million kg to 1.6 million kg, and furniture (US SIC code 25), from 439,630 kg to 427,052 kg.

Table 4-52

Change in NPRI Off-site Transfers by Industry (US SIC Code), 1995-1997

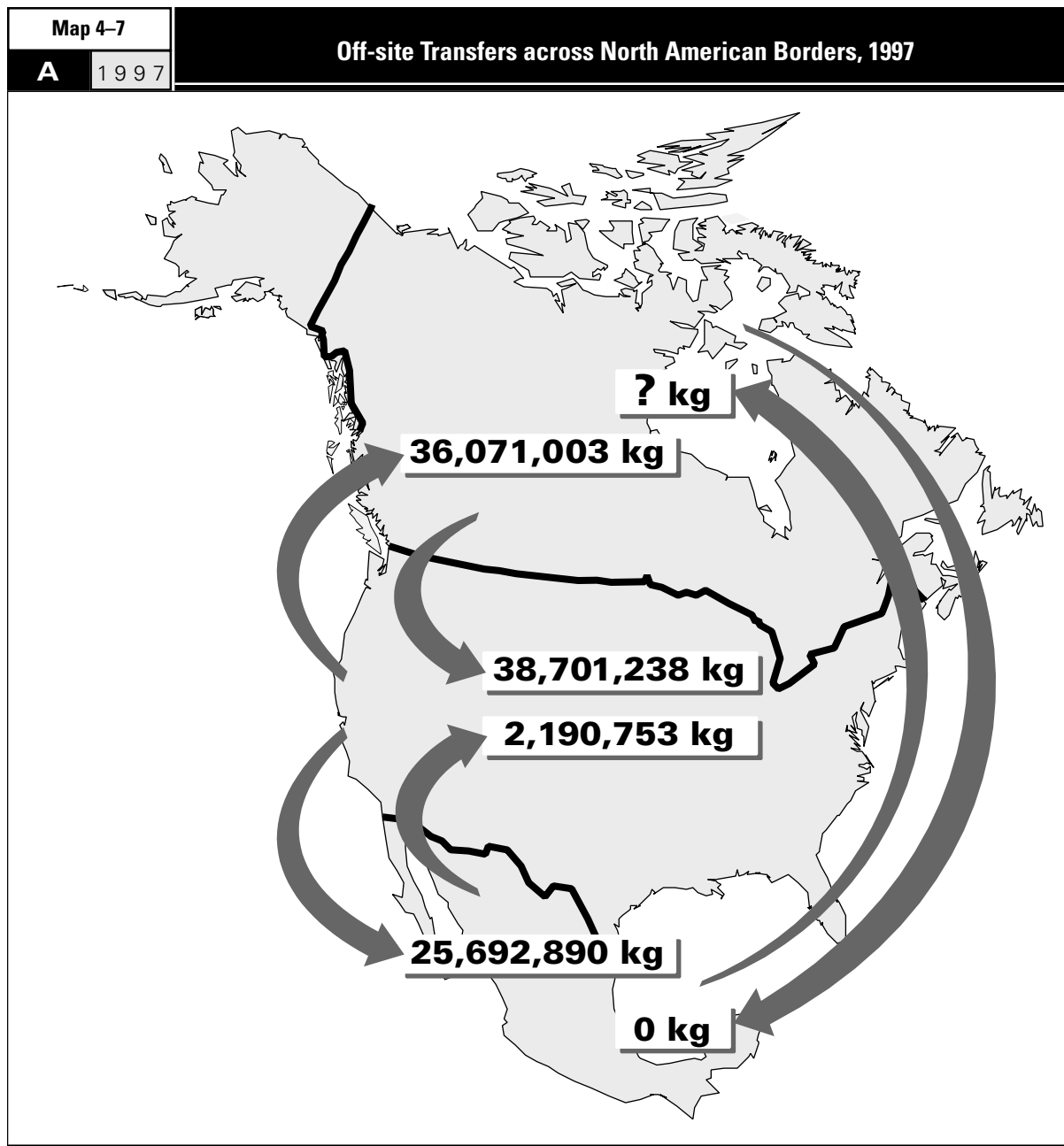
M 1997

US SIC Code	Industry	Total Transfers			Change 95-97	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
20	Food Products	403,624	370,415	752,763	349,139	86.5
22	Textile Mill Products	8,004	5,958	28,760	20,756	259.3
23	Apparel and Other Textile Products	0	0	0	0	—
24	Lumber and Wood Products	65,170	56,784	206,520	141,350	216.9
25	Furniture and Fixtures	7,793	9,506	137,990	130,197	1670.7
26	Paper Products	1,967,745	2,009,051	2,048,447	80,702	4.1
27	Printing and Publishing	101,053	165,616	152,956	51,903	51.4
28	Chemicals	11,252,469	11,721,914	12,459,163	1,206,694	10.7
29	Petroleum and Coal Products	399,149	520,887	1,121,630	722,481	181.0
30	Rubber and Plastics Products	1,123,575	1,111,216	927,044	-196,531	-17.5
31	Leather Products	6,030	7,600	7,027	997	16.5
32	Stone/Clay/Glass Products	384,957	243,232	93,052	-291,905	-75.8
33	Primary Metals	18,761,753	21,689,652	27,919,767	9,158,014	48.8
34	Fabricated Metals Products	1,566,219	1,762,636	1,750,866	184,647	11.8
35	Industrial Machinery	125,681	173,750	448,543	322,862	256.9
36	Electronic/Electrical Equipment	408,568	370,489	274,229	-134,339	-32.9
37	Transportation Equipment	953,249	1,095,230	879,806	-73,443	-7.7
38	Measurement/Photographic Instruments	1,500	50	250	-1,250	-83.3
39	Misc. Manufacturing Industries	212,165	202,967	299,448	87,283	41.1
	Total	37,748,704	41,516,953	49,508,261	11,759,557	31.2

