

TAKING STOCK

North American Pollutant Releases and Transfers 1 9 9 7

Disclaimer

The National Pollutant Release Inventory (NPRI) and the Toxics Release Inventory (TRI) data sets are constantly evolving, as facilities revise previous submissions to correct reporting errors or make other changes. For this reason, both Canada and the United States “lock” their data sets on a specific date and use this “locked” data set for annual summary reports. Each year, both countries issue revised databases that cover all reporting years.

The CEC follows a similar process. For the purposes of this report, the TRI data set of April 1999 and the NPRI data set of December 1999 were used. The CEC is aware that changes have occurred to both data sets for the reporting year 1997 since this time that are not reflected in this report. These changes will be reflected in the next report, which will summarize the 1998 data and make year-to-year comparisons with previous years' data.

This publication was prepared by the Secretariat of the Commission for Environmental Cooperation (CEC). The views contained herein do not necessarily reflect the views of the CEC, or the governments of Canada, Mexico or the United States of America.

Reproduction of this document in whole or in part and in any form for educational or non-profit purposes may be made without special permission from the CEC Secretariat, provided acknowledgement of the source is made. The CEC would appreciate receiving a copy of any publication or material that uses this document as a source.

Published by the Communications and Public Outreach Department of the CEC Secretariat.

For more information about this or other publications from the CEC, contact:

COMMISSION FOR ENVIRONMENTAL COOPERATION

393, rue St-Jacques Ouest, bureau 200

Montréal (Québec) Canada H2Y 1N9

Tel: (514) 350-4300 • Fax: (514) 350-4314

h t t p : / / w w w . c e c . o r g

ISBN 2-922305-45-7

(French edition: ISBN 2-922305-46-5;

Spanish edition: ISBN 2-922305-47-3)

© Commission for Environmental Cooperation, 2000

Legal Deposit-Bibliothèque nationale du Québec, 2000

Legal Deposit-Bibliothèque nationale du Canada, 2000

Disponible en français – Disponible en español

Paper:	Fifty percent recycled, with 20 percent post-consumer content / no coatings, no elemental chlorine
Ink:	Vegetable ink containing no chlorine or heavy metals
Fountain Solution:	No isopropyl alcohol / less than one percent VOCs
Press Washes:	Low VOC press washes used
Design & Layout:	Station I Communications
Printed in Canada	

Chapter**TAKING STOCK**

	Preface	v
	List of Acronyms	vii
	List of Definitions	ix
1	Overview of North American PRTRs	1
2	User's Guide to North American PRTR Data	13
3	On-site Releases	35
4	Off-site Transfers	139
5	Releases and Transfers	259
6	Special Analyses	379
7	Primary Metals Industry	409
	Appendix A: A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC	463
	Appendix B: List of Facilities that Appear in Tables	481
	Appendix C: Human Health Effects and Uses of Chemicals on the "Top 25" Lists	511
	Appendix D: TRI Form R	521
	Appendix E: NPRI Reporting Form	527
	Appendix F: Certificate for the Operation of Industrial Facilities under Federal Jurisdiction (<i>Cédula de Operación Anual</i>)	539

Preface

Pollutant release and transfer registers (PRTRs) provide a valuable source of information on the generation and management of pollutants by tracking the amounts of specific chemicals that are released and transferred from industrial facilities into and through our communities each year. By having access to such information, governments, industry and citizens alike are better equipped to set priorities, engage in informed dialogue and undertake positive action to prevent or reduce the generation and release of pollutants of concern.

Relatively simple in concept, the power of PRTRs to stimulate pollution reductions and improved environmental management is being increasingly recognized in countries around the world. We in North America are fortunate to have access to information collected under the US Toxics Release Inventory (TRI) and the Canadian National Pollutant Release Inventory (NPRI), two of the world's most well-established PRTR systems. As information from the Mexican *Registro de Emisiones y Transferencia de Contaminantes* (RETC) becomes available, we will be in a position to track substances of common concern on a continental basis. While the PRTR data collected in North America and included in this report do not cover all sources of pollutants—activities such as agriculture and transportation, small and medium-size facilities, and services such as dry cleaners and gas stations are not included—the information nevertheless provides an important part of the picture and a sound basis for action.

This report, which is fourth in the Commission for Environmental Cooperation's annual *Taking Stock* series, contains some positive news: releases of the chemicals in the matched data set have decreased by nine percent over the period from 1995–1997. However, some less positive trends have also emerged. Transfers, i.e., the amounts of substances shipped off-site for waste management or disposal, have increased by 27 percent during the same period. This serves as an indication that we need to reinforce our collective and independent efforts to promote preventive approaches to reducing industrial pollution in North America. Another finding worth noting is that while a small number of top facilities continue to dominate PRTR reporting (50 facilities, less than 0.1 percent of all reporting facilities, were responsible for one-quarter of total releases and transfers in 1997), the large block of facilities that reported less than 100,000 kg are not part of the overall reduction trend. These facilities with “smaller” reported amounts showed significant increases in both releases and transfers from 1995 to 1997.

The CEC is grateful for the interest and involvement of stakeholders throughout North America in the continued evolution of the *Taking Stock* series. As a result of suggestions they have made, this latest report is organized somewhat differently, with separate chapters on releases, transfers, and releases and transfers, respectively. Other features new this year are the inclusion of information on pollution prevention activities undertaken by facilities and an in-depth look at the primary metals sector.

Officials from Environment Canada, INE and the US EPA have provided assistance and support vital to the development of this report. This past year we have worked with the following officials from these agencies: Canada—Steve McCauley and François Lavallée; Mexico—Luis Sánchez Cataño and Hilda Martínez Salgado; the United States—Susan Hazen, John Harman and Maria Doa.

On behalf of CEC, I would like to thank the consultants who worked tirelessly to put this report together: Catherine Miller, Sharon Martin, John Young, and John Howay of Hampshire Research Associates (United States); Sarah Rang and Nicola Crawhall of Environmental Economics International (Canada); and Raphael Ramos of Dames and Moore de Mexico (Mexico).

I would also like to thank Lisa Nichols and Erica Phipps, past and present program managers, for their efforts in overseeing the CEC PRTR Program. Special thanks also go to the CEC Publications staff—Jeffrey Stoub, Douglas Kirk, Raymonde Lanthier and Miguel López—for their efforts in bringing this volume to fruition.

Janine Ferretti
Executive Director

Acronym**Meaning**

ARET	Accelerated Reduction/Elimination of Toxics
BACT	Best available control technology
BAF/BCF	Bioaccumulation/bioconcentration factor
BATEA	Best available technology economically achievable
CAAA	US Clean Air Act Amendments
CAFE	US Corporate Average Fuel Economy
CAS	Chemical Abstract Service
CEC	Commission for Environmental Cooperation
CEPA	Canadian Environmental Protection Act
CMAP	<i>Clasificación Mexicana de Actividades y Productos</i> (Mexican Activities and Products Classification)
CMVA	Canadian Vehicle Manufacturers' Association
COA	<i>Cédula de Operación Anual</i> (Annual Certificate of Operation: replaced the former <i>Cédula de Operación para Establecimientos Industriales de Jurisdicción Federal</i>) also: Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (1994)
CWA	US Clean Water Act
DOF	Mexican <i>Diario Oficial de la Federación</i> (Official Gazette of the Federation)
DRI	Direct reduced iron
EDF	Environmental Defense Fund
EPA	US Environmental Protection Agency
EPCRA	US Emergency Planning and Community Right-to-Know Act
HPV	High production volume
IARC	International Agency for Research on Cancer
IFCS	Intergovernmental Forum on Chemical Safety
INE	<i>Instituto Nacional de Ecología</i> (Mexican National Institute of Ecology)
INEGI	<i>Instituto Nacional de Estadística Geografía e Informática</i> (Mexican National Institute of Statistics, Geography and Informatics)
kg	kilograms
LAER	Lowest achievable emission rate
LGEEPA	<i>Ley General del Equilibrio Ecológico y la Protección al Ambiente</i> (General Law of Ecological Equilibrium and Environmental Protection)
MACT	Maximum Achievable Control Technology

MISA	Ontario Municipal Industrial Strategy for Abatement
MSDS	Material Safety Data Sheet
MSTP	Canadian municipal sewage treatment plant
NAAQS	US National Ambient Air Quality Standards
NAFTA	North American Free Trade Agreement
NAICS	North American Industry Classification System
NESHAPS	US National Emission Standards for Hazardous Air Pollutants
NOM	<i>Norma Oficial Mexicana</i> (Mexican Official Standard)
NPRI	National Pollutant Release Inventory (PRTR for Canada)
NSR	New Source Review (under US Clean Air Act Amendments)
NTP	US National Toxicological Program
OECD	Organization for Economic Cooperation and Development
OSHA	US Occupational Safety and Health Administration
PAH	Polycyclic aromatic hydrocarbons
PBT	Persistent bioaccumulative toxicant
PCB	Polychlorinated biphenyls
PFC	Perfluorocarbon
POTWs	US publicly owned treatment works
PVC	Polyvinyl chloride
PRTR	Pollutant release and transfer register
RCRA	US Resource Conservation and Recovery Act
RETC	<i>Registro de Emisiones y Transferencia de Contaminantes</i> (PRTR for Mexico)
Semarnap	<i>Secretaría de Medio Ambiente, Recursos Naturales y Pesca</i> (Mexican Secretariat of the Environment, Natural Resources and Fisheries)
SCA	Statement of Commitment and Action (of Canadian Steel Producers' Association)
SIC	Standard Industrial Classification
SOP	Strategic Options Process
SSOP	Steel Strategic Options Process
TRI	Toxics Release Inventory (PRTR for US)
TCE	Trichloroethylene
TSMP	Toxic Substances Management Policy
VOC	Volatile organic compound

Carcinogens

The International Agency for Research on Cancer <<http://www.iarc.fr>> and the US National Toxicological Program <<http://ntp-server.niehs.nih.gov>> evaluate chemical substances for their cancer-causing potential. Forty-five chemicals in the matched data set have been designated as known or suspected carcinogens by one or both agencies.

Chemical category

A group of closely-related individual chemicals that are counted together for purposes of PRTR reporting thresholds and release and transfer calculations. The chemicals are reported to the PRTRs under a single name.

Destruction

A variety of processes that change the chemical in waste into another substance. Destruction also includes physical or mechanical processes that reduce the environmental impact of the waste. This is the term used in the NPRI report of 1993 data to summarize chemical, physical, biological treatment and incineration. (See “treatment” as the term used to cover these activities in the TRI summary reports.)

Energy recovery

The combustion or burning of a wastestream to produce heat.

Environmental management hierarchy

The types of waste management plus source reduction prioritized as to environmental desirability. In order of preference, the one most beneficial to the environment is source reduction (prevention of pollution at its source), followed by recycling, energy recovery, treatment, and disposal as the least desirable option.

Fugitive emissions

Air emissions that are not released through stacks, vents, ducts, pipes, or any other confined air stream. Examples are equipment leaks or evaporation from surface impoundments.

Incineration

A method of treating solid, liquid, or gaseous wastes by burning.

Nonproduction-related waste

Waste that is generated as a one-time event, including large accidental spills, waste from a remedial action to clean up the environmental contamination from past disposal practices, or other wastes not occurring as a routine part of production operations. This does not include spills that occur as a routine part of the production operations that could be reduced or eliminated by improved handling, loading or unloading procedures.

Off-site transfers

Chemicals in waste that are moved off the grounds of the facility, including transfers of waste sent to other facilities or other locations, such as hazardous waste treatment facilities, municipal sewage treatment plants or landfills.

On-site

Within the boundaries of the facility, including areas where wastes may be stored, treated or disposed of that are separate from the production processes but still within the boundaries of the reporting facility.

Otherwise used

Any use of a chemical that is not manufacturing or processing, such as the use as a chemical processing aid, a manufacturing aid or an ancillary use during the production process.

Point source

The origin of known or deliberate environmental releases from fixed points such as smokestacks and wastewater discharge pipes.

Pollution prevention

See Source reduction.

Processing use

The use of a chemical as part of a chemical or physical process, including as a reactant, in processing a mixture or formulation, or as an article component.

Production ratio/activity index

The ratio of the production level associated with the chemical in the current reporting year to the previous year’s level.

Production-related waste

A term used by the US EPA to denote chemical waste generated as a result of routine production that could potentially be reduced or eliminated by improved handling, more efficient processes, change of product or in product quality, or change in raw materials. This does not include spills resulting from large-scale accidents or waste from remedial actions to clean up contamination. As used by the US EPA, it includes chemicals released, sent off-site for disposal, recycling and energy recovery, and recycled or used for energy recovery on-site.

Recycling

Extraction of a chemical from a manufacturing process stream that would otherwise have been treated as waste, with the extracted chemical being reused in the original production process, in another production process, or sold as a separate product.

Releases

Chemicals in waste released on-site to air, water, underground injection, or land.

Source reduction

A strategy for reduction of pollution that involves preventing the generation of waste in the first place, rather than cleaning it up, treating it, or recycling it after it has been produced. In Chapter 6 of *Taking Stock*, “source reduction” refers to activities (see below) reported to both TRI and NPRI to indicate actions undertaken to reduce the generation of waste. NPRI facilities may also indicate on-site reuse, recycling or recovery as a category of action to prevent pollution; TRI source reduction reporting does not include this category. In Chapter 6 of *Taking Stock*, “pollution prevention” refers to all the reportable activities, including on-site reuse, recycling and recovery.

Source reduction activity

The types of activities undertaken to accomplish source reduction. The term includes equipment or technology modifications, process or procedure modifications, reformulations or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

Tonne

A metric tonne, which is 1,000 kilograms or 1,1023 short tons or 0.9842 long tons.

Transfers

Chemicals in waste that are sent from the reporting facility to a facility that treats or disposes of the chemical. Transfers also include chemicals sent off-site for recycling and energy recovery under the TRI definition of transfers, but reporting of such transfers is optional under NPRI.

Treatment

A variety of processes that change the chemical in waste into another substance. Treatment also includes physical or mechanical processes that reduce the environmental impact of the waste. This is the term used in TRI reports to summarize chemical, physical, biological treatment and incineration. (See “destruction” as the term used to cover these activities in NPRI.)

Waste

The amount of the chemical that does not become a product and is not consumed or transformed during the production process. PRTRs differ as to whether materials destined for recycling, reuse, or energy recovery are included or not in their definition of waste.

Chapter 1: Overview of North American PRTRs

	Guide to <i>Taking Stock 1997</i>	3
1.1	Introduction	3
1.2	What is a Pollutant Release and Transfer Register?	4
1.3	Overview of Existing PRTR Programs in North America	6
1.3.1	The US TRI	6
1.3.2	Canada's NPRI	8
1.3.3	The RETC in Mexico	9
1.4	PRTR Contacts for Further Information	10
Boxes		
	CEC Support for North American PRTRs	5
	Worldwide Support for PRTR Development	6
	Public Access to Canadian NPRI Data and Information	11
	Additional Information on Mexican RETC	11
	Public Access to US TRI Data and Information	11

■ Guide to *Taking Stock 1997*

- **Chapter 1** introduces pollutant release and transfer registers (PRTRs) and the North American PRTR initiative, and describes each of the North American PRTR programs, including recent and forthcoming developments. Program contacts and web sites for all three countries are provided.
- **Chapter 2** offers guidance on using the North American PRTR data, explains how the data from the Canadian NPRI and United States TRI are compiled for this report (no data from Mexican facilities for 1997 are available) and provides context for understanding the data and their limitations. This chapter itemizes characteristics of the three North American PRTRs, and it explains the releases and transfers that facilities report.
- **Chapters 3 through 5** present the matched data from the United States and Canada for 1997 and compare the matched data for 1995–1997:
 - **Chapter 3** presents data on on-site releases. These data cover facilities' releases of the substances of concern that are emitted to the air, discharged to surface waters, injected into underground wells, and disposed of on the land at the facility site.
 - **Chapter 4** presents data on off-site transfers. These data address the amounts of the substances of concern present in waste transferred off-site for treatment or disposal. Some transfers are disposed of directly in landfills at the off-site location (not at the facility site). Other transfers may be treated at the off-site location; what remains after treatment is released or disposed of. These data do not estimate how much of the substance is released after treatment away from the facility, but instead estimate how much of the substance the reporting facility sends off-site for waste management, whether for disposal or for treatment.
 - **Chapter 5** presents data on total releases and transfers. These data, therefore, show the amount of the substances of concern that are in wastes the reporting facility generated that are released at the facility site or must be otherwise managed off-site.
- **Chapter 6** provides several special analyses: a summary of data at the parent-company level, a look at facilities reporting the smallest amounts of releases and transfers, and a discussion of pollution prevention activities.
- **Chapter 7** supplies a more detailed analysis of reporting by the primary metals industry, which refines and manufactures iron and steel as well as nonferrous metals such as aluminum, copper and zinc.
- **Appendix A** lists the chemicals required to be reported under the three PRTRs. **Appendix B** identifies facilities that appear in tables in this report. **Appendix C** indicates potential health effects and uses of chemicals with large totals for releases, transfers, or both. **Appendices D through F** show the TRI, NPRI, and COA reporting forms for 1997.

1.1 Introduction

North Americans are concerned about the effect of chemicals on their health and the environment. PRTRs are designed to track the quantities of substances of concern that are released into the air, water or land, and are a cornerstone in the effort to identify and provide information to the public on the sources and handling of chemical pollutants. Data on releases and transfers of these substances are submitted by individual facilities. These data are then fed into a national, publicly available database, allowing that information to be made available to the public. Many companies, as well as governments and communities, have used PRTR information as a basis for action to prevent and reduce chemical releases and transfers.

This report is the fourth in the annual *Taking Stock* series prepared by the Commission for Environmental Cooperation (CEC). By compiling these reports, which are based on the data collected under the national PRTR programs, the CEC aims to:

- provide an overview of North American pollutant releases and transfers, thereby enabling citizens to better understand the sources and handling of industrial pollution;
- provide information to help national, state and provincial governments as well as industry and communities identify priorities for pollution reduction;
- invite reductions in North American pollutant releases and transfers through information comparison;
- enable a more informed dialogue among citizens, industry and government and foster collaborative actions towards a more healthy environment;
- provide analyses and contextual information to assist citizens in understanding North American PRTR data; and
- encourage enhanced comparability of North American PRTR systems.

The preparation of this *Taking Stock* report, as in previous years, has benefited from the valuable input and suggestions provided by a broad range of stakeholders through the annual consultative process.

This chapter gives an overview of PRTRs and describes recent and forthcoming developments in each of the North American systems. Contacts and web sources for additional information in Canada, Mexico and the United States conclude this chapter.

1.2 What is a Pollutant Release and Transfer Register?

Pollutant release and transfer registers generally provide detailed data on types, locations and amounts of substances of concern released on-site and transferred off-site by industrial and other facilities. The register provides data on the amounts of listed substances released by the facilities to all environmental media, including air, water and land. The facilities also report on transfers of these substances in waste sent to other sites for treatment or disposal. PRTRs are recognized as an important tool for fulfilling the public's "right-to-know." Governments compile annual reports based on the PRTR data that are made available to the public; the databases are also made publicly accessible.

PRTRs are an innovative tool that can be used for a variety of purposes. PRTRs track environmental substances of concern and, thereby, help industry, government and citizens identify ways to prevent pollution, reduce waste generation, decrease releases and transfers and assume responsibility for chemical use. For example, many corporations use the data to report on their environmental performance and to identify opportunities for reducing/preventing pollution. Governments can use PRTR data to shift program priorities. New government programs or enforcement measures can be tailored to accomplish specific goals, such as reducing certain substances or targeting releases in a particular region. Communities and citizens use PRTR data to gain an understanding of the sources and management of pollutants and as a basis for dialogue with facilities and governments.

While there are many different environmental reporting databases, characteristics that PRTRs share are:

- reporting on individual substances,
- reporting by individual facilities,
- covering all environmental media,
- periodic reporting,
- defined and structured reporting,
- using computerized data management,
- limiting trade secrecy,
- indicating what is being held as a trade secret, and
- resulting in information actively disseminated to the public.

PRTRs collect data on individual substances, rather than on the volume of wastestreams containing mixtures of substances, because this is the only meaningful way to compile and compare information about the various types of on-site releases and off-site transfers. These chemical-specific data may be supplemented with additional information that is relevant to only one environmental medium (e.g., biological oxygen demand for water, total particulates for air, and amount of spent solvent waste transferred for treatment).

Reporting by facility is key to locating where releases occur and who or what generated them. This allows interested persons and groups to identify local industrial sources for releases of substances of concern. It also supports regional and other geographically based analyses of the data. Facility-specific information may be supplemented with data about more diffused sources of such releases.

CEC Support for North American PRTRs

The Commission for Environmental Cooperation (CEC), mandated under the terms of the North American Agreement on Environmental Cooperation, facilitates cooperation and public participation in fostering the conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade and social links between Canada, the United States and Mexico. The CEC recognizes the importance of pollutant release and transfer registers—such as the Toxics Release Inventory (TRI) in the United States, the National Pollutant Release Inventory (NPRI) in Canada and the *Registro de Emisiones y Transferencia de Contaminantes* (RETC) in Mexico—for their potential to enhance the quality of the North American environment.

At the Second Annual Regular Session of the CEC in 1995, the Environment Ministers of the three North American countries (the Council) noted in the Communiqué:

This past year, the NAFTA partners began to examine their common need for an inventory of polluting emissions. We have decided to create a North American Pollutant Release Inventory which will bring together, for the first time, existing national public information about emissions and long-range transportation of pollutants. This vital tool for improving the quality of the environment will be the result of harmonized methods of reporting on pollutant emissions of mutual concern.

At the Third Annual Regular Session in August 1996 the Ministers noted in the Communiqué:

The Council announced that the intention to produce the first annual North American Pollutant Release Inventory (NAPRI) will be published...as part of an effort to provide the public with information on pollutant sources and risks. This inventory will bring together for the first time existing

national public information from the three countries about emissions. In the long run, the NAPRI will help improve the quality of the environment by providing the public with information to assess North American pollutant sources and risks. It also serves as a model for similar efforts in other parts of the world because North America represents the largest landmass ever to be subjected to compatible methods of reporting on pollutant emissions of mutual concern.

At the Fourth Annual Regular Session of the CEC in June 1997 the Ministers passed Council Resolution 97-04 “Promoting Comparability of Pollutant Release and Transfer Registers (PRTRs).”

This resolution commits the three governments to work toward adopting more comparable PRTRs, to collaborate on the development of an Internet site to present a matched subset of data from the three North American PRTRs, as well as to cooperate with the CEC in the preparation of the annual CEC North American PRTR report. While recognizing that a higher degree of comparability among the PRTRs is desirable, the resolution specifically notes that each national PRTR program has developed a unique process for the collection and manipulation of environmental data sets.

At the Sixth Annual Regular Session of the CEC in June 1999, the Ministers noted in their Communiqué:

The Council reaffirms its commitment to assure that the peoples of North America have access to accurate information about the release and transfer of toxic chemicals from specific facilities into and through their communities. The Council supports the continued development and improvement of the North American PRTR system, with a goal of mandatory reporting for all nations.

Concerns about pollutants may arise in connection with any environmental medium. In addition, releases to one environmental medium may be transported to others. Volatile chemicals in water releases, for example, may vaporize into the air. Therefore, the reporting of releases and transfers to all environmental media is important.

To determine the status and trends in releases and transfers, reports must be made periodically and cover the same period of time for all facilities reporting. Without an established report period (e.g., reports covering one year), data from one facility cannot be compared to another or with previous reports from the same facility.

The ability to compile, sort, rank, and otherwise analyze the data depends upon their structure. A clearly defined and highly structured database allows for a wide range of analyses.

Similarly, the ability to analyze quickly and easily a large number of reports on chemical releases and transfers depends upon the submissions being managed in a computer database. While the data may be collected on paper, the design and structure of the reports are standardized so that computer management and analysis can reduce costs and errors and provide standardized analyses over time.

Much of the power of a PRTR comes from public disclosure of its contents and limiting the scope of trade secret claims. Active dissemination to a wide range of users in both raw and summarized form is important. For a PRTR to be effective, impediments to public availability of facility-specific information must be limited. In addition, users of a PRTR must know what types of data are being held back from disclosure (for instance, if a facility substituted a generic name for a substance emitted to air, concealing its chemical identity).

1.3 Overview of Existing PRTR Programs in North America

The first of the North American databases to be established was the Toxics Release Inventory (TRI) in the United States, which began collecting information for the year 1987. Canada's facilities first reported their releases and transfers to the National Pollutant Release Inventory (NPRI) for the year 1993. Mexico, in 1996, completed a successful case study demonstrating its proposed inventory. National implementation of this inventory, the *Registro de Emisiones y Transferencia de Contaminantes* (RETC), started in 1998 with the collection of data for 1997.

The two inventories in Canada and the United States have many basic similarities since they stem from the same primary purpose—to provide publicly available

Worldwide Support for PRTR Development

PRTRs are gaining increasing interest and policy support worldwide. Following are some of the key developments at the international level:

Chapter 19 of Agenda 21, adopted by some 150 heads of state and government during the 1992 United Nations Conference on Environment and Development (the “Earth Summit”), calls for the establishment of pollutant emission registers and promotes the principle of right-to-know.

The OECD, through a 1996 Council Recommendation, has called on member countries to take steps to establish, implement and make publicly available a PRTR system. The Council Recommendation also promotes comparability among national PRTRs and sharing of PRTR data between neighboring countries.

Recognizing the growing interest in establishing national PRTRs, not only among industrialized nations but also among industrializing countries and countries with economies in transition, the Inter-governmental Forum on Chemical Safety (IFCS) will have special session on PRTRs during its Forum III meeting in Salvador, Brazil, in October 2000.

information on a facility's releases and transfers to air, water and land. However, each inventory also has its unique aspects, which result from its historical development and the special industrial characteristics of the country. The Mexican system has been initiated, but awaits further development. **Chapter 2**, which focuses on using and interpreting the information presented in *Taking Stock 1997*, examines the similarities and differences among the three national programs in greater depth. The forms that are filled out by facilities in each country are reproduced in Appendices to this report. **Appendix D** contains the US TRI form, **Appendix E** the Canadian NPRI form, and **Appendix F** the Mexican COA.

1.3.1 The US TRI

The 1997 reporting year is the eleventh year of the US TRI. TRI was created under the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, following a fatal chemical-release accident from a facility owned by a US company in Bhopal, India. The original TRI list contained over 300 chemicals and covered the manufacturing sector. Since then, the US TRI has undergone

significant changes. The goal of these changes is to ensure that the public has access to comprehensive information about releases, transfers and other waste management of toxic chemicals in their communities. The US EPA, therefore, has taken steps to improve the information available through the TRI.

Beginning with the 1987 reporting year, TRI required information on on-site releases and off-site transfers to treatment and disposal. Passage of the Pollution Prevention Act of 1990 broadened the information TRI collects to include off-site transfers to recycling and energy recovery as well as facilities' management of toxic chemicals in waste on-site, such as on-site treatment, recycling and energy recovery, as well as qualitative information on pollution prevention activities at the facility. The first year for the expanded information reporting was 1991. There have also been yearly changes to the TRI chemical list as industry and the public petitioned EPA to add or remove chemicals. The most significant change to the TRI chemical list came with the addition of 286 chemicals and chemical categories for the 1995 reporting year.

The 1997 reporting year saw relatively few changes in TRI. The most significant modification was the deletion of two chemicals from the TRI chemical list: 2-bromo-2-nitropropane (bronopol) and 2,6-dimethylphenol. Neither of these substances is on the NPRI list. The United States also began correcting for a common reporting error for metals and metal compounds. Facilities frequently reported transfers of these chemicals to POTWs (publicly operated treatment works, i.e., municipal sewage treatment plants) or to other treatment sites. Because metals are not destroyed by treatment processes, EPA has added two new transfer categories: 1) solidification/stabilization of metals and metal compounds and 2) wastewater treatment of metals and metal compounds. As with the case of transfers of metals to sewage, these are assigned to the category "transfers to disposal," described by EPA as off-site releases.

The list of industrial sectors also has expanded. Section 313 of EPCRA, the law that created TRI, identified the manufacturing sector as the original set of industries required to submit TRI reports. The first modification to this list was the 1994 addition of federal facilities. This change was followed by the addition of seven new industrial sectors, for which 1998 is the first reporting year. These new industries include metal mines, coal mines, electricity generating facilities, petroleum bulk storage terminals, chemical wholesale distributors, hazardous waste management facilities and solvent recovery facilities.

Present changes underway for TRI include a focus on chemicals that are persistent, bioaccumulative and toxic (PBTs). Vice President Gore, in his 1998 Earth Day speech, called on EPA to take steps to provide the public with better information on these PBT chemicals. In response, the EPA issued a rule on 29

October 1999 on PBTs. This rule takes three actions regarding certain PBT chemicals. The first is the addition of seven PBT chemicals and one chemical category to the TRI chemical list. The second is to lower the reporting threshold for these chemicals below the present levels. The third action is to lower the threshold for certain chemicals and chemical categories already on the TRI chemical list.

There are three distinct proposed new thresholds. For dioxin and dioxin-like compounds, the threshold would be 0.1 grams. For chemicals that persist in the environment with a half-life greater than six months and have a bioaccumulation/bioconcentration factor (BAF/BCF) of greater than 5000, the threshold would be 10 pounds (4.5 kg) per year. For chemicals that persist in the environment with a half-life between two and six months and that have a BAF/BCF between 1000 and 5000, the threshold would be 100 pounds (45 kg) per year. (A BCF of 5000, for example, indicates a concentration of the targeted substance in an organism, such as a fish, at 5000 times the level in the surrounding medium, i.e., water.) The rule can be found on the Internet at <www.epa.gov/opptintr/tri>. This rule becomes effective with the 2000 reporting year.

Also within the PBT issue, EPA has proposed changing the reporting threshold for lead and lead compounds to 10 pounds (4.5 kg). (See **Section 2.1.4** in **Chapter 2** for current reporting thresholds.) It would also add tetraethyl lead as a listed TRI chemical at the lower reporting thresholds. The proposed rule can be found on the Internet at <www.epa.gov/opptintr/tri>.

EPA is reviewing exemptions for "otherwise use" of TRI chemicals, including the motor vehicle exemption. These modifications will establish more limited interpretations of the exemptions that facilities can claim for "otherwise use." The goal is to ensure the public's access to information on the release, transfer, and other waste management options for toxic chemicals in greater than *de minimis* amounts.

Other future changes to TRI include the possible addition of airports. In 1997, EPA received a petition from environmental groups requesting the addition of airports on the basis that these facilities meet the reporting criteria under Section 313 of EPCRA. Further action on this petition will follow the review of "otherwise use" exemptions, which include a motor vehicle exemption. Under present guidance, the motor vehicle exemption would limit the amount of information TRI would collect on releases, transfers, and other waste management of TRI chemicals at airports. Action is expected before the 2002 reporting year.

TRI also will benefit from a related program on chemicals testing. In an effort to increase the public's access to information on chemicals, EPA is presently

working on a program in cooperation with industry and environmental groups to collect more complete toxicity information on high production volume (HPV) chemicals. These are substances that are produced or imported in excess of one million pounds (454 tonnes) per year.

The voluntary program uses six internationally recognized testing protocols that together provide a basic picture of the toxicity of a chemical. Of the nearly 3,000 HPV chemicals in the United States, 203 are TRI chemicals. While only seven percent of all HPV chemicals have the full complement of testing protocols, 55 percent of the TRI chemicals that are HPVs have the full set. A primary objective of this program is to make the toxicity information available to the public, especially through the Internet. Further information on the program can be found on the Internet at <www.epa.gov/chemrtk/volchall.htm>.

1.3.2 Canada's NPRI

The 1997 data are the fifth set reported to NPRI. The NPRI was established with the help of a multi-stakeholder advisory committee, which included representatives from industry, environmental and labor organizations, and provincial ministries as well as federal departments. The first reporting requirements were detailed in the 27 March 1993, *Canada Gazette* notice by the Minister of the Environment pursuant to subsection 16(1) of the Canadian Environmental Protection Act (CEPA). NPRI requires information on on-site releases and off-site transfers to treatment and disposal. Off-site transfers to recycling and energy recovery are voluntary. Ongoing stakeholder consultations have modified reporting requirements since the first reporting year 1993.

A major change was instituted with the 1995 reporting year, requiring the weight of a byproduct to be included in the calculation of the reporting threshold, regardless of the concentration of the substance in that byproduct. Previously, such byproducts with concentrations of listed substances of less than one percent were not included in the calculation of the reporting threshold. Many facilities noted that the byproduct reporting change resulted in larger amounts reported for 1995 and subsequent reporting years. Also, for the 1996 reporting year, the amount of the release to each receiving water body and the amount of the transfer to each receiving site is required. Previously, the total amount of on-site surface water discharges or off-site transfers to treatment or disposal was required, but the amounts were not broken down by receiving site.

Based on stakeholder consultations conducted in 1996, Environment Canada made three noteworthy changes to the 1997 reporting requirements: an increased number of categories for the voluntary reporting of transfers off-site for recycling;

mandatory qualitative reporting of pollution prevention activities; and voluntary reporting of a production ratio or activity index.

These changes introduced new reporting requirements for off-site transfers in waste for recycling, based on the OECD International Waste Identification Codes. The section on quantities transferred off-site to recycling was optional for the 1997 reporting year and becomes mandatory with the 1998 reporting year. Reporting guidelines for 1997 included definitions of recycling and supporting instructions on reporting requirements. Environment Canada now requires more specific information than was previously the case. Facilities must now report on the actual quantities of materials transferred off-site for recycling, the nature of recycling activities, and the name and address of the receiving facility.

Starting with the 1997 reporting year, Environment Canada is also now requiring mandatory reporting on pollution prevention activities. Facilities that have taken measures to prevent the generation of pollutants or wastes are asked to identify these measures. The issue of quantifying amounts of waste reduced through pollution prevention activities has been raised in stakeholder consultations. However, it was decided to postpone this requirement.

Also, beginning with the 1997 reporting year, facilities are asked to provide voluntarily a production ratio or activity index for each substance. Such an index can assist in explaining year-to-year fluctuations in releases and transfers.

No additional substances were added to the NPRI list in 1997. In 1998, Environment Canada established a multi-stakeholder working group to make recommendations on substances that should be added or removed from the NPRI list, on a permanent process for adding and deleting substances and on alternative reporting thresholds. Based on these recommendations, Environment Canada is adding 73 new substances to the 1999 NPRI list. Acetone was also deleted for the 1999 reporting year following a review of the scientific evidence by Environment Canada. This brings the total number of substances on which companies must report in 1999 to 246 substances of concern and 20 substances identified as toxic under the Canadian Environmental Protection Act.

Environment Canada has also reviewed the Working Group's recommendations on alternate reporting thresholds for substances that are persistent, bioaccumulative and toxic. For the 2000 reporting year:

- four additional substances were added at current thresholds;
- the threshold for mercury was lowered to five kg per year and the one-percent concentration requirement was removed;

- 17 polycyclic aromatic hydrocarbons were added, with a 50-kg release-based reporting trigger;
- identified sources are required to report on a group of dioxins and furans;
- identified sources are required to report on hexachlorobenzene;
- the 10-employee threshold was removed for a variety of incinerators and wood preserving facilities.

In 1999 the Canadian Environmental Protection Act (CEPA) was renewed. It includes provisions that enshrine mandatory NPRI reporting and the annual publication of a summary report. Reports on stakeholder recommendations and Environment Canada's response to these recommendations can be found on the Environment Canada web site at <www.ec.gc.ca/pdb/npri>.

1.3.3 The RETC in Mexico

Industrial facilities in Mexico under federal jurisdiction report their annual emissions and transfers of pollutants in the Annual Certificate of Operation (*Cédula de Operación Anual*—COA). The National Institute of Ecology (*Instituto Nacional de Ecología*—INE) is the federal environmental authority in charge of the collection, management and analysis of COA data. The first reporting cycle covered the reporting year 1997.

Facilities under federal jurisdiction include facilities in 11 industrial sectors: petroleum, chemical and petrochemical, paints and inks, metallurgy (includes the iron and steel industry), automobile manufacture, cellulose and paper, cement and limestone, asbestos, glass, electric power generation, and hazardous waste management. While there are no reporting thresholds based on amount of chemical use, federal jurisdiction covers only those facilities whose processes include thermal treatment or a foundry.

Under the current legislation, only Sections I and II of the COA, which deal with the facilities' general information and air emissions of criteria pollutants, respectively, are mandatory according to the Agreement published in the Federal Official Publication (*Diario Oficial de la Federación*—DOF) on 9 April 1998. The air pollution section (Section II) requires reporting on seven pollutants (sulfur oxides, nitrogen oxides, particulates, hydrocarbons from combustion, carbon monoxide, carbon dioxide and volatile organic compounds). These pollutants, commonly referred to as criteria air pollutants, generally arise from combustion. They are of concern in such environmental problems as urban air pollution, including visibility and health effects of smog, climate change and acidification.

Section III of the COA, "Water Usage and Wastewater Discharge," is optional. These data cover volumes of wastewater and concentrations of heavy metals rather than specific amounts of substances that are in the wastewater. Section IV, "Hazardous Waste Generation, Treatment and Transfer," is also optional, but when submitted, the facility is exempted from having to submit the corresponding hazardous waste manifests to the INE during the same period of the COA. The reports cover volumes of hazardous waste that contain hazardous substances, but do not detail the amounts of the substances contained in the waste.

Finally, Section V, "Pollutant Releases and Transfers," is optional until the list of substances to be reported is published as a Mexican Official Standard (*Norma Oficial Mexicana*—NOM). This is the section of the form that would be comparable to NPRI and TRI reporting and the basis of the RETC. It gives the individual substances and the amounts of those substances for the individual media, including on-site releases and off-site transfers to treatment and disposal.

The first COA reporting cycle, with data collected for the year 1997, took place in 1998. The first National Pollutant Releases and Transfers Report, describing the RETC process and objectives, was issued in December 1999. This report is a summary of the status of the implementation of environmental policy tools for pollution control and prevention currently available and of the issues facing Mexico in its path to continued development of environmental policy. The report summarizes the numbers of reports received under the new COA system and the continuing legislative and administrative issues underlying the objective of a consolidated system for pollution prevention and control regulation.

For the 1997 reporting year, a total of 1,893 documents were submitted. About 60 percent of the documents (1,129 submissions) were considered complete COAs (that is, Section I and II data submitted) with 20 percent submitted in old, expired formats and the other 20 percent lacking some of the required information. Only five percent of all the forms received provided data in Section V, the basis for the RETC. Even for those forms with Section V data filled in, though, it was found that in many cases the information provided was inaccurate. INE noted that these issues arose mainly because the COA was a new form, different from the previous reporting obligations; there was not enough training in how to fill it out; and a few of the questions were found to be confusing.

While the first National Pollutant Release and Transfers Report does not contain data reported on the COA, it does present a summary of monitoring data on criteria air pollutants, average daily wastewater discharge volumes (both municipal and non-municipal), hazardous waste generation volumes from industrial facilities, and estimates of greenhouse gases from fuel consumption, industrial processes,

agriculture and other sources. These summaries present data from various recent time periods as collected under different governmental programs, for the Mexican states and for industry categories.

The last day of April 1999 was the deadline for industrial facilities to submit the second COA, covering the year 1998. The COA form for this second reporting cycle underwent minor changes, as a result of review of the COA forms from the previous year. There is more detail requested in Sections I and II, which includes annual air emissions estimations for criteria pollutants, total hydrocarbons and carbon dioxide emissions; and Section III, which includes reporting of heavy metals in wastewater discharges. Other sections basically remained the same. The COA form is available for downloading from the Internet at <www.ine.gob.mx/dggia/retc/coa/formato.html>. (Also see **Appendix F**.)

To increase and improve the level of reporting, INE has issued guidance manuals for individual industrial sectors. The purpose of the manuals is to identify the facility's sources of pollution, identify chemicals used, processed or generated and to estimate the corresponding emissions. The manuals for 15 industrial sectors can be downloaded at <www.ine.gob.mx/dggia/retc/coa/guias.html>.

In addition, INE and the Mexican Secretariat of Environment, Natural Resources and Fisheries (*Secretaría de Medio Ambiente, Recursos Naturales y Pesca*—Semarnap), in collaboration with Mexican industrial groups, academic institutions and professional associations, are organizing and conducting training courses at the national level on how to fill in the COA. The training courses conducted during 1998 and 1999 can be found at <www.ine.gob.mx/dggia/retc/coa/cursoper.html>. An interactive computer program to assist in filling in data on the COA form is under development and is expected to be available for downloading at the INE Internet site.