Table 4-53		Change in TRI Off-site Transfers by Industry (US SIC Code), 1995-1997				
M	1997					
US SIC Code	Industry	Total Transfers			Change 95-97	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
20	Food Products	8,472,941	8,683,875	11,056,516	2,583,575	30.5
21	Tobacco Products	72	181	929	857	1190.3
22	Textile Mill Products	1,341,040	1,124,905	1,400,523	59,483	4.4
23	Apparel and Other Textile Products	39,908	28,975	68,149	28,241	70.8
24	Lumber and Wood Products	249,416	174,181	249,478	62	0.0
25	Furniture and Fixtures	439,630	390,098	427,052	-12,578	-2.9
26	Paper Products	23,840,715	22,792,336	24,799,677	958,962	4.0
27	Printing and Publishing	265,655	259,396	285,188	19,533	7.4
28	Chemicals	115,331,590	110,014,698	127,308,998	11,977,408	10.4
29	Petroleum and Coal Products	3,593,689	3,921,808	4,391,613	797,924	22.2
30	Rubber and Plastics Products	6,285,115	6,014,420	6,303,337	18,222	0.3
31	Leather Products	793,672	852,442	921,985	128,313	16.2
32	Stone/Clay/Glass Products	3,404,666	3,859,139	4,240,455	835,789	24.5
33	Primary Metals	92,184,492	106,572,925	147,718,667	55,534,175	60.2
34	Fabricated Metals Products	11,501,052	14,650,903	17,503,446	6,002,394	52.2
35	Industrial Machinery	3,019,434	3,016,384	3,426,787	407,353	13.5
36	Electronic/Electrical Equipment	9,757,854	9,691,106	11,704,615	1,946,761	20.0
37	Transportation Equipment	7,999,339	6,670,222	8,053,776	54,437	0.7
38	Measurement/Photographic Instruments	2,189,411	1,749,398	1,606,489	-582,922	-26.6
39	Misc. Manufacturing Industries	1,439,613	826,753	816,796	-622,817	-43.3
	Multiple Codes 20-39	18,599,686	15,318,847	21,755,280	3,155,594	17.0
	Total	310,748,990	316,612,992	394,039,756	83,290,766	26.8

4.4 Transfers across Borders

NPRI and TRI facilities report the amounts of chemicals in waste they transferred to off-site locations, along with the address of the site to which the chemical wastestream is shipped. Most transfers occurred to sites within a nation's borders, but listed substances can also be shipped to a North American neighbor or to other countries (Map 4-7). Transfers to sewage/POTWs are not included in this analysis because they rarely cross national or even state/provincial boundaries.



- Amounts appear within receiving countries.
- Reporting of transfers to recycling and to energy recovery was voluntary in Canada in 1997; amounts given may not represent all such transfers from Canada.
- Amount from Mexico to the United States from Haztraks US Manifest Database, October 1998 <www.epa.gov/earth1r6/6en/h/haztraks>. This amount represents estimates of TRI chemicals in waste sent to US hazardous waste treatment, storage and disposal facilities from Mexican maquiladoras; amount given may not represent all transfers from Mexico.

Table 4-54		NPRI Off-site Transfers within Canada and to Other Countries, 1997					
A	1997	Outside Canada		Within Canada		Total Off-site Transfers	
		kg	%	kg	%	kg	%
Transfers to Recycling*		26,476,915	68.4	86,084,271	49.9	112,561,186	53.3
Transfers to Energy Recovery*		3,257,502	8.4	8,927,672	5.2	12,185,174	5.8
Transfers to Treatment (except metals)		3,020,688	7.8	16,309,845	9.5	19,330,533	9.2
Transfers to Disposal (except metals)		3,628,853	9.4	9,146,233	5.3	12,775,086	6.1
Transfers of Metals to Treatment/Disposal		2,339,232	6.0	51,931,427	30.1	54,270,659	25.7
Total Transfers		38,723,190	100.0	172,399,448	100.0	211,122,638	100.0

* Reporting of transfers to recycling and to energy recovery is voluntary; amounts given may not represent all such transfers.

► Does not include transfers to sewage. Does not include transfers to unknown destinations (less than 0.01% of total).

4.4.1 Transfers Outside the Country

(All Chemicals/Industries)

Canadian facilities reported transferring 38.7 million kg of all NPRI-listed substances out of the country in 1997. Transfers outside Canada were more likely to be sent for recycling than for other treatment/disposal methods, even though reporting of transfers to recycling is voluntary, so this may understate actual amounts. NPRI facilities

reported 26.5 million kg of transfers outside Canada to recycling, or 68 percent of such transfers. Within Canada, 50 percent of transfers (86.1 million kg) were made to recycling (**Table 4-54**).

TRI facilities transferred 63.7 million kg of all TRI-listed chemicals outside the United States in 1997. Almost all of these exported transfers—61.5 million kg or 97 percent of the total—went to recycling. Reporting of transfers to recycling is mandatory for TRI facilities. Within the United States,

65 percent of transfers (1.02 billion kg) were sent to recycling (**Table 4-55**).

For metals, a relatively smaller percentage was sent outside the country compared to that sent to sites within national boundaries. For Canada, these transfers of metals to treatment/disposal amounted to 51.9 million kg sent within Canada and 2.3 million kg sent outside Canada. For the United States, these transfers totaled 178.9 million kg inside the United States and 1.3 million kg outside US borders.

Table 4-55		TRI Off-site Transfers within United States and to Other Countries, 1997					
A	1997	Outside United States		Within United States		Total Off-site Transfers	
		kg	%	kg	%	kg	%
		61,499,509	96.5	1,016,674,919	65.0	1,078,174,428	66.2
		153,199	0.2	230,182,374	14.7	230,335,573	14.1
		585,897	0.9	112,448,282	7.2	113,034,179	6.9
		157,597	0.2	26,666,151	1.7	26,823,748	1.6
		1,321,963	2.1	178,934,823	11.4	180,256,786	11.1
Total Transfers		63,718,165	100.0	1,564,906,549	100.0	1,628,624,714	100.0

► Does not include transfers to sewage. Does not include transfers to unknown destinations (0.12% of total).

4.4.2 Transfers across North American Borders

(All Chemicals/Industries)

Virtually all of Canada's transfers outside its borders—99.9 percent—went to the United States. NPRI facilities sent 38.7 million kg of all NPRI-listed substances to US locations. This included 12.6 million kg transferred to sites in Indiana for recycling or energy recovery and 10.1 million kg trans-

ferred to sites in Michigan for management by recycling, energy recovery, treatment or disposal (including treatment/disposal of metals). Canada did not transfer NPRI substances to Mexico (**Table 4-56**).

US facilities sent 36.1 million kg of TRI-listed chemicals to receiving locations in Canada, or 57 percent of all US transfers out-of-country. Another 40 percent (25.7 million kg) was sent to Mexico. The largest recipient location of US transfers was Monterrey,

Mexico, with 25.0 million kg—almost all of it (24.7 million kg) sent to recycling. In Canada, Ontario received 23.2 million kg and Quebec received 12.8 million kg transferred from the United States. The US transfers to Ontario and Quebec went primarily to recycling, but included all transfer types (**Table 4-57**).

Mexico has not begun to collect mandatory data on transfers.