To remove the existing legal barriers for the complete implementation of the RETC, several legal and regulatory avenues are being explored. The General Law of Ecological Equilibrium and Environmental Protection (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*—LGEEPA) outlines the need to develop and consolidate the regulatory procedures and instruments for prevention and control of environmental pollution into a simplified administrative framework. The LGEEPA expressly empowers Semarnap to create a consolidated environmental information system based in the related licenses or permits that have to be obtained. The 1995-2000 Environmental Program (*Programa del Medio Ambiente 1995-2000*) also includes the implementation of a consolidated system, as a management and documentation tool, that encompasses pollutant atmospheric releases, wastewater discharges, hazardous waste generation and management, and highly hazardous activities.

While there are no particular regulations for hazardous materials reporting, exploration of what authorities might exist to aid in this effort is ongoing. Semarnap is considering the issuance of a regulation to prevent and control pollution of air, water and land for industries under federal jurisdiction. Such a regulation would not have to be passed by the Congress in order to be effective and, as a consequence of a regulation expressly requiring it, a list of chemicals to be reported would be mandatory. Semarnap is also exploring, under the LGEEPA, the issuance of an administrative agreement (*Acuerdo Administrativo*) for RETC management. Again, this would not have to be passed by Congress in order to achieve the mandatory reporting of releases and transfers of listed chemicals.

1.4 PRTR Contacts for Further Information

PRTR data and summaries are available free of charge. Boxes on the next page give contact telephone numbers and Internet sites for obtaining PRTR information in the three countries.

Public Access to Canadian NPRI Data and Information

Information on NPRI, the annual report, and the databases can be obtained from Environment Canada's national office:

Headquarters Tel: (819) 953-1656 Fax: (819) 994-3266

Environment Canada on the Internet: <www.ec.gc.ca>

NPRI data on the Internet, in English: <www.ec.gc.ca/pdb/npri>

NPRI data on the Internet, in French: <www.ec.gc.ca/pdb/inrp>

e-Mail: npri@ec.gc.ca

Additional Information on Mexican RETC

Instituto Nacional de Ecología
Dirección de Gestión Ambiental
Av. Revolución 1425 – 9
Col. Tlacopac, San Angel
01040 Mexico, D.F.
Tel: (525) 624-3750
Fax: (525) 624-3584

Luis Sánchez Cataño: lsanchez@ine.gob.mx

INE's web site for the RETC on the Internet, in Spanish:
<www.ine.gob.mx/dggia/retc/index.html>

RETC Documents on the Internet, in English:
<www.ine.gob.mx/dggia/retc/ingles/ingles.html>

Semarnap on the Internet: <www.semarnap.gob.mx>

Public Access to US TRI Data and Information

The EPA's TRI User Support (TRI-US) (800-424-9346 within the United States or 202-260-1531) provides TRI technical support in the form of general information, reporting assistance, and data requests.

EPA on the Internet: <www.epa.gov>

TRI information and selected data on the Internet:
<www.epa.gov/opptintr/tri>

On-line Data Access

EPA's Envirofacts: <www.epa.gov/enviro/html/tris/tris_overview.html>

RTK-NET: <www.rtk.net> for Internet access
202-234-8570 for free on-line access to TRI data, or
202-234-8494 for information.

National Library of Medicine's Toxnet (Toxicology Data Network) computer system: toxnet@tox.nlm.nih.gov
<sis.nlm.nih.gov/sis1/> for Toxnet home page
<www.nlm.nih.gov/pubs/factsheets/trifs.html> for information, including information related to TRI

Environmental Defense Fund Scorecard home page:
<www.scorecard.org/>

Chapter 2: User's Guide to North American PRTR Data

M Matched chemicals/industries

A All chemicals and industries

2.1	Understanding PRTR Data	15	2.3	Putting PRTR Data to Work	27
2.1.1	Facilities/Companies	15	2.3.1	Public Dissemination	27
2.1.2	Industrial Classification System	15	2.3.2	Using PRTR Data Alone	27
2.1.3	Chemicals	20	2.3.3	PRTR Data as a Basis for Dialogue	28
2.1.4	Thresholds	20	2.3.4	Recognizing the Limitations	28
2.1.5	Reporting Forms	21	<hr/>		
2.1.6	Amounts Reported	21	2.4	Putting PRTR Data in Context	28
2.1.7	Confidentiality Claims/Trade Secrecy	21	2.4.1	Chemicals of Concern	29
2.1.8	Releases and Transfers	21	2.4.2	Chemical Uses and Industry Processes	29
<hr/>			2.4.3	Toxicity and Human Health Effects	29
2.2	Creating the <i>Taking Stock 1997</i> Matched Data Set	22	2.4.4	Geographic Information	31
2.2.1	Effects of Matching Releases and Transfers	23	2.4.5	Other Sources of Environmental Releases	31
2.2.2	Effects of Matching Chemicals and Industries	24			
2.2.3	Effects of Revisions for Previous Years	26			

M Matched chemicals/industries

A All chemicals and industries

Boxes		
	On-site Releases and Off-site Transfers	17
	Beyond PRTR Data: Risk and Exposure Assessment	30
	Estimating Non-PRTR Sources of Pollutants in North America	32
Figures		
2-1	On-site Releases and Off-site Transfers	16
2-2	Percentage of Total Releases and Transfers Included/Excluded When Matching NPRI and TRI for Chemicals and Industries, 1997	26

Tables		
2-1	Comparison of Mandatory Reporting in North American PRTRs	18
2-2	Overview of North American Data: All Releases and Transfers, NPRI and TRI, 1997	22
2-3	Creating the Matched Data Set for <i>Taking Stock 1997</i> : Effects of Matching NPRI and TRI for Chemicals and Industries, 1997	25
2-4	Changes in Data as Result of Revisions Since <i>Taking Stock 1996</i> , NPRI and TRI, 1996	27

The CEC wishes to assist citizens in understanding and using the existing data from North American PRTRs. PRTR data serve many purposes very well, but they may not serve a particular purpose perfectly. To apply PRTR data appropriately, users need to understand what the numbers represent, the limitations involved in their use, and how they can be compared with data from other PRTRs or other sources. *Taking Stock* attempts to increase the value of the national inventories by presenting an analysis of the types and amounts of releases and transfers of substances of concern across North America.

This chapter offers guidance on using the North American data, with specific references to the data for 1997 from Canada and the United States. *Taking Stock 1997* summarizes PRTR data from reports that industrial facilities filed for the 1997 reporting year, the latest data available at the time this report was written. These PRTR reports were due to be submitted by the facilities during the summer of 1998. The US EPA released the TRI data to the public in a report dated April 1999, and Environment Canada released the NPRI data in December 1999. PRTR data from Mexico are not available for 1997.

2.1 Understanding PRTR Data

Simply put, facilities report to PRTRs the amounts of listed chemical substances that they release directly to the environment on-site and that they transfer off-site to other locations for reuse/recycling/recovery, for treatment, or for disposal. (Figure 2-1.) However, for each PRTR, these basic rules differ in the details. Thus, to use data from different PRTRs effectively, it is important to understand how they differ and how they are the same. Table 2-1 summarizes the basic data elements and what each country requires.

2.1.1 Facilities/Companies

Each PRTR system covers specified types of business activities. Canada's NPRI covers all business activities, with very few exceptions. Canada exempts those involved with the distribution, storage or retail sale of fuels; agriculture, mining and oil and gas well drilling, if these facilities do not process or otherwise use the substances; research and training institutions; and transportation vehicle repair facilities. In the United States, manufacturers have been required to report to TRI since its inception, and federally owned facilities were added in 1994. Beginning with reporting for 1998, several additional industries associated with manufacturing will also have to report to TRI. Mexico requires any facility under federal jurisdiction to report. These include the following industrial sectors: petroleum, chemical and petrochemical, paints and inks, metallurgical, automotive, cellulose and paper, cement and limestone, asbestos, glass, electric power generation, and hazardous

waste management. Federal jurisdiction is further limited to those facilities with thermal treatment processes or a foundry.

Note that "companies" do not report to PRTRs. Instead, each individual facility submits reports. Although some companies may centralize reporting procedures for all their facilities, individual submissions must be made for each facility. Both NPRI and TRI ask facilities to identify their parent companies. Although this information can be used to analyze PRTR reporting at the corporate level, painstaking care is needed to identify all versions of a corporate name (for example: GM, General Motors, Delco Div. of General Motors, etc.)

2.1.2 Industrial Classification System

Facilities are classified according to the type of industrial operations they carry out. This allows both the determination that they are required to report as well as comparisons among industrial sectors. All three countries require that facilities report using a type of industrial classification system, but these systems differ among the countries. Both the United States and Canada use a "Standard Industrial Classification" system, such that industries are identified by their "SIC code." These systems, however, are not the same. The Mexican COA uses the Mexican Activities and Products Classification (*Clasificación Mexicana de Actividades y Productos*—CMAP code), which is different yet again.

Fortunately for comparison purposes, Canada supplies facilities with a table that correlates Canadian SIC codes to their US equivalents and requires each facility to report both the Canadian and the US SIC code that characterizes the majority of its operations. This is essential to comparing the NPRI and TRI data, because there is no direct correspondence between the two SIC code systems.

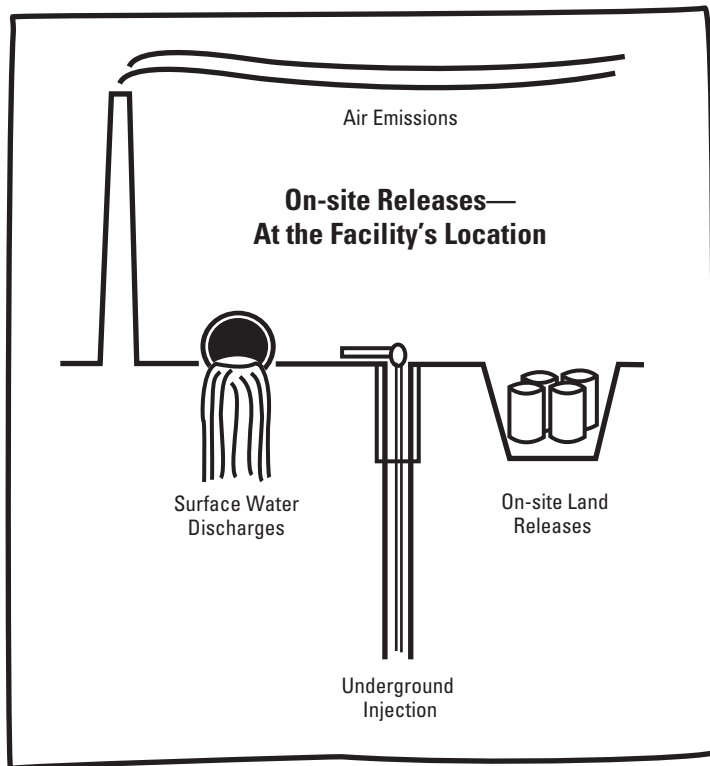
The United States, Canada and Mexico are working together to develop a common North American Industry Classification System (NAICS) that, if used, will allow more far-reaching comparisons in the future. In reporting year 1998, NPRI facilities will begin reporting their NAICS code, along with the Canadian and US SIC codes. TRI is expected to implement the NAICS sometime after the reporting year 2000. The Mexican RETC will use the NAICS code starting with the reporting year 2000. Information on NAICS is available from Statistics Canada on the Internet at <www.statcan.ca/english/Subjects/Standard/index.htm>. The US government has information on NAICS at: <www.ntis.gov/yellowbk/Inty205.htm>. For information on NAICS in Spanish, see the INEGI web site <www.inegi.gob.mx/economia/espanol/feconomia.html>. (The English site is <www.inegi.gob.mx/economia/ingles/feconomia.html>.)

[continued on page 20]

Figure 2-1

1997

On-site Releases and Off-site Transfers



Off-site Transfers— Sent to Locations away from the Facility



* On-site recycling and energy recovery reported to TRI only. Off-site recycling and energy recovery reporting voluntary in NPRI and mandatory in TRI.

On-site Releases and Off-site Transfers

(See also **Figure 2–1**, on previous page)

On-site Releases

On-site releases are the discharge of a pollutant to the environment at the site of the reporting facility. They include emissions to air, discharges to surface waters, releases to land and deep-well underground injection within the boundaries of the reporting facility.

On-site releases to air include emission from stacks, vents, ducts or pipes. Such emissions are often called point sources. Air emissions also occur as fugitive sources from equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Surface water discharges include direct discharges to streams, rivers, lakes, oceans and other bodies of water. These are releases from contained sources such as industrial process outflow pipes or open trenches. Discharges due to runoff from the facility's boundaries, including storm water runoff, are also included.

Underground injection is the injection of fluids into known geological formations, generally at great depths.

On-site releases to land include disposal of wastes in landfills in which wastes are buried, land treatment (also called application farming) whereby a waste is applied to or incorporated into soil for biological degradation, and disposal in surface impoundments which are uncovered holding areas used to evaporate or settle waste materials.

These on-site release and disposal methods are regulated by the local municipality, state/provincial or federal agencies in each country.

Off-site Transfers

Off-site transfers consist of shipments of a listed pollutant in waste to an off-site location. The waste is sent for treatment prior to final disposal (includes wastes sent to municipal sewage treatment plants) or for disposal at the off-site facility receiving the waste. Only the quantity of the listed chemical in the

waste is reported to the PRTR. The amount sent to each site along with the name and address of the receiving facility is reported.

Off-site transfers to treatment may be treated in a variety of ways. Treatment methods include physical treatments such as separation or encapsulation, chemical treatment such as stabilization or neutralization, biological treatment such as bio-oxidation, and incineration.

Transfers to municipal sewage treatment plants or publicly owned treatment works (POTWs) are wastewaters transferred through pipes or sewers to the facility owned by a municipality or other public body. The treatment or removal of the pollutant from the wastewater depends on the nature of the pollutant as well as the treatment methods present at the sewage treatment facility.

Transfers receiving off-site treatment do not necessarily constitute a release to the environment because the pollutant may be chemically or physically altered. The PRTR reports do not indicate how much, if any, of the pollutant is ultimately released.

Off-site transfers to disposal, however, include some of the same methods found on-site: disposal in landfills, land application farming, surface impoundments and underground injection.

Other transfers may go to facilities that recycle the substance for reuse or burn the substance as fuel (energy recovery). Such transfers are required to be reported to TRI; they are voluntary for NPRI until the reporting year 1998 when they also become mandatory.

Off-site transfers in waste are reported separately from on-site releases because their ultimate disposal will be in a different geographic location than that of the reporting facility and the waste becomes the responsibility of the receiving facility. They are reported to provide more complete information on the waste generated by the facility and the fate of the pollutant.

Table 2-1		Comparison of Mandatory Reporting in North American PRTRs		
M		1997		
Major Data Elements	US Toxics Release Inventory (TRI)	Canadian National Pollutant Release Inventory (NPRI)	Mexican Registro de Emisiones y Transferencia de Contaminantes (RETC)	
Identification				
Type of facilities reporting	Manufacturing and federal facilities. (Additional sectors, beginning with 1998 reporting year.)	Any facility manufacturing or using a listed chemical, except research, repair and retail sales. Agriculture, mining, well drilling also exempt, except if processing or otherwise using the substance.	Any facility under federal jurisdiction.	
Industry classification	All US SIC codes applicable to facility operations.	One primary SIC code per facility. Facility reports both Canadian and US SIC code.	One CMAP code per facility.	
List of chemicals	Chemicals manufactured or processed or used in manufacturing (601 substances, including 28 chemical categories).	Chemicals used or manufactured in sufficient quantities (176 substances, including 16 categories).	Six criteria air pollutants, for which a facility has a permit, are mandatory.	
Reporting Threshold				
Number of employees	10 or more.	10 or more.	No threshold.	
Activity/use of chemicals	Manufacture/process more than 25,000 pounds (11,338 kg) or use more than 10,000 pounds (4,535 kg).	Manufacture, process or use 10 tonnes (10,000 kg) or more.	No threshold. However, only substances for which a facility has a permit for air emissions must be reported.	
Concentration of chemicals in mixtures	Concentrations equal to or greater than 1 percent (0.1 percent for carcinogens) count toward activity/use threshold.	Concentrations equal to or greater than 1 percent plus total weight of byproducts count toward activity/use threshold.	No threshold.	
Type of Data Reported				
Units	Pounds reported; based on estimates.	Tonnes reported; based on estimates.	Facilities may report in their own units. RETC will convert to tonnes.	
Small-quantity reporting	Amounts for releases/transfers less than 1,000 pounds (454 kg) may be reported by range code; no amounts need be reported if total production-related waste does not exceed 500 pounds (227 kg) and manufacture, process or use does not exceed 1 million pounds (454 tonnes).	Total releases less than 1 tonne (1,000 kg) reported as total releases only. Releases to each medium less than 1 tonne (1,000 kg) reported by range code.	No different provisions for small-quantity reporting.	
Releases				
Air emissions	Fugitive and point source emissions reported separately; includes spills and leaks.	Fugitive, point source, storage/handling, spills, other reported separately.	Air emissions from production processes and from non-production-related processes reported separately by emission point. Amount from spills not included. Only air emissions permit substances reported.	
Surface water discharges	Amount to each water body reported (includes spills and leaks in amount). Percentage due to stormwater reported.	Amount of discharge, spills, and leaks to each water body. (Reporting of amounts separately for each water body began with 1996 reporting year.)	Not mandatory.	

Table 2-1 (cont.)

M 1997

Comparison of Mandatory Reporting in North American PRTRs (cont.)

Major Data Elements	US Toxics Release Inventory (TRI)	Canadian National Pollutant Release Inventory (NPRI)	Mexican Registro de Emisiones y Transferencia de Contaminantes (RETC)
Releases (cont.)			
On-site land releases	Amount to hazardous waste landfills, other on-site landfills, land treatment/application, surface impoundments reported separately. Spills and leaks included. (Reporting of categories for landfills – hazardous waste and all other – began with 1996 reporting year.)	Amount to landfills, land treatment/application, spills, leaks, other reported separately.	Not mandatory.
Underground injection	Amount to on-site Class I wells and all other wells. Amount from spills included. (Reporting amount to Class I wells separately from amount to all other wells began with 1996 reporting year.)	Amount to on-site wells. Amount from spills included.	Underground injection not practiced in Mexico.
Accidental spills	Included in release and transfer amounts. In different section of form, reported as one amount.	Reported separately under air, water and on-site land releases. Included in underground injection and transfer amounts.	Not mandatory.
Transfers			
Transfers to municipal sewage	Total amount reported. List name/address of each municipal sewage treatment plant.	Total amount reported to each sewage treatment plant. List name/address of each municipal sewage treatment plant. (Reporting of separate amounts to each sewage plant began with 1996 reporting year.)	Not mandatory.
Other off-site transfers	Amount reported by method of treatment/disposal; amount reported for each transfer location with name/address.	Amount reported by method of treatment/disposal; amount reported for each transfer location with name/address. (Reporting of separate amounts to each transfer location began with 1996 reporting year.)	Not mandatory.
Chemicals in Waste			
Management by treatment, disposal	Amount managed on-site and off-site by type of management.	Off-site transfers only.	Not mandatory.
Recycling/reuse/recovery	Amount managed on-site and off-site by type of waste management.	Not mandatory. (Mandatory reporting of off-site transfers only beginning with 1998 reporting year.)	Not mandatory.
Other Data Elements			
Type of on-site waste treatment	Type for each method used by type of wastestream (separate amounts not reported).	Not reported.	Not mandatory.
Projections	Two years following, amounts for on-site and off-site waste management.	Three years following, additional two years optional, for total releases and total transfers.	Not mandatory.
Pollution prevention/source reduction	Type of source reduction activities (21 categories).	Type of pollution prevention activity (8 categories).	Not mandatory.

2.1.3 Chemicals

Each PRTR system covers an itemized list of pollutant substances. These include both individual chemicals, such as toluene and 1,1,1-trichloroethane, and certain chemical groups, such as polycyclic aromatic compounds or zinc and zinc compounds. Typically, PRTRs focus on toxic chemicals, although definitions of “toxic” vary from country to country. PRTRs in place and in development around the world take various approaches to the list of substances for which they require reporting. Some, for example Mexico, include substances that affect air quality by contributing to smog formation although those substances are not necessarily deemed “toxic.”

Chemical substances often have more than one name (synonyms). Methyl bromide and bromo methane, for example, are names for the same substance (an ozone-depleting chemical whose production and use have been limited under the Montreal Protocol). PRTRs rely on the identification systems of various authorities to specify the exact chemicals that are to be reported. NPRI and TRI use Chemical Abstracts Service (CAS) Registry Numbers, which is a service of the American Chemical Society. The CAS number of bromo methane, for example, is 74-83-9. Tables in *Taking Stock* that present chemical-specific data include CAS numbers.

As of 9 June 1999, the Chemical Abstracts Service had listed more than 16 million chemical substances and identified more than 210,000 of them as regulated or covered by chemical inventories worldwide <www.cas.org/cgi-bin/regreport.pl>. Of this immense universe, NPRI covers over 170 chemical substances and TRI approximately 600. (Counts of the number of substances on a list vary, as some observers may count individual substances within a chemical category and others may not.) Seven pollutants are required to be reported on the Mexican COA (Section II). These are sulfur oxides, nitrogen oxides, particulates, hydrocarbons from combustion, carbon monoxide, carbon dioxide and volatile organic compounds. None of these are on the NPRI or TRI lists because the COA pollutants are categories of substances rather than individually listed ones and because NPRI and TRI collect data on substances from more diverse sources, including air emissions from sources other than combustion, and releases to water and soil. Therefore, data from the mandatory portion of the COA are not comparable to NPRI or TRI.

As explained below in **Section 2.2**, NPRI and TRI listed 165 substances in common in 1997. For a detailed comparison of the chemical lists in the three countries, see **Appendix A**.

2.1.4 Thresholds

One other central criterion determines who must report what data to a PRTR: a reporting threshold. PRTRs set parameters for minimum amounts of a reportable substance involved in certain activities—a facility’s first responsibility under a PRTR is to determine whether it meets this reporting threshold. Typically, the reporting threshold involves manufacturing a listed substance, using a listed substance in a process (for example, as a reagent or catalyst), or otherwise using a listed substance (for example, in cleaning industrial equipment). For NPRI, if 10 tonnes (22,050 lbs) or more of the substance is manufactured, processed or “otherwise used,” then releases and transfers must be reported. For TRI, the thresholds are more than 25,000 lbs (11.34 tonnes) if a substance is manufactured or processed and 10,000 lbs (4.54 tonnes) if it is “otherwise used.”

For the 1995 and subsequent reporting years, Canada requires, as does the United States, that the total weight of the byproduct, regardless of concentration, be included in the calculation of the reporting threshold, eliminating one difference between the two systems. For this reason, the base year used in this report for analysis of changes over time is 1995.

The other major difference in threshold requirements between TRI and NPRI is the amount of the substance in a mixture. Both countries require reporting if this amount equals or exceeds one percent by weight. However, the United States has an additional lower threshold for carcinogenic chemicals: chemicals identified as carcinogens by the Occupational Safety and Health Administration (OSHA) standard must be reported at levels of 0.1 percent.

The net effect of these differences in threshold is that, in general, US facilities will meet the threshold at slightly lower levels of chemical activity/use than Canadian ones. The Mexican RETC does not have reporting thresholds by amount of substance or number of employees. However, only facilities under federal jurisdiction, which is limited to those facilities with thermal treatment processes or a foundry, must report, and smaller facilities are not expected to fall under this classification.

The United States also has set an alternative threshold calculation for facilities with relatively small reportable amounts of a listed chemical: if a facility does not manufacture, process, or otherwise use more than 1 million pounds (454 tonnes) of the chemical, and if the facility’s “total reportable amount”—all on-site and off-site recycling, energy recovery, and treatment, plus production-related on-site releases and off-site transfers for disposal—is less than 500 pounds (227 kg). These facilities file short certification statements that identify the chemical but do not supply any quantitative information.

2.1.5 Reporting Forms

Facilities submit one reporting form for each listed substance for which they must report. A facility reporting on 10 chemicals files 10 forms (electronically in Canada and electronically or on hard copy in the United States). Thus, the individual, chemical-specific forms are the critical source of data for reports such as NPRI's annual Summary Report, TRI's annual Public Data Release, and the annual *Taking Stock* reports.

This point is important for understanding certain analyses of PRTR data, especially analyses of US data by industry sector. Using up to six SIC codes, TRI facilities identify the business activities or industry sectors associated with manufacture or use of each chemical on which they report. A facility may use the same SIC codes on all its TRI forms or it may use different SIC codes to describe its industrial activities for various chemicals. For example, a petrochemical facility may indicate petroleum refining as the industrial activity associated with one chemical, while it reports chemical manufacturing for another. One chemical form will be analyzed with other forms in petroleum refining and the second in chemical manufacturing. However, the facility itself—with the sum of all its reports—cannot be accounted as either a petroleum refinery or a chemical manufacturing plant for purposes of industry-based analyses of TRI data. In the analyses in *Taking Stock*, such facilities appear in the industry category called “multiple SIC codes.”

2.1.6 Amounts Reported

Amounts reported to NPRI and TRI are estimates. These estimates may reflect monitoring, engineering calculations, emission factors (which identify the amounts of a chemical that can be expected to result from particular industrial processes or from use of specific equipment), or other estimation techniques. Although the numbers represent estimates, NPRI and TRI require facilities to report releases and transfers to the tonne or pound, respectively. (For production-related waste management, in a separate section of the TRI form, facilities may report quantities rounded to two significant digits—for example, 2,100,000 pounds rather than 2,145,678 pounds.)

For releases of a substance that total less than one tonne, NPRI allows facilities to report just the total amount released and not the amounts in individual release categories by environmental medium. Therefore, in summary tables in this report, total releases will be more than the sum of the separate release categories. In contrast, the amounts of the individual releases for each medium are reported in TRI. Both NPRI and TRI require reporting of the amounts of individual types of transfers.

2.1.7 Confidentiality Claims/Trade Secrecy

The purpose of the Canadian and US databases is to provide the public with data about chemicals in the environment, so in general, both databases limit the type of information that facilities can claim as secret and withhold from public disclosure. In the United States, the only claim of trade secrecy that can be made is for the identity of the chemical. All data on release and transfer amounts are part of the database. Claiming trade secrecy is not widespread: only 11 TRI forms out of 71,670 submitted for 1997 contained such claims. The trade secrecy claims constitute 14,000 pounds (6,350 kg) of releases and 3,605 pounds (1,635 kg) of transfers. In Canada, all information in a report, including the identity of the facility, may be held confidential if it conforms to the criteria under the Federal Access to Information Act. According to the NPRI summary report, six facilities and 30 forms out of the national total of 7,375 forms were given confidential status for the 1997 NPRI reporting year. This represented 61 tonnes of releases and 3,352 tonnes of off-site transfers. Mexico is currently discussing criteria for trade secrecy.

2.1.8 Releases and Transfers

PRTRs collect data on two basic types of releases and transfers: those resulting from normal business activities—these represent the greatest potential for pollution prevention efforts—and those arising from accidents, from clean-up activities to remedy earlier releases, or from other one-time events. This section gives general descriptions of the types of releases and transfers. (See also **Figure 2-1**, on page 16). Both the NPRI and TRI databases contain much greater detail than is presented in these descriptions or in summary tables throughout *Taking Stock*.

Reporting instructions for NPRI and TRI give detailed information on the releases and transfers that facilities must report, and both systems supply guidance to specific industries in published manuals and/or training sessions. Reporting instructions are available on the NPRI and TRI web sites, respectively, at www.ec.gc.ca/pdb/npri/1998/index.html for 1998 NPRI instructions and www.epa.gov/opptintr/tri/report.htm for 1998 TRI instructions.

On-site Releases

Releases represent the entry of a chemical substance into the environment. Facilities report amounts of the listed chemicals they have released to the environment at their own location (“on-site”). Amounts are reported separately for each environmental medium:

- **Air emissions**—Releases to air that occur through identified outlets such as stacks (“smokestacks”) or vents are labeled “stack” or “point” emissions. Air releases that occur because of leaks are labeled “fugitive” or “non-point”

emissions. Generally, facilities apply pollution-control devices or technologies to limit stack emissions of listed chemicals. Some facilities have found PRTR reporting beneficial in helping to identify unexpected emissions sources, such as leaking ducts or pipes, which can then be corrected.

- **Surface water discharges**—Releases to surface water bodies such as rivers and lakes generally occur through discharge pipes. (Wastewater is generally treated first, to remove or minimize its pollutant content.) Rainwater may also wash pollutants from on-site waste storage areas into surface waters. These releases from run-off are also reportable, and surface water discharges reported to PRTRs usually rise in years with above-average rainfall, especially from storms.
- **Underground injection**—Facilities may inject listed chemicals in waste into deep underground wells, a practice more common in certain parts of the United States than in Canada. Underground injection is regulated, and deep wells that receive toxic waste are intended to isolate the pollutants from groundwater sources. Underground injection is not practiced in Mexico.
- **On-site land releases**—Releases to land at the facility include burying chemical waste in landfills, incorporating it into soil (“land treatment”), holding it in surface impoundments, accumulating it in waste piles or disposing of it by other methods.

Off-site Transfers

Facilities report amounts of the listed chemicals they have sent to other locations to be handled by various waste management practices. In PRTRs, the amount of the chemical in the waste is reported and not the total volume of the waste. Both NPRI and TRI have collected data on off-site transfers for treatment and for disposal since the respective inventories began (1993 for NPRI and 1987 for TRI). In 1991, TRI began requiring facilities to report transfers for recycling and energy recovery. Reporting of these transfer types has been optional in NPRI, but will become mandatory with reports for 1998, as discussed in **Chapter 1**.

- **Treatment**—Methods of treatment applied to chemical waste include physical, chemical, or biological treatment. Neutralization and incineration are examples. Treatment is intended to alter or destroy the chemical. Treatment processes must be appropriate for the particular substance—a chemical that will not burn, for example, cannot be successfully incinerated. Treatment processes are seldom 100 percent effective, and some release to the environment is likely.
- **Sewage Treatment**—Facilities may send their chemical waste to sewage treatment facilities—municipal sewage treatment plants (MSTPs) in Canada

or publicly owned treatment works (POTWs) in the United States. Again, effectiveness depends on both the substance and the sewage plant’s processes. Volatile chemicals are likely to evaporate (releases to air). Typically, secondary treatment processes apply microorganisms (with aeration or oxygenation) to biodegrade organic compounds.

- **Disposal**—Waste sent off-site for disposal may be disposed of on land or by underground injection. As with on-site land releases and underground injection, these methods represent direct releases to the environment, although they occur at locations away from the originating facility.
- **Transfers of Metals**—Metals sent to treatment or to sewage treatment may be captured and removed from waste and disposed of in landfills or by other disposal methods, but they are not destroyed by treatment processes. In the *Taking Stock* analyses, therefore, all transfers of metals are presented in a single separate category.

It should be noted that PRTRs do not measure all environmental releases occurring as a result of off-site transfers. Transfers sent for disposal and transfers of metals to treatment/sewage/disposal indicate releases at the receiving site, but transfers of other substances may also result in such releases.

2.2 Creating the *Taking Stock 1997* Matched Data Set

To compare data from PRTRs with different reporting requirements, *Taking Stock* relies on selecting the elements they have in common. The data are from Canada and the United States; the Mexican system is being implemented and data comparable to the PRTR data for the US and Canada are not available for 1997. The important principle is that the data compiled here represent the substances and the industries covered by both Canada’s NPRI and the US TRI. This matching process eliminates from the matched data set all facility submissions in both countries for chemicals whose releases and transfers are reported under one system but not the other. It also eliminates reporting forms submitted by facilities in any industry that is covered by one PRTR but not the other. Thus, the North American database used in this report consists of a matched data set of common industries and chemicals in the two PRTRs.

The matched data set for 1997 includes data on 165 substances reported from facilities in the manufacturing sector. In practice, the matched data set limits the analysis to this sector because non-manufacturing facilities were not required to report to TRI.

In creating the matched data set, specific differences between the two systems must be taken into account. One such issue is that while certain chemicals may be reportable in both systems, they may be defined differently. For sulfuric acid and hydrochloric acid, for example, the TRI definition has changed so that only aerosol forms are reportable; these are released only to air. All forms of these acids are still reportable to NPRI. For comparing TRI and NPRI data then, the matched data set includes only air emissions of these two chemicals.

In addition, while ammonia and isopropyl alcohol appear on both lists, they are not included in the matched data set because the definition for these substances differs. Total ammonia is reportable to NPRI, while only 10 percent of aqueous forms of ammonia along with all anhydrous forms are reportable to TRI. Only forms of isopropyl alcohol manufactured by the strong acid process are reportable to TRI, while all forms are reportable to NPRI. The matched data set also excludes any substance on one list but not the other.

TRI facilities report separately for certain chemicals and their compounds, while in NPRI, a chemical and its compounds count as one category. For example, TRI lists both lead and lead compounds, counting them as two separate substances, while NPRI lists the single category, lead and its compounds. All the analyses in *Taking Stock 1997* add the TRI amount reported for the given chemical to the amount reported for its compounds, to correspond with NPRI practice.

Environment Canada considers 1995 as a base year for NPRI, while EPA considers 1988 as a base year for TRI. Although each inventory started in an earlier year, unfamiliarity with reporting and data quality concerns led them to use these years as a more reliable baseline to measure subsequent progress and trends. Beginning with the 1997 data, TRI also adopted 1995 as an additional baseline for tracking progress because more than 250 additional substances were added to the TRI list for reporting that year. Therefore, **Chapters 3, 4 and 5**, which compare PRTR data across the years, examine 1995–1997 data. The chemicals and industries matched for 1995–1997 are the same as those used for 1997 only.

The following sections present summary data to demonstrate the method used to select comparable data sets. Throughout *Taking Stock 1997*, letters (M = matched chemicals/industries or A = all chemicals/industries) on the left sides of the tables and figures indicate which data set is in use. Only tables and figures based on the same data set can be meaningfully compared with one another.

A	1997	Canadian NPRI Number	US TRI Number
		Canadian NPRI Number	US TRI Number
		1,973	21,490
		7,375	71,670
		Releases	kg
		kg	kg
		109,576,994	603,929,200
		15,070,781	99,034,903
		18,224,597	99,552,788
		18,792,841	157,326,308
		Total Releases	959,843,200
		161,875,744	959,843,200
		Transfers	
		19,330,533	113,107,404
		9,916,973	121,026,218
		12,785,886	26,861,725
		54,307,787	186,467,756
		Total Transfers	447,463,104
		96,341,179	447,463,104
		Total Releases and Transfers	1,407,306,303
		258,216,923	1,407,306,303
		112,563,826	1,080,026,543
		12,185,174	230,378,937

* Optional reporting for NPRI, required for TRI.

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

2.2.1 Effects of Matching Releases and Transfers

In 1997, Canadian facilities in all industries reported 258.2 million kg of releases and transfers to NPRI. In the United States, manufacturing facilities and federal facilities—the only sectors covered by TRI—reported 1.41 billion kg of releases and transfers. While most analyses in *Taking Stock 1997* use the matched data set, a few address the complete NPRI and TRI data as summarized in **Table 2-2**.

Matched releases and transfers in *Taking Stock 1997* exclude transfers to recycling and energy recovery. NPRI facilities voluntarily reported transfers of 112.6 million kg to recycling/reuse and 12.2 million kg to energy recovery in 1997. TRI facilities, for which these reporting categories are mandatory, transferred 1.08 billion kg to recycling and 230.4 million kg to energy recovery. Totals presented by Environment Canada and the US EPA in their 1997 summary reports include these amounts.

2.2.2 Effects of Matching Chemicals and Industries

In 1997, Canadian manufacturing facilities reported 45.0 million kg of releases and transfers for substances reportable to NPRI but not covered in TRI—or reportable in both systems but defined differently. These reports were eliminated from the matched data set (“excluded due to chemical only”). Canadian facilities in non-manufacturing industries reported 60.2 million kg of releases and transfers for substances covered in both PRTRs. Because these industries did not have to report in TRI, the NPRI reports for these facilities were also removed in compiling the matched data set (“excluded due to industry only”). In addition, some reports in the NPRI database fell into both categories (“excluded due to both chemical and industry”), and their 23.1 million kg of total releases and transfers were also excluded (**Table 2–3**).

In TRI, matching for common chemicals eliminated 238.1 million kg of releases and transfers. Matching for industries excluded a much smaller amount—6.2 million kg—because nearly all of TRI’s industrial base is covered in NPRI. A total of

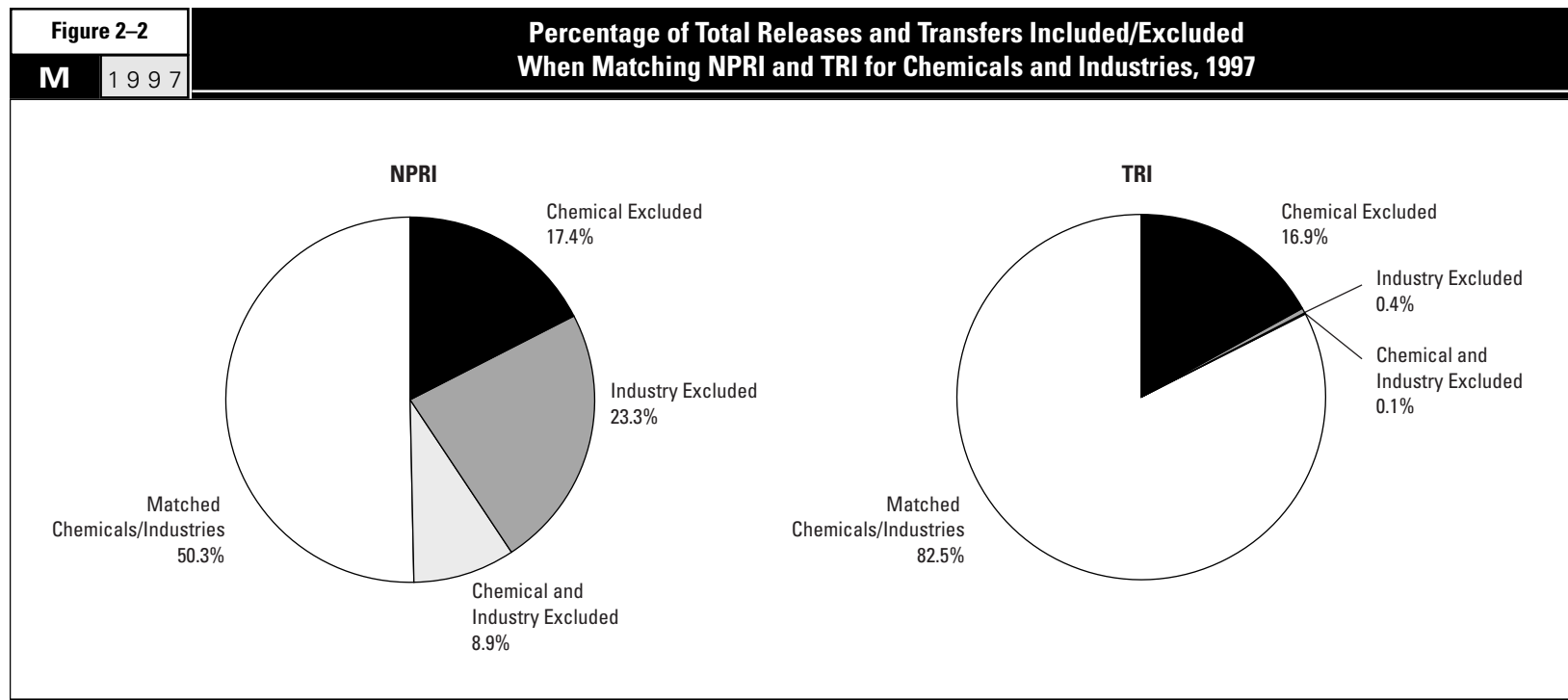
1.6 million kg was excluded because both the chemical and the industry were not comparable to NPRI.

The 1997 matched data set thus included 50 percent of the matched releases and transfers in the NPRI database and 83 percent of those in the TRI database. The largest factor in this matching process was the difference in reporting definitions of ammonia, described above. Excluding ammonia eliminated 17 percent of NPRI’s releases and 9 percent of those in TRI from the matched data set.

Chemical exclusions alone eliminated 17 percent of total releases and transfers in both systems. Another 23 percent of NPRI releases and transfers were excluded by industry differences between the two PRTRs and a further 9 percent by both chemical and industry differences (**Figure 2–2**).