Table 4-56		NPRI Off-site Transfers to Other Countries from Canada, 1997						
A	1997							
Receiving Country	Transfers to Recycling* (kg)	Transfers to Energy Recovery* (kg)	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers Received (kg)	% of Transfers Outside Canada	
Germany	7,757	0	0	0	0	7,757	0.02	
United Kingdom	14,195	0	0	0	0	14,195	0.04	
United States	26,454,963	3,257,502	3,020,688	3,628,853	2,339,232	38,701,238	99.9	
California	138,820	0	0	0	0	138,820	0.4	
Connecticut	316,400	0	0	0	0	316,400	0.8	
Illinois	131,588	0	152,279	0	840,570	1,124,437	2.9	
Indiana	9,978,000	2,582,330	0	0	0	12,560,330	32.4	
Iowa	293,000	0	0	0	0	293,000	0.8	
Kansas	0	110,420	0	0	0	110,420	0.3	
Louisiana	1,096,710	0	0	0	0	1,096,710	2.8	
Maryland	5,708	0	0	0	0	5,708	0.0	
Massachusetts	0	0	105,500	0	0	105,500	0.3	
Michigan	5,987,403	129,469	1,938,551	833,459	1,165,175	10,054,057	26.0	
Mississippi	2,700	0	0	0	0	2,700	0.0	
New Jersey	860,271	35,000	0	0	0	895,271	2.3	
New York	4,515,436	17,618	332	0	49,500	4,582,886	11.8	
North Dakota	0	0	0	0	3,721	3,721	0.0	
Ohio	1,859,536	112,627	289,501	2,792,700	242,910	5,297,274	13.7	
Oregon	0	119	0	0	0	119	0.0	
Pennsylvania	456,834	0	420,921	0	0	877,755	2.3	
South Carolina	74,021	0	0	0	0	74,021	0.2	
Texas	524,730	0	0	0	0	524,730	1.4	
Utah	30,500	86,400	0	0	0	116,900	0.3	
Washington	183,306	183,519	113,604	2,694	37,356	520,479	1.3	
Total Transferred Outside Canada	26,476,915	3,257,502	3,020,688	3,628,853	2,339,232	38,723,190	100.0	

* Reporting of transfers to recycling and to energy recovery is voluntary; amounts given may not represent all such transfers.

Table 4-57

TRI Off-site Transfers to Other Countries from the United States, 1997

A 1997

Receiving Country	Transfers to Recycling (kg)	Transfers to Energy Recovery (kg)	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers Received (kg)	% of Transfers Outside US
Belgium	33,098	0	0	0	0	33,098	0.1
Canada	34,075,347	153,199	563,279	157,597	1,121,581	36,071,003	56.6
Alberta	4,762	0	0	0	0	4,762	0.0
British Columbia	58,569	0	2,586	0	0	61,155	0.1
Manitoba	50,074	0	0	0	0	50,074	0.1
Ontario	22,179,810	113,168	369,294	157,385	375,681	23,195,338	36.4
Quebec	11,782,132	40,031	191,399	212	745,900	12,759,674	20.0
China	50,228	0	0	0	0	50,228	0.1
Finland	3,039	0	0	0	0	3,039	0.0
France	31,646	0	0	0	0	31,646	0.0
Germany	1,137,591	0	0	0	0	1,137,591	1.8
Italy	8,857	0	0	0	0	8,857	0.0
Japan	360,519	0	0	0	0	360,519	0.6
Mexico	25,469,895	0	22,618	0	200,377	25,692,890	40.3
Monterrey	24,746,200	0	22,618	0	200,377	24,969,195	39.2
Other Cities	723,695	0	0	0	0	723,695	1.1
Singapore	21,022	0	0	0	0	21,022	0.0
United Arab Emirates	236,553	0	0	0	0	236,553	0.4
United Kingdom	71,714	0	0	0	5	71,719	0.1
Total Transferred Outside US	61,499,509	153,199	585,897	157,597	1,321,963	63,718,165	100.0

Table 4-58		Off-site Transfers across National Boundaries, between United States and Canada, 1997						
M	1997	To/From Canadian Province					Total Cross-Boundary Transfers	
To/From US State	To British Columbia (kg)	To Ontario (kg)	From Ontario (kg)	To Quebec (kg)	From Quebec (kg)	From Saskatchewan (kg)	To Canada (kg)	From Canada (kg)
Arizona	0	1,691	0	0	0	0	1,691	0
Connecticut	0	291,927	0	250,207	0	0	542,134	0
Illinois	0	0	0	0	840,570	0	0	840,570
Indiana	0	53,861	0	0	0	0	53,861	0
Kentucky	0	51,168	0	113	0	0	51,281	0
Louisiana	0	0	0	1,416	0	0	1,416	0
Maine	0	0	0	192,830	0	0	192,830	0
Massachusetts	0	3,400	0	176,515	105,500	0	179,915	105,500
Michigan	0	338,900	2,277,158	1,265	105,862	0	340,165	2,383,020
New Hampshire	0	0	0	9,524	0	0	9,524	0
New Jersey	0	452	0	39,072	0	0	39,524	0
New York	0	654	36,532	230,204	0	0	230,858	36,532
North Carolina	0	0	0	51	0	0	51	0
North Dakota	0	0	0	0	0	3,721	0	3,721
Ohio	0	42,529	109,909	54	181,200	0	42,583	291,109
Pennsylvania	0	52,540	0	2,303	0	0	54,843	0
Puerto Rico	0	69	0	0	0	0	69	0
Rhode Island	0	1,126	0	10,171	0	0	11,297	0
Vermont	0	0	0	2,411	0	0	2,411	0
Virginia	0	113	0	0	0	0	113	0
Washington	2,536	0	0	183	0	0	2,719	0
West Virginia	0	40	0	4,100	0	0	4,140	0
Total	2,536	838,470	2,423,599	920,419	1,233,132	3,721	1,761,425	3,660,452

► Does not include transfers to sewage, recycling or energy recovery.

4.4.3 Transfers between US States and Canadian Provinces

(Matched Chemicals/Industries)

For the matched data set for 1997, US facilities transferred a total of 1.8 million kg to Canada, while Canadian facilities sent 3.7 million kg to the United States (Table 4-58). This analysis includes only the industries, chemi-

cals and transfer types that both NPRI and TRI cover. Thus, transfers to recycling and to energy recovery are excluded.

Facilities in the US state of Connecticut sent 542,134 kg to Canadian locations for treatment or disposal, more than any other state for the matched data set. Roughly half the Connecticut transfers were to Ontario, the rest went to Quebec. Michigan

ranked second among US states for transfers to Canada, with 340,165 kg, almost entirely sent to Ontario. New York facilities sent 230,858 kg in transfers to Canada, almost all to Quebec. Connecticut and Michigan together accounted for three-quarters of US transfers to Ontario, while Connecticut and New York accounted for half the US transfers to Quebec.

Two-thirds of Canada's transfers to the United States originated in Ontario (2.4 million kg) and most of the remainder came from Quebec (1.2 million kg). Ontario facilities principally sent transfers to Michigan (2.3 million kg, or 96 percent of Michigan's transfers from Canada). Quebec's largest transfer was to Illinois (840,570 kg—all of the transfers to Illinois from Canada). As seen below, one Quebec facility made this transfer to Illinois.

Provinces Receiving Largest Amounts of Transfers from US Facilities: Quebec and Ontario

Eight sites in Quebec received transfers of listed substances in waste from US facilities in the matched data set for 1997. The largest amount of US transfers to Quebec went to a site in Blainville, which received 828,756 kg from facilities reporting to TRI, along with 3.7 million kg from facilities reporting to NPRI. This site received 19 percent of its transfers from TRI facilities. Four Canadian sites with smaller totals (less than 9,000 kg each) each received transfers only from one or two US facilities. The majority of transfers to the Quebec sites, from both TRI and NPRI facilities, consisted of metals (Table 4-59).

In Ontario, 11 sites received transfers from TRI facilities in the matched data set. A site in Corunna received 476,296 kg from TRI facilities (the largest amount sent by TRI facilities

to an Ontario location). It also received 11.5 million kg from NPRI facilities. TRI transfers represented four percent of this location's total PRTR-reported waste. Although NPRI facilities transferred 8.7 million kg of metals to the Corunna site, TRI facilities principally sent nonmetals to this site (all but 18,685 kg) for treatment or disposal. A site in Hamilton received 99 percent of its 297,206-kg total from TRI facilities. Three Ontario sites received all their PRTR transfers from TRI facilities, in amounts ranging from 52,193 kg down to 40 kg. As in Quebec, these sites received transfers from one or two US facilities each (Table 4-60).

States Receiving Largest Amounts of Transfers from Canada: Michigan and Illinois

Seven Michigan sites received transfers from facilities reporting to NPRI. The top two received the great majority of the transferred chemicals in waste from

NPRI facilities. NPRI facilities sent 1.3 million kg to a site in Northville and 1.0 million kg to a site in Alpena. These amounts represented 95 percent and 99 percent, respectively, of the transfers sent to these two sites. The transfers to Northville came from eight NPRI facilities and consisted largely of metals, which totaled 1.2 million kg. One NPRI facility reported the total amount transferred from Canada to Alpena (1.0 million kg to treatment). A site in Houghton Lake, with a total of 4,380 kg of transfers, received 97 percent of that total from one NPRI facility for disposal (Table 4-61).

A site in Chicago, Illinois, received transfers of 840,570 kg of metals from one NPRI facility in Quebec, plus 58 kg of metals from one TRI facility. This was the only transfer from a Canadian facility in the matched data set to Illinois (Table 4-62).

Table 4-59		Transfers to Sites in Quebec that Receive Transfers from both TRI and NPRI Facilities, 1997							
M	1997								
Rank	Transfer Site Name	Location	City/Province	Number of Facilities	Number of Forms	From US TRI Facilities			Total Transfers (kg)
						Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	
1	Stablex Canada Inc	Boul. Industriel	Blainville, QC	53	114	106,524	95	722,137	828,756
2	Laidlaw Environmental Services	Boul. Sainte-Marguerite	Mercier, QC	4	10	53,798	4	0	53,802
3	Chemrec Inc.	Brosseau	Cowansville, QC	1	2	24,762	0	0	24,762
4	Noranda Copper Smelting & Refining	Portelände St.	Rouyn-Noranda, QC	2	3	0	0	8,693	8,693
5	Recyclage d'aluminium Québec Inc.	Rue Dutord	Bécancour, QC	1	1	0	0	4,082	4,082
6	Nova Lead Inc.	Rue Garnier	Ville Ste. Catherine, QC	1	1	0	0	209	209
7	Laidlaw Environmental Services	R.R. No. D	Thurso, QC	1	1	113	0	0	113
8	Noranda Metallurgy Inc.	Ave. Réal-Caouette	Rouyn-Noranda, QC	1	1	2	0	0	2
Total				64	133	185,199	99	735,121	920,419

Table 4-60		Transfers to Sites in Ontario that Receive Transfers from both TRI and NPRI Facilities, 1997							
M	1997								
Rank	Transfer Site Name	Location	City/Province	Number of Facilities	Number of Forms	From US TRI Facilities			Total Transfers (kg)
						Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	
1	Laidlaw Environmental Services	Telfer Rd.	Corunna, ON	20	96	337,434	120,177	18,685	476,296
2	Philip Environmental Metals	Centennial Parkway	Hamilton, ON	3	6	0	0	293,956	293,956
3	Custom Cryogenic	Davis St. West	Simcoe, ON	1	1	0	0	52,193	52,193
4	Philip Environmental Service	Parkdale Ave. North	Hamilton, ON	4	12	0	0	7,620	7,620
5	Laidlaw Environmental Services	Avonhead Rd.	Mississauga, ON	1	5	0	3,219	304	3,523
6	Laidlaw Environmental Services	Allanport Rd.	Thorold, ON	2	7	0	2,032	141	2,173
7	Safety Kleen	Woolwich St./Regional Rd.17	Breslau, ON	1	3	0	0	1,227	1,227
8	Barnes Environmental Int'l	Parkside Dr.	Waterdown, ON	1	1	0	0	788	788
9	Quantex Technologies	Trillium Parl Pl.	Kitchener, ON	2	4	0	0	428	428
10	Philip Enterprises Inc.	Petit Rd.	Fort Erie, ON	2	2	0	113	113	226
11	Exolon ESK Co. of Canada	Queen Street, South	Thorold, ON	1	1	40	0	0	40
Total				38	138	337,474	125,541	375,455	838,470

Rank	Number of Facilities	Number of Forms	From Canadian NPRI Facilities			Total Transfers (kg)	Total North American Transfers (kg)	% from US TRI Facilities
			Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/ Disposal (kg)			
1	49	102	82,463	386,065	3,188,920	3,657,448	4,486,204	18.5
2	22	46	858,824	0	1,922	860,746	914,548	5.9
3	3	14	32,349	0	1,340	33,689	58,451	42.4
4	0	0	0	0	0	0	8,693	100.0
5	1	3	0	0	15,400	15,400	19,482	21.0
6	0	0	0	0	0	0	209	100.0
7	0	0	0	0	0	0	113	100.0
8	0	0	0	0	0	0	2	100.0
	75	165	973,636	386,065	3,207,582	4,567,283	5,487,702	16.8