The great majority of analyses presented in *Taking Stock 1997* examine this matched data set.

Table 2-3		Creating the Matched Data Set for <i>Taking Stock 1997</i> : Effects of Matching NPRI and TRI for Chemicals and Industries, 1997							
*	1997	NPRI				TRI			
		Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
A	Total in Individual Database	7,375	161,875,744	96,341,179	258,216,923	71,670	959,843,200	447,463,104	1,407,306,304
	Excluded due to chemical only	1,042	34,720,232	10,261,966	44,982,198	12,604	186,763,148	51,365,075	238,128,223
	Hydrochloric and sulfuric acid: non-air releases	386	178,265	7,434,993	7,613,258	495	326,307	4,142,267	4,468,574
	Isopropyl alcohol	186	2,147,101	911,446	3,058,547	72	416,459	47,398	463,857
	Ammonia	228	27,941,409	1,078,847	29,020,256	2,708	89,265,716	9,068,098	98,333,814
	Other chemicals	242	4,453,457	836,680	5,290,137	9,329	96,754,666	38,107,312	134,861,978
	Excluded due to industry only	1,516	24,971,373	35,212,319	60,183,692	647	4,310,097	1,924,557	6,234,654
	Excluded due to both chemical and industry	218	21,735,215	1,358,633	23,093,848	167	1,467,102	132,532	1,599,634
M	Total for Matched Chemicals/Industries	4,599	80,448,924	49,508,261	129,957,185	58,252	767,302,852	394,040,940	1,161,343,792
		%	%	%	%	%	%	%	%
	Total in Individual Database	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Excluded due to chemical only	14.1	21.4	10.7	17.4	17.6	19.5	11.5	16.9
	Hydrochloric and sulfuric acid: non-air releases	5.2	0.1	7.7	2.9	0.7	0.0	0.9	0.3
	Isopropyl alcohol	2.5	1.3	0.9	1.2	0.1	0.0	0.0	0.0
	Ammonia	3.1	17.3	1.1	11.2	3.8	9.3	2.0	7.0
	Other chemicals	3.3	2.8	0.9	2.0	13.0	10.1	8.5	9.6
	Excluded due to industry only	20.6	15.4	36.5	23.3	0.9	0.4	0.4	0.4
	Excluded due to both chemical and industry	3.0	13.4	1.4	8.9	0.2	0.2	0.0	0.1
	Total for Matched Chemicals/Industries	62.4	49.7	51.4	50.3	81.3	79.9	88.1	82.5



2.2.3 Effects of Revisions for Previous Years

Facilities that report to PRTRs are free to revise their previous years' submissions at any time. They may correct previous errors, or they may re-calculate earlier years' data using a different estimation method. Some facilities that adopt new methods of estimating reportable amounts find that their results for the current year give a very different picture of releases and transfers from previous years. They may appear to have made large increases or decreases in reportable amounts, when in fact only the estimation methods have changed. These facilities may choose to revise earlier submissions so that their totals over time reflect consistent assumptions and approaches.

Each year, some facilities miss the reporting deadline or certain quality-control issues affecting their submissions are unresolved at the time the database is used for preparation of the annual PRTR report. Facilities may also withdraw earlier submissions if they determine that they were not, in fact, required to report. A facility may have misinterpreted the threshold calculations, for example, or it may have misunderstood that only particular forms of a listed substance had to be

reported. A facility that changes its estimation methods may also find that the revised calculations for a previous year leave it below the reporting threshold.

As a result, database totals for a given year change when revised reports, late reports, and withdrawals are received. *Taking Stock 1996* reported a total of 1.55 billion kg in North American releases and transfers, reflecting the complete NPRI and TRI databases for that year. (As noted above in **Section 2.2.1**, this excludes voluntary reporting in NPRI and mandatory reporting in TRI of transfers to recycling/reuse and energy recovery.) Revisions received since the close of the 1996 reporting period raised the total to 1.56 billion kg. This amounted to a difference of one-half of one percent (0.5 percent). Both Canadian and US revisions increased the totals for releases and decreased them for transfers. (**Table 2-4**.)

Data for the previous years, 1995 and 1996, are presented in this report, *Taking Stock 1997*, for comparison purposes. Some of the data in previous editions of *Taking Stock* may have been revised so that readers should use the current report or the current databases. Similarly, both Canada and the United States update previous years' data when releasing the next year's data.

Table 2-4		Changes in Data as Result of Revisions Since <i>Taking Stock 1996</i> , NPRI and TRI, 1996			
A	*	1996 Data, Reported in <i>Taking Stock 1996</i> *		with Revisions Submitted Since <i>Taking Stock 1996</i> **	
		Canadian NPRI Number	US TRI Number	Canadian NPRI Number	US TRI Number
Total Facilities		1,856	21,626	1,867	22,047
Total Forms		6,754	71,381	6,771	72,643
Releases	kg		kg	kg	kg
Total Air Emissions		98,115,143	658,544,200	98,777,609	661,580,673
Surface Water Discharges		13,013,766	78,588,757	12,955,490	81,283,355
Underground Injection		17,820,743	92,666,263	17,820,743	92,624,631
On-site Land Releases		13,868,575	140,164,719	13,879,775	150,622,890
Total Releases		143,025,595	969,963,939	143,640,954	986,111,549
Transfers					
Treatment, Destruction		20,676,683	131,563,187	20,722,032	102,712,978
Sewage/To POTWs		7,548,491	106,944,902	7,607,352	107,981,229
Disposal, Containment		34,137,359	135,166,656	33,955,734	157,859,735
Total Transfers		62,362,520	373,674,745	62,285,118	368,553,942
Total Releases and Transfers		205,388,115	1,343,638,684	205,926,072	1,354,665,491

* 1996 All 1996 Chemicals/Industries reported in 1996 (in 1996 databases).
 ➤ Canada and US data only. Mexico data not collected for 1996.

** 1997 Revised since 1996 report (in 1997 databases).

2.3 Putting PRTR Data to Work

2.3.1 Public Dissemination

As one of the purposes of the databases is to provide the PRTR information to the public, both TRI and NPRI are available in a variety of formats: annual summary reports, detailed data in hard and electronic form, and over the Internet (see contact information at the end of **Chapter 1**). The type and level of detail of the information to be made public under the Mexican RETC is still under discussion. In the beginning, summary data by industrial sector and at the national, state and municipal level will be published. When data might be available to the public at the facility level has not been decided.

PRTR data have a wealth of potential uses beyond the needs and resources of government. Companies and individual facilities use PRTR data to report on their

waste management activities and environmental performances. Publicly available PRTR data also provide a basis for local citizens and industries to track progress in reducing pollutant releases and transfers. The data can also be used to build a regional picture of releases and transfers, and to encourage companies to expand their environmental management programs.

2.3.2 Using PRTR Data Alone

PRTR data are valuable for what they reveal. Using PRTR data alone, releases and transfers can be analyzed by chemical, by facility, by business sector, or for a geographical area—and over time. What chemical is released in the largest amount in a given community? Where are transfers of chemicals in waste into a particular province or state coming from? What chemicals are reported in surface water discharges to tributaries throughout a watershed? How does one facility compare with another in the same business? Such analyses can also show overall progress

or lack thereof. Are local facilities reducing the releases they report? Are reductions in on-site releases accompanied by increases in transfers of listed substances off-site? What industry-wide trends are evident?

PRTR data can answer these questions. In turn, many answers point to new questions that require more information than PRTRs typically supply. For example, how have facilities reduced their releases? Although facilities indicate what source reduction activities they have undertaken during the year (beginning with the 1997 reporting year in NPRI and the 1991 reporting year in TRI), specific reductions cannot be linked directly to any such activity reported in the PRTR data. TRI facilities also report a production index, showing how much production levels have increased or declined since the previous year; reporting a production index to NPRI is voluntary. Again, specific reductions cannot be linked to this index. In both cases, many other factors influence changes in amounts reported from year to year.

2.3.3 PRTR Data as a Basis for Dialogue

While PRTR data alone can provide much information of potential interest, some questions can only be answered by finding out more about what is “behind the numbers.” For example, how have facilities reduced their releases? Did facilities take specific actions to bring about these reductions? Have facilities eliminated or reduced releases of one chemical by switching to processes that use another? If so, is that substance less potentially harmful—or not? To be able to answer such questions, it is necessary to find out more about the facilities. NPRI facilities have the opportunity to comment on their releases and on their transfers, and a facility’s comments—included in the NPRI database—may explain its increases or decreases in reported amounts from previous years. The TRI database does not contain such comments. Most often, however, calling a facility is the only way to obtain an explanation of its releases and transfers and their year-to-year changes. Contact points are provided by facilities as part of their PRTR reporting forms.

2.3.4 Recognizing the Limitations

A principal factor in making good use of PRTR data is to know their limitations. PRTR data:

- do not encompass all potentially harmful substances,
- do not address all sources from which chemicals of concern move into the environment,
- do not identify all on-site releases and off-site transfers from a facility,

- do not measure releases and transfers—they estimate them,
- do not supply a direct perspective on the ultimate environmental fate of chemical substances that reporting facilities release or ship off-site for disposal or other disposition,
- do not provide information on the toxicity or potential health effects of substances released or transferred by reporting facilities,
- do not indicate risks from substances released or transferred by reporting facilities,
- do not identify exposures of human or ecological populations to substances released or transferred by reporting facilities.

Other important information also lies beyond the bounds of PRTR data. For example, information about local/regional geography, demographics, and economics may be needed to interpret PRTR data appropriately in community and ecological contexts.

2.4 Putting PRTR Data in Context

Releases and transfers reported to PRTRs do not happen in a vacuum. They occur in many contexts—physical and chemical, economic and regulatory, geographic and ecological.

Substances that are released on-site or transferred off-site have physical and chemical characteristics that influence their ultimate disposition and their potential consequences for human and ecological life. Some of these substances are used or produced for particular aims—to induce a necessary reaction during manufacture of desired products; to give a product improved performance, a longer life or a better appearance; to clean a surface; to meet a certain demand in the commercial or industrial marketplace. Others result as non-product output from production of goods (a byproduct of manufacture) or delivery of services (such as waste generated from production of electricity). Facilities that report to NPRI or TRI may expand, cut back, or change product lines, bringing about change in their releases and transfers. Some have actively sought ways to reduce the amounts of toxic chemicals they use, to reduce their contributions to pollution—and their costs. Regulations focused on protecting air and water have fostered such improvements at many facilities.

Reportable substances are released to specific environmental media at known locations under specific conditions. Prevailing winds, for example, shape the plume emitted from a stack, and the substances in that plume tend to travel a given

distance in a given direction. Populations both near and far may potentially be affected. Reportable substances may also be shipped across town or out of the country for reuse/recycling/recovery or for treatment or disposal.

Chemicals of concern released to the environment or transferred off-site for disposal by PRTR facilities join those that originate from other sources—from agriculture and transportation, from sectors not required to report (to TRI), and from small sources such as service stations and dry-cleaning establishments.

2.4.1 Chemicals of Concern

Some questions require external information from the start. How effective has the Montreal Protocol been in reducing air emissions of ozone-depleting chemicals? PRTRs collect data on ozone-depleters, but the databases do not explicitly identify these chemicals. Users will need a list of the substances covered by the Montreal Protocol <www.unep.org/unep/secretar/ozone/montreal.htm> to begin investigating air emissions of those substances reported to NPRI and TRI.

A similar step is required to analyze NPRI or TRI data for carcinogens, endocrine disruptors, persistent bioaccumulating toxic pollutants, or other chemical groups. Resources for identifying these groups include:

- Carcinogens—International Agency for Research on Cancer (IARC) <www.iarc.fr/> and US National Toxicological Program (NTP) <ntp-server.niehs.nih.gov/>. (Note: Releases and transfers of known and suspected carcinogens reported to both NPRI and TRI are analyzed in **Chapters 3** through **5** of this report.)
- Endocrine disruptors—World Wildlife Fund Canada <www.wwfcanada.org/>; OECD (discusses research but does not list substances) <www.oecd.org/ehs/endocrin.htm>.
- PBTs—US EPA's proposed TRI regulations and related developments <www.epa.gov/opptintr/tri/pbtrule.htm>.

2.4.2 Chemical Uses and Industry Processes

Releases and transfers arise from particular industrial processes or activities. To assess the significance of the chemicals and amounts reported to PRTRs involves understanding their use.

Many general sources summarize the industrial and commercial uses of specific chemicals. Trichloroethylene (TCE), for example, is used in degreasing fabricated metal parts and as a chemical intermediary in fluorocarbon production. Patterns

of releases from these two principal uses differ substantially. TCE has replaced an ozone-depleting chemical, 1,1,1-trichloroethane, in metal degreasing, an application likely to generate air emissions. However, the predominant—and growing—use of TCE is in producing the hydrofluorocarbon HFC-134a, a use less likely to yield TCE emissions to air. Factsheets and other reference materials that supply toxicity data often summarize uses as well, and the EDF Scorecard also offers such information. Other resources include:

- US National Safety Council's Environment Writer Chemical Backgrounder Index <www.nsc.org/ehc/ew/chemical.htm>,
- Environmental Chemicals Data and Information Network <agnic.nal.usda.gov/agdb/env_chem.html>,
- New Jersey's Right to Know Hazardous Substance Fact Sheets <www.state.nj.us/health/eoh/rtkweb/rtkhsfs.htm>, and
- ChemExpo <www.chemexpo.com>.

Some PRTRs—the States of New Jersey and Massachusetts are examples—collect additional data on facilities' use of toxic chemicals. Known in various contexts as throughput data, materials accounting, or chemical use data, this information allows a more complete accounting of a facility's use of a toxic chemical—how much is brought on-site, produced, held in inventory, shipped in product, transferred as waste to other locations and released to the environment. Such data support a much more extensive range of analyses than the limited release and transfer data available in NPRI and TRI. One example would be assessments of the relative efficiency of facilities that manufacture the same product.

2.4.3 Toxicity and Human Health Effects

“How dangerous are these chemical releases and transfers to my health?” Users of PRTR-type information are likely to ask this question early on, especially if they are examining data from nearby facilities. This question also underlies many more sophisticated analyses of PRTR data. There are no simple answers.

The potential of a substance to cause harm arises from both:

- its inherent toxicity—how harmful is it?—and
- exposure to it—how much and by what route?

What is known about the toxicity and ill effects of various chemicals results principally from studies of animals and human beings that have been exposed to them (ranging from laboratory tests to accidental exposures of human populations,

such as workers). Various authoritative bodies have collected such data and, while PRTR data do not contain such information, the NPRI and TRI web sites link users to various sources of it.

The NPRI web site <www.ec.gc.ca/pdb/npri/links.html> directs users to the US Agency for Toxic Substances and Disease Registry for ToxFAQs summaries about hazardous substances <www.atsdr.cdc.gov/toxfaq.html> and the HazDat database, which includes information on the effects of hazardous substances on human health <www.atsdr.cdc.gov/hazdat.html>; the International Agency for Research on Cancer <www.iarc.fr/>; and Toxicology Excellence for Risk Assessment <www.tera.org/>, which compiles human health risk values from various international health organizations.

US EPA's TRI web site offers links to summaries of effects, exposures, and environmental fate for some 40 selected TRI chemicals <www.epa.gov/chemfact/>, as well as to the ToxFAQs summaries mentioned above <www.atsdr.cdc.gov/toxfaq.html>.

Other sources of health and safety information about chemical substances include:

- Canadian Centre for Occupational Health and Safety—<www.ccohs.ca/oshanswers/>
- State of New Jersey, Department of Health, Right-to-Know Hazardous Substances Fact Sheets—<www.state.nj.us/health/eoh/rtkweb/rtkhsfs.htm>
- National Safety Council, *Crossroads* on Chemical Databases and Material Safety Data Sheets (MSDSs)—<www.nsc.org/xroads/chem.htm>

In its Scorecard <www.scorecard.org/>, the Environmental Defense Fund (EDF) has mounted the most ambitious on-line source of information about potential ecological and human health effects. For more than 6,500 chemicals, Scorecard reports on recognized and suspected health hazards associated with the chemical in 12 categories (cancer, cardiovascular or blood toxicity, developmental toxicity, endocrine toxicity, gastrointestinal or liver toxicity, immunotoxicity, kidney toxicity, musculoskeletal toxicity, neurotoxicity, reproductive toxicity, respiratory toxicity, and skin or sense organ toxicity).

Scorecard also supplies up to 12 hazard rankings for each chemical. These indicate whether a chemical has been found to be more or less hazardous in particular respects than other chemicals in the database. Existing ranking systems weigh

Beyond PRTR Data: Risk and Exposure Assessment

PRTR data supply information on amounts of substances released to the environment at specific locations. Identifying and assessing potential harm from particular releases of a chemical to the environment is a complex task, requiring information additional to that given in PRTRs, and the results are always tentative or, at best, relative.

A substance is released to a specific medium (air, water, land)—does it remain in that medium or does it move from one to another? How long does it remain in the environment—in which medium—and in what form? How far does it travel? If deposited from air to land in agricultural communities, will it be taken up by crops? How much of such a crop will people eat? What is the physical relationship of the releases to human populations—are the pollutants discharged to surface waters in which people swim or upstream of drinking water intakes? Do prevailing winds carry air emissions toward or away from human populations? Are susceptible populations—school children, the elderly—likely to be exposed to these pollutants?

Answering these questions—and many more—constitutes a risk and exposure assessment. Such assessments should make clear their assumptions and the scientific uncertainties involved in their results.

toxicity alone or in combination with the persistence of a chemical in an environmental medium, and such ranking systems have addressed both human health effects and ecological effects. EDF has added rankings that compare chemicals for their toxicity and potential for human exposure (labeled Toxic Equivalency Potential). These EDF scores compare each chemical's cancer-causing potential—based on both its cancer-causing toxicity and its exposure potential—to benzene. Non-cancer health risks are similarly compared to toluene. (Environment Canada has undertaken support for development of a web-based Scorecard for NPRI data. Organizations involved include the Canadian Institute for Environmental Law and Policy, Canadian Environmental Law Association, and the Canadian Environmental Defence Fund.)

These sources can help PRTR data users begin to weigh the risks posed by releases of specific substances and set priorities for prevention and protection. As

noted in the Scorecard web site <www.scorecard.org/env-releases/us-map.tcl>: "Scorecard cannot tell you whether the amount of pollution in your own area is safe or unsafe, and it does not calculate the amount of health risk that reported pollution in your area poses. Scorecard tells you which chemical releases in your area might be of potential health concern, based on available data, and helps you identify the highest priorities among those chemical releases."

2.4.4 Geographic Information

Every release originates in a particular place. What happens next depends on landforms, stream flow, and air currents—as well as on the physical and chemical properties of the substances of concern. PRTR data can be aggregated by geographic location—postal code, municipality, county or census division, province or state. Data can be mapped. (EDF's Scorecard <www.scorecard.org> and US EPA's Envirofacts <www.epa.gov/enviro> map TRI data on the Internet. Canada's NPRI web site <www.ec.gc.ca/pdb/npri> offers mapping capability for NPRI data.) Maps can correlate releases and transfers with demographic data, sensitive ecological populations, locations of non-PRTR sources of pollution, and other geographic information. Watershed and airshed maps are especially valuable for assessing the cumulative impacts of pollutant sources.

2.4.5 Other Sources of Environmental Releases

Facilities that report to PRTRs are not the only sources of pollutant releases to the environment. For example, neither NPRI nor TRI capture release and transfer data for small factories and businesses that do not meet the reporting thresholds. Further, TRI has not covered non-manufacturing sources, except for federal facilities, although another seven industries related to manufacturing have begun reporting to TRI for the 1998 reporting year. Thus, because of reporting thresholds and/or industry classification, entities such as dry-cleaning establishments and gasoline service stations do not report to the North American PRTRs. Nor do NPRI or TRI capture releases from mobile sources (that is, motor vehicles and other forms of transportation) or from agriculture.

Moreover, the lists of substances covered by the North American PRTRs do not include all chemicals or classes of chemicals for which environmental releases may cause concern. Releases of PRTR-listed substances, and the burdens they impose

on the environment, need to be considered in the context of other (similar or different) environmental burdens posed by non-listed pollutants from many sources, large and small.

Information about these other releases may be gathered from various sources. For example, air and water permitting systems may require regular reporting of emissions. In other cases, governments may estimate the contribution of other sources of environmental releases, as in annual inventories of emissions of "criteria pollutants." Motor vehicle emissions, for example, may be estimated from such data as gasoline consumption (and its chemical composition), national or regional estimates of mileage driven under urban or highway conditions, etc. All three North American countries have estimated their national greenhouse gas emissions in response to the United Nations' Framework Convention on Climate Change.

NPRI Summary Reports supply national summaries of such information, when available. The 1996 report, for example, reviewed available data on architectural surface coatings (paints), commercial and consumer solvents, dry cleaning and solvent degreasing. The 1997 report includes estimates of NPRI substances from mobile sources and fuel distribution as well as estimates of criteria air pollutants. In the United States, the *1996 TRI Public Data Release* compared TRI reporting of selected chemicals with fertilizer and pesticide uses and with estimated total emissions of volatile organic compounds (VOCs).

Mexico's 1997 RETC report (its first national pollutant releases and transfers report) presents data on several groups of pollutants: monitoring data on criteria air pollutants, average daily wastewater discharge volumes (both municipal and non-municipal), hazardous waste generation volumes from industrial facilities, and estimates of greenhouse gases from fuel consumption, industrial processes, agriculture and other sources. These summaries present data from various recent time periods as collected under different governmental programs. The data are presented for Mexican states and for industry categories and include both point sources and non-point sources. Like the Canadian and US non-point source estimates, they are based on monitoring data or estimates for categories of sources, rather than on estimates of individual sources.

Estimating Non-PRTR Sources of Pollutants in North America

Data on industrial point sources are the focus of PRTRs, but they can be a small fraction of sources of releases for some pollutants. The CEC has begun a multi-year effort aimed at addressing other sources of North American pollutant releases, including:

- mobile sources (transportation),
- area sources (agriculture, mining, parking lots),
- small sources (dry cleaners, automobile service stations, others).

The first part of the study has identified inventories in the three countries that have the potential to provide information on nonpoint sources of pollutants. The study (“Compilation of Information on Emissions from Nonpoint Sources,” Eastern Research Group, Inc., May 1999) presents an overview of such inventories developed from interviews and literature and Internet searches. This identifies the source categories and pollutants that each inventory covers, how often each is updated, and how comparable the data are to those in PRTRs. The authors were unable to evaluate the actual data in each inventory, and the list includes a number of inventories that have previously been identified as limited in completeness and/or data quality.

This survey identified approximately 40 inventories or studies (including the PRTR in each country) that were either specific inventories of nonpoint sources or studies that would be instrumental in developing nonpoint source

inventories. The study found that, in Canada and the United States, the nonpoint source studies tended to be part of large national inventories, while in Mexico, the majority of the nonpoint source studies were developed for specific local, urban areas.

As the study notes, the vast majority of these inventories address air pollution sources. Water quality studies done in all three countries quantify pollutant concentrations in water bodies, but do not link these to sources. Only two programs in the United States were identified that correlate water quality with sources, including nonpoint sources such as agricultural and urban run-off. Both of these are primarily watershed modeling systems that attempt to relate water body conditions to known sources (such as facilities reporting to PRTRs) and to estimated emissions from other likely sources.

The study found that nonpoint source inventories are in different stages of development in each of the three countries:

- In Mexico, nonpoint source inventories have been developed in the last three to five years for criteria air pollutants in large urban areas that have significant air quality problems.
- In Canada, national nonpoint source inventories for criteria air pollutants are fairly complete, but such inventories for hazardous air pollutants address fewer source categories.

- The United States has extensive nonpoint source inventories for both criteria and hazardous air pollutants and some limited nonpoint source inventories of discharges to water bodies.

All three countries have developed comprehensive greenhouse gas inventories. However, because of the methods used to construct these inventories, nonpoint sources are not easily distinguished from point sources.

The authors of the study predict little difficulty in obtaining access to the inventories in the United States and Canada, although their project did not include attempts to retrieve data. EPA and Environment Canada, the primary custodians of the inventories, assert that they are publicly available. Data from these inventories are often not disseminated directly, but presented in the form of summary reports, although data may be available on request. In Mexico, most of the inventories were developed for individual cities and urban areas, so there is not always centralized data control, or only summary nonpoint source data may be available.

Including data on emissions of PRTR pollutants from nonpoint sources in the *Taking Stock* reports would provide a more complete understanding of the relative importance of facility-specific releases and transfers. Discussion of releases of other pollutants (such as criteria pollutants) from both point and nonpoint sources would provide an additional perspective on the role played by

PRTR releases in the broader context of environmental protection. In general, however, the amount of nonpoint source data identified in the survey as comparable to the PRTR data was very limited:

- The inventories track criteria air pollutants that are not substances collected by the Canadian NPRI or the US TRI, but are collected by the mandatory portion of the Mexican COA.
- Few of the inventories track substances on the NPRI and the TRI lists.
- Many inventories report on both point and nonpoint sources in aggregated categories that could lead to double counting.

The survey found that a significant amount of activity is underway in all three countries to develop improved estimates of nonpoint source air emissions, but that currently available data are limited for cross-country PRTR comparison purposes. The report also addressed several issues that affect the ability to produce meaningful comparisons to PRTR data. These include variable definitions of nonpoint sources, varying degrees of accuracy and consistency across countries in methods for making estimates, and the need for data management systems to facilitate data exchange. Efforts to address these issues in each country will make the data in these inventories more useful from a North American perspective.

Chapter 3: On-site Releases

M

All tables and figures in Chapter 3 are from the 1997 Matched Data Set

	Key Findings	39		3.3 Changes in Releases, 1995–1997	96
3.1	Introduction	39		3.3.1 Overview	96
3.2	1997 On-site Releases	40		3.3.2 Changes in Releases by State and Province	99
3.2.1	North American Releases	40		3.3.3 NPRI and TRI Facilities with Largest Changes	102
	Releases by State and Province	42		NPRI Facilities with Largest Decreases/Increases	102
	Top Facilities	46		TRI Facilities with Largest Decreases/Increases	108
	Releases by Chemical	48		3.3.4 Changes in Releases by Chemical	112
	Carcinogens	51		NPRI Chemicals with Largest Decreases/Increases	113
	Metals	56		TRI Chemicals with Largest Decreases/Increases	114
	Releases by Industry	60		Carcinogens	115
3.2.2	NPRI and TRI Releases	62		Metals	126
	Top Facilities	63		3.3.5 Changes in Releases by Industry	136
	Releases by Chemical	71			
	Carcinogens	74			
	Metals	82			
	Releases by Industry	89			
	Average Releases	92			

M

All tables and figures in Chapter 3 are from the 1997 Matched Data Set

On-site Releases, 1997

Figures

3-1	North American On-site Releases by Type, NPRI and TRI	41
3-2	Distribution of North American On-site Releases, NPRI and TRI	41
3-3	North American Releases, Top 50 Facilities and All Others	48
3-4	Distribution of North American Releases, Top 50 Facilities and All Others	48
3-5	Distribution of North American Releases, Top 25 Chemicals and All Others	50
3-6	Distribution of North American Releases, Known or Suspected Carcinogens and All Others	53
3-7	North American Releases of Known or Suspected Carcinogens, Top 50 Facilities and All Others	53
3-8	Distribution of North American Releases, Metals and Their Compounds and All Others	57
3-9	North American Releases of Metals and Their Compounds, Top 50 Facilities and All Others	57
3-10	North American Top Three Industries for Total Releases	61
3-11	Distribution of On-site Releases, NPRI and TRI	62
3-12	NPRI and TRI Total On-site Releases, Top 50 Facilities and All Others	68
3-13	Distribution of Total On-site Releases of Top 50 Facilities, NPRI and TRI	68
3-14	Comparisons for Top Five Chemicals under NPRI and TRI for Total On-site Releases	73
3-15	Distribution of NPRI and TRI On-site Releases of Known or Suspected Carcinogens	76
3-16	NPRI and TRI On-site Releases of Known or Suspected Carcinogens, Top 50 Facilities and All Others	77
3-17	Distribution of NPRI and TRI On-site Releases of Metals and Their Compounds	83

3-18	NPRI and TRI On-site Releases of Metals and Their Compounds, Top 50 Facilities and All Others	88
3-19	Industries with Largest Total On-site Releases, NPRI and TRI	91
3-20	Average On-site Releases per Form by Industry, NPRI and TRI	94

Maps

3-1	North American On-site Releases: States and Provinces	43
3-2	North American On-site Releases to Air: States and Provinces	44
3-3	North American On-site Releases to Surface Waters: States and Provinces	44
3-4	North American On-site Releases to Underground Injection: States and Provinces	45
3-5	North American On-site Releases to Land: States and Provinces	45

Tables

3-1	North American On-site Releases, NPRI and TRI	40
3-2	North American On-site Releases, by Province and State	42
3-3	The 50 North American Facilities with the Largest Total Releases	46
3-4	The 25 Chemicals with the Largest Releases in North America	49
3-5	Releases in North America of Known or Suspected Carcinogens	52
3-6	The 50 North American Facilities with the Largest Total Releases of Known or Suspected Carcinogens	54
3-7	Releases in North America of Metals and Their Compounds	56

M

All tables and figures in Chapter 3 are from the 1997 Matched Data Set

3-8	The 50 North American Facilities with the Largest Total Releases of Metals and Their Compounds	58	3-18	TRI On-site Releases of Known or Suspected Carcinogens	75
3-9	Releases in North America by Industry	60	3-19	The 50 NPRI Facilities with the Largest Total On-site Releases of Known or Suspected Carcinogens	78
3-10	On-site Releases, NPRI and TRI	62	3-20	The 50 TRI Facilities with the Largest Total On-site Releases of Known or Suspected Carcinogens	80
3-11	The 50 NPRI Facilities with the Largest Total On-site Releases	64	3-21	NPRI On-site Releases of Metals and Their Compounds	82
3-12	The 50 TRI Facilities with the Largest Total On-site Releases	66	3-22	TRI On-site Releases of Metals and Their Compounds	83
3-13	NPRI Total On-site Releases by All Facilities and by Facilities with Largest Amounts, by Province	69	3-23	The 50 NPRI Facilities with the Largest Total On-site Releases of Metals and Their Compounds	84
3-14	TRI Total On-site Releases by All Facilities and by Facilities with Largest Amounts, by State	70	3-24	The 50 TRI Facilities with the Largest Total On-site Releases of Metals and Their Compounds	86
3-15	The 25 NPRI Chemicals with the Largest Total On-site Releases	71	3-25	NPRI On-site Releases by Industry	89
3-16	The 25 TRI Chemicals with the Largest Total On-site Releases	72	3-26	TRI On-site Releases by Industry	90
3-17	NPRI On-site Releases of Known or Suspected Carcinogens	74	3-27	Average On-site Releases per Form, by Industry, NPRI and TRI	93
			3-28	Average On-site Releases per Form, NPRI and TRI	95

Changes in On-site Releases, 1995-1997**Figures**

3-21	Percent Change in North American On-site Releases	97	3-26	NPRI and TRI Total On-site Releases of Metals and Their Compounds: Facilities with Largest Changes and All Others	127
3-22	Percent Change in North American On-site Releases, by Type	98	3-27	Percent Change in On-site Releases for Primary Industries, NPRI and TRI	136
3-23	NPRI and TRI Total On-site Releases: Facilities with Largest Changes and All Others	103			
3-24	Percent Change in Total On-site Releases of Selected Chemicals, NPRI and TRI	112			
3-25	NPRI and TRI Total On-site Releases of Known or Suspected Carcinogens: Facilities with Largest Changes and All Others	117			

Map

3-6	Percent Change in North American Total On-site Releases	101
-----	---	-----

M

All tables and figures in Chapter 3 are from the 1997 Matched Data Set

Changes in On-site Releases, 1995–1997 (cont.)

Tables					
3–29	North American On-site Releases	96	3–42	NPRI Facilities with Largest Decrease in On-site Releases of Known or Suspected Carcinogens	118
3–30	NPRI On-site Releases by Province	99	3–43	NPRI Facilities with Largest Increase in On-site Releases of Known or Suspected Carcinogens	120
3–31	TRI On-site Releases by State	100	3–44	TRI Facilities with Largest Decrease in On-site Releases of Known or Suspected Carcinogens	122
3–32	NPRI Facilities with Largest Decrease in On-site Releases	104	3–45	TRI Facilities with Largest Increase in On-site Releases of Known or Suspected Carcinogens	124
3–33	NPRI Facilities with Largest Increase in On-site Releases	106	3–46	Change in NPRI On-site Releases of Metals and Their Compounds	126
3–34	TRI Facilities with Largest Decrease in On-site Releases	108	3–47	Change in TRI On-site Releases of Metals and Their Compounds	127
3–35	TRI Facilities with Largest Increase in On-site Releases	110	3–48	NPRI Facilities with Largest Decrease in On-site Releases of Metals and Their Compounds	128
3–36	The 10 Chemicals with the Largest Decrease in NPRI Releases	113	3–49	NPRI Facilities with Largest Increase in On-site Releases of Metals and Their Compounds	130
3–37	The 10 Chemicals with the Largest Increase in NPRI Releases	113	3–50	TRI Facilities with Largest Decrease in On-site Releases of Metals and Their Compounds	132
3–38	The 10 Chemicals with Largest Decrease in TRI On-site Releases	114	3–51	TRI Facilities with Largest Increase in On-site Releases of Metals and Their Compounds	134
3–39	The 10 Chemicals with Largest Increase in TRI On-site Releases	114	3–52	Change in NPRI On-site Releases by Industry	137
3–40	Change in NPRI On-site Releases of Known or Suspected Carcinogens	115	3–53	Change in TRI On-site Releases by Industry	138
3–41	Change in TRI On-site Releases of Known or Suspected Carcinogens	116			

■ Key Findings

- In 1997, North American facilities released 847.8 million kg of listed substances as reported to TRI and NPRI. These on-site releases represent the total for all chemicals and industries covered by the matched data set.
- Total releases declined nine percent from 1995 to 1997. NPRI facilities reported a 13 percent reduction. In TRI, the decrease was eight percent.
- For both NPRI and TRI, air emissions decreased. NPRI facilities reported a six percent decrease and TRI facilities a 17 percent decrease in air emissions from 1995 to 1997. Increases were reported by NPRI facilities in underground injection (18 percent) and by TRI facilities in surface water discharges (27 percent) and on-site land releases (eight percent). All other types of releases declined.
- Canadian facilities accounted for seven percent of the facilities and reporting forms in the 1997 matched data, but contributed closer to 10 percent of the on-site releases, including 12 percent of North American emissions to air. With 93 percent of the North American facilities and forms, the US TRI facilities reported nearly 91 percent of the on-site releases.
- More than one-quarter of all North American releases in the matched data set originated in four states and provinces: Texas, Louisiana, Utah and Ontario.
- Both Texas and Ontario facilities reported a decrease in on-site releases from 1995 to 1997 (21 percent for Texas and 13 percent for Ontario). However, Louisiana and Utah facilities reported increases (four percent for Louisiana and 23 percent for Utah).
- Fifty facilities with the largest releases in North America reported one-third (34 percent) of total releases in 1997, although they represented just 0.2 percent of all facilities in the matched data set.
- Industries reporting the largest releases were the same in NPRI and in TRI, but did not appear in the same order. The primary metals industry reported the largest NPRI releases, followed by chemical manufacturing and paper products. In TRI, chemical manufacturing ranked first for total releases, followed by primary metals and paper products.
- Two chemical groups of special concern did not share in the overall reduction of releases from 1995 to 1997. NPRI releases decreased less than one percent both for substances designated as known or suspected carcinogens and for metals. Although TRI facilities reported a three percent decrease in releases of designated carcinogens, their releases of metals rose by 18 percent.
- Of the three industries contributing the largest releases in NPRI and TRI, two—chemical manufacturing and paper products—reported decreases from 1995 to 1997. In both countries, releases reported by the primary metals industry increased.

3.1 Introduction

This chapter examines reporting of on-site releases of PRTR-listed substances in North America. These releases—to air, water, land, or underground injection wells—occur at the facility. As explained in **Chapter 2**, this chapter analyzes data for industries and chemicals that must be reported in both the US and Canada (the matched data set). Mexican data are not available for the 1997 reporting year.

The data for on-site releases for 1997 are presented first: those for the combined North American data 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 on-site releases 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.

Table 3-1		North American On-site Releases, NPRI and TRI, 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
On-site Releases		kg	%	kg	%	kg	%		
Total Air Emissions		512,213,962	60.4	62,838,622	78.1	449,375,340	58.6	12.3	87.7
Surface Water Discharges		98,842,863	11.7	4,224,169	5.3	94,618,694	12.3	4.3	95.7
Underground Injection		78,847,314	9.3	4,197,660	5.2	74,649,654	9.7	5.3	94.7
On-site Land Releases		157,720,611	18.6	9,062,108	11.3	148,658,503	19.4	5.7	94.3
Total Releases		847,751,115	100.0	80,448,924	100.0	767,302,191	100.0	9.5	90.5

* The sum of individual release types for NPRI will not equal total releases because total releases of less than 1 tonne may be reported as total releases only.
 ► Canada and US data only. Mexico data not collected for 1997.

3.2 1997 On-site Releases

In 1997, 20,555 North American facilities in industries covered by both the Canadian NPRI and the US TRI filed 62,851 reports on the substances that are common to both PRTRs (Table 3-1).

The 1,430 facilities reporting to Canada's NPRI and the 4,599 forms they submitted represented seven percent of the North American totals in the matched data set. The 19,125 US TRI facilities and their 58,252 forms accounted for 93 percent of these totals.

3.2.1 North American Releases

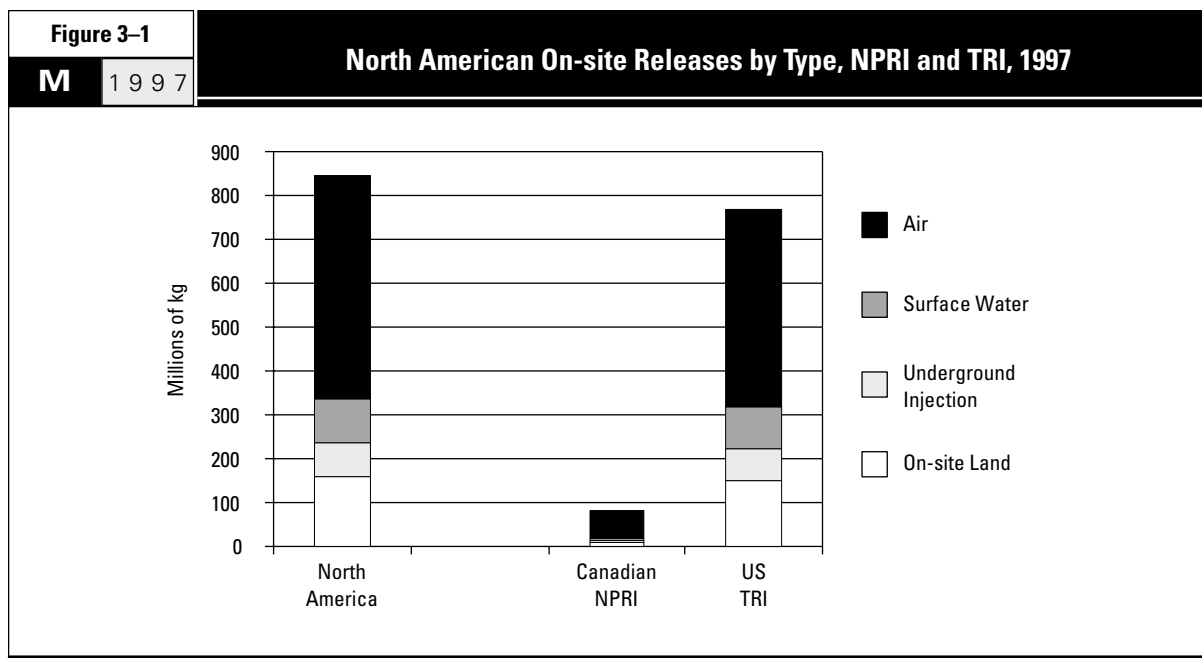
Overview

On-site releases in North America totaled 847.8 million kg in 1997 for the matched data set. Most of the North American reporting occurs in the United States, with its larger industrial base. NPRI facilities reported 80.4 million kg or 9.5 percent of the North American releases, while TRI facilities reported 767.3 million kg or 90.5 percent of the total. With seven percent of the facilities and forms, NPRI reporting thus contributed a somewhat larger

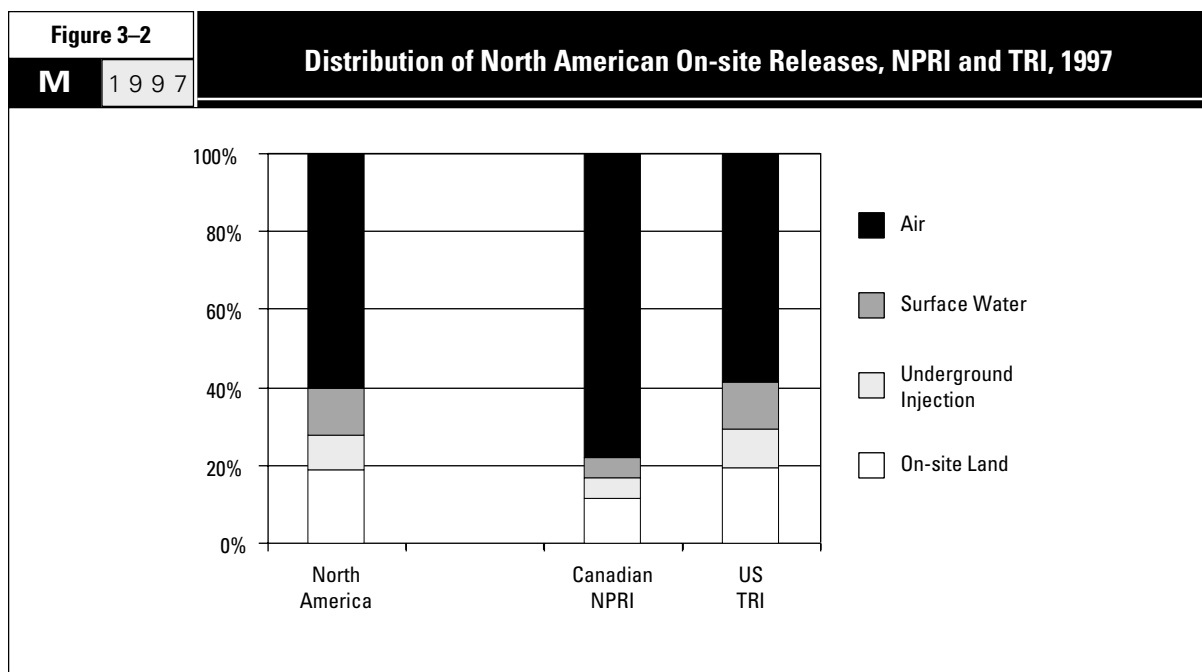
portion of North American releases than might be expected (Table 3-1).