Rank	Number of Facilities	Number of Forms	From Canadian NPRI Facilities			Total Transfers (kg)	Total North American Transfers (kg)	% from US TRI Facilities
			Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/ Disposal (kg)			
1	53	215	2,264,233	38,488	8,741,535	11,044,256	11,520,552	4.1
2	1	4	3,250	0	0	3,250	297,206	98.9
3	0	0	0	0	0	0	52,193	100.0
4	6	20	26,276	0	16,540	42,816	50,436	15.1
5	24	76	324,264	10,445	19,725	354,434	357,957	1.0
6	12	17	11,421	4,338	1,317	17,076	19,249	11.3
7	1	3	5,699	0	0	5,699	6,926	17.7
8	2	5	0	0	328,303	328,303	329,091	0.2
9	0	0	0	0	0	0	428	100.0
10	4	11	3,591	0	8,871	12,462	12,688	1.8
11	0	0	0	0	0	0	40	100.0
	103	351	2,638,734	53,271	9,116,291	11,808,296	12,646,766	6.6

Table 4-61		Transfers to Sites in Michigan that Receive Transfers from both NPRI and TRI Facilities, 1997							
M		1997							
Rank	Transfer Site Name	Location	City/State	Number of Facilities	Number of Forms	From Canadian NPRI Facilities			Total Transfers (kg)
						Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	
1	Browning-Ferris Industries, Arbor Hills Landfill	Six Mile Road	Northville, MI	8	21	0	105,862	1,152,605	1,258,467
2	Systech Corp.	Ford Ave	Alpena, MI	1	6	1,046,162	0	0	1,046,162
3	City Environmental	Frederick St.	Detroit, MI	1	2	66,070	0	0	66,070
4	Fluid Security Inc.	Harrison Road	Houghton Lake, MI	1	2	0	4,265	0	4,265
5	Dynecol Inc.	Georgia Street	Detroit, MI	1	2	3,989	0	0	3,989
6	Environmental Waste Control	Princeton Avenue	Inkster, MI	1	1	3,740	0	0	3,740
7	Dow Chemical U.S.A.	Michigan Division	Midland, MI	1	3	327	0	0	327
Total				14	37	1,120,288	110,127	1,152,605	2,383,020

Table 4-62		Transfers to Sites in Illinois that Receive Transfers from both NPRI and TRI Facilities, 1997							
M		1997							
Rank	Transfer Site Name	Location	City/State	Number of Facilities	Number of Forms	From Canadian NPRI Facilities			Total Transfers (kg)
						Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	
1	Midwest Zinc	1001 Westweed	Chicago, IL	1	1	0	0	840,570	840,570

Rank	Number of Facilities	Number of Forms	From US TRI Facilities			Total Transfers (kg)	Total North American Transfers (kg)	% from Canadian NPRI Facilities
			Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/ Disposal (kg)			
1	22	57	3,812	25	65,928	69,765	1,328,221	94.7
2	1	4	16,072	0	0	16,072	1,062,234	98.5
3	60	170	609,827	1,709	132,317	743,853	809,923	8.2
4	2	2	0	0	115	115	4,380	97.4
5	57	168	267,854	32,598	415,005	715,457	719,446	0.6
6	9	18	4,634	9,070	282	13,986	17,726	21.1
7	6	45	1,656,397	3,900	0	1,660,297	1,660,624	0.0
	157	464	2,558,596	47,302	613,647	3,219,545	5,602,554	42.5

Rank	Number of Facilities	Number of Forms	From US TRI Facilities			Total Transfers (kg)	Total North American Transfers (kg)	% from Canadian NPRI Facilities
			Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/ Disposal (kg)			
1	1	1	0	0	58	58	840,628	99.99

4.4.4 US-Canadian Cross-Border

Transfers by Industry

(Matched Chemicals/Industries)

Seven Canadian industries reported transfers across the US-Canadian border in the matched data set for 1997. The primary metals industry transferred the largest amount to the United States—2.0 million kg. All of this amount, which represented 54 percent of the total for Canada-to-US transfers, consisted of metals sent to treatment/disposal. NPRI facilities in the chemical manufacturing industry transferred 1.5 million kg, or 42 percent of the total. This consisted primarily of non-metals sent to treatment. NPRI's lumber and wood products facilities ranked third, transferring 102,650 kg to US sites for disposal. Four other Canadian industries (transportation equipment, fabricated metals, stone/clay/glass and miscellaneous manufacturing) reported transfers across the border, in amounts ranging from 36,411 kg to 132 kg (Table 4-63).

Table 4-63		Industries Reporting Transfers to US from Canadian NPRI Facilities, 1997				
M	1997					
US SIC Code	Industry	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers (kg)	% of Total
33	Primary Metals	0	0	1,992,564	1,992,564	54.4
28	Chemicals	1,441,157	79,116	0	1,520,273	41.5
24	Lumber and Wood Products	0	102,650	0	102,650	2.8
37	Transportation Equipment	0	0	36,411	36,411	1.0
34	Fabricated Metals Products	3,740	0	4,321	8,061	0.2
32	Stone/Clay/Glass Products	0	361	0	361	0.0
39	Misc. Manufacturing Industries	132	0	0	132	0.0
Total		1,445,029	182,127	2,033,296	3,660,452	100.0

Table 4-64		Industries Reporting Transfers to Canada from US TRI Facilities, 1997				
M	1997					
US SIC Code	Industry	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers (kg)	% of Total
28	Chemicals	389,079	8,159	30,753	427,991	24.3
34	Fabricated Metals Products	6,523	113	417,522	424,158	24.1
33	Primary Metals	0	29,052	361,785	390,837	22.2
	Multiple Codes 20-39	128,644	80	79,983	208,707	11.8
26	Paper Products	0	0	180,478	180,478	10.2
29	Petroleum and Coal Products	6	82,981	76	83,063	4.7
36	Electronic/Electrical Equipment	9	0	23,158	23,167	1.3
32	Stone/Clay/Glass Products	0	5,251	4,410	9,661	0.5
37	Transportation Equipment	632	4	5,860	6,496	0.4
39	Misc. Manufacturing Industries	0	0	6,471	6,471	0.4
30	Rubber and Plastics Products	203	0	0	203	0.0
23	Apparel and Other Textile Products	113	0	0	113	0.0
38	Measurement/Photographic Instruments	0	0	76	76	0.0
35	Industrial Machinery	0	0	4	4	0.0
	Total	525,209	125,640	1,110,576	1,761,425	100.0

In TRI, 14 industries, including the group of facilities that reported multiple industry codes, transferred listed substances to Canadian sites for treatment or disposal. The chemical manufacturing industry transferred 427,991 kg, and the fabricated metals industry transferred 424,158 kg. These two industries contributed 24 percent each of the US total. The primary metals industry ranked third in TRI for cross-border transfers to Canada, with 390,837 kg, another 22 percent of the US total. The multiple codes group, with 208,707 kg (or 12 percent), and the paper products industry, with 180,478 kg (or 10 percent), followed. The chemical manufacturing and multiple-codes industry groups mostly sent nonmetals to treatment, while the others mostly or entirely transferred metals. The nine remaining TRI industries sending PRTR substances to Canada were petroleum refining, electronic/electrical equipment, stone/clay/glass, transportation equipment, miscellaneous manufacturing, rubber and plastics, apparel, instruments, and industrial machinery (Table 4-64).