North American facilities reported releasing 512.2 million kg of listed substances to air in 1997. This amounted to 60 percent of North American releases. Discharges to surface water totaled 98.8 million kg, 12 percent of the total. Facilities also injected 78.8 million kg of listed substances in the matched data set into underground wells, which represented nine percent of all releases. On-site land disposal, the second-largest release type, totaled 157.7 million kg or 19 percent of the total (Figures 3-1 and 3-2).

Canadian facilities reported 12 percent of North American air emissions, but six percent or less of the other release types. US facilities reported 96 percent of the surface water discharges, 95 percent of the underground injection, and 94 percent of the on-site land releases.



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



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

Releases by State and Province

More than one-quarter of all North American releases in the matched data set originated in four states and provinces: Texas, Louisiana, Utah and Ontario. Texas reported the largest releases, with 83.9 million kg. Texas facilities reported the largest amounts of air emissions (38.7 million kg) and underground injection (27.1 million kg—**Table 3–2** and **Maps 3–1** through **3–5**).

Louisiana ranked second among states and provinces for total releases, with 63.2 million kg. Surface water discharges in Louisiana totaled 20.9 million kg, more than in any other state or province. Facilities in Louisiana also reported 18.8 million kg released to underground injection, second only to Texas.

Facilities in Utah reported 41.8 million kg of releases, the third-largest total, and those in Ontario reported 40.0 million kg, the fourth-largest total. Utah and Ontario did not lead in any release category, but on-site releases to land totaled 12.0 million kg in Utah, the third-largest amount among states and provinces. Ontario's air emissions totaled 36.0 million kg, second behind Texas. The largest on-site land releases were reported in Montana (17.1 million kg), although this state ranked 19th for total releases.

Four states and provinces had releases of less than 500,000 kg. They were Newfoundland, Prince Edward Island, Vermont and Hawaii. Facilities in the District of Columbia reported no releases.

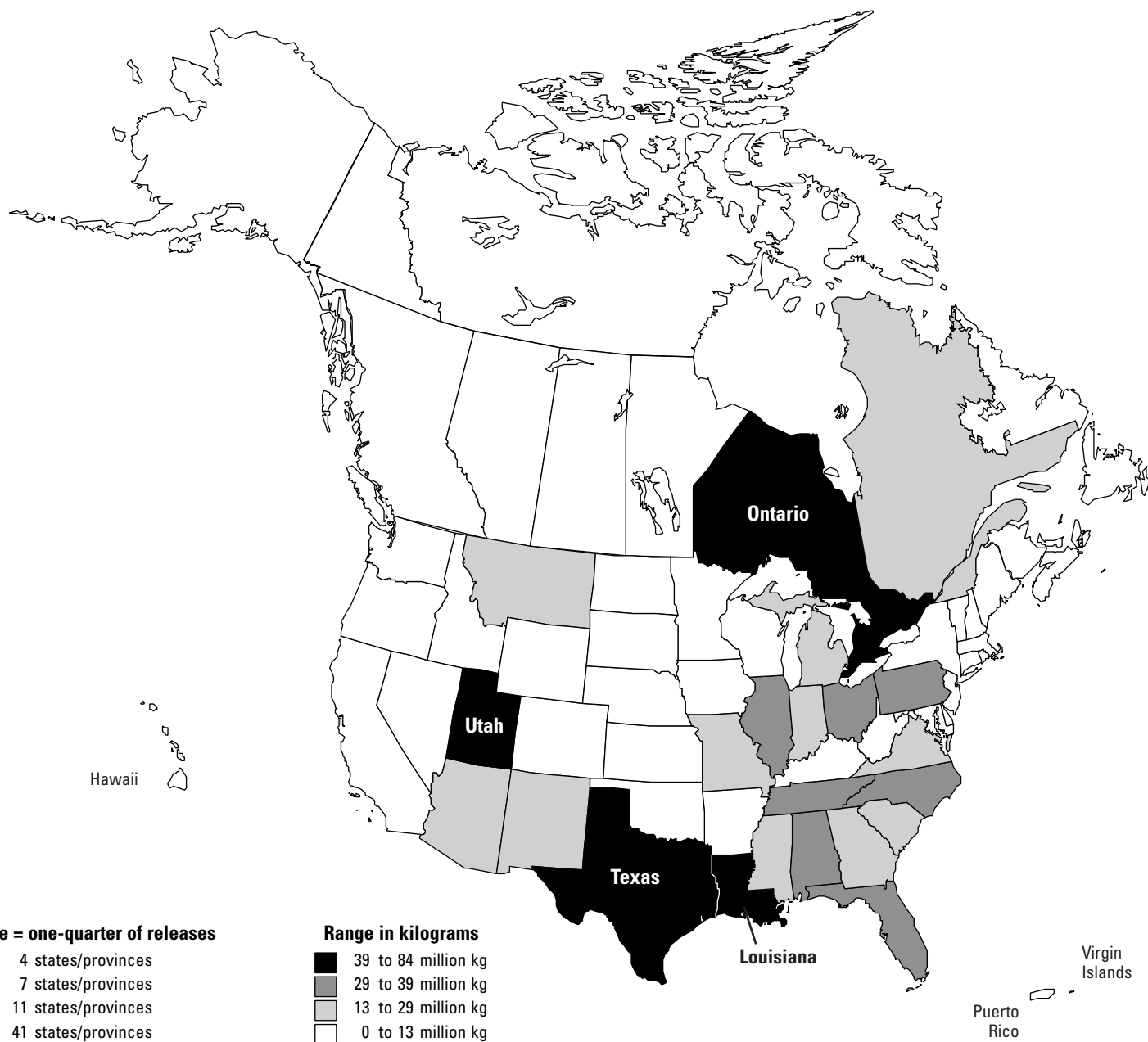
Table 3–2					
North American On-site Releases, by Province and State, 1997					
M	1997				
Province/State	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
Texas	38,699,081	9,086,284	27,113,580	8,984,055	83,883,000
Louisiana	20,218,057	20,906,839	18,788,650	3,310,832	63,224,378
Utah	29,292,846	551,154	0	11,991,001	41,835,001
Ontario	36,049,425	1,149,543	0	2,682,311	39,955,770
Ohio	18,397,663	2,519,375	4,146,794	11,928,550	36,992,382
Tennessee	29,475,027	433,000	3,857,299	2,112,648	35,877,974
Pennsylvania	15,581,050	17,384,468	0	748,188	33,713,706
Florida	9,799,141	3,691,701	9,816,593	8,706,340	32,013,775
Illinois	17,846,951	2,158,283	1,520	11,138,116	31,144,870
Alabama	24,083,443	1,814,015	4	4,302,073	30,199,535
North Carolina	17,855,348	2,834,574	13,197	8,332,258	29,035,377
Indiana	19,026,535	884,957	87,618	7,812,085	27,811,195
Mississippi	13,104,815	5,277,258	3,851,531	2,519,643	24,753,247
Missouri	12,486,375	1,255,584	0	9,037,762	22,779,721
Georgia	16,090,372	3,074,232	0	1,209,219	20,373,823
Michigan	16,610,760	163,603	2,151,240	1,074,965	20,000,568
South Carolina	17,660,101	1,078,794	0	611,086	19,349,981
Virginia	17,163,630	1,657,917	0	526,512	19,348,059
Montana	1,560,643	38,172	0	17,100,808	18,699,623
Quebec	10,042,745	1,195,907	0	3,384,956	14,649,326
Arizona	3,657,642	19	2	9,778,878	13,436,541
New Mexico	919,208	3,648	0	12,364,744	13,287,600
Kentucky	10,746,890	254,436	0	1,241,926	12,243,252
Alberta	6,535,005	422,063	4,195,518	825,838	11,987,370
Wisconsin	10,144,520	1,297,358	2	513,695	11,955,575
New York	9,265,335	1,901,094	113	540,875	11,707,417
Arkansas	7,448,214	727,009	656,793	1,395,928	10,227,944
Oregon	6,508,451	1,915,261	0	1,253,309	9,677,021
California	6,743,559	1,855,386	13,217	309,372	8,921,534
Washington	7,685,887	947,713	0	102,277	8,735,877
West Virginia	4,885,110	2,957,563	0	22,647	7,865,320
Iowa	5,808,061	1,117,395	0	904,592	7,830,048
Kansas	6,125,545	249,930	425,762	427,013	7,228,250
Idaho	1,073,907	508,103	0	4,647,354	6,229,364
Oklahoma	4,772,487	293,724	750,444	251,223	6,067,878
New Jersey	3,406,353	2,091,688	0	524,913	6,022,954
British Columbia	5,099,159	281,346	0	70,769	5,459,128
Minnesota	5,238,940	66,321	0	65,957	5,371,218
Maryland	2,399,558	884,574	0	1,162,227	4,446,359
Wyoming	562,694	176	2,975,170	27,637	3,565,677
Manitoba	1,584,802	34,570	0	1,774,178	3,397,552
Maine	2,398,587	420,723	0	127,781	2,947,091
Puerto Rico	2,893,226	476	0	600	2,894,302
New Brunswick	1,467,892	878,778	0	8,254	2,357,036
Connecticut	2,004,136	292,732	0	17,516	2,314,384
Nebraska	1,891,807	219,271	0	29,920	2,140,998
Massachusetts	2,048,545	21,932	0	8,731	2,079,208
Nevada	586,225	0	0	1,235,152	1,821,377
South Dakota	526,009	816,327	0	1,060	1,343,396
Colorado	874,450	410,834	0	46,067	1,331,351
Nova Scotia	710,039	45,264	0	308,191	1,063,517
Delaware	780,983	94,961	0	135,131	1,011,075
New Hampshire	859,600	39,392	0	71,547	970,539
Saskatchewan	921,011	20,722	2,142	55	946,849
Rhode Island	702,832	952	0	1,964	705,748
Alaska	398,450	141,154	122	766	540,492
Virgin Islands	536,198	671	0	666	537,535
North Dakota	315,176	193,895	0	776	509,847
Newfoundland	409,896	1,054	0	1,356	412,606
Prince Edward Island	18,648	194,922	0	6,200	219,770
Vermont	91,314	83,508	0	118	174,940
Hawaii	123,603	258	3	0	123,864
District of Columbia	0	0	0	0	0
Total	512,213,962	98,842,863	78,847,314	157,720,611	847,751,115

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

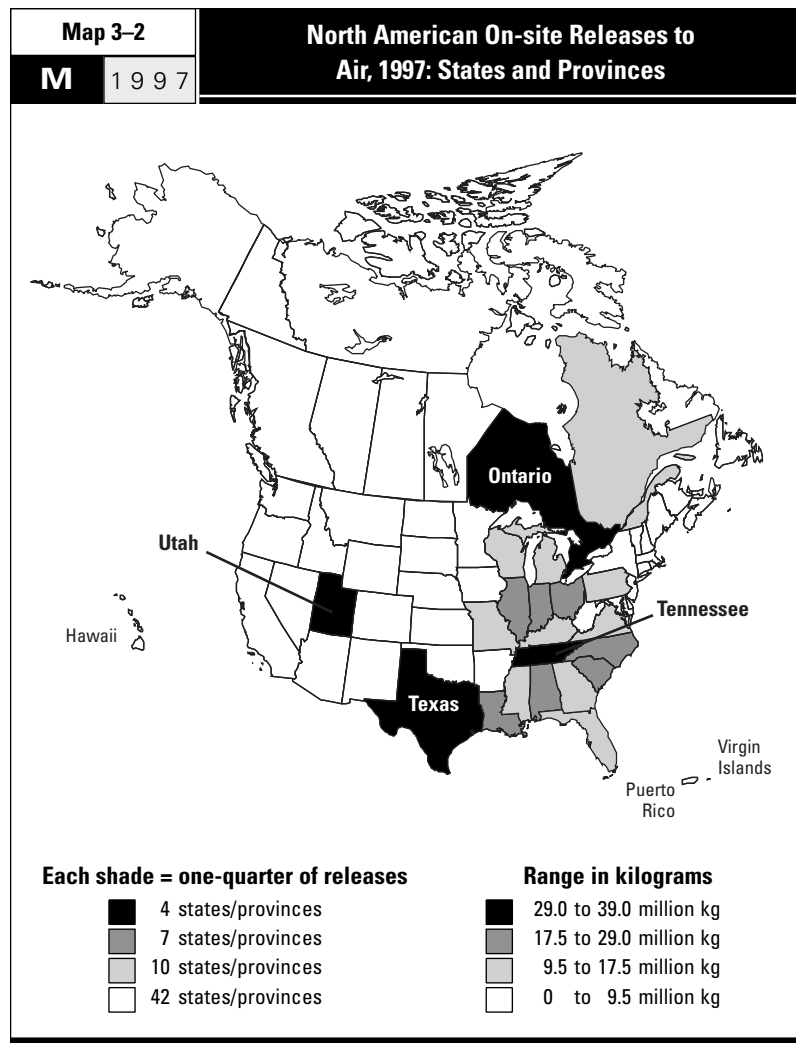
Map 3-1

M 1997

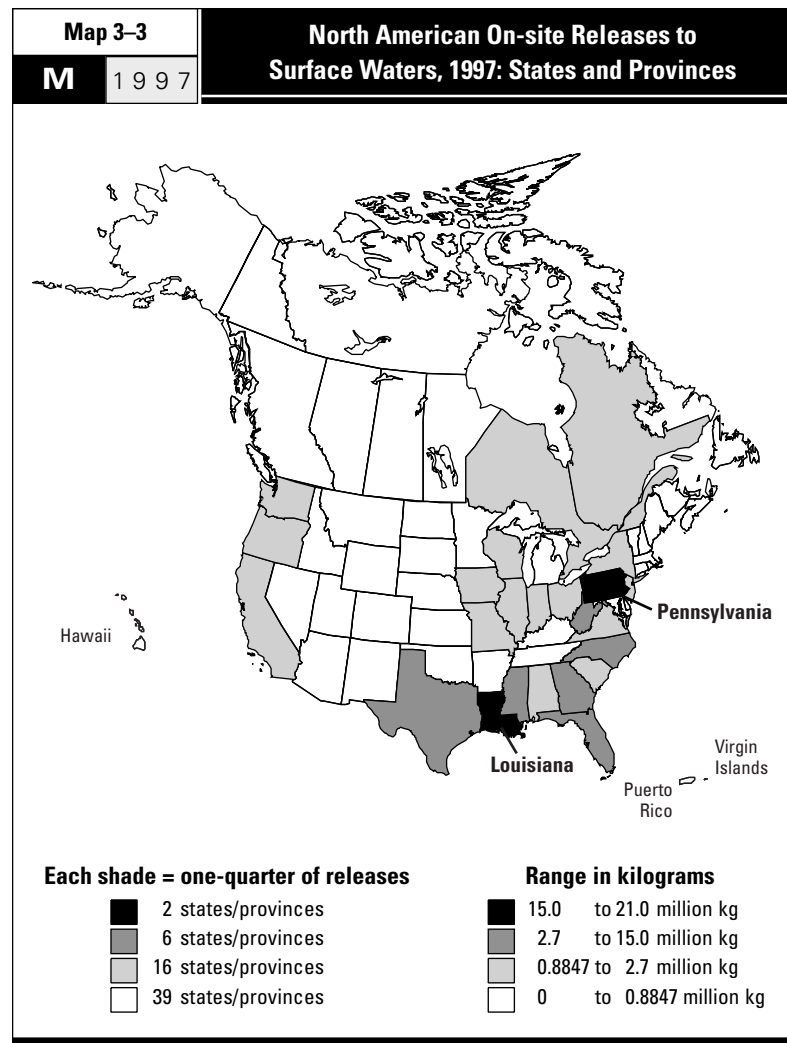
North American On-site Releases, 1997: States and Provinces



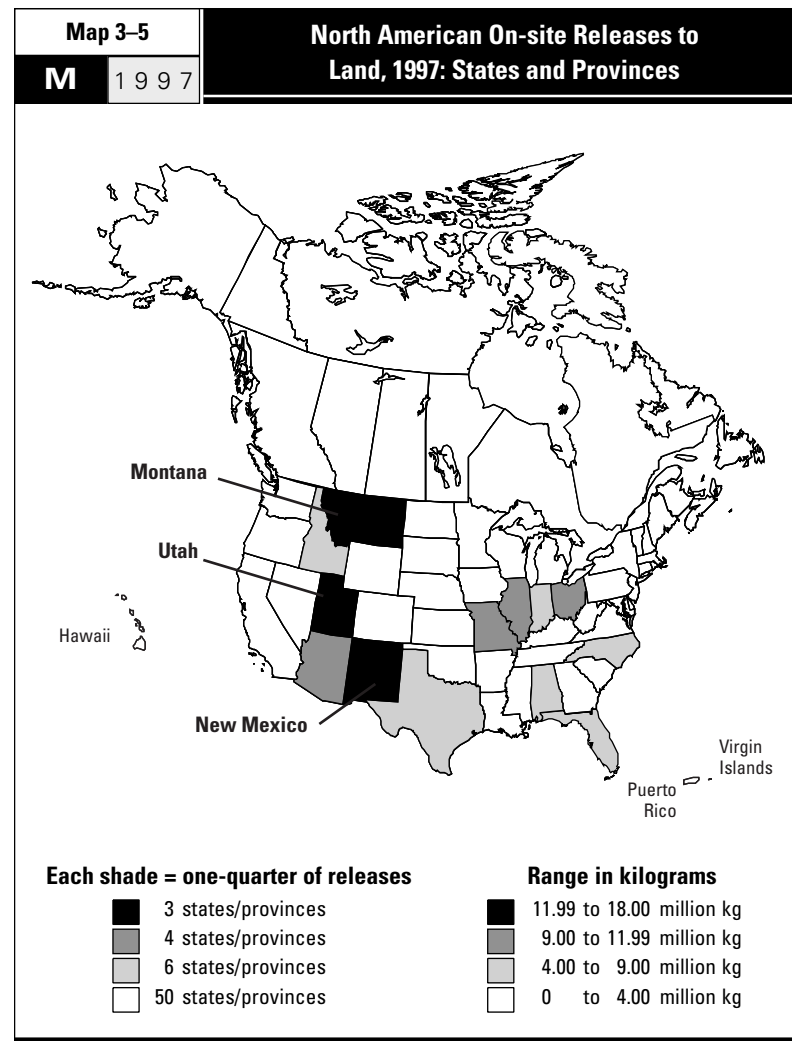
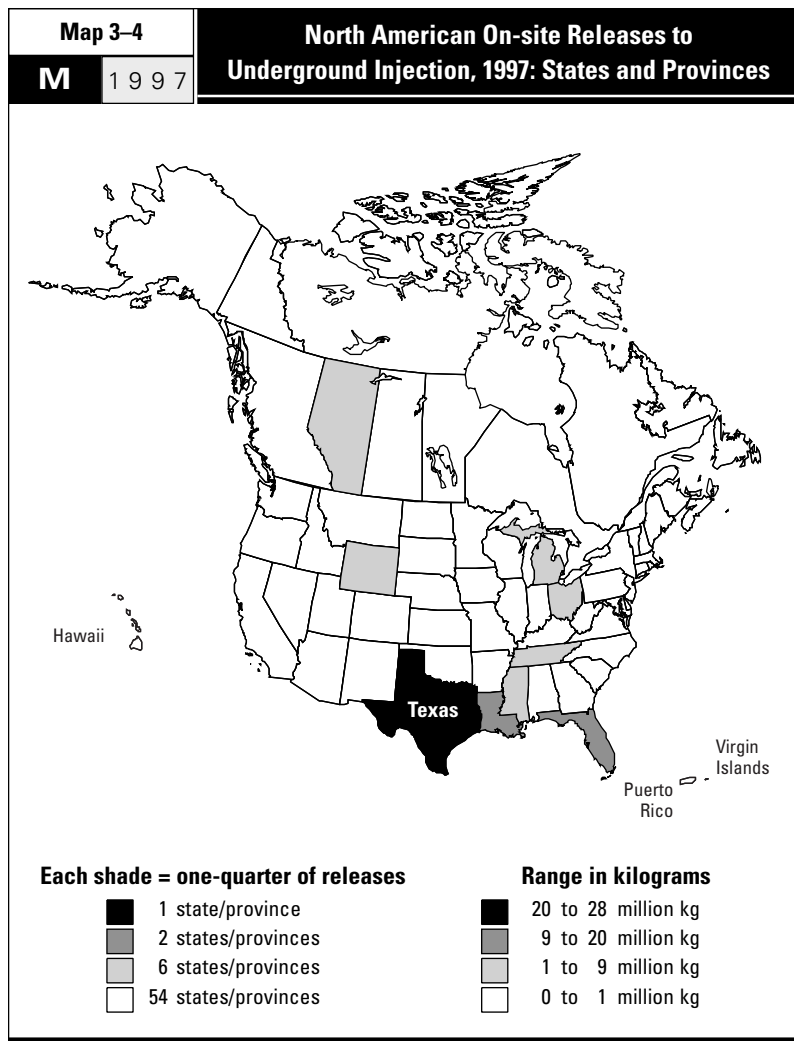
► Canada and US data only. Mexico data not collected for 1997.



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



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



Top Facilities

The 50 North American facilities with the largest releases in the matched data set reported 285.3 million kg of releases in 1997. Although they represented just 0.2 percent of the reporting facilities, these facilities contributed 34 percent of total North American releases (Table 3-3 and Figure 3-3).

These 50 facilities reported the majority of North American underground injection (62.9 million kg or 80 percent of the North American total) and on-site land releases (113.1 million kg or 72 percent of the total). However, they reported less than half the surface water discharges (43.5 million kg or 44 percent) and a much smaller portion of the air emissions (65.8 million kg or 13 percent).

Thus, for the top facilities, air emissions were markedly smaller, and on-site land releases and underground injection larger, than for other facilities as a whole. Air emissions constituted 23 percent of the top 50 facilities' releases, while on-site land releases represented 40 percent and underground injection 22 percent. For other facilities, air emissions were 79 percent of the total, on-site land releases eight percent, and underground injection three percent (Figure 3-4).

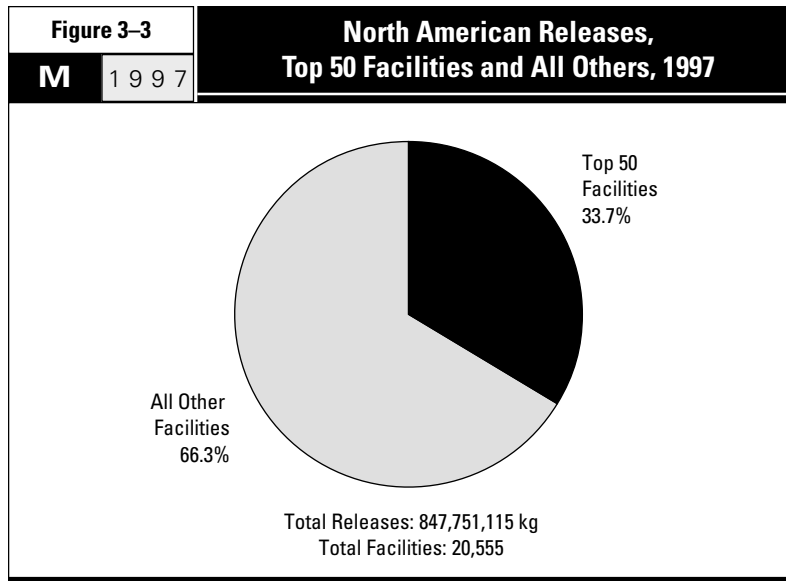
Table 3-3		The 50 North American Facilities with the Largest Total Releases, 1997			
Rank	Facility	City, State/Province	SIC Codes		Number of Forms
			Canada	US	
1	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT		33	6
2	ASARCO Inc.	East Helena, MT		33	10
3	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA		28	12
4	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	13
5	Armco Inc. (Route 8 S.)	Butler, PA		33	14
6	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	14
7	Solutia Inc.	Gonzalez, FL		28	18
8	DuPont	Victoria, TX		28	29
9	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	13
10	Lenzing Fibers Corp.	Lowland, TN		28	5
11	Cytec Ind. Inc., Fortier Plant	Westwego, LA		28	24
12	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN		33	33
13	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL		28	4
14	Northwestern Steel & Wire Co.	Sterling, IL		33	6
15	American Chrome & Chemicals, Harrison's & Crosfield American	Corpus Christi, TX		28	2
16	BASF Corp.	Freeport, TX		28	26
17	GM Powertrain Defiance, General Motors Corp.	Defiance, OH		33	20
18	Elkem Metals Co.	Marietta, OH		33	6
19	ASARCO Inc., Glover Plant	Annapolis, MO		33	7
20	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7
21	BP Chemicals Inc., BP America Inc.	Lima, OH		28	27
22	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX		28	17
23	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1
24	DuPont	Pass Christian, MS		28	11
25	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC		28	6
26	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	9
27	Celanese Canada Inc.	Edmonton, AB	37	28	11
28	Vicksburg Chemical Co.	Vicksburg, MS		28	3
29	DuPont	New Johnsonville, TN		28	11
30	Rubicon Inc.	Geismar, LA		28	24
31	Monsanto Co.	Luling, LA		28	14
32	FMC Corp.	Pocatello, ID		28	12
33	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL		28	4
34	Eastman Kodak Co., Kodak Park	Rochester, NY		38	46
35	Coastal Chem Inc., Coastal Corp.	Cheyenne, WY		28	12
36	Angus Chemical Co.	Sterlington, LA		28	11
37	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ		33	13
38	Sterling Chemicals Inc.	Texas City, TX		28	34
39	DuPont	Beaumont, TX		28	22
40	Granite City Steel, National Steel Corp.	Granite City, IL		33	22
41	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	White Springs, FL		28	4
42	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN		28	63
43	IMC-Agrico Co., IMC Global Inc.	Saint James, LA		28	6
44	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5
45	USS Fairfield Works, USX Corp.	Fairfield, AL		33	15
46	International Paper Co.	Hampton, SC		30	10
47	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA		29	32
48	Westvaco Corp., Bleached Board Div.	Covington, VA		26	16
49	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS		Mult.	5
50	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	7
Subtotal					742
% of Total					1.2
Total					62,851

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

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	28,270,233	0	0	0	28,270,233	Chlorine (air)
2	47,346	2,280	0	17,100,454	17,150,080	Zinc and compounds (land)
3	48,716	13,487,112	0	291,886	13,827,714	Phosphoric acid (water)
4	288,368	3,644	0	12,053,733	12,345,745	Zinc/Copper and compounds (land)
5	98,510	11,793,413	0	0	11,891,923	Nitric acid and nitrate compounds (water)
6	109,489	4,441	0	10,908,661	11,022,591	Copper/Zinc/Lead and compounds (land)
7	103,557	826	9,712,998	0	9,817,381	Nitric acid and nitrate compounds (UIJ)
8	176,213	791	8,861,812	5,445	9,044,261	Nitric acid and nitrate compounds (UIJ)
9	92,972	0	0	8,503,492	8,596,464	Copper and compounds (land)
10	7,619,166	2,879	0	142,766	7,764,811	Carbon disulfide (air)
11	71,934	3,167	7,594,695	0	7,669,796	Acetonitrile, Acrylic acid, Acrylamide (UIJ)
12	777,508	13,242	0	6,463,719	7,254,469	Zinc and compounds (land)
13	6,848,254	9,265	0	175,510	7,033,029	Carbon disulfide (air)
14	60,613	7,982	0	6,716,100	6,784,695	Zinc/Manganese and compounds (land)
15	2,131	703	0	6,575,964	6,578,798	Chromium and compounds (land)
16	143,873	6,353,578	5,407	0	6,502,858	Nitric acid and nitrate compounds (water)
17	333,612	18,744	0	5,620,881	5,973,237	Zinc and compounds (land)
18	174,841	205,442	0	4,752,382	5,132,665	Manganese and compounds (land)
19	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
20	4,259,786	0	0	649,000	4,908,786	Sulfuric acid (air)
21	142,400	0	4,146,788	0	4,289,188	Acetonitrile, Acrylamide, Cyanide compounds (UIJ)
22	54,412	306	4,198,418	3,985	4,257,121	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
23	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
24	282,458	0	3,809,524	0	4,091,982	Manganese and compounds (UIJ)
25	163,429	0	0	3,805,895	3,969,324	Phosphoric acid (land)
26	119,063	183	0	3,839,901	3,959,147	Zinc and compounds (land)
27	294,315	0	3,542,000	593	3,836,908	Methanol, Methyl ethyl ketone (UIJ)
28	34,454	3,668,877	0	0	3,703,331	Nitric acid and nitrate compounds (water)
29	33,946	32,986	3,516,553	57	3,583,542	Manganese and compounds (UIJ)
30	144,879	79	3,274,650	0	3,419,608	Nitric acid and nitrate compounds, Methanol (UIJ)
31	38,598	90,123	3,277,869	0	3,406,590	Formaldehyde (UIJ)
32	13,048	338	0	3,362,448	3,375,834	Zinc and compounds, Phosphorus (land)
33	12,939	3,170,390	0	0	3,183,329	Phosphoric acid (water)
34	2,750,339	288,950	0	18,603	3,057,892	Dichloromethane, Hydrochloric acid, Methanol (air)
35	11,497	0	2,975,170	109	2,986,776	Nitric acid and nitrate compounds (UIJ)
36	59,908	96,610	2,800,966	0	2,957,484	Nitric acid and nitrate compounds, Formaldehyde (UIJ)
37	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
38	367,117	2,312	2,502,904	0	2,872,333	Acetonitrile, Acrylamide, Nitric acid and nitrate compounds, tert-Butyl alcohol (UIJ)
39	119,905	315	2,672,011	0	2,792,231	Nitric acid and nitrate compounds (UIJ)
40	100,722	6,116	0	2,668,366	2,775,204	Zinc and compounds (land)
41	54,427	0	0	2,630,385	2,684,812	Phosphoric acid (land)
42	2,375,308	53,946	0	235,359	2,664,613	Hydrochloric acid, Methanol, Sulfuric acid, Toluene, Xylene, Hydrogen fluoride, Bromomethane, Ethylene glycol, Ethylene (air)
43	74,646	2,242,020	0	165,209	2,481,875	Phosphoric acid (water)
44	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
45	149,742	794	0	2,139,993	2,290,529	Zinc and compounds (land)
46	2,264,625	31	0	0	2,264,656	Methanol, Phenol (air)
47	371,814	1,859,247	0	1	2,231,062	Nitric acid and nitrate compounds (water)
48	2,102,416	35,531	0	52,444	2,190,391	Methanol, Hydrochloric acid (air)
49	4,946	6,145	0	2,066,666	2,077,757	Manganese and compounds (land)
50	2,045,900	480	0	0	2,046,380	Cyclohexane (air)
	65,841,154	43,463,862	62,891,765	113,112,614	285,309,395	
	12.9	44.0	79.8	71.7	33.7	
	512,213,962	98,842,863	78,847,314	157,720,611	847,751,115	

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

► UIJ=underground injection



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

Releases by Chemical

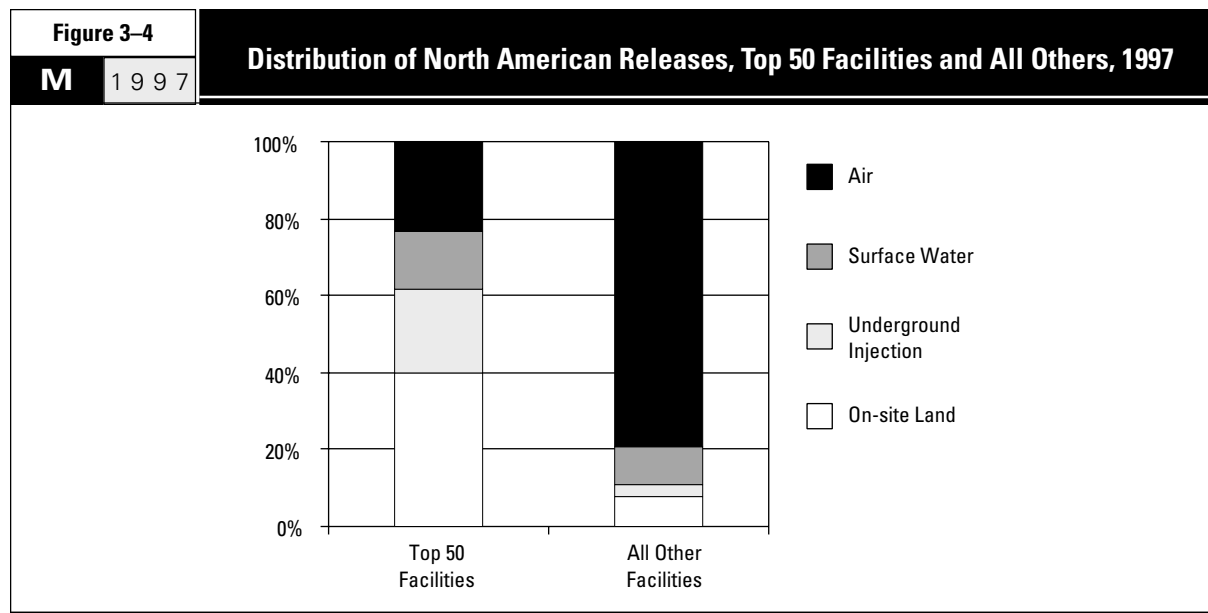
There are 165 substances on both the TRI and NPRI lists. These are the substances in the matched data set. However, just 25 of these substances represented 89 percent of the total on-site releases in North America. Of the 165 substances, 48 are known or suspected carcinogens and 15 are metals with their compounds. These groups of substances are considered in more detail in this section.

Top Chemicals

North American facilities reported releasing more methanol—118.4 million kg—than any other chemical in the matched data set. Most releases of methanol, a volatile chemical, occurred as emissions to air—103.3 million kg in 1997. Releases of nitric acid and nitrate compounds, which ranked second after methanol, totaled 100.4 million kg. Most releases of nitric acid and nitrate compounds were surface water discharges, which totaled 70.1 million kg. Facilities also injected 27.3 million kg of nitric acid and nitrate compounds into underground wells. Zinc and its compounds ranked third for total releases, with 65.1 million kg, including 59.9 million kg of on-site land releases (**Table 3-4**).