4.4.5 US-Canada Cross-Border

Transfers by Chemical

(Matched Chemicals/Industries)

NPRI and TRI facilities both transferred more zinc and its compounds across the US-Canada border than any other substance in the matched data set. NPRI facilities reported transferring to the United States a total of 26 substances in the matched data set (**Table 4-65**). TRI facilities reported a total of 46 substances in transfers to Canada. (**Table 4-66**).

NPRI transfers of zinc and its compounds to treatment/disposal totaled 1.4 million kg, 39 percent of all NPRI cross-border transfers to treatment/disposal in the United States. In NPRI, transfers of xylene (409,385 kg), toluene (404,697 kg) and copper and its compounds (397,554 kg) amounted to 11 percent each of the total transfers sent to the United States. TRI facilities transferred 409,234 kg of zinc and its compounds to Canada, 23 percent of the US transfers to Canada. Copper and its compounds ranked second with 382,878 kg or 22 percent. TRI facilities transferred 173,617 kg of methanol (10 percent of the TRI total) and 149,879 kg of nickel and its compounds (nine percent of the total).

Table 4-65		Chemicals in Transfers to US from Canadian NPRI Facilities, 1997				
M	1997					
CAS Number	Chemical	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers (kg)	% of Total
—	Zinc (and its compounds)	0	0	1,420,407	1,420,407	38.8
1330-20-7	Xylene (mixed isomers)	409,385	0	0	409,385	11.2
108-88-3	Toluene	403,713	984	0	404,697	11.1
—	Copper (and its compounds)	0	0	397,554	397,554	10.9
78-93-3	Methyl ethyl ketone	210,306	0	0	210,306	5.7
67-56-1	Methanol	180,693	0	0	180,693	4.9
—	Manganese (and its compounds)	0	0	117,050	117,050	3.2
50-00-0	Formaldehyde	0	105,831	0	105,831	2.9
75-09-2	Dichloromethane	73,800	0	0	73,800	2.0
—	Nitric acid and nitrate compounds	32	72,000	0	72,032	2.0
—	Lead (and its compounds)	0	0	67,583	67,583	1.8
108-95-2	Phenol	66,070	31	0	66,101	1.8
108-10-1	Methyl isobutyl ketone	44,317	0	0	44,317	1.2
79-01-6	Trichloroethylene	22,000	0	0	22,000	0.6
71-36-3	n-Butyl alcohol	20,454	0	0	20,454	0.6
—	Nickel (and its compounds)	0	0	16,871	16,871	0.5
127-18-4	Tetrachloroethylene	9,700	0	0	9,700	0.3
—	Chromium (and its compounds)	0	0	7,366	7,366	0.2
—	Cobalt (and its compounds)	0	0	4,185	4,185	0.1
111-42-2	Diethanolamine	3,740	0	0	3,740	0.1
62-53-3	Aniline	453	3,281	0	3,734	0.1
—	Cadmium (and its compounds)	0	0	2,280	2,280	0.1
100-41-4	Ethylbenzene	125	0	0	125	0.0
100-42-5	Styrene	125	0	0	125	0.0
92-52-4	Biphenyl	77	0	0	77	0.0
84-74-2	Dibutyl phthalate	39	0	0	39	0.0
Total		1,445,029	182,127	2,033,296	3,660,452	100.0
% of Total		39.5	5.0	55.5	100.0	

Table 4-66		Chemicals in Transfers to Canada from US TRI Facilities, 1997				
M	1997					
CAS Number	Chemical	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers (kg)	% of Total
—	Zinc (and its compounds)	0	0	409,234	409,234	23.2
—	Copper (and its compounds)	0	0	382,878	382,878	21.7
67-56-1	Methanol	173,617	0	0	173,617	9.9
—	Nickel (and its compounds)	0	0	149,879	149,879	8.5
108-88-3	Toluene	110,042	723	0	110,765	6.3
1330-20-7	Xylene (mixed isomers)	81,736	2,152	0	83,888	4.8
7664-38-2	Phosphoric acid	493	77,011	0	77,504	4.4
—	Lead (and its compounds)	0	0	74,445	74,445	4.2
—	Chromium (and its compounds)	0	0	55,950	55,950	3.2
—	Nitric acid and nitrate compounds	50,244	0	0	50,244	2.9
7664-39-3	Hydrogen fluoride	38,065	0	0	38,065	2.2
91-20-3	Naphthalene	40	33,462	0	33,502	1.9
75-05-8	Acetonitrile	32,113	0	0	32,113	1.8
—	Manganese (and its compounds)	0	0	27,139	27,139	1.5
85-44-9	Phthalic anhydride	13,079	0	0	13,079	0.7
1634-04-4	Methyl tert-butyl ether	9,423	0	0	9,423	0.5
100-41-4	Ethylbenzene	5,610	700	0	6,310	0.4
—	Cyanides	4,442	193	0	4,635	0.3
—	Arsenic (and its compounds)	0	0	4,100	4,100	0.2
7782-50-5	Chlorine	0	3,287	0	3,287	0.2
—	Mercury (and its compounds)	0	0	3,016	3,016	0.2
75-00-3	Chloroethane	2,439	0	0	2,439	0.1
71-43-2	Benzene	57	1,860	0	1,917	0.1
107-13-1	Acrylonitrile	1,822	0	0	1,822	0.1
—	Antimony (and its compounds)	0	0	1,766	1,766	0.1
1319-77-3	Cresol (mixed isomers)	0	1,735	0	1,735	0.1
108-95-2	Phenol	0	1,510	0	1,510	0.1
—	Cobalt (and its compounds)	0	0	1,479	1,479	0.1
98-82-8	Cumene	0	862	0	862	0.0
108-10-1	Methyl isobutyl ketone	715	0	0	715	0.0
—	Cadmium (and its compounds)	0	0	690	690	0.0
74-85-1	Ethylene	0	659	0	659	0.0
120-12-7	Anthracene	0	602	0	602	0.0
100-42-5	Styrene	487	77	0	564	0.0
92-52-4	Biphenyl	13	511	0	524	0.0
110-82-7	Cyclohexane	121	128	0	249	0.0
80-62-6	Methyl methacrylate	237	0	0	237	0.0
107-21-1	Ethylene glycol	203	0	0	203	0.0
95-63-6	1,2,4-Trimethylbenzene	0	123	0	123	0.0
74-87-3	Chloromethane	96	0	0	96	0.0
71-36-3	n-Butyl alcohol	68	0	0	68	0.0
78-93-3	Methyl ethyl ketone	36	2	0	38	0.0
115-07-1	Propylene	0	36	0	36	0.0
117-81-7	Di(2-ethylhexyl) phthalate	9	0	0	9	0.0
91-22-5	Quinoline	0	7	0	7	0.0
108-31-6	Maleic anhydride	2	0	0	2	0.0
Total		525,209	125,640	1,110,576	1,761,425	100.0
% of Total		29.8	7.1	63.0	100.0	