The large surface water discharges of nitric acid and nitrate compounds and the large on-site land releases of zinc and its compounds significantly influenced the distribution of releases of the top 25 chemicals, compared to

[continued on page 50]



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

Table 3-4

M 1997

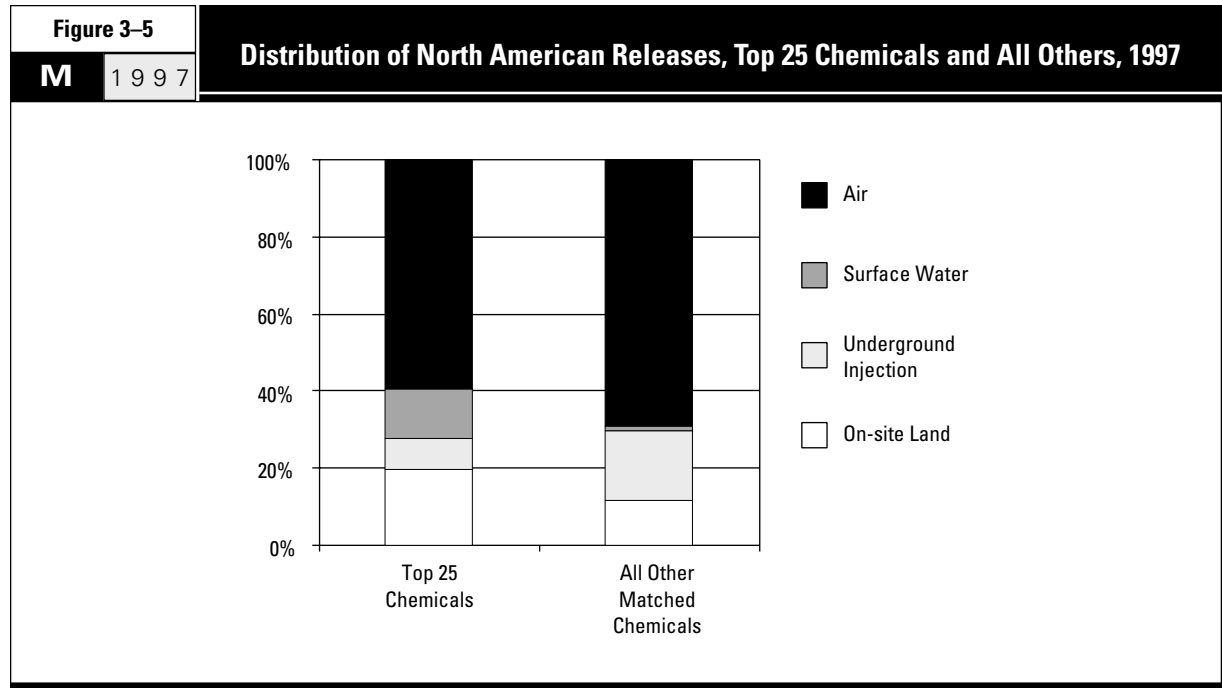
The 25 Chemicals with the Largest Releases in North America, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	NPRI/TRI as % of Total										
							Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)	Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)	
67-56-1	Methanol	103,309,718	4,307,908	10,320,650	441,758	118,386,601	15.0/ 85.0	26.8/ 73.2	22.5/ 77.5	1.6/ 98.4	16.1/ 83.9						
—	Nitric acid and nitrate compounds	1,485,737	70,092,845	27,274,131	1,551,218	100,405,925	6.9/ 93.1	3.4/ 96.6	2.0/ 98.0	2.6/ 97.4	3.1/ 96.9						
—	Zinc (and its compounds)	4,375,920	599,874	167,413	59,909,894	65,061,318	17.8/ 82.2	9.6/ 90.4	0.2/ 99.8	8.3/ 91.7	8.9/ 91.1						
108-88-3	Toluene	57,178,994	19,940	254,014	336,874	57,797,513	10.7/ 89.3	30.2/ 69.8	8.3/ 91.7	0.5/ 99.5	10.6/ 89.4						
1330-20-7	Xylene (mixed isomers)	39,882,720	19,179	73,134	37,564	40,022,182	16.0/ 84.0	14.1/ 85.9	18.5/ 81.5	7.7/ 92.3	16.0/ 84.0						
—	Manganese (and its compounds)	1,111,400	2,207,366	6,536,436	28,832,410	38,696,839	4.6/ 95.4	10.6/ 89.4	0.0/ 100.0	5.6/ 94.4	4.9/ 95.1						
7664-38-2	Phosphoric acid	832,953	19,749,343	6,012	13,708,634	34,298,617	1.9/ 98.1	0.1/ 99.9	0.0/ 100.0	0.0/ 100.0	0.1/ 99.9						
7782-50-5	Chlorine	30,097,364	126,794	27,480	33,455	30,288,037	3.0/ 97.0	10.0/ 90.0	0.0/ 100.0	0.0/ 100.0	3.0/ 97.0						
78-93-3	Methyl ethyl ketone	27,963,245	18,830	1,160,021	72,532	29,222,187	15.0/ 85.0	0.0/ 100.0	81.0/ 19.0	0.4/ 99.6	17.6/ 82.4						
7647-01-0	Hydrochloric acid	27,562,613	0	0	0	27,562,613	5.1/ 94.9	—/ —	—/ —	—/ —	5.1/ 94.9						
75-09-2	Dichloromethane	23,559,964	4,347	239,467	5,119	23,809,687	9.8/ 90.2	1.7/ 98.3	0.0/ 100.0	1.0/ 99.0	9.7/ 90.3						
75-15-0	Carbon disulfide	23,138,230	12,992	234,723	2	23,387,547	0.1/ 99.9	0.0/ 100.0	0.0/ 100.0	0.0/ 100.0	0.1/ 99.9						
—	Copper (and its compounds)	3,288,255	73,552	133,659	18,341,134	21,840,400	12.8/ 87.2	11.1/ 88.9	0.0/ 100.0	1.2/ 98.8	3.0/ 97.0						
100-42-5	Styrene	20,784,435	19,930	91,848	225,402	21,127,342	3.9/ 96.1	0.0/ 100.0	0.1/ 99.9	0.2/ 99.8	3.9/ 96.1						
74-85-1	Ethylene	15,682,265	422	1,194	52	15,684,983	12.7/ 87.3	0.5/ 99.5	0.0/ 100.0	3.8/ 96.2	12.7/ 87.3						
—	Chromium (and its compounds)	471,955	63,146	513,398	14,208,243	15,262,424	8.4/ 91.6	20.6/ 79.4	0.0/ 100.0	5.1/ 94.9	5.1/ 94.9						
7664-93-9	Sulfuric acid	13,941,694	0	0	0	13,941,694	32.0/ 68.0	—/ —	—/ —	—/ —	32.0/ 68.0						
71-36-3	n-Butyl alcohol	10,875,063	36,162	1,415,908	15,668	12,347,082	11.0/ 89.0	0.0/ 100.0	0.0/ 100.0	0.2/ 99.8	9.7/ 90.3						
50-00-0	Formaldehyde	6,786,773	317,389	4,552,904	51,377	11,712,702	23.0/ 77.0	64.7/ 35.3	1.3/ 98.7	0.0/ 100.0	15.6/ 84.4						
—	Lead (and its compounds)	1,130,933	28,090	119,761	8,785,379	10,069,524	48.3/ 51.7	19.1/ 80.9	0.0/ 100.0	7.9/ 92.1	12.4/ 87.6						
75-05-8	Acetonitrile	415,089	3,384	8,569,053	28	8,987,554	2.7/ 97.3	0.0/ 100.0	0.0/ 100.0	0.0/ 100.0	0.1/ 99.9						
79-01-6	Trichloroethylene	8,616,177	251	447	1,802	8,619,908	8.1/ 91.9	0.0/ 100.0	0.0/ 100.0	0.0/ 100.0	8.1/ 91.9						
115-07-1	Propylene	8,347,776	2,357	1,194	304	8,351,831	11.6/ 88.4	0.0/ 100.0	0.0/ 100.0	0.0/ 100.0	11.6/ 88.4						
108-10-1	Methyl isobutyl ketone	7,938,745	8,681	39,183	1,882	7,990,948	9.1/ 90.9	0.0/ 100.0	0.0/ 100.0	1.5/ 98.5	9.1/ 90.9						
7664-39-3	Hydrogen fluoride	7,349,802	14,262	0	6,823	7,370,891	23.5/ 76.5	0.0/ 100.0	—/ —	0.0/ 100.0	23.4/ 76.6						
	Subtotal	446,127,820	97,727,044	61,732,030	146,567,554	752,246,349	11.9/ 88.1	4.2/ 95.8	6.3/ 93.7	5.6/ 94.4	9.2/ 90.8						
	% of Total	87.1	98.9	78.3	92.9	88.7											
	Total	512,213,962	98,842,863	78,847,314	157,720,611	847,751,115	12.3/ 87.7	4.3/ 95.7	5.3/ 94.7	5.7/ 94.3	9.5/ 90.5						

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

other chemicals in the matched data set. Thirteen percent of total releases of the top 25 chemicals consisted of surface water discharges, while on-site land disposal represented 20 percent. For all other matched chemicals, surface waters received one percent of total releases and on-site land disposal received 12 percent (Figure 3-5).

(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

In 1997, North American facilities reported releasing 128.0 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/>> (Table 3-5). Fifteen percent of all releases in 1997 consisted of designated carcinogens.

Dichloromethane was released in the largest amount—23.8 million kg including 23.6 million kg emitted to air. Styrene ranked second among carcinogens for releases with 21.1 million kg

including 20.8 million kg of air emissions. Ranking third, chromium and its compounds had releases of 15.3 million kg, and this included 14.2 million kg of on-site land releases.

Carcinogenic substances were more likely to be released to air and less likely to be released to surface waters than other matched chemicals. Sixty-seven percent of releases of the designated carcinogens were emitted to air, compared to 59 percent for other matched chemicals. Less than one percent of the releases of carcinogenic substances were discharged to surface waters, compared to 14 percent for other matched chemicals (Figure 3-6).

The six designated carcinogens with the largest releases were also among the top 25 chemicals for total releases: dichloromethane, styrene, chromium (and its compounds), formaldehyde, lead (and its compounds) and trichloroethylene (see Table 3-4).

The 50 North American facilities with the largest releases of carcinogenic substances accounted for 38 percent of such releases, with 48.1 million kg (Figure 3-7 and Table 3-6). These facilities reported 87 percent (10.1 million kg) of the underground injection and 81 percent (23.6 million kg) of the on-site land releases of these substances.

Table 3-5		Releases in North America of Known or Suspected Carcinogens [†] , 1997				
M		1997				
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
75-09-2	Dichloromethane	23,559,964	4,347	239,467	5,119	23,809,687
100-42-5	Styrene	20,784,435	19,930	91,848	225,402	21,127,342
—	Chromium (and its compounds)	471,955	63,146	513,398	14,208,243	15,262,424
50-00-0	Formaldehyde	6,786,773	317,389	4,552,904	51,377	11,712,702
—	Lead (and its compounds)	1,130,933	28,090	119,761	8,785,379	10,069,524
79-01-6	Trichloroethylene	8,616,177	251	447	1,802	8,619,908
75-07-0	Acetaldehyde	5,967,068	104,368	206,516	53,572	6,331,624
71-43-2	Benzene	5,393,705	5,811	199,817	28,519	5,628,282
67-66-3	Chloroform	3,473,336	78,045	12,224	3,335	3,567,931
79-06-1	Acrylamide	8,166	2,881	3,208,173	138,569	3,357,989
127-18-4	Tetrachloroethylene	3,095,999	942	6,856	2,308	3,106,968
—	Nickel (and its compounds)	639,094	76,988	64,436	2,132,622	2,915,533
—	Arsenic (and its compounds)	237,381	3,399	34,544	2,615,079	2,891,228
107-13-1	Acrylonitrile	560,549	553	1,828,525	374	2,391,280
108-05-4	Vinyl acetate	1,650,099	1,211	194,114	1,082	1,846,566
106-99-0	1,3-Butadiene	1,334,885	1,185	454	133	1,336,918
75-01-4	Vinyl chloride	460,670	247	168	0	461,285
—	Cadmium (and its compounds)	65,249	1,939	24	389,886	457,198
107-06-2	1,2-Dichloroethane	434,015	854	2,062	1,331	438,272
75-21-8	Ethylene oxide	417,452	1,647	6,869	446	426,859
—	Cobalt (and its compounds)	38,314	18,330	20,255	300,841	377,928
98-95-3	Nitrobenzene	29,168	135	289,369	3	318,675
1332-21-4	Asbestos (friable)	3,289	1	0	286,359	289,649
75-56-9	Propylene oxide	259,541	10,413	5,306	402	275,662
56-23-5	Carbon tetrachloride	162,386	142	14,947	61	177,616
123-91-1	1,4-Dioxane	65,366	91,712	0	2,090	159,168
117-81-7	Di(2-ethylhexyl) phthalate	126,086	262	0	32,239	159,113
106-89-8	Epichlorohydrin	142,514	4,219	0	4,312	151,049
106-46-7	1,4-Dichlorobenzene	126,942	783	907	889	129,621
140-88-5	Ethyl acrylate	83,005	71	0	233	83,370
26471-62-5	Toluenediisocyanate (mixed isomers)	23,641	115	0	164	24,551
79-46-9	2-Nitropropane	10,761	1,265	0	0	12,026
101-77-9	4,4'-Methylenedianiline	4,185	39	6,826	0	11,050
139-13-9	Nitrilotriacetic acid	2,623	3,390	1,088	0	7,346
302-01-2	Hydrazine	5,063	5	0	113	5,181
64-67-5	Diethyl sulfate	3,365	0	0	0	3,365
62-56-6	Thiourea	465	158	2,268	113	3,004
584-84-9	Toluene-2,4-diisocyanate	2,952	2	0	0	2,964
77-78-1	Dimethyl sulfate	2,052	0	0	0	2,052
121-14-2	2,4-Dinitrotoluene	817	857	0	0	1,674
91-08-7	Toluene-2,6-diisocyanate	1,271	0	0	0	1,271
101-14-4	4,4'-Methylenebis(2-chloroaniline)	1,028	0	0	0	1,034
95-80-7	2,4-Diaminotoluene	888	0	0	0	888
96-09-3	Styrene oxide	5	0	0	0	302
94-59-7	Safrole	229	0	0	0	229
606-20-2	2,6-Dinitrotoluene	199	11	0	0	210
90-94-8	Michler's ketone	182	0	0	0	182
96-45-7	Ethylene thiourea	130	0	0	0	130
	Subtotal	86,184,372	845,133	11,623,573	29,272,397	127,958,830
	% of Total	16.8	0.9	14.7	18.6	15.1
	Total for All Matched Chemicals	512,213,962	98,842,863	78,847,314	157,720,611	847,751,115

[†] 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.

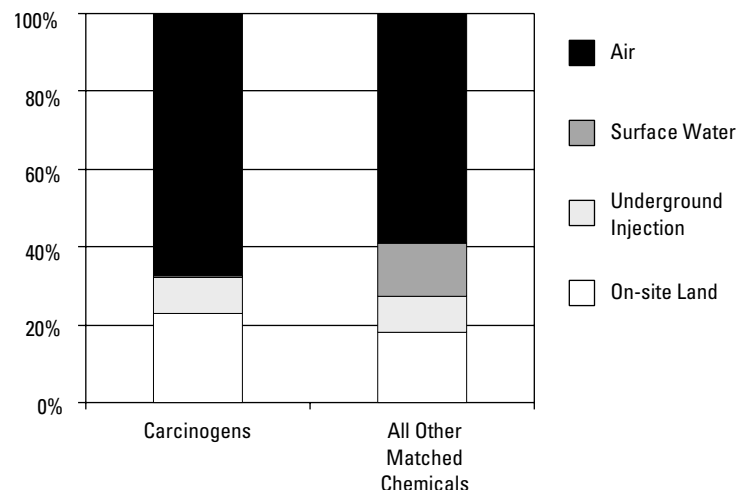
- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total				
Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)
9.8 / 90.2	1.7 / 98.3	0.0 / 100.0	1.0 / 99.0	9.7 / 90.3
3.9 / 96.1	0.0 / 100.0	0.1 / 99.9	0.2 / 99.8	3.9 / 96.1
8.4 / 91.6	20.6 / 79.4	0.0 / 100.0	5.1 / 94.9	5.1 / 94.9
23.0 / 77.0	64.7 / 35.3	1.3 / 98.7	0.0 / 100.0	15.6 / 84.4
48.3 / 51.7	19.1 / 80.9	0.0 / 100.0	7.9 / 92.1	12.4 / 87.6
8.1 / 91.9	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	8.1 / 91.9
3.8 / 96.2	3.5 / 96.5	18.4 / 81.6	0.0 / 100.0	4.2 / 95.8
26.7 / 73.3	12.7 / 87.3	17.6 / 82.4	2.3 / 97.7	26.3 / 73.7
6.2 / 93.8	7.0 / 93.0	0.0 / 100.0	0.0 / 100.0	6.2 / 93.8
4.0 / 96.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
1.7 / 98.3	3.0 / 97.0	0.0 / 100.0	0.3 / 99.7	1.7 / 98.3
46.1 / 53.9	31.1 / 68.9	0.0 / 100.0	2.0 / 98.0	12.5 / 87.5
61.8 / 38.2	45.2 / 54.8	0.0 / 100.0	0.0 / 100.0	5.2 / 94.8
0.9 / 99.1	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.3 / 99.7
8.7 / 91.3	0.0 / 100.0	72.1 / 27.9	9.2 / 90.8	15.3 / 84.7
7.9 / 92.1	2.4 / 97.6	0.0 / 100.0	0.0 / 100.0	7.9 / 92.1
9.5 / 90.5	85.0 / 15.0	0.0 / 100.0	— / —	9.5 / 90.5
61.2 / 38.8	42.8 / 57.2	0.0 / 100.0	0.1 / 99.9	9.0 / 91.0
4.2 / 95.8	3.2 / 96.8	0.0 / 100.0	99.1 / 0.9	4.5 / 95.5
3.8 / 96.2	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	3.8 / 96.2
21.4 / 78.6	9.0 / 91.0	0.0 / 100.0	3.5 / 96.5	5.5 / 94.5
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	— / —	18.5 / 81.5	18.3 / 81.7
5.0 / 95.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	4.7 / 95.3
0.2 / 99.8	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.2 / 99.8
2.0 / 98.0	2.9 / 97.1	— / —	0.0 / 100.0	2.5 / 97.5
15.3 / 84.7	0.0 / 100.0	— / —	0.1 / 99.9	12.5 / 87.5
0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0	0.0 / 100.0
6.3 / 93.7	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	6.2 / 93.8
0.1 / 99.9	0.0 / 100.0	— / —	0.0 / 100.0	0.2 / 99.8
0.6 / 99.4	0.0 / 100.0	— / —	0.0 / 100.0	3.2 / 96.8
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	0.0 / 100.0	0.0 / 100.0	— / —	39.0 / 61.0
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	— / —	— / —	0.3 / 99.7
0.5 / 99.5	— / —	— / —	— / —	0.5 / 99.5
0.0 / 100.0	95.2 / 4.8	— / —	— / —	48.7 / 51.3
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.6 / 99.4
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	98.3 / 1.7
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
10.2 / 89.8	31.4 / 68.6	2.4 / 97.6	5.2 / 94.8	8.5 / 91.5
12.3 / 87.7	4.3 / 95.7	5.3 / 94.7	5.7 / 94.3	9.5 / 90.5

Figure 3-6

Distribution of North American Releases, Known or Suspected Carcinogens[†] and All Others, 1997

M 1997



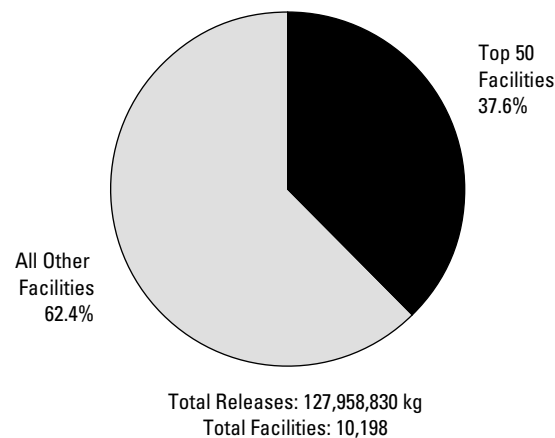
[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

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

Figure 3-7

North American Releases of Known or Suspected Carcinogens[†], Top 50 Facilities and All Others, 1997

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

Table 3-6		The 50 North American Facilities with the Largest Total Releases of Known or Suspected Carcinogens [†] , 1997			
M	1997				
Rank	Facility	City, State/Province	SIC Codes		Number of Forms
			Canada	US	
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1
2	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	5
4	Monsanto Co.	Luling, LA		28	2
5	ASARCO Inc.	East Helena, MT		33	4
6	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX		28	5
7	ASARCO Inc., Glover Plant	Annapolis, MO		33	4
8	Angus Chemical Co.	Sterlington, LA		28	4
9	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR		33	1
10	Aquaglass Corp., Masco Corp.	Adamsville, TN		30	1
11	Solutia Inc., Chocolate Bayou	Alvin, TX		28	3
12	Eastman Kodak Co., Kodak Park	Rochester, NY		38	9
13	BP Chemicals Inc., BP America Inc.	Lima, OH		28	10
14	Cytec Ind. Inc., Fortier Plant	Westwego, LA		28	5
15	Foamex L.P., Div. of Kih	Corry, PA		30	2
16	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4
17	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	6
18	Borden Chemicals & Plastics LP	Geismar, LA		28	7
19	Carpenter Co., Tupelo Div.	Verona, MS		30	2
20	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR		28	1
21	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	7
22	Northwestern Steel & Wire Co.	Sterling, IL		33	2
23	Boeing Co.	Wichita, KS		Mult.	6
24	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	5
25	Carpenter Co.	Russellville, KY		Mult.	5
26	Sterling Chemicals Inc.	Texas City, TX		28	9
27	Foamex Intl Inc.	Milan, TN		30	2
28	FMC Corp.	Pocatello, ID		28	4
29	GE Co.	Ottawa, IL		28	4
30	Vitafoam Inc., British Vita PLC	Tupelo, MS		30	3
31	Carpenter Co.	Richmond, VA		Mult.	3
32	Carpenter Co.	Elkhart, IN		Mult.	3
33	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN		30	1
34	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR		28	2
35	GE Plastics Co., GE Co.	Mount Vernon, IN		28	4
36	Foamex L.P., Foamex Intl. Inc.	Morristown, TN		30	2
37	Celanese Canada Inc.	Edmonton, AB	37	28	6
38	General Foam Corp., PMC Inc.	West Hazelton, PA		30	3
39	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR		33	1
40	Elkem Metals Co.	Marietta, OH		33	4
41	DuPont	Pass Christian, MS		28	4
42	Nu-Foam Prods. Inc., Ohio Decorative Prods. Inc.	Chattanooga, TN		30	2
43	Tomkins Ind. Inc., Lasco Bathware Div.	Three Rivers, MI		30	1
44	Flexible Foam Prods., Ohio Decorative Prods. Inc.	Elkhart, IN		30	2
45	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA		30	1
46	Cleveland Laminating Corp.	Cleveland, OH		26	1
47	Weyerhaeuser Co.	Longview, WA		Mult.	5
48	Kimberly-Clark Corp.	Mobile, AL		26	2
49	3V Inc.	Georgetown, SC		28	4
50	Dofasco Inc.	Hamilton, ON	29	33	5
Subtotal					180
% of Total					1.1
Total for All Matched Carcinogens					17,017

[†] 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.

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
2	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
3	27,487	452	0	4,073,128	4,101,067	Lead/Arsenic and compounds (land)
4	15,601	0	3,221,043	0	3,236,644	Formaldehyde (UIJ)
5	23,355	1,262	0	1,739,278	1,763,895	Lead and compounds (land)
6	20,563	0	1,690,118	656	1,711,337	Acrylamide, Acrylonitrile (UIJ)
7	21,141	5	0	1,582,218	1,603,364	Lead and compounds (land)
8	12,481	1,956	1,126,995	0	1,141,432	Formaldehyde (UIJ)
9	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
10	1,057,867	0	0	0	1,057,867	Styrene (air)
11	13,064	0	1,025,986	0	1,039,050	Acrylonitrile (UIJ)
12	980,987	25,565	0	6,803	1,013,355	Dichloromethane (air)
13	27,171	0	965,267	0	992,438	Acrylamide (UIJ)
14	4,009	235	979,139	0	983,383	Acrylamide (UIJ)
15	903,448	0	0	0	903,448	Dichloromethane (air)
16	248,650	0	0	649,000	897,650	Chromium and compounds (land)
17	13,177	267	0	833,526	846,970	Lead/Arsenic/Chromium and compounds (land)
18	815,549	187	9	0	815,745	Benzene (air)
19	704,215	0	0	0	704,215	Dichloromethane (air)
20	689,524	0	0	0	689,524	Dichloromethane (air)
21	8,074	0	0	672,109	680,183	Lead/Chromium and compounds (land)
22	4,921	345	0	593,651	598,917	Chromium/Lead and compounds (land)
23	595,943	452	0	0	596,395	Tetrachloroethylene (air)
24	99,783	98	0	494,901	594,782	Lead and compounds (land)
25	571,776	0	0	0	571,776	Dichloromethane (air)
26	67,453	0	481,566	0	549,019	Acrylamide (UIJ)
27	521,285	0	0	0	521,285	Dichloromethane (air)
28	2,924	0	0	477,785	480,709	Chromium/Cadmium and compounds (land)
29	446,033	117	0	115	446,265	Styrene, Acrylonitrile (air)
30	425,644	0	0	0	425,644	Dichloromethane (air)
31	414,129	0	0	0	414,129	Dichloromethane (air)
32	408,975	0	0	0	408,975	Dichloromethane (air)
33	404,393	0	0	0	404,393	Styrene (air)
34	396,123	0	0	0	396,123	Dichloromethane (air)
35	392,178	270	0	0	392,448	Dichloromethane (air)
36	392,006	0	0	0	392,006	Dichloromethane (air)
37	151,422	0	227,000	0	378,422	Vinyl acetate, Acetaldehyde (UIJ)
38	377,050	0	0	0	377,050	Dichloromethane (air)
39	0	88	0	365,306	365,394	Nickel and compounds (land)
40	27,223	5,442	0	326,985	359,650	Chromium and compounds (land)
41	0	0	358,277	0	358,277	Chromium and compounds (UIJ)
42	354,187	0	0	0	354,187	Dichloromethane (air)
43	352,562	0	0	0	352,562	Styrene (air)
44	350,198	0	0	0	350,198	Dichloromethane (air)
45	347,116	0	0	0	347,116	Styrene (air)
46	346,032	0	0	0	346,032	Dichloromethane (air)
47	320,666	19,157	0	0	339,823	Acetaldehyde (air)
48	316,100	11,792	0	0	327,892	Chloroform (air)
49	319,397	0	0	0	319,397	Dichloromethane (air)
50	315,968	446	0	82	316,496	Benzene (air)
	14,347,632	68,270	10,075,400	23,581,208	48,072,510	
	16.6	8.1	86.7	80.6	37.6	
	86,184,372	845,133	11,623,573	29,272,397	127,958,830	

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

► UIJ=underground injection

Metals

Releases of the 15 metals and metal compounds reportable to both NPRI and TRI totaled 161.0 million kg in North America in 1997, 19 percent of total releases. The great majority (137.8 million kg) was released to on-site land disposal (**Table 3-7**). On-site land releases of metals and their compounds accounted for 16 percent of all releases of all substances in the matched data set. Thus, the pattern of releases for metals contrasted sharply with the pattern of releases for non-metal substances in the matched data set. On-site land releases amounted to 86 percent of all metals releases but only three percent of releases of all other matched chemicals (**Figure 3-8**).

Zinc and its compounds ranked first for total releases, followed by manganese and copper and their compounds. Of the 65.1 million kg of releases of zinc and zinc compounds, 59.9 million kg were released on-site to land.

On-site land releases constituted more than 60 percent of the releases of 13 of the 15 metals. The exceptions were mercury and vanadium; 62 percent (6,596 kg) of the releases of mercury and its compounds and 79 percent of the releases of vanadium (217,869 kg) were emitted to air. (Mercury is used in making chlorine gas and caustic soda and in thermometers, batteries, mercury lamps, and other products. Mercury salts are used in ointments. Mercury is also a catalyst for 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 3-7		Releases in North America of Metals and Their Compounds, 1997				
M	1997					
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	4,375,920	599,874	167,413	59,909,894	65,061,318
—	Manganese (and its compounds)	1,111,400	2,207,366	6,536,436	28,832,410	38,696,839
—	Copper (and its compounds)	3,288,255	73,552	133,659	18,341,134	21,840,400
—	Chromium (and its compounds)	471,955	63,146	513,398	14,208,243	15,262,424
—	Lead (and its compounds)	1,130,933	28,090	119,761	8,785,379	10,069,524
—	Nickel (and its compounds)	639,094	76,988	64,436	2,132,622	2,915,533
—	Arsenic (and its compounds)	237,381	3,399	34,544	2,615,079	2,891,228
7429-90-5	Aluminum (fume or dust)	783,402	19,548	0	1,473,752	2,278,190
—	Antimony (and its compounds)	47,966	19,511	5,538	565,945	639,540
—	Cadmium (and its compounds)	65,249	1,939	24	389,886	457,198
—	Cobalt (and its compounds)	38,314	18,330	20,255	300,841	377,928
7440-62-2	Vanadium (fume or dust)	217,869	484	0	56,156	274,610
—	Selenium (and its compounds)	42,338	5,091	1,546	144,258	193,895
—	Silver (and its compounds)	8,310	3,005	71	18,641	30,027
—	Mercury (and its compounds)	6,596	192	19	3,758	10,571
	Subtotal	12,464,982	3,120,515	7,597,100	137,777,998	160,999,225
	% of Total	2.4	3.2	9.6	87.4	19.0
	Total for All Matched Chemicals	512,213,962	98,842,863	78,847,314	157,720,611	847,751,115

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

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

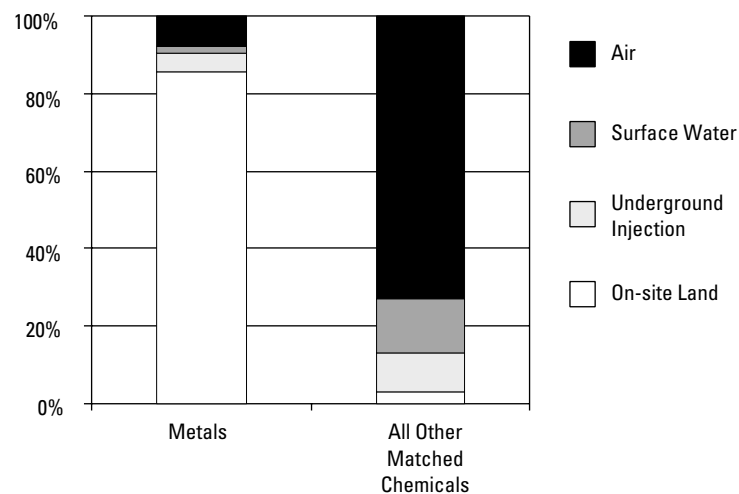
The 50 facilities with the largest releases of metals and metal compounds reported the overwhelming majority—84 percent—of such releases in 1997. They reported 135.8 million kg of releases of metals, including 122.3 million kg released on-site to land. They also reported 7.3 million kg of underground injection of these substances (96 percent of that total—see **Figure 3-9** and **Table 3-8**).

NPRI/TRI as % of Total				
Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)
17.8 / 82.2	9.6 / 90.4	0.2 / 99.8	8.3 / 91.7	8.9 / 91.1
4.6 / 95.4	10.6 / 89.4	0.0 / 100.0	5.6 / 94.4	4.9 / 95.1
12.8 / 87.2	11.1 / 88.9	0.0 / 100.0	1.2 / 98.8	3.0 / 97.0
8.4 / 91.6	20.6 / 79.4	0.0 / 100.0	5.1 / 94.9	5.1 / 94.9
48.3 / 51.7	19.1 / 80.9	0.0 / 100.0	7.9 / 92.1	12.4 / 87.6
46.1 / 53.9	31.1 / 68.9	0.0 / 100.0	2.0 / 98.0	12.5 / 87.5
61.8 / 38.2	45.2 / 54.8	0.0 / 100.0	0.0 / 100.0	5.2 / 94.8
8.0 / 92.0	1.7 / 98.3	— / —	31.9 / 68.1	23.5 / 76.5
12.1 / 87.9	3.1 / 96.9	0.0 / 100.0	0.1 / 99.9	1.1 / 98.9
61.2 / 38.8	42.8 / 57.2	0.0 / 100.0	0.1 / 99.9	9.0 / 91.0
21.4 / 78.6	9.0 / 91.0	0.0 / 100.0	3.5 / 96.5	5.5 / 94.5
97.4 / 2.6	33.7 / 66.3	— / —	5.1 / 94.9	78.4 / 21.6
10.9 / 89.1	78.4 / 21.6	0.0 / 100.0	0.0 / 100.0	4.8 / 95.2
15.1 / 84.9	5.7 / 94.3	0.0 / 100.0	0.3 / 99.7	4.9 / 95.1
0.8 / 99.2	1.0 / 99.0	0.0 / 100.0	4.9 / 95.1	2.3 / 97.7
21.0 / 79.0	11.2 / 88.8	0.0 / 100.0	6.4 / 93.6	7.3 / 92.7
12.3 / 87.7	4.3 / 95.7	5.3 / 94.7	5.7 / 94.3	9.5 / 90.5

Figure 3-8

Distribution of North American Releases, Metals and Their Compounds and All Others, 1997

M 1997

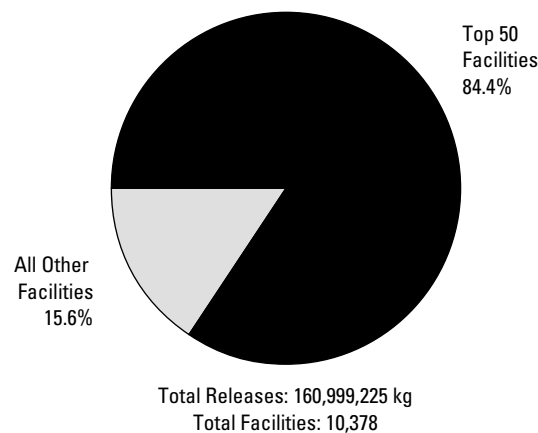


► Canada and US data only. Mexico data not collected for 1997.

Figure 3-9

North American Releases of Metals and Their Compounds, Top 50 Facilities and All Others, 1997

M 1997



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

Table 3-8		The 50 North American Facilities with the Largest Total Releases of Metals and Their Compounds, 1997			
Rank	Facility	City, State/Province	SIC Codes		Number of Forms
			Canada	US	
1	ASARCO Inc.	East Helena, MT		33	9
2	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	10
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	8
4	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	11
5	Northwestern Steel & Wire Co.	Sterling, IL		33	4
6	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN		33	11
7	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1
8	GM Powertrain Defiance, General Motors Corp.	Defiance, OH		33	6
9	Elkem Metals Co.	Marietta, OH		33	5
10	ASARCO Inc., Glover Plant	Annapolis, MO		33	7
11	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1
12	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	8
13	DuPont	Pass Christian, MS		28	6
14	DuPont	New Johnsonville, TN		28	5
15	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ		33	11
16	Granite City Steel, National Steel Corp.	Granite City, IL		33	6
17	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5
18	FMC Corp.	Pocatello, ID		28	9
19	USS Fairfield Works, USX Corp.	Fairfield, AL		33	8
20	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS		Mult.	3
21	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	5
22	Chemetals Inc., Comilog	New Johnsonville, TN		28	1
23	Louisiana Pigment Co. L.P.	Westlake, LA		28	1
24	Co-Steel Lasco	Whitby, ON	29	33	6
25	Kerr-McGee Chemical LLC	Henderson, NV		28	2
26	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR		33	1
27	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6
28	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC		22	7
29	P4 Production L.L.C.	Soda Springs, ID		Mult.	4
30	Austeel Lemont Co. Inc.	Lemont, IL		33	5
31	Imco Recycling Inc.	Morgantown, KY		33	4
32	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6
33	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	5
34	Millennium Inorganic Chemicals, Millennium Chemicals Inc.	Baltimore, MD		28	2
35	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI		33	6
36	Bethlehem Steel Corp.	Sparrows Point, MD		33	6
37	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	11
38	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL		33	5
39	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6
40	Griffin Wheel Co., Amsted Ind. Inc.	Keokuk, IA		33	2
41	GE Co., Silicone Prods.	Waterford, NY		28	2
42	Geneva Steel	Vineyard, UT		33	8
43	LTV Steel Co. Inc.	East Chicago, IN		33	4
44	Griffin Wheel Co., Columbus Plant, Amsted Ind. Inc.	Groveport, OH		33	2
45	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5
46	Georgia-Pacific Corp.	Ashdown, AR		26	3
47	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR		33	1
48	Griffin Wheel Co., Amsted Ind. Inc.	Bessemer, AL		33	2
49	Griffin Wheel Co., Amsted Ind. Inc.	Kansas City, KS		33	2
50	Great Southern Paper Co., Georgia-Pacific Corp.	Cedar Springs, GA		26	5
	Subtotal				259
	% of Total				1.2
	Total for All Matched Metals				21,727

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

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	40,338	2,280	0	17,100,454	17,143,072	Zinc and compounds (land)
2	133,922	3,644	0	12,048,532	12,186,098	Zinc/Copper and compounds (land)
3	71,865	4,215	0	10,900,498	10,976,578	Copper/Zinc/Lead and compounds (land)
4	18,596	0	0	8,503,492	8,522,088	Copper and compounds (land)
5	55,261	1,179	0	6,716,100	6,772,540	Zinc/Manganese and compounds (land)
6	140,596	7,755	0	6,450,341	6,598,692	Zinc and compounds (land)
7	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
8	33,575	2,175	0	5,564,083	5,599,833	Zinc and compounds (land)
9	174,615	205,442	0	4,752,382	5,132,439	Manganese and compounds (land)
10	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
11	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
12	118,721	183	0	3,839,901	3,958,805	Zinc and compounds (land)
13	0	0	3,809,524	0	3,809,524	Manganese and compounds (UIJ)
14	0	0	3,516,553	0	3,516,553	Manganese and compounds (UIJ)
15	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
16	22,216	5,704	0	2,667,815	2,695,735	Zinc and compounds (land)
17	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
18	4,674	338	0	2,167,628	2,172,640	Zinc/Chromium and compounds (land)
19	6,353	794	0	2,133,209	2,140,356	Zinc and compounds (land)
20	4,354	6,145	0	2,066,666	2,077,165	Manganese and compounds (land)
21	22,322	152	0	1,730,140	1,752,614	Zinc and compounds (land)
22	15,556	583	0	1,523,810	1,539,949	Manganese and compounds (land)
23	9	122	0	1,405,896	1,406,027	Manganese and compounds (land)
24	14,253	362	0	1,245,254	1,259,869	Zinc and compounds (land)
25	6,077	0	0	1,152,381	1,158,458	Manganese and compounds (land)
26	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
27	365,986	0	0	649,000	1,014,986	Chromium and compounds (land), Nickel and compounds (air)
28	969,901	0	0	0	969,901	Zinc and compounds (air)
29	35,863	226	0	905,652	941,741	Zinc and compounds (land)
30	12,521	226	0	766,139	778,886	Zinc and compounds (land)
31	14,163	0	0	739,864	754,027	Aluminum (land)
32	12,053	47	0	717,505	729,605	Zinc/Manganese and compounds (land)
33	706,574	3,780	0	0	710,354	Zinc/Lead and compounds (air)
34	0	68,027	0	603,175	671,202	Manganese and compounds (land)
35	15,320	0	0	561,405	576,725	Zinc/Manganese and compounds (land)
36	7,758	19,570	0	471,883	499,211	Manganese and compounds (land)
37	482,280	15,840	0	0	498,120	Lead/Copper/Zinc and compounds (air)
38	24,617	0	0	459,411	484,028	Chromium and compounds, Aluminum (land)
39	18,012	2,682	0	442,030	462,724	Manganese and compounds (land)
40	8,164	0	0	446,893	455,057	Manganese and compounds (land)
41	454	6,984	0	444,671	452,109	Copper and compounds (land)
42	1,169	771	0	437,700	439,640	Manganese/Zinc and compounds (land)
43	6,508	1,383	0	425,397	433,288	Manganese and compounds (land)
44	8,164	0	0	423,423	431,587	Manganese and compounds (land)
45	0	0	0	402,950	402,950	Zinc/Lead and compounds (land)
46	2,998	88,436	0	290,395	381,829	Manganese and compounds (land)
47	0	88	0	365,306	365,394	Nickel and compounds (land)
48	3,583	0	0	355,157	358,740	Manganese and compounds (land)
49	3,583	0	0	321,290	324,873	Manganese and compounds (land)
50	33,760	19,464	0	266,811	320,035	Zinc/Manganese and compounds (land)
	5,780,452	469,291	7,326,077	122,265,927	135,841,747	
	46.4	15.0	96.4	88.7	84.4	
	12,464,982	3,120,515	7,597,100	137,777,998	160,999,225	

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

► UIJ=underground injection

Releases by Industry

In 1997, the chemical manufacturing industry reported 272.9 million kg of on-site releases of substances in the matched data set, 32 percent of the North American total and the largest amount reported by any industry (Table 3-9 and Figure 3-10). This included the largest air emissions (113.7 million kg), nearly half the surface water discharges (47.2 million kg) and almost all of the underground injection (78.1 million kg).

The primary metals industry ranked second for total releases in 1997 with 190.0 million kg. This included more than two-thirds of all on-site land releases, or 109.7 million kg. As noted in the previous section, metals and metal compounds in industrial waste are typically released on-site to land (or transferred off-site to land disposal, as discussed in Chapter 4). Chapter 7 examines the primary metals industry in greater depth.

Pulp and paper production accounted for the third-largest total releases in 1997. The paper products industry reported releases of 112.3 million kg, including air emissions of 97.3 million kg. (A special chapter in *Taking Stock 1995* examined the pulp and paper industry and its PRTR reporting and identified influences that have contributed to large reductions in releases for this sector since 1995.)

Together, the top three industries reported 68 percent of all on-site releases in North America in 1997.

Table 3-9		Releases in North America by Industry, 1997				
M	1997					
US SIC Rank	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	28 Chemicals	113,693,205	47,151,749	78,122,963	33,873,604	272,904,779
2	33 Primary Metals	58,115,488	21,996,486	170,771	109,735,033	190,032,817
3	26 Paper Products	97,305,455	9,241,146	13,197	5,775,791	112,338,644
4	30 Rubber and Plastics Products	44,638,371	6,346	0	402,885	45,055,140
5	37 Transportation Equipment	42,317,214	110,814	0	263,853	42,699,007
6	Multiple Codes 20-39*	33,568,587	4,991,863	231	3,573,169	42,133,850
7	29 Petroleum and Coal Products	21,436,142	5,257,182	538,853	784,473	28,019,407
8	34 Fabricated Metals Products	21,721,052	637,815	3	387,233	22,761,249
9	24 Lumber and Wood Products	13,046,929	17,776	0	21,308	13,087,552
10	27 Printing and Publishing	12,187,084	4,249	0	113	12,191,946
11	32 Stone/Clay/Glass Products	10,493,573	24,676	0	1,530,176	12,050,633
12	20 Food Products	2,935,202	7,719,766	2	872,630	11,527,600
13	25 Furniture and Fixtures	11,371,130	17	0	5,515	11,377,301
14	22 Textile Mill Products	7,570,432	154,069	0	92,657	7,817,258
15	36 Electronic/Electrical Equipment	5,684,149	846,004	1,292	185,533	6,720,557
16	35 Industrial Machinery	6,409,666	3,757	0	104,668	6,518,894
17	38 Measurement/Photographic Instruments	4,033,302	587,910	0	55,644	4,676,856
18	39 Misc. Manufacturing Industries	4,389,928	1,027	2	40,961	4,434,996
19	21 Tobacco Products	585,081	77,587	0	0	662,668
20	31 Leather Products	474,005	10,039	0	4,484	488,528
21	23 Apparel and Other Textile Products	237,967	2,585	0	10,881	251,433
Total for All Matched Industries		512,213,962	98,842,863	78,847,314	157,720,611	847,751,115

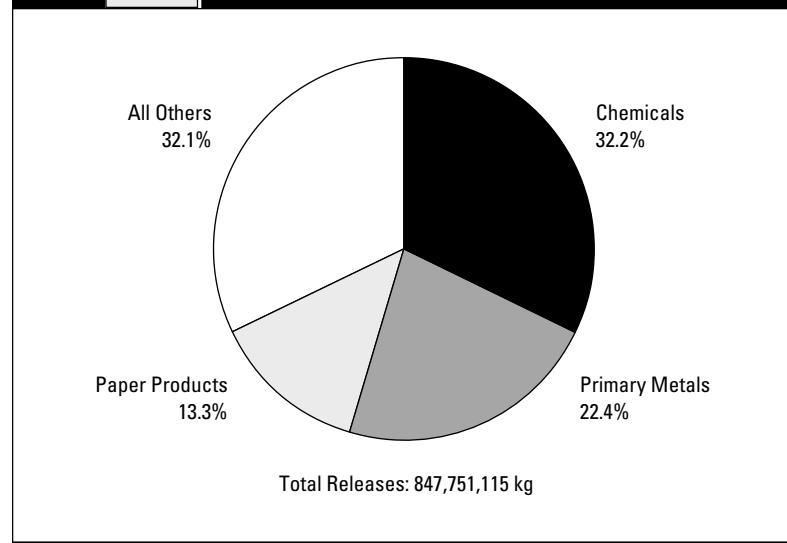
* Multiple SIC codes reported only in US data.
 ► Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total				
Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)
11.6 / 88.4	1.8 / 98.2	5.3 / 94.7	0.2 / 99.8	6.7 / 93.3
16.8 / 83.2	3.1 / 96.9	0.0 / 100.0	7.8 / 92.2	10.0 / 90.0
15.3 / 84.7	20.4 / 79.6	0.0 / 100.0	4.6 / 95.4	15.2 / 84.8
13.2 / 86.8	8.0 / 92.0	— / —	8.3 / 91.7	13.2 / 86.8
14.5 / 85.5	0.4 / 99.6	— / —	2.4 / 97.6	14.4 / 85.6
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
19.6 / 80.4	7.1 / 92.9	13.2 / 86.8	2.1 / 97.9	16.7 / 83.3
9.3 / 90.7	0.1 / 99.9	0.0 / 100.0	0.4 / 99.6	9.0 / 91.0
16.9 / 83.1	82.0 / 18.0	— / —	0.0 / 100.0	17.0 / 83.0
13.2 / 86.8	86.9 / 13.1	— / —	0.0 / 100.0	13.2 / 86.8
8.2 / 91.8	19.4 / 80.6	— / —	0.4 / 99.6	7.2 / 92.8
2.2 / 97.8	5.4 / 94.6	0.0 / 100.0	2.8 / 97.2	4.4 / 95.6
6.9 / 93.1	0.0 / 100.0	— / —	0.0 / 100.0	6.9 / 93.1
3.7 / 96.3	0.0 / 100.0	— / —	0.0 / 100.0	3.6 / 96.4
1.3 / 98.7	0.3 / 99.7	0.0 / 100.0	2.4 / 97.6	1.2 / 98.8
4.2 / 95.8	0.5 / 99.5	— / —	0.0 / 100.0	4.1 / 95.9
0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0	0.0 / 100.0
12.2 / 87.8	38.9 / 61.1	0.0 / 100.0	81.2 / 18.8	12.9 / 87.1
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.0 / 100.0
5.0 / 95.0	0.0 / 100.0	— / —	0.0 / 100.0	4.8 / 95.2
0.1 / 99.9	0.0 / 100.0	— / —	0.0 / 100.0	0.1 / 99.9
12.3 / 87.7	4.3 / 95.7	5.3 / 94.7	5.7 / 94.3	9.5 / 90.5

Figure 3-10

M 1997

North American Top Three Industries for Total Releases, 1997



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

3.2.2 NPRI and TRI Releases

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

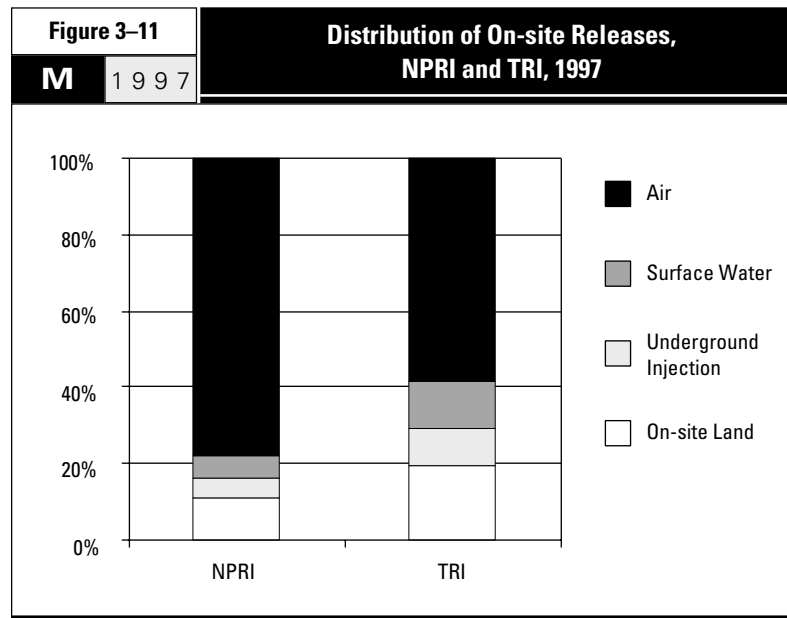
Overview

In the matched data set, a total of 1,430 facilities submitted NPRI reports in 1997, while 19,125 facilities reported to TRI. NPRI submissions totaled 4,599 forms; the TRI total was 58,252 (Table 3-10).

Emissions to air were the largest release type in both Canada (62.8 million kg) and the United States (449.4 million kg). On-site land disposal received the second-largest amounts of releases in both PRTRs: 9.1 million kg in NPRI and 148.7 million kg in TRI. NPRI facilities reported releasing 4.2 million kg each to surface waters and to underground injection. In TRI, surface water discharges totaled 94.6 million kg and underground injection totaled 74.6 million kg.

The percentage distribution of releases differed substantially between NPRI and TRI. In NPRI, air emissions represented 78 percent of all on-site releases, a much higher proportion than TRI's 59 percent. Surface water discharges were more than twice the percentage of total releases in TRI (12 percent) compared to NPRI (five percent). Similarly, underground injection amounted to nearly 10 percent of TRI releases and five percent of NPRI releases. The differential was only slightly less for on-site land releases, which amounted to 19 percent of TRI releases and 11 percent of those in NPRI (Figure 3-11).

Table 3-10		On-site Releases, NPRI and TRI, 1997			
M	1997	NPRI		TRI	
		Number		Number	
Total Facilities		1,430		19,125	
Total Forms		4,599		58,252	
		kg	%	kg	%
Total Air Emissions		62,838,622	78.1	449,375,340	58.6
Surface Water Discharges		4,224,169	5.3	94,618,694	12.3
Underground Injection		4,197,660	5.2	74,649,654	9.7
On-site Land Releases		9,062,108	11.3	148,658,503	19.4
Matched Releases		80,448,924	100.0	767,302,191	100.0



Top Facilities

In NPRI, the 50 facilities with the largest releases represented 3.5 percent of all NPRI facilities (in the 1997 matched data set). In TRI, the 50 facilities with the largest releases represented just 0.3 percent of all TRI facilities because of the much larger number of reporting facilities.

The 50 NPRI facilities with the largest releases in 1997 reported 54 percent—43.6 million kg—of NPRI's on-site releases. In TRI, the 50 facilities with the largest releases reported 37 percent—279.9 million kg—of the total (Tables 3-11 and 3-12 and Figure 3-12).

In NPRI, the 50 facilities with the largest releases reported air emissions of 29.6 million kg, 47 percent of all

NPRI air emissions. In TRI, 65.1 million kg of air emissions by the facilities with the largest releases amounted to just 15 percent of the TRI total. In both countries, the top 50 facilities for releases reported approximately half the surface water discharges. These were 2.1 million kg in NPRI (50 percent of all NPRI surface water discharges) and 43.6 million kg in TRI (46 percent).

Facilities with the largest releases also reported the majority of underground injection and on-site land releases in both countries. However, NPRI facilities reported larger percentages of NPRI's total in these categories than was the case in TRI. The 50 NPRI facilities reported 4.1 million kg of underground injection (98 percent of NPRI's total) and 7.8 million kg of on-

site land releases (86 percent). The 50 TRI facilities reported 60.9 million kg of underground injection (82 percent of TRI's total) and 110.3 million kg of on-site land releases (74 percent).

Releases reported by the two groups of facilities thus showed conspicuous differences. Surface water discharges, underground injection and on-site land releases by the TRI facilities with the largest releases amounted to more than twice the proportion of such releases for the NPRI facilities with the largest amounts. Conversely, air emissions for the NPRI facilities with the largest amounts of on-site releases were almost three times those of TRI facilities with the largest amounts (68 percent versus 23 percent—Figure 3-13).

Table 3-11		The 50 NPRI Facilities with the Largest Total On-site Releases, 1997				
Rank	Facility	City, State/Province	SIC Codes		Number of Forms	
			Canada	US		
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7	
2	Celanese Canada Inc.	Edmonton, AB	37	28	11	
3	Ispat Sidbec Inc. Acière, Ispat Mexicana	Contrecoeur, QC	29	33	5	
4	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	7	
5	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	7	
6	Bayer Inc., Bayer AG	Sarnia, ON	37	28	17	
7	General Motors of Canada Ltd., Oshawa Car Assembly Plant	Oshawa, ON	32	37	13	
8	Co-Steel Lasco	Whitby, ON	29	33	6	
9	Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John, NB	27	26	4	
10	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	10	
11	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28	15	
12	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	8	
13	Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge, ON	16	30	8	
14	Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga, ON	28	27	2	
15	Methanex Corporation	Medicine Hat, AB	37	28	3	
16	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28	4	
17	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	23	
18	Morbern Incorporated	Cornwall, ON	16	30	3	
19	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28	10	
20	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	6	
21	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6	
22	Sunworthy Wallcoverings, Borden Co. Ltd.	Brampton, ON	27	26	2	
23	International Wallcoverings Ltd.	Brampton, ON	27	26	4	
24	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	4	
25	Avenor Inc., Dryden Mill	Dryden, ON	27	26	7	
26	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	16	
27	Paintplas Inc.	Ajax, ON	32	30	10	
28	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	11	
29	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	5	
30	Ford Motor Company, Oakville Assembly Plant	Oakville, ON	32	37	11	
31	Papiers Domtar - Centre d'affaires Windsor	Windsor, QC	27	26	6	
32	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	12	
33	Alcan Smelters and Chemicals Ltd.	Kitimat, BC	29	33	4	
34	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	2	
35	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28	6	
36	MB Paper Ltd., Powell River Division	Powell River, BC	27	26	4	
37	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26	4	
38	Dofasco Inc.	Hamilton, ON	29	33	18	
39	Cartons St-Laurent Inc.	LaTuque, QC	27	26	8	
40	Standard Products (Canada) Limited, Rubber Plant #1	Stratford, ON	15	30	3	
41	Canfor Pulp & Paper Mills, Canadian Forest Products Ltd.	Prince George, BC	27	26	4	
42	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26	4	
43	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5	
44	Avenor Inc., Gold River Operations	Gold River, BC	27	26	6	
45	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26	6	
46	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	18	
47	General Motors of Canada Ltd., Oshawa Truck Assembly Centre	Oshawa, ON	32	37	14	
48	Société canadienne de métaux Reynolds, Reynolds Metals Co.	Baie-Comeau, QC	29	33	6	
49	Kimberly-Clark Corporation	Terrace Bay, ON	27	26	4	
50	Pétromont, Société en commandite	Varenes, QC	37	28	10	
Subtotal					389	
% of Total					8.5	
Total					4,599	

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	4,259,786	0	0	649,000	4,908,786	Sulfuric acid (air)
2	294,315	0	3,542,000	593	3,836,908	Methanol, Methyl ethyl ketone (UIJ)
3	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
4	2,045,900	480	0	0	2,046,380	Cyclohexane (air)
5	22,992	165	0	1,759,790	1,782,947	Zinc and compounds (land)
6	1,397,853	22,937	0	0	1,421,799	Cyclohexane, Chloromethane (air)
7	1,299,755	0	0	0	1,299,855	Xylene, Toluene (air)
8	14,253	362	0	1,245,254	1,259,869	Zinc and compounds (land)
9	246,211	824,078	0	0	1,070,289	Methanol (water)
10	845,060	15,550	0	96,347	956,957	Methanol (air)
11	205,010	160,160	570,160	0	935,330	Nitric acid and nitrate compounds (UIJ, water)
12	874,078	724	0	0	874,802	Methanol (air)
13	817,865	0	0	0	817,865	Methyl ethyl ketone (air)
14	797,000	0	0	0	797,000	Methanol (air)
15	790,620	0	0	80	790,700	Methanol (air)
16	761,100	0	900	0	762,000	Methanol (air)
17	474,924	280,405	0	4,784	760,113	Nitric acid and nitrate compounds (water), Methanol, Vanadium, Methyl isobutyl ketone, Methyl ethyl ketone (air)
18	757,500	0	0	0	757,500	Methyl ethyl ketone (air)
19	750,109	0	0	0	750,109	Methyl ethyl ketone, Methanol, Toluene (air)
20	740,792	3,780	0	0	744,572	Zinc/Lead and compounds (air)
21	12,053	47	0	717,505	729,605	Zinc/Manganese and compounds (land)
22	707,900	0	0	0	707,900	Methyl ethyl ketone, Toluene (air)
23	669,500	0	0	0	669,500	Methyl ethyl ketone, Toluene (air)
24	588,500	11,130	0	6,870	606,500	Chlorine dioxide, Methanol, Chlorine (air)
25	597,481	1,610	0	2,001	601,092	Methanol (air)
26	103,757	31,645	0	442,030	577,432	Manganese and compounds (land)
27	552,000	0	0	0	552,000	Xylene, Toluene, Methyl isobutyl ketone (air)
28	24,567	524,450	0	0	549,017	Nitric acid and nitrate compounds (water)
29	521,402	20,700	0	0	542,102	Methanol, Chlorine (air)
30	531,275	0	0	0	531,275	Xylene, 1,2,4-Trimethylbenzene, n-Butyl alcohol (air)
31	470,060	56,100	0	0	527,484	Methanol (air)
32	499,280	15,840	0	0	515,120	Lead/Copper/Zinc and compounds (air)
33	485,800	0	0	0	485,800	Hydrogen fluoride (air)
34	474,000	0	0	0	474,000	Methanol (air)
35	444,335	0	0	0	444,335	Ethylene glycol, Ethylene (air)
36	443,000	0	0	0	443,270	Methanol (air)
37	442,050	0	0	0	442,050	Methanol (air)
38	424,762	6,176	0	125	431,063	Benzene (air)
39	391,679	39,052	0	0	430,731	Methanol (air)
40	427,400	0	0	0	427,400	Xylene (air)
41	418,400	0	0	0	418,400	Methanol (air)
42	412,600	0	0	0	412,600	Methanol, Chlorine (air)
43	0	0	0	402,950	402,950	Zinc/Lead and compounds (land)
44	401,100	0	0	0	401,100	Methanol (air)
45	196,200	74,800	0	127,400	398,400	Manganese and compounds (land, water), Methanol (air)
46	391,146	2,259	0	0	393,911	Hydrochloric acid, Ethylene, Benzene (air)
47	391,423	0	0	0	391,461	Xylene, n-Butyl alcohol (air)
48	388,581	0	0	0	388,581	Hydrogen fluoride (air)
49	387,820	90	0	0	387,910	Methanol (air)
50	386,842	34	0	0	386,876	Propylene, Ethylene (air)
	29,628,871	2,093,124	4,113,060	7,755,134	43,593,436	
	47.2	49.6	98.0	85.6	54.2	
	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924	

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

► UIJ = underground injection

Table 3-12		The 50 TRI Facilities with the Largest Total On-site Releases, 1997		
M	1997			
Rank	Facility	City, State	US SIC Code	Number of Forms
1	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT	33	6
2	ASARCO Inc.	East Helena, MT	33	10
3	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28	12
4	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	13
5	Armco Inc. (Route 8 S.)	Butler, PA	33	14
6	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	14
7	Solutia Inc.	Gonzalez, FL	28	18
8	DuPont	Victoria, TX	28	29
9	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	13
10	Lenzing Fibers Corp.	Lowland, TN	28	5
11	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	24
12	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	33
13	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28	4
14	Northwestern Steel & Wire Co.	Sterling, IL	33	6
15	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	2
16	BASF Corp.	Freeport, TX	28	26
17	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	20
18	Elkem Metals Co.	Marietta, OH	33	6
19	ASARCO Inc., Glover Plant	Annapolis, MO	33	7
20	BP Chemicals Inc., BP America Inc.	Lima, OH	28	27
21	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	17
22	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1
23	DuPont	Pass Christian, MS	28	11
24	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28	6
25	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	9
26	Vicksburg Chemical Co.	Vicksburg, MS	28	3
27	DuPont	New Johnsonville, TN	28	11
28	Rubicon Inc.	Geismar, LA	28	24
29	Monsanto Co.	Luling, LA	28	14
30	FMC Corp.	Pocatello, ID	28	12
31	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL	28	4
32	Eastman Kodak Co., Kodak Park	Rochester, NY	38	46
33	Coastal Chem Inc., Coastal Corp.	Cheyenne, WY	28	12
34	Angus Chemical Co.	Sterlington, LA	28	11
35	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	13
36	Sterling Chemicals Inc.	Texas City, TX	28	34
37	DuPont	Beaumont, TX	28	22
38	Granite City Steel, National Steel Corp.	Granite City, IL	33	22
39	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	White Springs, FL	28	4
40	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN	28	63
41	IMC-Agrico Co., IMC Global Inc.	Saint James, LA	28	6
42	USS Fairfield Works, USX Corp.	Fairfield, AL	33	15
43	International Paper Co.	Hampton, SC	30	10
44	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA	29	32
45	Westvaco Corp., Bleached Board Div.	Covington, VA	26	16
46	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.	5
47	Weyerhaeuser Co.	Longview, WA	Mult.	18
48	Dow Chemical Co.	Freeport, TX	28	68
49	International Paper Co., Mansfield Mill	Mansfield, LA	26	10
50	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28	20
Subtotal				828
% of Total				1.4
Total				58,252

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	28,270,233	0	0	0	28,270,233	Chlorine (air)
2	47,346	2,280	0	17,100,454	17,150,080	Zinc and compounds (land)
3	48,716	13,487,112	0	291,886	13,827,714	Phosphoric acid (water)
4	288,368	3,644	0	12,053,733	12,345,745	Zinc/Copper and compounds (land)
5	98,510	11,793,413	0	0	11,891,923	Nitric acid and nitrate compounds (water)
6	109,489	4,441	0	10,908,661	11,022,591	Copper/Zinc/Lead and compounds (land)
7	103,557	826	9,712,998	0	9,817,381	Nitric acid and nitrate compounds (UIJ)
8	176,213	791	8,861,812	5,445	9,044,261	Nitric acid and nitrate compounds (UIJ)
9	92,972	0	0	8,503,492	8,596,464	Copper and compounds (land)
10	7,619,166	2,879	0	142,766	7,764,811	Carbon disulfide (air)
11	71,934	3,167	7,594,695	0	7,669,796	Acetonitrile, Acrylic acid, Acrylamide (UIJ)
12	777,508	13,242	0	6,463,719	7,254,469	Zinc and compounds (land)
13	6,848,254	9,265	0	175,510	7,033,029	Carbon disulfide (air)
14	60,613	7,982	0	6,716,100	6,784,695	Zinc/Manganese and compounds (land)
15	2,131	703	0	6,575,964	6,578,798	Chromium and compounds (land)
16	143,873	6,353,578	5,407	0	6,502,858	Nitric acid and nitrate compounds (water)
17	333,612	18,744	0	5,620,881	5,973,237	Zinc and compounds (land)
18	174,841	205,442	0	4,752,382	5,132,665	Manganese and compounds (land)
19	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
20	142,400	0	4,146,788	0	4,289,188	Acetonitrile, Acrylamide, Cyanide compounds (UIJ)
21	54,412	306	4,198,418	3,985	4,257,121	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
22	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
23	282,458	0	3,809,524	0	4,091,982	Manganese and compounds (UIJ)
24	163,429	0	0	3,805,895	3,969,324	Phosphoric acid (land)
25	119,063	183	0	3,839,901	3,959,147	Zinc and compounds (land)
26	34,454	3,668,877	0	0	3,703,331	Nitric acid and nitrate compounds (water)
27	33,946	32,986	3,516,553	57	3,583,542	Manganese and compounds (UIJ)
28	144,879	79	3,274,650	0	3,419,608	Nitric acid and nitrate compounds, Methanol (UIJ)
29	38,598	90,123	3,277,869	0	3,406,590	Formaldehyde (UIJ)
30	13,048	338	0	3,362,448	3,375,834	Zinc and compounds, Phosphorus (land)
31	12,939	3,170,390	0	0	3,183,329	Phosphoric acid (water)
32	2,750,339	288,950	0	18,603	3,057,892	Dichloromethane, Hydrochloric acid, Methanol (air)
33	11,497	0	2,975,170	109	2,986,776	Nitric acid and nitrate compounds (UIJ)
34	59,908	96,610	2,800,966	0	2,957,484	Nitric acid and nitrate compounds, Formaldehyde (UIJ)
35	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
36	367,117	2,312	2,502,904	0	2,872,333	Acetonitrile, Acrylamide, Nitric acid and nitrate compounds, tert-Butyl alcohol (UIJ)
37	119,905	315	2,672,011	0	2,792,231	Nitric acid and nitrate compounds (UIJ)
38	100,722	6,116	0	2,668,366	2,775,204	Zinc and compounds (land)
39	54,427	0	0	2,630,385	2,684,812	Phosphoric acid (land)
40	2,375,308	53,946	0	235,359	2,664,613	Hydrochloric acid, Methanol, Sulfuric acid, Toluene, Xylene, Hydrogen fluoride, Bromomethane, Ethylene glycol, Ethylene (air)
41	74,646	2,242,020	0	165,209	2,481,875	Phosphoric acid (water)
42	149,742	794	0	2,139,993	2,290,529	Zinc and compounds (land)
43	2,264,625	31	0	0	2,264,656	Methanol, Phenol (air)
44	371,814	1,859,247	0	1	2,231,062	Nitric acid and nitrate compounds (water)
45	2,102,416	35,531	0	52,444	2,190,391	Methanol, Hydrochloric acid (air)
46	4,946	6,145	0	2,066,666	2,077,757	Manganese and compounds (land)
47	1,851,284	117,389	0	0	1,968,673	Methanol, Acetaldehyde (air)
48	1,884,177	64,115	0	14,283	1,962,575	Hydrochloric acid, Ethylene, Propylene, Chlorine (air)
49	1,754,569	1,790	0	156,121	1,912,480	Methanol (air)
50	386,059	0	1,517,577	0	1,903,636	Ethylene glycol (UIJ)
	65,068,407	43,646,126	60,867,342	110,333,020	279,914,895	
	14.5	46.1	81.5	74.2	36.5	
	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191	

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

➤ UIJ = underground injection

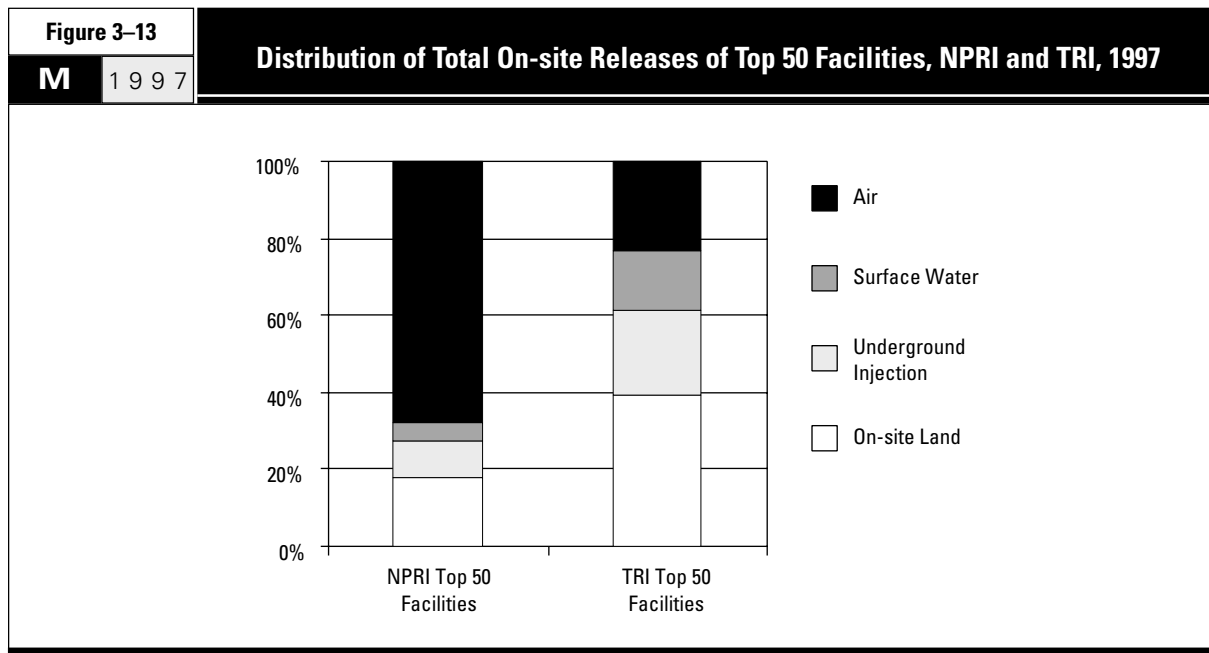
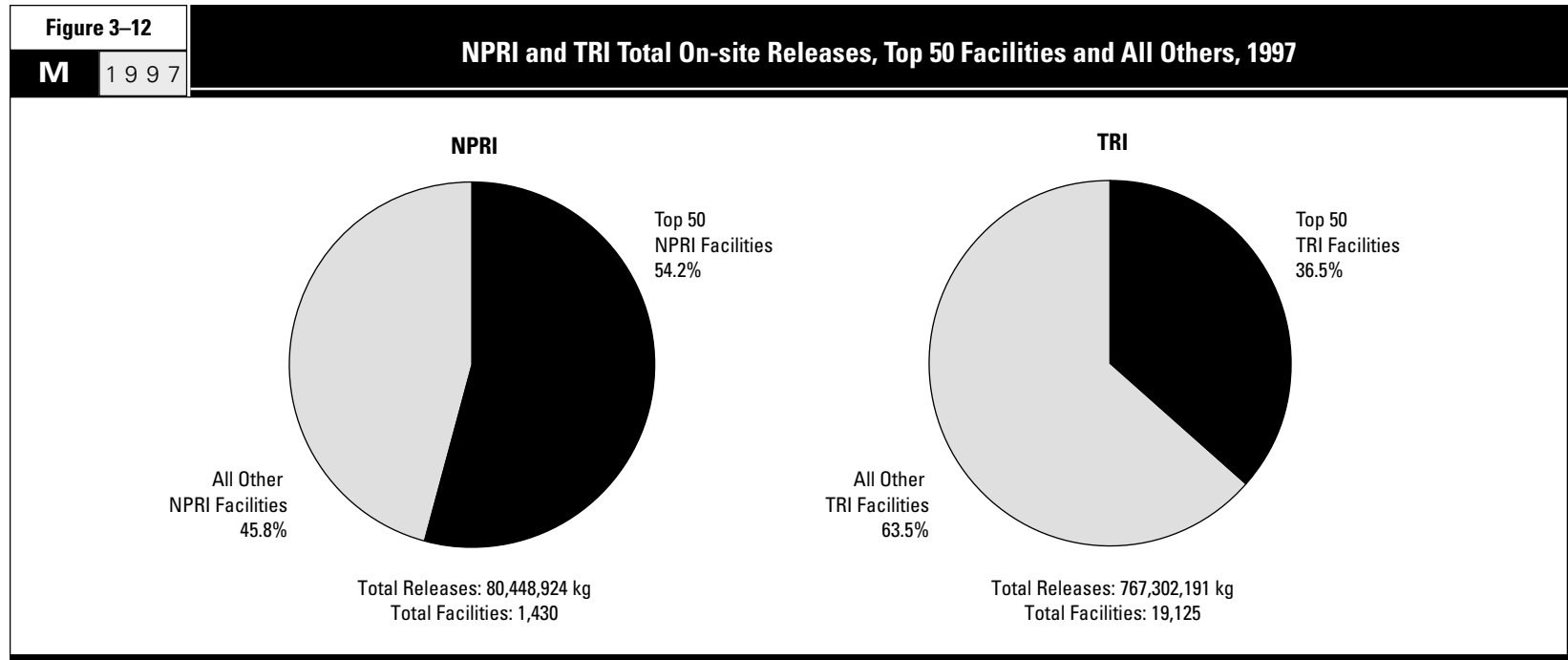


Table 3-13

NPRI Total On-site Releases by All Facilities and by Facilities with Largest Amounts, by Province, 1997

M 1997

Province	All NPRI Facilities						Top 50 Facilities		Top 50 Facilities as % of All Facilities	
	Number of Facilities	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Number of Facilities	Total Releases (kg)	Facilities (%)	Total Releases (%)
Alberta	107	6,535,005	422,063	4,195,518	825,838	11,987,370	7	8,455,835	6.5	70.5
British Columbia	77	5,099,159	281,346	0	70,769	5,459,128	6	2,603,220	7.8	47.7
Manitoba	44	1,584,802	34,570	0	1,774,178	3,397,552	2	2,527,519	4.5	74.4
New Brunswick	25	1,467,892	878,778	0	8,254	2,357,036	2	1,676,789	8.0	71.1
Newfoundland	8	409,896	1,054	0	1,356	412,606	0	0	0.0	0.0
Nova Scotia	23	710,039	45,264	0	308,191	1,063,517	0	0	0.0	0.0
Ontario	767	36,049,425	1,149,543	0	2,682,311	39,955,770	23	21,839,022	3.0	54.7
Prince Edward Island	3	18,648	194,922	0	6,200	219,770	0	0	0.0	0.0
Quebec	356	10,042,745	1,195,907	0	3,384,956	14,649,326	9	5,948,949	2.5	40.6
Saskatchewan	20	921,011	20,722	2,142	55	946,849	1	542,102	5.0	57.3
Total	1,430	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924	50	43,593,436	3.5	54.2

Geographic Distribution of Top Facilities

Twenty-three of the NPRI facilities reporting the largest releases were located in Ontario, which ranked first among provinces for total releases in 1997. The 23 facilities represented three percent of Ontario's facilities, but contributed 55 percent of Ontario's total releases. Nine of the top facilities reported in Quebec, which ranked

second for total releases. Constituting three percent of Quebec's facilities, their releases amounted to 41 percent of Quebec's total. In Alberta, which ranked third, seven facilities—seven percent of the province's facilities—reported 71 percent of the province's releases. However, facilities among NPRI's top 50 also contributed half or more of total releases in Manitoba,

New Brunswick and Saskatchewan (**Table 3-13**).

In TRI, eight of the 50 facilities reporting the largest releases were in Texas, which was also the state with the largest total releases. These facilities represented one percent of Texas' facilities and reported 43 percent of the state's releases. Another eight of the top 50 TRI facilities reported in Louisiana, which ranked second overall.

They constituted three percent of that state's facilities and reported 60 percent of its releases. Two facilities in Utah, amounting to two percent of that state's facilities, reported 94 percent of all its releases. Utah ranked third among US states for total releases. Facilities in TRI's top 50 also accounted for more than half the releases in five other states: Arizona, Idaho, Montana, New Mexico and Wyoming (**Table 3-14**).

TAKING STOCK: North American Pollutant Releases and Transfers

Table 3-14		TRI Total On-site Releases by All Facilities and by Facilities with Largest Amounts, by State, 1997								
State	Number of Facilities	All TRI Facilities					Top 50 Facilities		Top 50 Facilities as % of All Facilities	
		Total Air Emissions (kg)	Surface Water Discharges (kg)	Under ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Number of Facilities	Total Releases (kg)	Facilities (%)	Total Releases (%)
Alabama	461	24,083,443	1,814,015	4	4,302,073	30,199,535	2	9,323,558	0.4	30.9
Alaska	6	398,450	141,154	122	766	540,492	0	0	0.0	0.0
Arizona	175	3,657,642	19	2	9,778,878	13,436,541	2	11,485,598	1.1	85.5
Arkansas	326	7,448,214	727,009	656,793	1,395,928	10,227,944	0	0	0.0	0.0
California	1,154	6,743,559	1,855,386	13,217	309,372	8,921,534	0	0	0.0	0.0
Colorado	151	874,450	410,834	0	46,067	1,331,351	0	0	0.0	0.0
Connecticut	278	2,004,136	292,732	0	17,516	2,314,384	0	0	0.0	0.0
Delaware	60	780,983	94,961	0	135,131	1,011,075	0	0	0.0	0.0
District of Columbia	1	0	0	0	0	0	0	0	0.0	—
Florida	457	9,799,141	3,691,701	9,816,593	8,706,340	32,013,775	3	15,685,522	0.7	49.0
Georgia	609	16,090,372	3,074,232	0	1,209,219	20,373,823	0	0	0.0	0.0
Hawaii	10	123,603	258	3	0	123,864	0	0	0.0	0.0
Idaho	50	1,073,907	508,103	0	4,647,354	6,229,364	1	3,375,834	2.0	54.2
Illinois	1,166	17,846,951	2,158,283	1,520	11,138,116	31,144,870	2	9,559,899	0.2	30.7
Indiana	913	19,026,535	884,957	87,618	7,812,085	27,811,195	1	7,254,469	0.1	26.1
Iowa	356	5,808,061	1,117,395	0	904,592	7,830,048	0	0	0.0	0.0
Kansas	245	6,125,545	249,930	425,762	427,013	7,228,250	0	0	0.0	0.0
Kentucky	380	10,746,890	254,436	0	1,241,926	12,243,252	0	0	0.0	0.0
Louisiana	261	20,218,057	20,906,839	18,788,650	3,310,832	63,224,378	8	37,906,609	3.1	60.0
Maine	75	2,398,587	420,723	0	127,781	2,947,091	0	0	0.0	0.0
Maryland	165	2,399,558	884,574	0	1,162,227	4,446,359	0	0	0.0	0.0
Massachusetts	422	2,048,545	21,932	0	8,731	2,079,208	0	0	0.0	0.0
Michigan	786	16,610,760	163,603	2,151,240	1,074,965	20,000,568	0	0	0.0	0.0
Minnesota	429	5,238,940	66,321	0	65,957	5,371,218	0	0	0.0	0.0
Mississippi	264	13,104,815	5,277,258	3,851,531	2,519,643	24,753,247	3	9,873,070	1.1	39.9
Missouri	502	12,486,375	1,255,584	0	9,037,762	22,779,721	2	8,880,342	0.4	39.0
Montana	23	1,560,643	38,172	0	17,100,808	18,699,623	1	17,150,080	4.3	91.7
Nebraska	141	1,891,807	219,271	0	29,920	2,140,998	0	0	0.0	0.0
Nevada	43	586,225	0	0	1,235,152	1,821,377	0	0	0.0	0.0
New Hampshire	97	859,600	39,392	0	71,547	970,539	0	0	0.0	0.0
New Jersey	498	3,406,353	2,091,688	0	524,913	6,022,954	0	0	0.0	0.0
New Mexico	32	919,208	3,648	0	12,364,744	13,287,600	1	12,345,745	3.1	92.9
New York	600	9,265,335	1,901,094	113	540,875	11,707,417	1	3,057,892	0.2	26.1
North Carolina	736	17,855,348	2,834,574	13,197	8,332,258	29,035,377	2	8,099,165	0.3	27.9
North Dakota	29	315,176	193,895	0	776	509,847	0	0	0.0	0.0
Ohio	1,464	18,397,663	2,519,375	4,146,794	11,928,550	36,992,382	3	15,395,090	0.2	41.6
Oklahoma	261	4,772,487	293,724	750,444	251,223	6,067,878	0	0	0.0	0.0
Oregon	227	6,508,451	1,915,261	0	1,253,309	9,677,021	0	0	0.0	0.0
Pennsylvania	1,120	15,581,050	17,384,468	0	748,188	33,713,706	1	11,891,923	0.1	35.3
Puerto Rico	134	2,893,226	476	0	600	2,894,302	0	0	0.0	0.0
Rhode Island	116	702,832	952	0	1,964	705,748	0	0	0.0	0.0
South Carolina	439	17,660,101	1,078,794	0	611,086	19,349,981	1	2,264,656	0.2	11.7
South Dakota	64	526,009	816,327	0	1,060	1,343,396	0	0	0.0	0.0
Tennessee	568	29,475,027	433,000	3,857,299	2,112,648	35,877,974	3	14,012,966	0.5	39.1
Texas	1,080	38,699,081	9,086,284	27,113,580	8,984,055	83,883,000	8	35,913,813	0.7	42.8
Utah	125	29,292,846	551,154	0	11,991,001	41,835,001	2	39,292,824	1.6	93.9
Vermont	33	91,314	83,508	0	118	174,940	0	0	0.0	0.0
Virgin Islands	2	536,198	671	0	666	537,535	0	0	0.0	0.0
Virginia	387	17,163,630	1,657,917	0	526,512	19,348,059	1	2,190,391	0.3	11.3
Washington	254	7,685,887	947,713	0	102,277	8,735,877	1	1,968,673	0.4	22.5
West Virginia	125	4,885,110	2,957,563	0	22,647	7,865,320	0	0	0.0	0.0
Wisconsin	798	10,144,520	1,297,358	2	513,695	11,955,575	0	0	0.0	0.0
Wyoming	27	562,694	176	2,975,170	27,637	3,565,677	1	2,986,776	3.7	83.8
Total	19,125	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191	50	279,914,895	0.3	36.5

Table 3-15

The 25 NPRI Chemicals with the Largest Total On-site Releases, 1997

M 1997

Rank	CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	67-56-1	Methanol	15,543,558	1,154,512	2,320,000	6,875	19,031,512	23.7
2	1330-20-7	Xylene (mixed isomers)	6,372,745	2,713	13,501	2,907	6,401,451	8.0
3	108-88-3	Toluene	6,115,409	6,018	21,076	1,573	6,151,767	7.6
4	—	Zinc (and its compounds)	780,353	57,381	301	4,967,666	5,813,918	7.2
5	78-93-3	Methyl ethyl ketone	4,185,441	0	940,000	281	5,133,281	6.4
6	7664-93-9	Sulfuric acid	4,463,666	0	0	0	4,463,666	5.5
7	—	Nitric acid and nitrate compounds	101,941	2,407,847	538,340	39,576	3,089,698	3.8
8	110-82-7	Cyclohexane	2,892,115	1,150	10	430	2,893,761	3.6
9	75-09-2	Dichloromethane	2,302,312	72	0	49	2,303,223	2.9
10	74-85-1	Ethylene	1,991,309	2	0	2	1,992,363	2.5
11	—	Manganese (and its compounds)	51,292	233,638	1	1,615,414	1,909,572	2.4
12	50-00-0	Formaldehyde	1,557,910	205,448	60,500	0	1,828,117	2.3
13	7664-39-3	Hydrogen fluoride	1,725,586	0	0	0	1,725,590	2.1
14	71-43-2	Benzene	1,442,715	737	35,259	647	1,479,788	1.8
15	7647-01-0	Hydrochloric acid	1,401,424	0	0	0	1,401,424	1.7
16	—	Lead (and its compounds)	546,567	5,371	43	694,021	1,251,363	1.6
17	71-36-3	n-Butyl alcohol	1,196,101	0	0	30	1,200,412	1.5
18	10049-04-4	Chlorine dioxide	1,199,187	0	0	0	1,199,244	1.5
19	115-07-1	Propylene	972,163	0	0	0	972,363	1.2
20	7782-50-5	Chlorine	902,293	12,626	0	0	917,863	1.1
21	100-42-5	Styrene	811,993	0	63	542	818,325	1.0
22	—	Chromium (and its compounds)	39,548	12,999	220	718,372	776,821	1.0
23	108-10-1	Methyl isobutyl ketone	726,057	0	0	29	728,543	0.9
24	79-01-6	Trichloroethylene	694,039	0	0	0	695,270	0.9
25	—	Copper (and its compounds)	420,087	8,155	10	228,895	660,947	0.8
Subtotal			58,435,811	4,108,669	3,929,324	8,277,309	74,840,282	93.0
% of Total NPRI Releases			93.0	97.3	93.6	91.3	93.0	
Total NPRI Releases			62,838,622	4,224,169	4,197,660	9,062,108	80,448,924	100.0

Releases by Chemical

Top Chemicals

Releases of the 25 chemicals reported in the largest amounts in each system constituted 93 percent of NPRI's total releases and 89 percent of those in TRI. In NPRI, releases of the top 25 chemicals totaled 74.8 million kg and in TRI the total was 683.3 million kg (Tables 3-15 and 3-16).