4.4.6 US-Mexican Cross-Border Transfers

(All Chemicals and Industries)

In 1997, four TRI industries reported transfers to Mexico, led by the primary metals industry with 24.8 million kg, or 97 percent of all US-to-Mexico transfers for all TRI chemicals. This amount consisted largely of transfers to recycling (24.6 million kg). All transfers to Mexico by the other three industries were also made to recycling: 617,256 kg by the chemical manufacturing industry, 246,484 kg by facilities reporting multiple industry codes, and 3,093 kg by the food products industry (**Table 4-67**).

Zinc and its compounds, with the largest transfers in both directions across the US-Canadian border, was also transferred by TRI facilities to Mexico in large quantities. TRI facilities sent 20.5 million kg of zinc and its compounds to Mexico, 80 percent of all TRI transfers to that country. TRI transfers to Mexico exceeded two mil-

lion kg for two other metals: manganese and its compounds (2.2 million kg) and lead and its compounds (2.1 million kg). TRI facilities reported transferring a total of 12 substances to Mexico (**Table 4-68**).

Mexico has not begun to collect mandatory data on transfers under COA. However, for waste generators located in Mexican border states, information on hazardous waste shipments from maquiladoras to the United States is available under a system called Haztraks. The US EPA and Semarnap in Mexico jointly created Haztraks to trace the movement of hazardous waste between the two countries. Chapter V, Article 153 (section vi), of Mexico's General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) requires that materials or hazardous waste generated in processes that use imported raw materials must return those materials or hazardous wastes to the originating country. Other Mexican waste generators also ship hazardous wastes to the United States. Under the 1983 bilateral La Paz Agree-

ment, the United States agrees to the importation of hazardous wastes from Mexico when the shipment complies with US laws.

Under this system, foreign parent companies export raw materials or partially assembled components to their plants in Mexico. The finished goods produced at the Mexican facility can then be exported with tariffs only on the value added at the Mexican facility. Any hazardous wastes generated by the facilities must be returned to the country of origin. Such wastes include acids, bases, heavy metals, metal-plating wastes, organic solvents and cyanide wastes. During 1997, the maquiladoras sent 9.2 million kg of such wastes from facilities in 10 Mexican border cities back to the United States (**Table 4-69**).

These wastes may contain chemicals on the PRTR lists. However, the Haztraks system tracks the total volume of waste rather than the amount of the chemical in the waste. These wastestreams contain specific chemicals, but typically also contain carrier materials such as water or soil. Identification of

wastes in Haztraks follows the US system for reporting under the Resource Conservation and Recovery Act (RCRA). The exact amount of the chemical contained in the waste is not reported.

An earlier analysis that compared TRI and RCRA reporting found that, for 1991, approximately 28 percent of the amount reported as RCRA wastes was also reported as waste under TRI for that year (*Toxics Watch 1995*, INFORM, New York, NY, Table 6-7, p. 282). If this ratio were applied to the data on transfers of RCRA-type wastes from Mexican maquiladoras, then approximately 2.2 million kg of TRI chemicals were transferred from Mexican maquiladoras to the United States during 1997 (**Table 4-70**).

The Haztraks system also tracks hazardous waste sent to Mexico. The 25.7 million kg sent from US facilities to Monterrey, Mexico, are part of this system. These transfers were generally baghouse dust from electric arc furnaces, sent from steel companies for recovery of zinc (see **Table 4-57**).

Table 4-67		Industries Reporting Transfers to Mexico from US TRI Facilities, 1997						
A		1997						
US SIC Code	Industry	Transfers to Recycling (kg)	Transfers to Energy Recovery (kg)	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers (kg)	% of Total
33	Primary Metals	24,603,062	0	22,618	0	200,377	24,826,057	96.6
28	Chemicals	617,256	0	0	0	0	617,256	2.4
	Multiple Codes 20-39	246,484	0	0	0	0	246,484	1.0
20	Food Products	3,093	0	0	0	0	3,093	0.0
	Total	25,469,895	0	22,618	0	200,377	25,692,890	100.0

Table 4-68		Chemicals in Transfers to Mexico from US TRI Facilities, 1997						
A		1997						
CAS Number	Chemical	Transfers to Recycling (kg)	Transfers to Energy Recovery (kg)	Transfers to Treatment (except metals) (kg)	Transfers to Disposal (except metals) (kg)	Transfers of Metals to Treatment/Disposal (kg)	Total Transfers (kg)	% of Total
—	Zinc (and its compounds)	20,469,087	0	0	0	0	20,469,087	79.7
—	Manganese (and its compounds)	1,985,061	0	0	0	183,385	2,168,446	8.4
—	Lead (and its compounds)	2,143,918	0	0	0	0	2,143,918	8.3
—	Antimony (and its compounds)	614,322	0	0	0	0	614,322	2.4
—	Chromium (and its compounds)	116,309	0	0	0	2,323	118,632	0.5
—	Copper (and its compounds)	72,308	0	0	0	10,390	82,698	0.3
—	Cadmium (and its compounds)	43,689	0	0	0	0	43,689	0.2
—	Aluminum (fume or dust)	3,765	0	22,618	0	0	26,383	0.1
—	Nickel (and its compounds)	19,385	0	0	0	4,279	23,664	0.1
—	Arsenic (and its compounds)	1,834	0	0	0	0	1,834	0.0
—	Barium compounds	150	0	0	0	0	150	0.0
—	Vanadium (fume or dust)	67	0	0	0	0	67	0.0
	Total	25,469,895	0	22,618	0	200,377	25,692,890	100.0
	% of Total	99.1	0.0	0.1	0.0	0.8	100.0	