Both NPRI and TRI facilities reported larger releases of methanol than of any other chemical—19.0 million kg in NPRI and 99.4 million kg in TRI (Figure 3-14). However, this represented one quarter (24 percent) of NPRI releases and one eighth (13 percent) of TRI releases.

No other chemical accounted for as much as 10 percent of the NPRI releases. NPRI facilities reported approximately six million kg each of xylene, toluene and zinc and its compounds—each chemical comprising approximately eight percent of NPRI total releases.

TRI facilities, however, reported releasing 97.3 million kg of nitric acid and nitrate compounds (13 percent of the TRI total), nearly matching the TRI releases of methanol. TRI releases of zinc and its compounds totaled 59.2 million kg (eight percent of all releases), and TRI facilities also reported 51.6 million kg of toluene (seven percent of total releases).

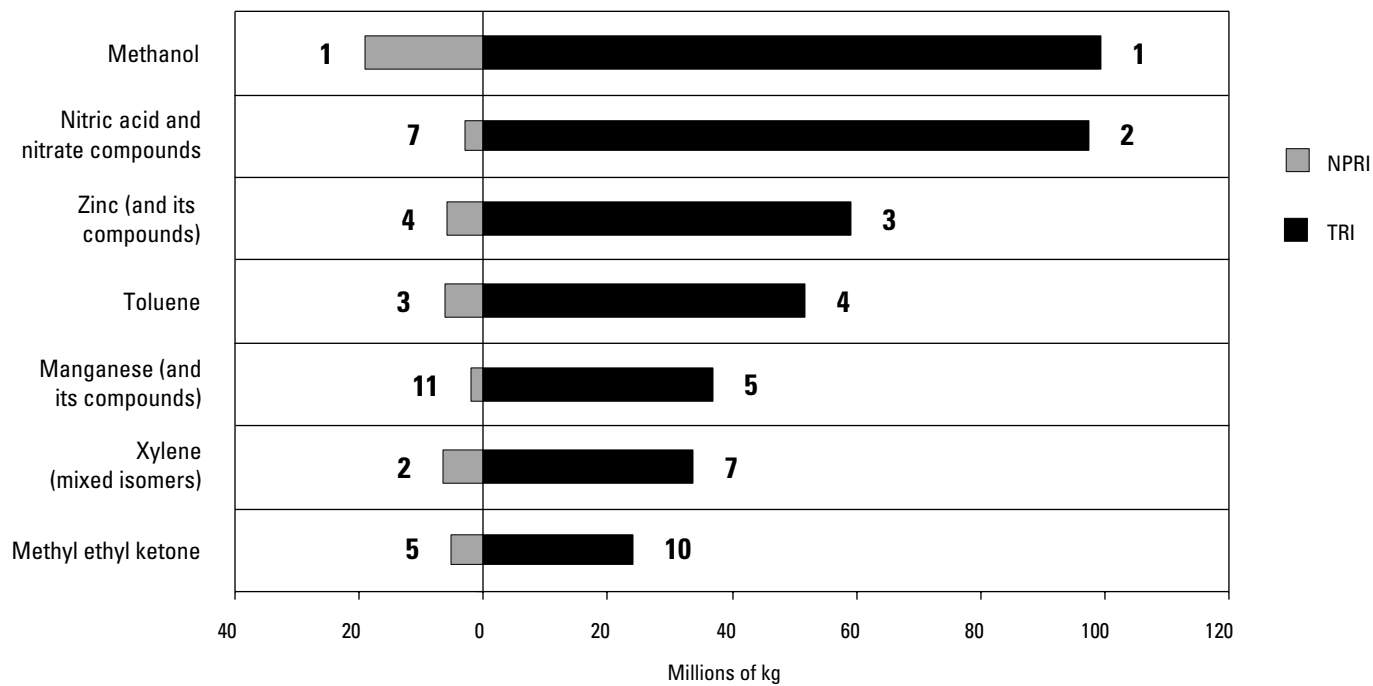
Twenty-one substances appear on both the NPRI and TRI “top 25” lists. These consisted of n-butyl alcohol, chlorine, chromium and its compounds, copper and its compounds, dichloromethane, ethylene, formaldehyde, hydrochloric acid, lead and its compounds, manganese and its compounds, methanol, methyl ethyl ketone, methyl isobutyl ketone, nitric acid and nitrate compounds, propylene, styrene, sulfuric acid, toluene, trichloroethylene, xylene and zinc and its compounds.

Table 3-16		The 25 TRI Chemicals with the Largest Total On-site Releases, 1997						
M	1	9	9	7				
Rank	CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	67-56-1	Methanol	87,766,160	3,153,396	8,000,650	434,883	99,355,089	12.9
2	—	Nitric acid and nitrate compounds	1,383,796	67,684,998	26,735,791	1,511,642	97,316,227	12.7
3	—	Zinc (and its compounds)	3,595,567	542,493	167,112	54,942,228	59,247,400	7.7
4	108-88-3	Toluene	51,063,585	13,922	232,938	335,301	51,645,746	6.7
5	—	Manganese (and its compounds)	1,060,108	1,973,728	6,536,435	27,216,996	36,787,267	4.8
6	7664-38-2	Phosphoric acid	816,890	19,734,443	6,012	13,708,634	34,265,979	4.5
7	1330-20-7	Xylene (mixed isomers)	33,509,975	16,466	59,633	34,657	33,620,731	4.4
8	7782-50-5	Chlorine	29,195,071	114,168	27,480	33,455	29,370,174	3.8
9	7647-01-0	Hydrochloric acid	26,161,189	0	0	0	26,161,189	3.4
10	78-93-3	Methyl ethyl ketone	23,777,804	18,830	220,021	72,251	24,088,906	3.1
11	75-15-0	Carbon disulfide	23,122,430	12,992	234,723	2	23,370,147	3.0
12	75-09-2	Dichloromethane	21,257,652	4,275	239,467	5,070	21,506,464	2.8
13	—	Copper (and its compounds)	2,868,168	65,397	133,649	18,112,239	21,179,453	2.8
14	100-42-5	Styrene	19,972,442	19,930	91,785	224,860	20,309,017	2.6
15	—	Chromium (and its compounds)	432,407	50,147	513,178	13,489,871	14,485,603	1.9
16	74-85-1	Ethylene	13,690,956	420	1,194	50	13,692,620	1.8
17	71-36-3	n-Butyl alcohol	9,678,962	36,162	1,415,908	15,638	11,146,670	1.5
18	50-00-0	Formaldehyde	5,228,863	111,941	4,492,404	51,377	9,884,585	1.3
19	7664-93-9	Sulfuric acid	9,478,028	0	0	0	9,478,028	1.2
20	75-05-8	Acetonitrile	403,907	3,384	8,569,053	28	8,976,372	1.2
21	—	Lead (and its compounds)	584,366	22,719	119,718	8,091,358	8,818,161	1.1
22	79-01-6	Trichloroethylene	7,922,138	251	447	1,802	7,924,638	1.0
23	115-07-1	Propylene	7,375,613	2,357	1,194	304	7,379,468	1.0
24	108-10-1	Methyl isobutyl ketone	7,212,688	8,681	39,183	1,853	7,262,405	0.9
25	75-07-0	Acetaldehyde	5,740,593	100,748	168,516	53,572	6,063,429	0.8
Subtotal			393,299,358	93,691,848	58,006,491	138,338,071	683,335,768	89.1
% of Total TRI Releases			87.5	99.0	77.7	93.1	89.1	
Total TRI Releases			449,375,340	94,618,694	74,649,654	148,658,503	767,302,191	100.0

Figure 3-14

M 1997

Comparisons for Top Five Chemicals under NPRI and TRI for Total On-site Releases, 1997



► Numbers indicate rank for releases in matched data set.

Carcinogens

Of the 48 substances in the matched data set 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/>>, NPRI facilities reported releases of 36 and TRI facilities of all 48. In NPRI, these releases totaled 10.8 million kg, or 14 percent of all NPRI releases. In TRI, releases of known or suspected carcinogens totaled 117.1 million kg, or 15 percent of TRI releases (**Tables 3-17 and 3-18**).

Dichloromethane was reported in the largest amounts in both NPRI (2.3 million kg) and TRI (21.5 million kg). NPRI releases of three additional designated carcinogens exceeded one million kg each: formaldehyde (1.8 million kg), benzene (1.5 million kg) and lead and its compounds (1.3 million kg). In TRI, carcinogenic substances with the largest releases (following dichloromethane) were styrene (20.3 million kg), chromium and its compounds (14.5 million kg) and formaldehyde (9.9 million kg).

Table 3-17		NPRI On-site Releases of Known or Suspected Carcinogens [†] , 1997					
M	1997						
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Carcinogens
75-09-2	Dichloromethane	2,302,312	72	0	49	2,303,223	21.2
50-00-0	Formaldehyde	1,557,910	205,448	60,500	0	1,828,117	16.8
71-43-2	Benzene	1,442,715	737	35,259	647	1,479,788	13.6
—	Lead (and its compounds)	546,567	5,371	43	694,021	1,251,363	11.5
100-42-5	Styrene	811,993	0	63	542	818,325	7.5
—	Chromium (and its compounds)	39,548	12,999	220	718,372	776,821	7.2
79-01-6	Trichloroethylene	694,039	0	0	0	695,270	6.4
—	Nickel (and its compounds)	294,522	23,945	1	43,233	364,094	3.4
108-05-4	Vinyl acetate	142,947	0	140,000	100	283,107	2.6
75-07-0	Acetaldehyde	226,475	3,620	38,000	0	268,195	2.5
67-66-3	Chloroform	215,365	5,479	0	0	221,835	2.0
—	Arsenic (and its compounds)	146,693	1,535	0	0	149,053	1.4
106-99-0	1,3-Butadiene	105,530	28	0	0	105,819	1.0
1332-21-4	Asbestos (friable)	0	0	0	53,026	53,026	0.5
127-18-4	Tetrachloroethylene	51,508	28	0	8	52,407	0.5
75-01-4	Vinyl chloride	43,581	210	0	0	43,991	0.4
—	Cadmium (and its compounds)	39,919	829	0	505	41,353	0.4
—	Cobalt (and its compounds)	8,207	1,647	0	10,572	20,614	0.2
117-81-7	Di(2-ethylhexyl) phthalate	19,287	0	0	36	19,849	0.2
107-06-2	1,2-Dichloroethane	18,247	27	0	1,319	19,603	0.2
75-21-8	Ethylene oxide	15,714	0	0	0	16,159	0.1
75-56-9	Propylene oxide	13,005	0	0	0	13,005	0.1
106-46-7	1,4-Dichlorobenzene	8,000	0	0	0	8,100	0.1
107-13-1	Acrylonitrile	5,190	0	0	0	6,469	0.1
123-91-1	1,4-Dioxane	1,298	2,700	0	0	3,998	0.0
139-13-9	Nitrilotriacetic acid	2,623	0	0	0	2,868	0.0
121-14-2	2,4-Dinitrotoluene	0	816	0	0	816	0.0
26471-62-5	Toluenediisocyanate (mixed isomers)	143	0	0	0	774	0.0
79-06-1	Acrylamide	327	0	0	0	527	0.0
56-23-5	Carbon tetrachloride	256	0	0	0	336	0.0
96-09-3	Styrene oxide	0	0	0	0	297	0.0
140-88-5	Ethyl acrylate	100	0	0	0	161	0.0
77-78-1	Dimethyl sulfate	10	0	0	0	10	0.0
584-84-9	Toluene-2,4-diisocyanate	0	0	0	0	10	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	0	0	0	0	6	0.0
106-89-8	Epichlorohydrin	0	0	0	0	4	0.0
	Subtotal	8,754,031	265,491	274,086	1,522,430	10,849,393	100.0
	% of Total	13.9	6.3	6.5	16.8	13.5	
	Total	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924	

[†] 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 3-18

TRI On-site Releases of Known or Suspected Carcinogens†, 1997

M 1997

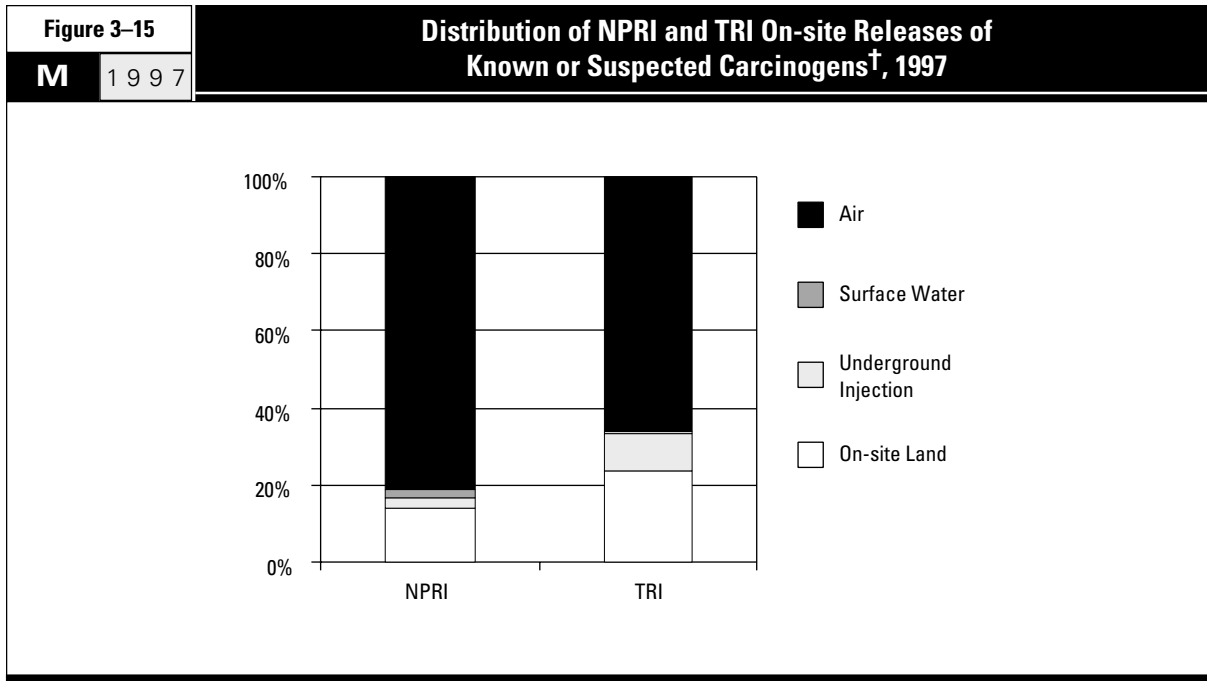
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Carcinogens
75-09-2	Dichloromethane	21,257,652	4,275	239,467	5,070	21,506,464	18.4
100-42-5	Styrene	19,972,442	19,930	91,785	224,860	20,309,017	17.3
—	Chromium (and its compounds)	432,407	50,147	513,178	13,489,871	14,485,603	12.4
50-00-0	Formaldehyde	5,228,863	111,941	4,492,404	51,377	9,884,585	8.4
—	Lead (and its compounds)	584,366	22,719	119,718	8,091,358	8,818,161	7.5
79-01-6	Trichloroethylene	7,922,138	251	447	1,802	7,924,638	6.8
75-07-0	Acetaldehyde	5,740,593	100,748	168,516	53,572	6,063,429	5.2
71-43-2	Benzene	3,950,990	5,074	164,558	27,872	4,148,494	3.5
79-06-1	Acrylamide	7,839	2,881	3,208,173	138,569	3,357,462	2.9
67-66-3	Chloroform	3,257,971	72,566	12,224	3,335	3,346,096	2.9
127-18-4	Tetrachloroethylene	3,044,491	914	6,856	2,300	3,054,561	2.6
—	Arsenic (and its compounds)	90,688	1,864	34,544	2,615,079	2,742,175	2.3
—	Nickel (and its compounds)	344,572	53,043	64,435	2,089,389	2,551,439	2.2
107-13-1	Acrylonitrile	555,359	553	1,828,525	374	2,384,811	2.0
108-05-4	Vinyl acetate	1,507,152	1,211	54,114	982	1,563,459	1.3
106-99-0	1,3-Butadiene	1,229,355	1,157	454	133	1,231,099	1.1
107-06-2	1,2-Dichloroethane	415,768	827	2,062	12	418,669	0.4
75-01-4	Vinyl chloride	417,089	37	168	0	417,294	0.4
—	Cadmium (and its compounds)	25,330	1,110	24	389,381	415,845	0.4
75-21-8	Ethylene oxide	401,738	1,647	6,869	446	410,700	0.4
—	Cobalt (and its compounds)	30,107	16,683	20,255	290,269	357,314	0.3
98-95-3	Nitrobenzene	29,168	135	289,369	3	318,675	0.3
75-56-9	Propylene oxide	246,536	10,413	5,306	402	262,657	0.2
1332-21-4	Asbestos (friable)	3,289	1	0	233,333	236,623	0.2
56-23-5	Carbon tetrachloride	162,130	142	14,947	61	177,280	0.2
123-91-1	1,4-Dioxane	64,068	89,012	0	2,090	155,170	0.1
106-89-8	Epichlorohydrin	142,514	4,219	0	4,312	151,045	0.1
117-81-7	Di(2-ethylhexyl) phthalate	106,799	262	0	32,203	139,264	0.1
106-46-7	1,4-Dichlorobenzene	118,942	783	907	889	121,521	0.1
140-88-5	Ethyl acrylate	82,905	71	0	233	83,209	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	23,498	115	0	164	23,777	0.0
79-46-9	2-Nitropropane	10,761	1,265	0	0	12,026	0.0
101-77-9	4,4'-Methylenedianiline	4,185	39	6,826	0	11,050	0.0
302-01-2	Hydrazine	5,063	5	0	113	5,181	0.0
139-13-9	Nitrotriacetic acid	0	3,390	1,088	0	4,478	0.0
64-67-5	Diethyl sulfate	3,365	0	0	0	3,365	0.0
62-56-6	Thiourea	465	158	2,268	113	3,004	0.0
584-84-9	Toluene-2,4-diisocyanate	2,952	2	0	0	2,954	0.0
77-78-1	Dimethyl sulfate	2,042	0	0	0	2,042	0.0
91-08-7	Toluene-2,6-diisocyanate	1,271	0	0	0	1,271	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	1,028	0	0	0	1,028	0.0
95-80-7	2,4-Diaminotoluene	888	0	0	0	888	0.0
121-14-2	2,4-Dinitrotoluene	817	41	0	0	858	0.0
94-59-7	Safrole	229	0	0	0	229	0.0
606-20-2	2,6-Dinitrotoluene	199	11	0	0	210	0.0
90-94-8	Michler's ketone	182	0	0	0	182	0.0
96-45-7	Ethylene thiourea	130	0	0	0	130	0.0
96-09-3	Styrene oxide	5	0	0	0	5	0.0
	Subtotal	77,430,341	579,642	11,349,487	27,749,967	117,109,437	100.0
	% of Total	17.2	0.6	15.2	18.7	15.3	
	Total	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191	

† 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.

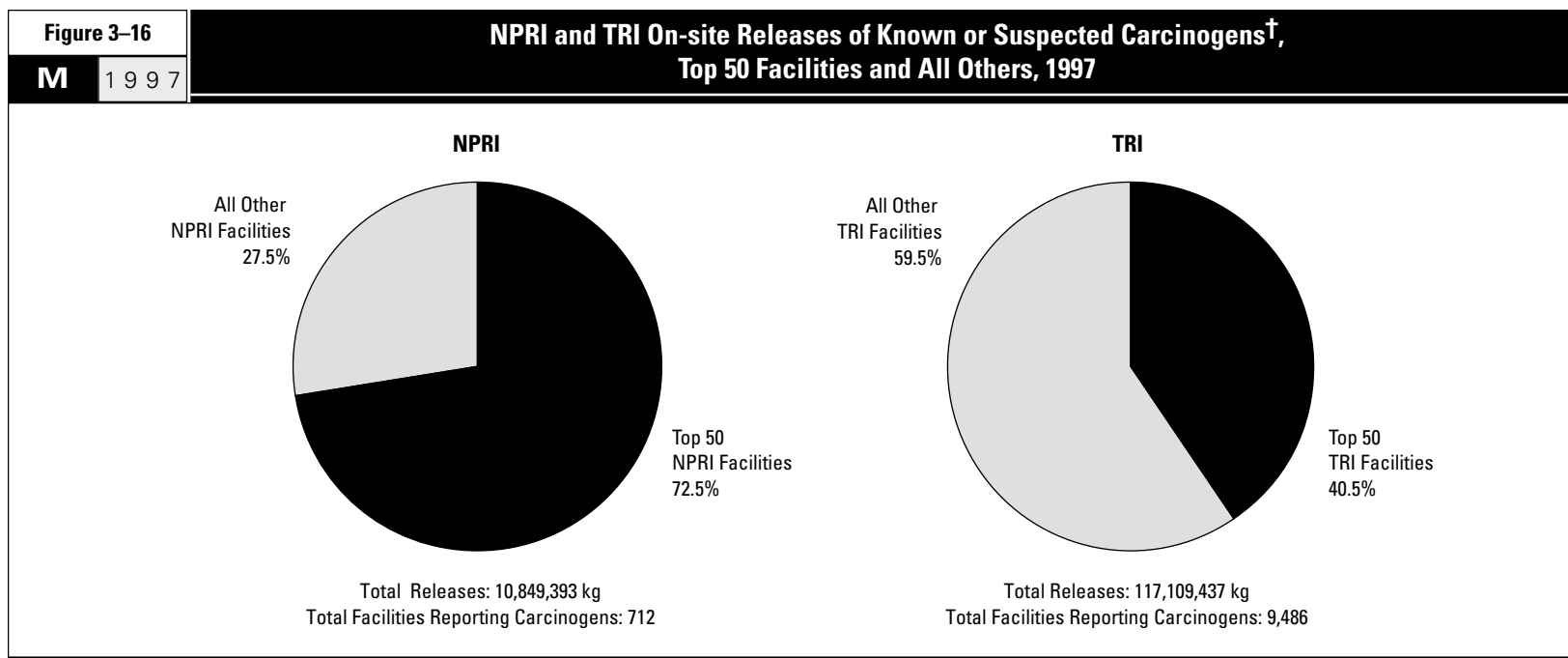
► A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Releases of the designated carcinogens were distributed quite differently in the two PRTRs, although air emissions were predominant in both cases, totaling 8.8 million kg in NPRI and 77.4 million kg in TRI. On-site land releases ranked second among release types, with 1.5 million kg in NPRI and 27.7 million kg in TRI. NPRI facilities released approximately equal amounts of the designated carcinogens to surface waters (265,491 kg) and to underground injection (274,086 kg), whereas TRI facilities released almost 20 times the amount of such substances to underground injection (11.3 million kg) as to surface waters (579,642 kg).

Thus, although surface water discharges received the smallest percentage of releases of carcinogenic substances in both systems, this percentage was five times larger in NPRI (2.4 percent) than in TRI (0.5 percent). TRI facilities were more likely to release such substances to on-site land disposal (24 percent of TRI releases of the carcinogens) or to underground injection (10 percent) than their NPRI counterparts (14 percent and three percent, respectively—Figure 3-15).



[†] 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.

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

The 50 NPRI facilities with the largest releases of designated carcinogens in the matched data set reported 7.9 million kg of such releases, or 73 percent of NPRI's total releases of these substances. This included more than two-thirds of the total amounts reported in NPRI for carcinogenic

substances in each release type, ranging from 69 percent (6.0 million kg) of the air emissions to 92 percent (1.4 million kg) of the on-site land releases (**Figure 3-16** and **Table 3-19**).

The 50 TRI facilities with the largest releases of designated carcinogens in the matched data set reported

47.4 million kg, or 41 percent of the total releases of carcinogens. These facilities reported a great majority of the TRI releases of carcinogenic substances to underground injection (10.1 million kg or 89 percent of the total) and on-site land disposal (23.5 million kg or 85 percent), but a

much smaller proportion of all TRI releases to air (13.7 million kg or 18 percent) and surface waters (67,904 kg or 12 percent—**Figure 3-16** and **Table 3-20**).

Table 3-19		The 50 NPRI Facilities with the Largest Total On-site Releases of Known or Suspected Carcinogens [†] , 1997			
M	1997				
Rank	Facility	City, Province	SIC Codes		Number of Forms
			Canada	US	
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4
2	Celanese Canada Inc.	Edmonton, AB	37	28	6
3	Dofasco Inc.	Hamilton, ON	29	33	5
4	Novopharm Limited	Scarborough, ON	37	28	1
5	Carpenter Canada Ltd.	Woodbridge, ON	16	30	2
6	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	5
7	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24	1
8	Domfoam International Inc.	St Léonard, QC	16	30	2
9	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6
10	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	2
11	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	3
12	Novopharm Limited	Markham, ON	37	28	1
13	Valle Foam Industries Inc., Valle 1	Brampton, ON	16	30	2
14	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	2
15	Sandvik Steel Canada, Sandvik Steel, Inc.	Arnprior, ON	29	33	1
16	Vitafoam Products Canada Ltd., Vita-Toronto	Downsview, ON	16	30	3
17	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	2
18	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33	6
19	Foamex Canada Inc., Foamex L.P.	Toronto, ON	16	30	2
20	Weyerhaeuser Canada Ltd., Edson O.S.B. Mill	Edson, AB	25	24	2
21	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	3
22	Mirolin Industries, MRL Incorporated	Toronto, ON	16	30	2
23	Weyerhaeuser Canada Ltd., Drayton Valley O.S.B. Mill	Drayton Valley, AB	25	24	2
24	Carpenter Canada Ltd., Calgary Division	Calgary, AB	16	30	2
25	Dow Chemical Canada Inc.	Sarnia, ON	37	28	17
26	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	1
27	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	1
28	Co-Steel Lasco	Whitby, ON	29	33	3
29	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	3
30	Valle Foam Industries Inc., Valle 2	Brampton, ON	16	30	2
31	Inco Limited, Manitoba Division	Thompson, MB	29	33	3
32	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28	1
33	Bayer Inc., Bayer AG	Sarnia, ON	37	28	5
34	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24	1
35	Uniboard Canada Inc., Division Mont-Laurier	Mont-Laurier, QC	25	24	1
36	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24	1
37	Weyerhaeuser Canada Ltd., Slave Lake O.S.B. Mill	Slave Lake, AB	25	24	2
38	De Havilland Inc., Bombardier Inc.	Downsview, ON	32	35	1
39	René Matériaux composites Ltée	St-Éphrem-de-Beauce, QC	32	37	2
40	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	4
41	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	4
42	Malette Québec Inc., Panneaux Malette OSB	St-Georges de Champlain, QC	25	24	1
43	MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction, QC	16	30	1
44	Nova Chemicals (Canada) Ltd.	Corunna, ON	36	29	2
45	Ranger Board Ltd., West Fraser Mills Ltd.	Blue Ridge, AB	25	24	1
46	Vitafoam Products Canada Ltd.	Calgary, AB	16	30	3
47	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	4
48	Wolverine Tube (Canada) Inc.	London, ON	29	33	1
49	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	1
50	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28	3
Subtotal					136
% of Total					11.7
Total for All NPRI Matched Carcinogens					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	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	248,650	0	0	649,000	897,650	Chromium and compounds (land)
2	151,422	0	227,000	0	378,422	Vinyl acetate, Acetaldehyde (UIJ)
3	315,968	446	0	82	316,496	Benzene (air)
4	313,250	0	0	0	313,250	Dichloromethane (air)
5	296,820	0	0	0	296,820	Dichloromethane (air)
6	278,510	2,520	0	0	281,030	Lead and compounds (air)
7	279,000	0	0	0	279,000	Formaldehyde (air)
8	245,996	0	0	0	245,996	Dichloromethane (air)
9	237,840	2,690	0	0	242,390	Benzene (air)
10	4,625	412	0	229,755	234,792	Lead and compounds (land)
11	233,458	996	0	0	234,454	Lead and compounds (air)
12	226,993	0	0	0	226,993	Dichloromethane (air)
13	218,200	0	0	0	218,252	Dichloromethane (air)
14	13,030	199,400	0	0	212,430	Formaldehyde (water)
15	203,760	0	0	0	203,760	Trichloroethylene (air)
16	201,660	0	0	0	202,260	Dichloromethane (air)
17	2,045	78	0	167,150	169,273	Lead and compounds (land)
18	165,794	2,112	0	0	167,918	Benzene (air)
19	156,995	0	0	0	157,075	Dichloromethane (air)
20	131,500	0	0	0	131,500	Formaldehyde (air)
21	0	0	0	125,530	125,530	Lead and compounds (land)
22	119,860	0	0	0	119,860	Dichloromethane, Styrene (air)
23	115,430	0	0	0	115,430	Formaldehyde (air)
24	103,050	0	0	0	103,060	Dichloromethane (air)
25	53,503	2	0	46,576	100,758	Asbestos (land), Benzene, Styrene (air)
26	100,000	3	0	0	100,003	Benzene (air)
27	92,090	2,250	0	0	94,340	Chloroform (air)
28	1,220	99	0	91,254	92,573	Lead and compounds (land)
29	3,312	5	0	87,410	90,727	Lead and compounds (land)
30	86,518	0	0	0	86,518	Dichloromethane (air)
31	67,452	17,851	0	0	85,303	Nickel and compounds (air)
32	84,600	0	0	0	84,600	Vinyl acetate (air)
33	81,872	31	0	0	82,673	1,3-Butadiene (air)
34	82,298	0	0	0	82,298	Formaldehyde (air)
35	78,500	0	0	0	78,500	Formaldehyde (air)
36	77,100	0	0	0	77,100	Formaldehyde (air)
37	76,330	0	0	0	76,330	Formaldehyde (air)
38	72,200	0	0	0	72,200	Trichloroethylene (air)
39	71,000	0	0	0	71,000	Styrene, Dichloromethane (air)
40	69,349	650	0	0	69,999	Lead and compounds (air)
41	69,711	219	0	0	69,991	Benzene (air)
42	66,857	0	0	0	66,857	Formaldehyde (air)
43	66,510	0	0	0	66,510	Styrene (air)
44	65,070	0	0	0	65,070	Benzene, 1,3-Butadiene (air)
45	64,585	0	0	0	64,585	Formaldehyde (air)
46	64,402	0	0	0	64,402	Dichloromethane (air)
47	63,689	288	0	0	63,977	Benzene (air)
48	62,500	0	0	0	62,500	Trichloroethylene (air)
49	62,136	0	0	0	62,136	Formaldehyde (air)
50	56,400	0	0	0	56,400	Styrene, Benzene (air)
	6,003,060	230,052	227,000	1,396,757	7,861,096	
	68.6	86.7	82.8	91.7	72.5	
	8,754,031	265,491	274,086	1,522,430	10,849,393	

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

► UIJ - underground injection

Table 3-20		The 50 TRI Facilities with the Largest Total On-site Releases of Known or Suspected Carcinogens [†] , 1997		
M	1997			
Rank	Facility	City, State	US SIC Code	Number of Forms
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1
2	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	5
4	Monsanto Co.	Luling, LA	28	2
5	ASARCO Inc.	East Helena, MT	33	4
6	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	5
7	ASARCO Inc., Glover Plant	Annapolis, MO	33	4
8	Angus Chemical Co.	Sterlington, LA	28	4
9	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1
10	Aquaglass Corp., Masco Corp.	Adamsville, TN	30	1
11	Solutia Inc., Chocolate Bayou	Alvin, TX	28	3
12	Eastman Kodak Co., Kodak Park	Rochester, NY	38	9
13	BP Chemicals Inc., BP America Inc.	Lima, OH	28	10
14	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	5
15	Foamex L.P., Div. of Kihl	Corry, PA	30	2
16	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	6
17	Borden Chemicals & Plastics LP	Geismar, LA	28	7
18	Carpenter Co., Tupelo Div.	Verona, MS	30	2
19	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR	28	1
20	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	7
21	Northwestern Steel & Wire Co.	Sterling, IL	33	2
22	Boeing Co.	Wichita, KS	Mult.	6
23	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	5
24	Carpenter Co.	Russellville, KY	Mult.	5
25	Sterling Chemicals Inc.	Texas City, TX	28	9
26	Foamex Intl Inc.	Milan, TN	30	2
27	FMC Corp.	Pocatello, ID	28	4
28	GE Co.	Ottawa, IL	28	4
29	Vitafoam Inc., British Vita PLC	Tupelo, MS	30	3
30	Carpenter Co.	Richmond, VA	Mult.	3
31	Carpenter Co.	Elkhart, IN	Mult.	3
32	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN	30	1
33	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28	2
34	GE Plastics Co., GE Co.	Mount Vernon, IN	28	4
35	Foamex L.P., Foamex Intl. Inc.	Morristown, TN	30	2
36	General Foam Corp., PMC Inc.	West Hazelton, PA	30	3
37	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33	1
38	Elkem Metals Co.	Marietta, OH	33	4
39	DuPont	Pass Christian, MS	28	4
40	Nu-Foam Prods. Inc., Ohio Decorative Prods. Inc.	Chattanooga, TN	30	2
41	Tomkins Ind. Inc., Lasco Bathware Div.	Three Rivers, MI	30	1
42	Flexible Foam Prods., Ohio Decorative Prods. Inc.	Elkhart, IN	30	2
43	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA	30	1
44	Cleveland Laminating Corp.	Cleveland, OH	26	1
45	Weyerhaeuser Co.	Longview, WA	Mult.	5
46	Kimberly-Clark Corp.	Mobile, AL	26	2
47	3V Inc.	Georgetown, SC	28	4
48	Rubicon Inc.	Geismar, LA	28	9
49	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33	2
50	Dow Chemical Co.	Plaquemine, LA	28	18
	Subtotal			194
	% of Total			1.2
	Total for All TRI Carcinogens			15,905

[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research (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	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
2	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
3	27,487	452	0	4,073,128	4,101,067	Lead/Arsenic and compounds (land)
4	15,601	0	3,221,043	0	3,236,644	Formaldehyde (UIJ)
5	23,355	1,262	0	1,739,278	1,763,895	Lead and compounds (land)
6	20,563	0	1,690,118	656	1,711,337	Acrylamide, Acrylonitrile (UIJ)
7	21,141	5	0	1,582,218	1,603,364	Lead and compounds (land)
8	12,481	1,956	1,126,995	0	1,141,432	Formaldehyde (UIJ)
9	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
10	1,057,867	0	0	0	1,057,867	Styrene (air)
11	13,064	0	1,025,986	0	1,039,050	Acrylonitrile (UIJ)
12	980,987	25,565	0	6,803	1,013,355	Dichloromethane (air)
13	27,171	0	965,267	0	992,438	Acrylamide (UIJ)
14	4,009	235	979,139	0	983,383	Acrylamide (UIJ)
15	903,448	0	0	0	903,448	Dichloromethane (air)
16	13,177	267	0	833,526	846,970	Lead/Arsenic/Chromium and compounds (land)
17	815,549	187	9	0	815,745	Benzene (air)
18	704,215	0	0	0	704,215	Dichloromethane (air)
19	689,524	0	0	0	689,524	Dichloromethane (air)
20	8,074	0	0	672,109	680,183	Lead/Chromium and compounds (land)
21	4,921	345	0	593,651	598,917	Chromium/Lead and compounds (land)
22	595,943	452	0	0	596,395	Tetrachloroethylene (air)
23	99,783	98	0	494,901	594,782	Lead and compounds (land)
24	571,776	0	0	0	571,776	Dichloromethane (air)
25	67,453	0	481,566	0	549,019	Acrylamide (UIJ)
26	521,285	0	0	0	521,285	Dichloromethane (air)
27	2,924	0	0	477,785	480,709	Chromium/Cadmium and compounds (land)
28	446,033	117	0	115	446,265	Styrene, Acrylonitrile (air)
29	425,644	0	0	0	425,644	Dichloromethane (air)
30	414,129	0	0	0	414,129	Dichloromethane (air)
31	408,975	0	0	0	408,975	Dichloromethane (air)
32	404,393	0	0	0	404,393	Styrene (air)
33	396,123	0	0	0	396,123	Dichloromethane (air)
34	392,178	270	0	0	392,448	Dichloromethane (air)
35	392,006	0	0	0	392,006	Dichloromethane (air)
36	377,050	0	0	0	377,050	Dichloromethane (air)
37	0	88	0	365,306	365,394	Nickel and compounds (land)
38	27,223	5,442	0	326,985	359,650	Chromium and compounds (land)
39	0	0	358,277	0	358,277	Chromium and compounds (UIJ)
40	354,187	0	0	0	354,187	Dichloromethane (air)
41	352,562	0	0	0	352,562	Styrene (air)
42	350,198	0	0	0	350,198	Dichloromethane (air)
43	347,116	0	0	0	347,116	Styrene (air)
44	346,032	0	0	0	346,032	Dichloromethane (air)
45	320,666	19,157	0	0	339,823	Acetaldehyde (air)
46	316,100	11,792	0	0	327,892	Chloroform (air)
47	319,397	0	0	0	319,397	Dichloromethane (air)
48	40,207	8	268,481	0	308,696	Nitrobenzene (UIJ)
49	2,422	0	0	298,413	300,835	Chromium and compounds (land)
50	69,173	72	0	229,595	298,840	Asbestos (land)
	13,743,394	67,904	10,116,881	23,460,134	47,388,313	
	17.7	11.7	89.1	84.5	40.5	
	77,430,341	579,642	11,349,487	27,749,967	117,109,437	

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

► UIJ = underground injection

Metals

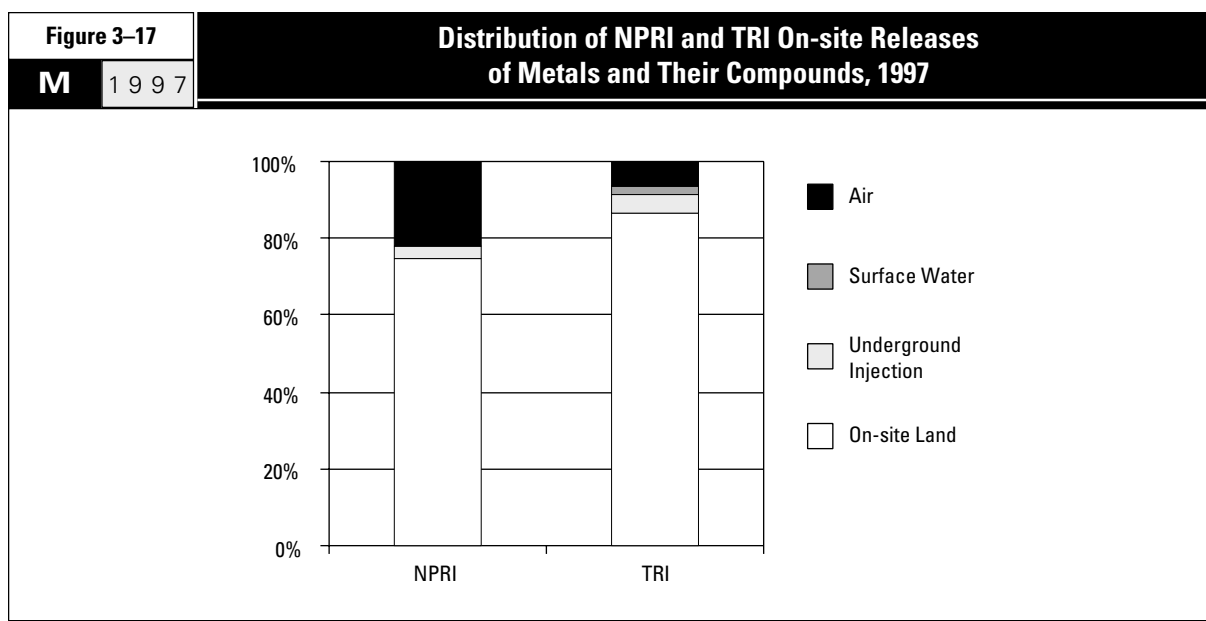
Fifteen percent of NPRI releases and 20 percent of TRI releases in 1997 consisted of metals and their compounds. These releases totaled 11.8 million kg in NPRI and 149.2 million kg in TRI. The 15 metals and their compounds were principally released on-site to land. The 8.8 million kg of metals and compounds released to on-site land disposal in NPRI amounted to 97 percent of all NPRI on-site land releases. The 129.0 million kg similarly reported in TRI amounted to 87 percent of all TRI on-site land releases (**Tables 3-21 and 3-22**).