Table 4-69		RCRA Hazardous Waste Sent from Mexican Maquiladoras to US, 1997				
A	1997					
RCRA Waste Code	Type of Waste	Cities with Maquiladoras Reporting Waste Sent to US				
		Tijuana (kg)	Mexicali (kg)	San Luis (kg)	Nogales (kg)	Agua Prieta (kg)
Wastestreams Possibly Containing Substances in Matched Chemical Database						
D Codes	Mixed	82,830	62,984	1,605	5,705	4,871
F Codes	Mixed	93,134	24,263	3,002	8,617	0
D and F Codes	Mixed	1,152,010	191,202	27,937	24,653	41,859
Other Mixed	Mixed	1,206	1,533	0	0	0
D004	Arsenic	685,161	0	0	0	0
D006	Cadmium	129,569	11,782	0	3,138	0
D007	Chromium	12,336	62,531	0	109	0
D008	Lead	2,278,405	737,343	10,866	14,122	136
D009	Mercury	4,898	0	0	499	0
D010	Selenium	0	190	0	0	0
D011	Silver	2,268	0	0	0	0
D019	Carbon tetrachloride	0	0	0	0	0
D035	Methyl ethyl ketone	2,603	1,324	10,558	0	0
D039	Tetrachloroethylene	0	118	0	0	0
D040	Trichloroethylene	1,252	0	0	0	0
D043	Vinyl chloride	1,043	0	0	0	0
F001	Spent halogenated solvents used in degreasing including tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride and chlorinated fluorocarbons	18,095	1,633	0	417	0
F002	Spent halogenated solvents, including tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane	52,925	4,463	0	2,086	0
F003	Spent non-halogenated solvents including xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexane, and methanol	81,352	4,780	2,558	9,415	5,533
F005	Spent non-halogenated solvents including toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane	290	0	2,476	22,912	0
F006	Wastewater treatment sludge from electroplating except from sulfuric acid anodizing of aluminum, tin plating on carbon steel, aluminum or zinc-aluminum plating on carbon steel, cleaning/stripping of carbon steel, chemical etching of aluminum	58,268	209	26,794	0	0
F008	Plating bath residues containing cyanides	0	0	0	0	0
F009	Spent stripping and cleaning bath solutions containing cyanides	0	0	0	0	0
F019	Wastewater treatment sludge from aluminum coating conversion	0	1,923	0	0	0
U226	1,1,1-Trichloroethane	281	0	0	0	0
Toxic Waste Subtotal		4,657,926	1,106,277	85,796	91,674	52,399
Chemicals on TRI List Not on NPRI List						
D005	Barium	3,574	3,066	0	0	0
Other Hazardous Wastestreams						
D001	Ignitable waste	415,039	58,095	32,064	30,113	0
D002	Corrosive waste	184,889	18,050	0	2,467	1,787
D003	Reactive waste	1,950	408	0	0	0
Other Hazardous Waste Subtotal		601,878	76,553	32,064	32,581	1,787
Total		5,263,377	1,185,896	117,859	124,254	54,186

Source: Haztracks US Manifest Database, October 1998 <www.epa.gov/earth1r6/6en/h/haztracks>.

RCRA Waste Code	Type of Waste	Cities with Maquiladoras Reporting Waste Sent to US					Total (kg)
		Juarez (kg)	Acuna (kg)	Nuevo Laredo (kg)	Reynosa (kg)	Matamoros (kg)	
Wastestreams Possibly Containing Substances in Matched Chemical Database							
D Codes	Mixed	342,377	0	3,084	83,256	46,676	633,388
F Codes	Mixed	186,757	0	7,156	5,515	2,277	330,721
D and F Codes	Mixed	414,767	662	2,422	2,766	38,957	1,897,235
Other Mixed	Mixed	227	0	0	0	0	2,966
D004	Arsenic	0	0	0	0	0	685,161
D006	Cadmium	22,222	0	0	13,279	0	179,991
D007	Chromium	15,664	0	0	0	0	90,640
D008	Lead	191,465	0	880	29,542	22,404	3,285,163
D009	Mercury	8,426	0	0	0	0	13,823
D010	Selenium	0	0	0	0	0	190
D011	Silver	0	0	0	0	0	2,268
D019	Carbon tetrachloride	0	0	0	39,129	0	39,129
D035	Methyl ethyl ketone	4,789	0	0	0	57,061	76,336
D039	Tetrachloroethylene	0	0	0	0	0	118
D040	Trichloroethylene	0	0	0	0	0	1,252
D043	Vinyl chloride	0	0	0	0	0	1,043
F001	Spent halogenated solvents used in degreasing including tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride and chlorinated fluorocarbons	317	0	0	1,324	1,270	23,057
F002	Spent halogenated solvents, including tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane	20,735	0	0	0	3,873	84,082
F003	Spent non-halogenated solvents including xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexane, and methanol	87,147	0	0	463	44,218	235,465
F005	Spent non-halogenated solvents including toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane	24,036	0	7,456	35,175	88,091	180,435
F006	Wastewater treatment sludge from electroplating except from sulfuric acid anodizing of aluminum, tin plating on carbon steel, aluminum or zinc-aluminum plating on carbon steel, cleaning/stripping of carbon steel, chemical etching of aluminum	17,034	0	0	0	0	102,304
F008	Plating bath residues containing cyanides	1,333	0	0	0	0	1,333
F009	Spent stripping and cleaning bath solutions containing cyanides	1,433	0	0	0	0	1,433
F019	Wastewater treatment sludge from aluminum coating conversion	0	0	0	0	0	1,923
U226	1,1,1-Trichloroethane	0	0	0	0	0	281
Toxic Waste Subtotal		1,338,731	662	20,998	210,449	304,826	7,869,737
Chemicals on TRI List Not on NPRI List							
D005	Barium	1,197	0	0	0	0	7,837
Other Hazardous Wastestreams							
D001	Ignitable waste	210,141	0	0	18,712	50,649	814,812
D002	Corrosive waste	322,767	0	0	0	17,406	547,365
D003	Reactive waste	1,052	0	0	0	200	3,610
Other Hazardous Waste Subtotal		533,959	0	0	18,712	68,254	1,365,788
Total		1,873,888	662	20,998	229,161	373,080	9,243,361

Table 4-70		Estimated North American PRTR Chemicals in RCRA Hazardous Waste Sent from Mexican Maquiladoras to US, 1997	
A	1997		
Type of Waste	RCRA Wastestreams* (kg)	Estimated Amount of TRI Chemicals in Wastestreams** (kg)	
Wastestreams Possibly Containing Substances in Matched Chemical Database	7,869,737	2,188,574	
Chemicals on TRI List Not on NPRI List	7,837	2,179	
Total Toxic Waste	7,877,574	2,190,753	
Other Hazardous Waste	1,365,788	379,826	
Total	9,243,361	2,570,579	

* Total volume of wastestream. **Source:** Haztraks US Manifest Database, October, 1998 <www.epa.gov/earth1r6/6en/h/haztraks>.

** Calculated as 28 percent of RCRA wastestream as found in *Toxics Watch 1995*, INFORM, New York, NY, Table 6-7, p.282.