Zinc and manganese (and their compounds) headed both the NPRI and TRI lists of metals for total releases. NPRI facilities reported releasing 5.8 million kg of zinc and its compounds and 1.9 million kg of manganese and its compounds. NPRI releases of lead and its compounds, ranking third, totaled 1.3 million kg. TRI releases included 59.2 million kg of zinc and its compounds and 36.8 million kg of manganese and its compounds. Copper and its compounds ranked third, with 21.2 million kg.

Table 3-21		NPRI On-site Releases of Metals and Their Compounds, 1997				
M	1997					
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	780,353	57,381	301	4,967,666	5,813,918
—	Manganese (and its compounds)	51,292	233,638	1	1,615,414	1,909,572
—	Lead (and its compounds)	546,567	5,371	43	694,021	1,251,363
—	Chromium (and its compounds)	39,548	12,999	220	718,372	776,821
—	Copper (and its compounds)	420,087	8,155	10	228,895	660,947
7429-90-5	Aluminum (fume or dust)	62,897	334	0	469,900	534,619
—	Nickel (and its compounds)	294,522	23,945	1	43,233	364,094
7440-62-2	Vanadium (fume or dust)	212,229	163	0	2,863	215,356
—	Arsenic (and its compounds)	146,693	1,535	0	0	149,053
—	Cadmium (and its compounds)	39,919	829	0	505	41,353
—	Cobalt (and its compounds)	8,207	1,647	0	10,572	20,614
—	Selenium (and its compounds)	4,629	3,989	0	0	9,280
—	Antimony (and its compounds)	5,794	606	0	321	7,301
—	Silver (and its compounds)	1,255	172	0	52	1,479
—	Mercury (and its compounds)	52	2	0	184	244
	Subtotal	2,614,044	350,766	576	8,751,998	11,756,014
	% of Total	4.2	8.3	0.0	96.6	14.6
	Total	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924

Table 3-22		TRI On-site Releases of Metals and Their Compounds, 1997				
M 1997						
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	3,595,567	542,493	167,112	54,942,228	59,247,400
—	Manganese (and its compounds)	1,060,108	1,973,728	6,536,435	27,216,996	36,787,267
—	Copper (and its compounds)	2,868,168	65,397	133,649	18,112,239	21,179,453
—	Chromium (and its compounds)	432,407	50,147	513,178	13,489,871	14,485,603
—	Lead (and its compounds)	584,366	22,719	119,718	8,091,358	8,818,161
—	Arsenic (and its compounds)	90,688	1,864	34,544	2,615,079	2,742,175
—	Nickel (and its compounds)	344,572	53,043	64,435	2,089,389	2,551,439
7429-90-5	Aluminum (fume or dust)	720,505	19,214	0	1,003,852	1,743,571
—	Antimony (and its compounds)	42,172	18,905	5,538	565,624	632,239
—	Cadmium (and its compounds)	25,330	1,110	24	389,381	415,845
—	Cobalt (and its compounds)	30,107	16,683	20,255	290,269	357,314
—	Selenium (and its compounds)	37,709	1,102	1,546	144,258	184,615
7440-62-2	Vanadium (fume or dust)	5,640	321	0	53,293	59,254
—	Silver (and its compounds)	7,055	2,833	71	18,589	28,548
—	Mercury (and its compounds)	6,544	190	19	3,574	10,327
	Subtotal	9,850,938	2,769,749	7,596,524	129,026,000	149,243,211
	% of Total	2.2	2.9	10.2	86.8	19.5
	Total	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191

Although in both PRTRs the predominant release for metals and their compounds was on-site to land (74 percent of all releases of metals in NPRI and 86 percent in TRI), the distribution of other release types for these substances differed. NPRI facilities were more likely to release metals to air (2.6 million kg or 22 percent of all releases of metals and their compounds) than were TRI facilities (9.9 million kg or seven percent of such releases). NPRI facilities reported only a very small amount of underground injection of metals and their compounds (576 kg or less than one-hundredth of one percent of all releases of metals), while TRI facilities disposed of about five percent (7.6 million kg) of their releases of metals in this way. Surface waters received comparable percentages of NPRI metals releases (350,766 kg or three percent) to those in TRI (2.8 million kg or two percent—Figure 3-17).



In NPRI, 50 facilities reported nearly all the releases of metals and their compounds: 11.6 million kg of a total of 11.8 million kg (98 percent). This included 8.7 million kg of on-site land releases, from a total of 8.8 million kg (nearly 100 percent). These 50 facilities also reported more than 95 percent of the air emissions and surface water discharges of the metals. The 50 TRI facilities with the largest such releases reported a total of 129.3 million kg or 87 percent of the TRI total. This included most of the on-site land releases (117.2 million kg, or 91 percent of all TRI on-site land releases of metals) and most of the underground injection (7.3 million kg or 96 percent). However, these TRI facilities accounted for a much smaller proportion of the air emissions (4.2 million kg or 43 percent) and even less of the surface water discharges (527,893 kg or 19 percent—**Tables 3–23** and **3–24** and **Figure 3–18**).

Table 3–23		The 50 NPRI Facilities with the Largest Total On-site Releases of Metals and Their Compounds, 1997				
M	1997			SIC Codes		Number of Forms
Rank	Facility	City, Province	Canada	US		
1	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5	
2	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	5	
3	Co-Steel Lasco	Whitby, ON	29	33	6	
4	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6	
5	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6	
6	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	5	
7	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	11	
8	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6	
9	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5	
10	Sydney Steel Corporation	Sydney, NS	29	33	8	
11	Recyclage d'aluminium Québec Inc., Philip Services Corp.	Bécancour, QC	29	33	1	
12	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26	2	
13	Recyclage d'aluminium Québec, Ragueneau, Philip Services Corp.	Baie-Comeau, QC	29	33	1	
14	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	9	
15	North Atlantic Refining Ltd	Come By Chance, NF	36	29	4	
16	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-De-Valleyfield, QC	29	33	8	
17	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	2	
18	Inco Limited, Manitoba Division	Thompson, MB	29	33	4	
19	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	4	
20	Esco Limited	Port Coquitlam, BC	29	33	2	
21	Falconbridge Limited, Smelter Complex	Falconbridge, ON	29	33	9	
22	Inco Limited, Port Colborne Refinery	Port Colborne, ON	29	33	5	
23	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37	3	
24	Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour, QC	29	33	2	
25	Cartons St-Laurent Inc.	LaTuque, QC	27	26	2	
26	Kronos Canada, Inc.	Varenes, QC	37	28	2	
27	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	3	
28	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26	1	
29	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	39	39	2	
30	Dofasco Inc.	Hamilton, ON	29	33	6	
31	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37	1	
32	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Pap	Prince Albert, SK	27	26	1	
33	Stelco Inc., Hilton Works	Hamilton, ON	29	33	8	
34	Industries James Maclaren Inc., Division de la pâte kraft	Thurso, QC	27	26	1	
35	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	5	
36	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	1	
37	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5	
38	Weyerhaeuser Canada Ltd.	Grande Prairie, AB	04	24	1	
39	NRI Industries Inc., Cawthra Plant	Toronto, ON	15	30	1	
40	Irving Oil Limited, Refining Division	Saint John, NB	36	29	3	
41	Spruce Falls Inc., Tembec Inc.	Kapuskasing/O'Brien, ON	27	26	1	
42	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29	2	
43	Gerdau Courtice Steel Inc., Courtice Steel Inc.	Cambridge, ON	29	33	5	
44	Wabash Alloys, Wabash Alloys Ontario	Toronto, ON	29	33	4	
45	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	8	
46	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28	3	
47	Crestbrook Forest Industries, Pulp Division	Cranbrook, BC	27	26	1	
48	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26	2	
49	Ivaco Rolling Mills	L'Orignal, ON	29	33	7	
50	Michelin North America (Canada) Inc.	Bridgewater, NS	15	30	2	
Subtotal					197	
% of Total					12.8	
Total for All NPRI Matched Metals					1,541	

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
2	22,322	152	0	1,730,140	1,752,614	Zinc and compounds (land)
3	14,253	362	0	1,245,254	1,259,869	Zinc and compounds (land)
4	365,986	0	0	649,000	1,014,986	Chromium and compounds (land), Nickel and compounds (air)
5	12,053	47	0	717,505	729,605	Zinc/Manganese and compounds (land)
6	706,574	3,780	0	0	710,354	Zinc/Lead and compounds (air)
7	482,280	15,840	0	0	498,120	Lead/Copper/Zinc and compounds (air)
8	18,012	2,682	0	442,030	462,724	Manganese and compounds (land)
9	0	0	0	402,950	402,950	Zinc/Lead and compounds (land)
10	0	300	0	289,990	290,290	Zinc/Manganese and compounds (land)
11	0	0	0	275,000	275,000	Aluminum (land)
12	0	74,800	0	127,400	202,200	Manganese and compounds (land, water)
13	0	0	0	185,000	185,000	Aluminum (land)
14	157,755	11,413	0	0	169,168	Lead/Copper and compounds (air)
15	132,922	0	0	0	132,922	Vanadium (air)
16	93,146	13,328	0	0	107,762	Zinc and compounds (air)
17	0	6,790	0	96,347	103,137	Zinc and compounds (land)
18	75,252	18,525	0	0	93,777	Nickel and compounds (air)
19	87,952	110	0	4,784	92,846	Vanadium (air)
20	609	0	0	63,886	64,495	Manganese and compounds (land)
21	55,299	2,428	0	21	57,748	Zinc/Lead/Nickel and compounds (air)
22	949	1,047	0	53,900	55,896	Nickel/Copper and compounds (land)
23	44,898	0	0	0	44,898	Aluminum (air)
24	0	0	0	40,000	40,000	Manganese and compounds (land)
25	1,532	36,834	0	0	38,366	Manganese and compounds (water)
26	0	32,500	0	0	32,500	Manganese and compounds (water)
27	28,487	0	0	345	28,836	Vanadium, Nickel and compounds (air)
28	0	28,500	0	0	28,500	Manganese and compounds (water)
29	0	400	0	25,400	25,800	Lead and compounds (land)
30	16,758	6,173	0	0	22,931	Zinc/Manganese and compounds (air)
31	21,505	0	0	0	21,505	Chromium and compounds (air)
32	0	20,700	0	0	20,700	Manganese and compounds (water)
33	9,400	8,900	0	0	19,660	Zinc and compounds (water, air), Manganese and compounds (air)
34	0	0	0	18,970	18,970	Manganese and compounds (land)
35	17,280	968	0	0	18,248	Lead and compounds (air)
36	0	11,130	0	6,870	18,000	Chromium and compounds (water, land)
37	16,600	0	0	0	17,750	Zinc and compounds (air)
38	0	14,200	0	0	14,200	Manganese and compounds (water)
39	100	0	0	12,900	13,000	Zinc and compounds (land)
40	12,470	0	0	0	12,470	Vanadium, Nickel and compounds (air)
41	2,330	0	0	9,100	11,430	Manganese and compounds (land)
42	11,190	0	0	0	11,190	Vanadium (air)
43	10,608	0	0	0	10,608	Zinc and compounds (air)
44	10,522	0	0	0	10,522	Aluminum (air)
45	8,721	0	0	200	10,321	Zinc/Lead and compounds (air)
46	7,580	2,527	0	0	10,107	Cobalt/Copper and compounds (air)
47	0	10,100	0	0	10,100	Manganese and compounds (water)
48	0	9,500	0	0	9,500	Manganese and compounds (water)
49	8,552	1	0	0	9,447	Zinc/Manganese and compounds (air)
50	0	83	0	9,151	9,234	Zinc/Copper and compounds (land)
	2,502,732	334,670	0	8,706,548	11,550,046	
	95.7	95.4	0.0	99.5	98.2	
	2,614,044	350,766	576	8,751,998	11,756,014	

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

Table 3-24		The 50 TRI Facilities with the Largest Total On-site Releases of Metals and Their Compounds, 1997				
M	1997	Rank	Facility	City, State	US SIC Code	Number of Forms
		1	ASARCO Inc.	East Helena, MT	33	9
		2	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	10
		3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	8
		4	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	11
		5	Northwestern Steel & Wire Co.	Sterling, IL	33	4
		6	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	11
		7	American Chrome & Chemicals, Harrisons & Crosfield Americ	Corpus Christi, TX	28	1
		8	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	6
		9	Elkem Metals Co.	Marietta, OH	33	5
		10	ASARCO Inc., Glover Plant	Annapolis, MO	33	7
		11	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1
		12	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	8
		13	DuPont	Pass Christian, MS	28	6
		14	DuPont	New Johnsonville, TN	28	5
		15	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	11
		16	Granite City Steel, National Steel Corp.	Granite City, IL	33	6
		17	FMC Corp.	Pocatello, ID	28	9
		18	USS Fairfield Works, USX Corp.	Fairfield, AL	33	8
		19	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.	3
		20	Chemetals Inc., Comilog	New Johnsonville, TN	28	1
		21	Louisiana Pigment Co. L.P.	Westlake, LA	28	1
		22	Kerr-McGee Chemical LLC	Henderson, NV	28	2
		23	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1
		24	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22	7
		25	P4 Production L.L.C.	Soda Springs, ID	Mult.	4
		26	Austeel Lemont Co. Inc.	Lemont, IL	33	5
		27	Imco Recycling Inc.	Morgantown, KY	33	4
		28	Millennium Inorganic Chemicals, Millennium Chemicals Inc.	Baltimore, MD	28	2
		29	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI	33	6
		30	Bethlehem Steel Corp.	Sparrows Point, MD	33	6
		31	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33	5
		32	Griffin Wheel Co., Amsted Ind. Inc.	Keokuk, IA	33	2
		33	GE Co., Silicone Prods.	Waterford, NY	28	2
		34	Geneva Steel	Vineyard, UT	33	8
		35	LTV Steel Co. Inc.	East Chicago, IN	33	4
		36	Griffin Wheel Co., Columbus Plant, Amsted Ind. Inc.	Groveport, OH	33	2
		37	Georgia-Pacific Corp.	Ashdown, AR	26	3
		38	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33	1
		39	Griffin Wheel Co., Amsted Ind. Inc.	Bessemer, AL	33	2
		40	Griffin Wheel Co., Amsted Ind. Inc.	Kansas City, KS	33	2
		41	Great Southern Paper Co., Georgia-Pacific Corp.	Cedar Springs, GA	26	5
		42	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	8
		43	Alabama River Pulp Co. Inc., Parsons & Whittemore Inc.	Perdue Hill, AL	26	3
		44	AK Steel Corp., AK Steel Holding	Middletown, OH	33	9
		45	Tenneco Packaging, Tenneco Inc.	Tomahawk, WI	26	2
		46	LTV Steel Co. Inc.	Cleveland, OH	33	5
		47	TXI Ops. L.P.	Midlothian, TX	32	4
		48	WCI Steel Inc.	Warren, OH	33	6
		49	Gulf States Steel Inc., GSS Holding Corp.	Gadsden, AL	33	6
		50	U.S. Pipe & Fndy. Co., Walter Ind. Inc.	Birmingham, AL	33	1
			Subtotal			248
			% of Total			1.2
			Total for All TRI Matched Metals			20,186

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	40,338	2,280	0	17,100,454	17,143,072	Zinc and compounds (land)
2	133,922	3,644	0	12,048,532	12,186,098	Zinc/Copper and compounds (land)
3	71,865	4,215	0	10,900,498	10,976,578	Copper/Zinc/Lead and compounds (land)
4	18,596	0	0	8,503,492	8,522,088	Copper and compounds (land)
5	55,261	1,179	0	6,716,100	6,772,540	Zinc/Manganese and compounds (land)
6	140,596	7,755	0	6,450,341	6,598,692	Zinc and compounds (land)
7	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
8	33,575	2,175	0	5,564,083	5,599,833	Zinc and compounds (land)
9	174,615	205,442	0	4,752,382	5,132,439	Manganese and compounds (land)
10	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
11	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
12	118,721	183	0	3,839,901	3,958,805	Zinc and compounds (land)
13	0	0	3,809,524	0	3,809,524	Manganese and compounds (UIJ)
14	0	0	3,516,553	0	3,516,553	Manganese and compounds (UIJ)
15	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
16	22,216	5,704	0	2,667,815	2,695,735	Zinc and compounds (land)
17	4,674	338	0	2,167,628	2,172,640	Zinc/Chromium and compounds (land)
18	6,353	794	0	2,133,209	2,140,356	Zinc and compounds (land)
19	4,354	6,145	0	2,066,666	2,077,165	Manganese and compounds (land)
20	15,556	583	0	1,523,810	1,539,949	Manganese and compounds (land)
21	9	122	0	1,405,896	1,406,027	Manganese and compounds (land)
22	6,077	0	0	1,152,381	1,158,458	Manganese and compounds (land)
23	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
24	969,901	0	0	0	969,901	Zinc and compounds (air)
25	35,863	226	0	905,652	941,741	Zinc and compounds (land)
26	12,521	226	0	766,139	778,886	Zinc and compounds (land)
27	14,163	0	0	739,864	754,027	Aluminum (land)
28	0	68,027	0	603,175	671,202	Manganese and compounds (land)
29	15,320	0	0	561,405	576,725	Zinc/Manganese and compounds (land)
30	7,758	19,570	0	471,883	499,211	Manganese and compounds (land)
31	24,617	0	0	459,411	484,028	Chromium and compounds, Aluminum (land)
32	8,164	0	0	446,893	455,057	Manganese and compounds (land)
33	454	6,984	0	444,671	452,109	Copper and compounds (land)
34	1,169	771	0	437,700	439,640	Manganese/Zinc and compounds (land)
35	6,508	1,383	0	425,397	433,288	Manganese and compounds (land)
36	8,164	0	0	423,423	431,587	Manganese and compounds (land)
37	2,998	88,436	0	290,395	381,829	Manganese and compounds (land)
38	0	88	0	365,306	365,394	Nickel and compounds (land)
39	3,583	0	0	355,157	358,740	Manganese and compounds (land)
40	3,583	0	0	321,290	324,873	Manganese and compounds (land)
41	33,760	19,464	0	266,811	320,035	Zinc/Manganese and compounds (land)
42	61,102	0	0	257,326	318,428	Zinc/Lead and compounds (land)
43	821	54,422	0	259,410	314,653	Manganese and compounds (land)
44	21,406	172	0	285,171	306,749	Manganese and compounds (land)
45	6,754	7,800	0	280,635	295,189	Zinc and compounds (land)
46	9,361	1,089	0	284,118	294,568	Manganese/Zinc and compounds (land)
47	683	0	0	286,232	286,915	Manganese and compounds (land)
48	3,757	483	0	279,193	283,433	Manganese and compounds (land)
49	5,316	18,049	0	254,240	277,605	Zinc/Manganese and compounds (land)
50	227	0	0	267,574	267,801	Manganese and compounds (land)
	4,219,564	527,893	7,326,077	117,232,542	129,306,076	
	42.8	19.1	96.4	90.9	86.6	
	9,850,938	2,769,749	7,596,524	129,026,000	149,243,211	

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

➤ UIJ = underground injection

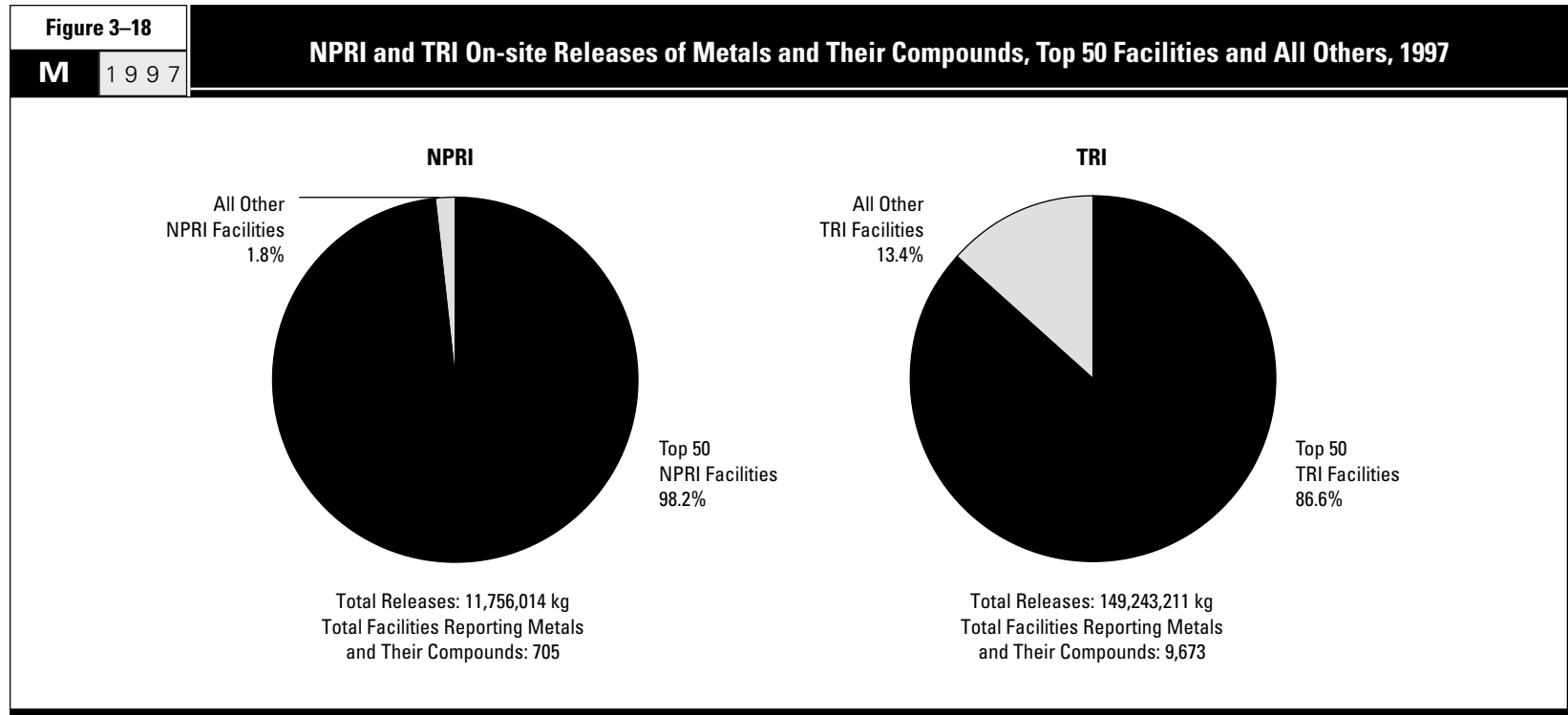


Table 3-25

M 1997

NPRI On-site Releases by Industry (US SIC Code), 1997

Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	33	Primary Metals	9,744,792	671,989	0	8,593,216	19,025,036	23.6
2	28	Chemicals	13,212,747	855,945	4,126,753	75,807	18,334,510	22.8
3	26	Paper Products	14,916,645	1,880,731	0	268,191	17,068,622	21.2
4	37	Transportation Equipment	6,133,168	474	0	6,278	6,147,046	7.6
5	30	Rubber and Plastics Products	5,903,820	506	0	33,451	5,945,315	7.4
6	29	Petroleum and Coal Products	4,209,603	371,307	70,907	16,589	4,671,163	5.8
7	24	Lumber and Wood Products	2,203,872	14,570	0	0	2,219,981	2.8
8	34	Fabricated Metals Products	2,022,079	956	0	1,356	2,039,537	2.5
9	27	Printing and Publishing	1,605,074	3,693	0	0	1,609,267	2.0
10	32	Stone/Clay/Glass Products	856,086	4,781	0	5,436	868,511	1.1
11	25	Furniture and Fixtures	788,036	0	0	0	788,675	1.0
12	39	Misc. Manufacturing Industries	534,789	400	0	33,251	571,518	0.7
13	20	Food Products	63,295	416,097	0	24,076	503,468	0.6
14	22	Textile Mill Products	281,092	0	0	0	281,192	0.3
15	35	Industrial Machinery	268,290	20	0	0	269,113	0.3
16	36	Electronic/Electrical Equipment	71,274	2,700	0	4,457	82,010	0.1
17	31	Leather Products	23,680	0	0	0	23,680	0.0
18	23	Apparel and Other Textile Products	280	0	0	0	280	0.0
19	38	Measurement/Photographic Instruments	0	0	0	0	0	0.0
Total			62,838,622	4,224,169	4,197,660	9,062,108	80,448,924	100.0

Releases by Industry

In 1997, the industries reporting the largest releases in NPRI were primary metals with 19.0 million kg, chemical manufacturing with 18.3 million kg and paper products with 17.1 million kg. TRI industries reporting the largest releases were chemical manufacturing with 254.6 million kg, primary metals with 171.0 million kg and paper products with 95.3 million kg (Tables 3-25 and 3-26). Chapter 7 profiles

the primary metals industry and its PRTR reporting in both countries.

In both countries, these three industries together reported two-thirds (68 percent) of all releases in the 1997 matched data set. In NPRI, however, the top three industries contributed roughly equal shares of the total releases (24 percent to 21 percent). TRI releases were more concentrated in the largest industry: chemical manufacturing with 33 percent of the total, primary metals with 22 percent, and

paper products with 12 percent (Figure 3-19).

Facilities in the primary metals industry reported the largest on-site releases to land in both NPRI (8.6 million kg) and TRI (101.1 million kg). In NPRI, however, the primary metals industry reported more air emissions (9.7 million kg) than on-site land releases. In TRI, the sector's on-site land releases outweighed its air emissions (totaling 48.4 million kg) by two to one.

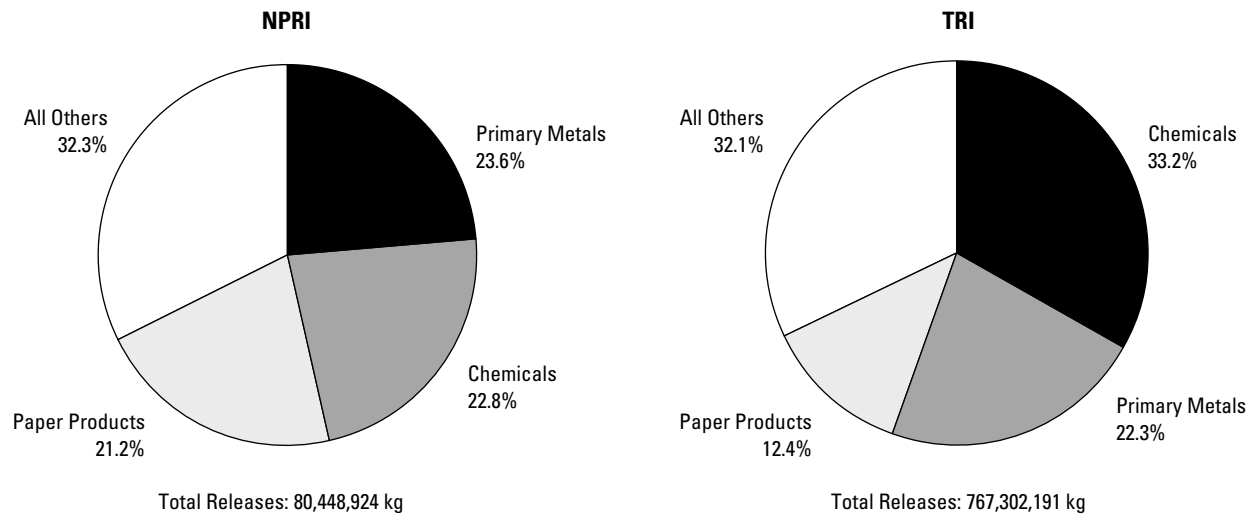
The chemical manufacturing industry reported the largest amounts in TRI for the other release types: 100.5 million kg of air emissions, 46.3 million kg of surface water discharges and 74.0 million kg of underground injection. In NPRI, the paper products sector was the largest industrial source of air emissions (14.9 million kg) and surface water discharges (1.9 million kg). Chemical manufacturing facilities reported nearly all of NPRI's underground injection (4.1 million kg).

Table 3-26		TRI On-site Releases by Industry, 1997						
M		1997						
Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	28	Chemicals	100,480,458	46,295,804	73,996,210	33,797,797	254,570,269	33.2
2	33	Primary Metals	48,370,696	21,324,497	170,771	101,141,817	171,007,781	22.3
3	26	Paper Products	82,388,810	7,360,415	13,197	5,507,600	95,270,022	12.4
4		Multiple Codes 20-39	33,568,587	4,991,863	231	3,573,169	42,133,850	5.5
5	30	Rubber and Plastics Products	38,734,551	5,840	0	369,434	39,109,825	5.1
6	37	Transportation Equipment	36,184,046	110,340	0	257,575	36,551,961	4.8
7	29	Petroleum and Coal Products	17,226,539	4,885,875	467,946	767,884	23,348,244	3.0
8	34	Fabricated Metals Products	19,698,973	636,859	3	385,877	20,721,712	2.7
9	32	Stone/Clay/Glass Products	9,637,487	19,895	0	1,524,740	11,182,122	1.5
10	20	Food Products	2,871,907	7,303,669	2	848,554	11,024,132	1.4
11	24	Lumber and Wood Products	10,843,057	3,206	0	21,308	10,867,571	1.4
12	25	Furniture and Fixtures	10,583,094	17	0	5,515	10,588,626	1.4
13	27	Printing and Publishing	10,582,010	556	0	113	10,582,679	1.4
14	22	Textile Mill Products	7,289,340	154,069	0	92,657	7,536,066	1.0
15	36	Electronic/Electrical Equipment	5,612,875	843,304	1,292	181,076	6,638,547	0.9
16	35	Industrial Machinery	6,141,376	3,737	0	104,668	6,249,781	0.8
17	38	Measurement/Photographic Instruments	4,033,302	587,910	0	55,644	4,676,856	0.6
18	39	Misc. Manufacturing Industries	3,855,139	627	2	7,710	3,863,478	0.5
19	21	Tobacco Products	585,081	77,587	0	0	662,668	0.1
20	31	Leather Products	450,325	10,039	0	4,484	464,848	0.1
21	23	Apparel and Other Textile Products	237,687	2,585	0	10,881	251,153	0.0
Total			449,375,340	94,618,694	74,649,654	148,658,503	767,302,191	100.0

Figure 3-19

M 1997

Industries with Largest Total On-site Releases, NPRI and TRI, 1997



Average Releases

Facilities generally report using one form per substance. In 1997, NPRI facilities averaged somewhat larger total releases per reporting form—17,493 kg per form—than did TRI facilities—13,172 per form. Thus, NPRI releases per form were 1.3 times the TRI average (**Table 3–27**).

Comparing averages per reporting form instead of per facility compensates for the small difference between NPRI and TRI in the average number of forms per facility (3.22 forms per facility in NPRI and 3.05 in TRI). Differences in average releases per form can arise from various factors, including different types of industry and production capacity of facilities, different levels of pollution prevention and controls under

different regulatory requirements, and different methods used to estimate amounts of releases. 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 the information supplied in NPRI and TRI and cannot be examined using PRTR data.

NPRI forms reported larger average releases than those in TRI in 13 of the industrial sectors in the matched data set (**Table 3–27** and **Figure 3–20**). These included four of the five industries reporting the largest releases to NPRI in 1997: the primary metals, paper products, rubber and plastics

products and transportation equipment industries. Forms submitted by NPRI facilities in the primary metals and paper products sectors averaged 1.1 times the amount of releases reported on TRI forms in those industries. For the rubber and plastics products and transportation equipment industries, the difference was considerably greater: 1.7 times the TRI average.

There were six industry groups in which TRI releases per form exceeded those in NPRI (**Table 3–27**). These included chemical manufacturing. However, these larger TRI averages in particular sectors were outweighed by the predominance of industrial sectors in which NPRI forms had larger averages per form than in TRI.

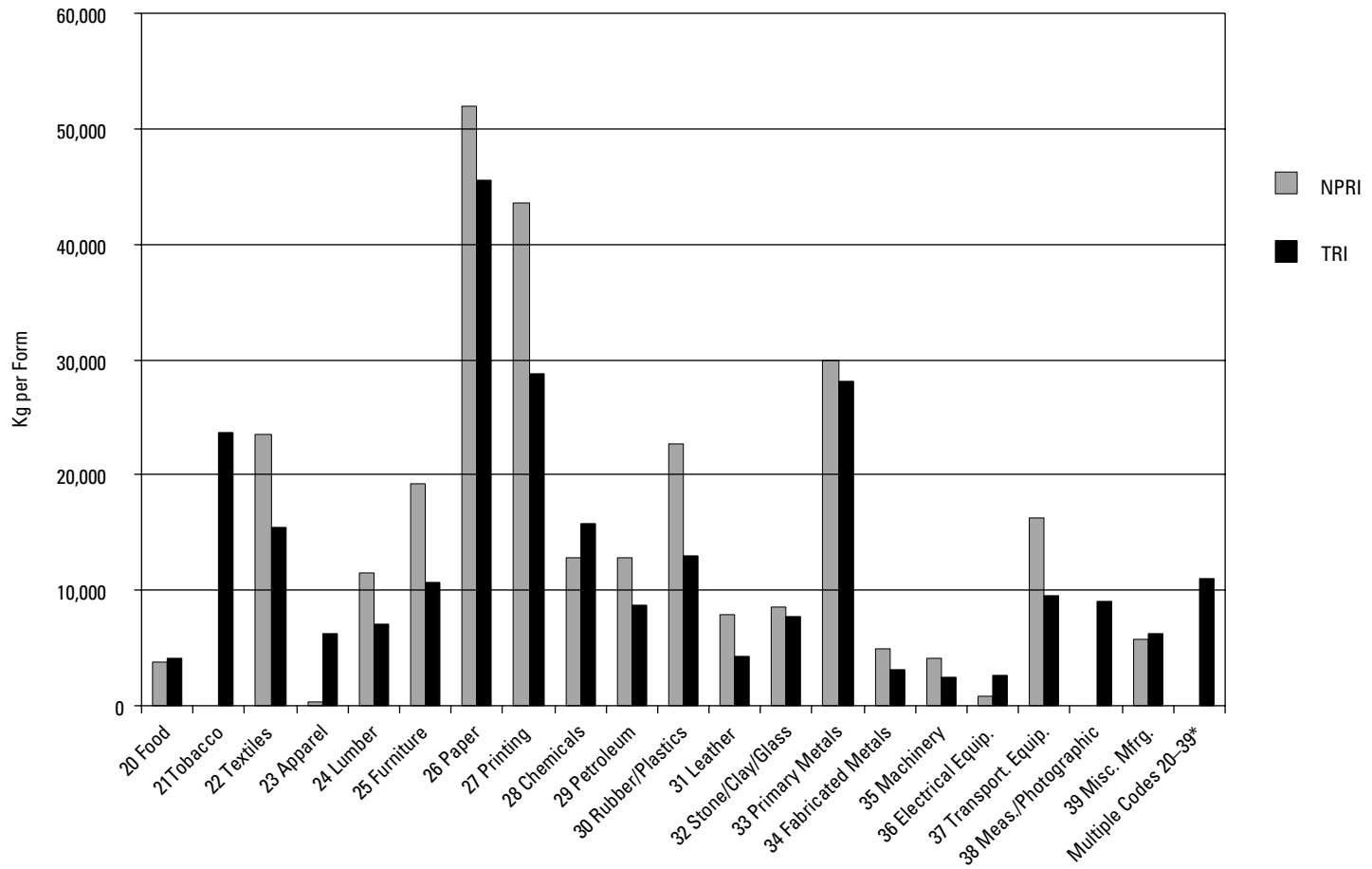
The difference in NPRI and TRI average releases occurred specifically in air emissions. Air emissions constituted a considerably larger portion of NPRI releases than of those reported to TRI (see **Table 3–1**), and average air emissions—per form and per facility—were nearly twice as high in NPRI as in TRI (**Table 3–28**).

Releases to air reported to NPRI averaged 13,664 kg per reporting form—1.8 times the 7,714 kg average on TRI forms. On a per facility basis, air emissions averaged 43,943 kg in NPRI—1.9 times the 23,497 kg average for TRI facilities. In the other release types though, TRI forms and facilities reported greater releases on average than their NPRI counterparts.

Table 3-27		Average On-site Releases per Form, by Industry, 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	31	Leather Products	7,893	4,226	1.9
2	25	Furniture and Fixtures	19,236	10,674	1.8
3	30	Rubber and Plastics Products	22,606	13,032	1.7
4	37	Transportation Equipment	16,349	9,516	1.7
5	24	Lumber and Wood Products	11,562	7,075	1.6
6	35	Industrial Machinery	4,077	2,546	1.6
7	34	Fabricated Metals Products	4,856	3,109	1.6
8	22	Textile Mill Products	23,433	15,443	1.5
9	27	Printing and Publishing	43,494	28,757	1.5
10	29	Petroleum and Coal Products	12,798	8,644	1.5
11	26	Paper Products	51,880	45,497	1.1
12	32	Stone/Clay/Glass Products	8,515	7,717	1.1
13	33	Primary Metals	29,867	28,099	1.1
14	20	Food Products	3,757	4,083	0.9
15	39	Misc. Manufacturing Industries	5,773	6,313	0.9
16	28	Chemicals	12,830	15,745	0.8
17	36	Electronic/Electrical Equipment	891	2,597	0.3
18	23	Apparel and Other Textile Products	280	6,279	0.0
19	38	Measurement/Photographic Instruments	0	8,959	0.0
	21	Tobacco Products	—	23,667	—
		Multiple Codes 20-39*	—	10,972	—
		Total	17,493	13,172	1.3

* Multiple SIC codes reported only in TRI data.

Figure 3-20
M 1997
Average On-site Releases per Form by Industry, NPRI and TRI, 1997



* Multiple SIC codes reported only in TRI data.

Table 3-28		Average On-site Releases per Form, NPRI and TRI, 1997								
M	1997	NPRI			TRI					
		Number	Forms/Facility		Number	Forms/Facility				
			kg/form	kg/facility		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					
		kg	kg/form	kg/facility	kg	kg/form	kg/facility			
Total Air Emissions		62,838,622	13,664	43,943	449,375,340	7,714	23,497	1.8	1.9	
Surface Water Discharges		4,224,169	918	2,954	94,618,694	1,624	4,947	0.6	0.6	
Underground Injection		4,197,660	913	2,935	74,649,654	1,281	3,903	0.7	0.8	
On-site Land Releases		9,062,108	1,970	6,337	148,658,503	2,552	7,773	0.8	0.8	
Matched Releases		80,448,924	17,493	56,258	767,302,191	13,172	40,120	1.3	1.4	

3.3 Changes in Releases, 1995–1997

This section of *Taking Stock 1997* shows changes in amounts of releases reported from 1995 to 1997 using the 1997 matched data set. As noted in **Chapter 2**, the chemicals and industries covered by NPRI and TRI did not change from 1995 to 1997; however, as the sections below attest, the amounts of substances released did.

3.3.1 Overview

From 1995 to 1997, the number of facilities reporting to North American PRTRs declined by about 750 facilities to a total of 20,555. The number of forms decreased by about 2,000 to a total of 62,851. However, these changes resulted from a four percent decrease in TRI facilities and forms, offset in part by a 10 percent increase in NPRI reporting (**Table 3–29**).

Releases reported to North American PRTRs declined 80 million kg from 1995 to 1997, dropping from 927.7 million kg in 1995 to 847.8 million kg. Overall, North American facilities achieved a nine percent reduction in releases from 1995 to 1997, including a 13 percent reduction in releases reported to NPRI and an eight percent reduction in TRI releases (**Table 3–29** and **Figure 3–21**).

This 80-million-kg overall reduction reflected an even larger reduction

Table 3–29		North American On-site Releases, 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
On-site Releases		kg	kg	kg	kg	%
Total Air Emissions		606,027,858	563,409,745	512,213,962	-93,813,896	-15.5
Surface Water Discharges		86,945,023	81,681,095	98,842,863	11,897,840	13.7
Underground Injection		87,824,019	75,235,496	78,847,314	-8,976,705	-10.2
On-site Land Releases		146,726,294	153,435,348	157,720,611	10,994,317	7.5
Total Releases		927,660,074	873,890,403	847,751,115	-79,908,959	-8.6

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

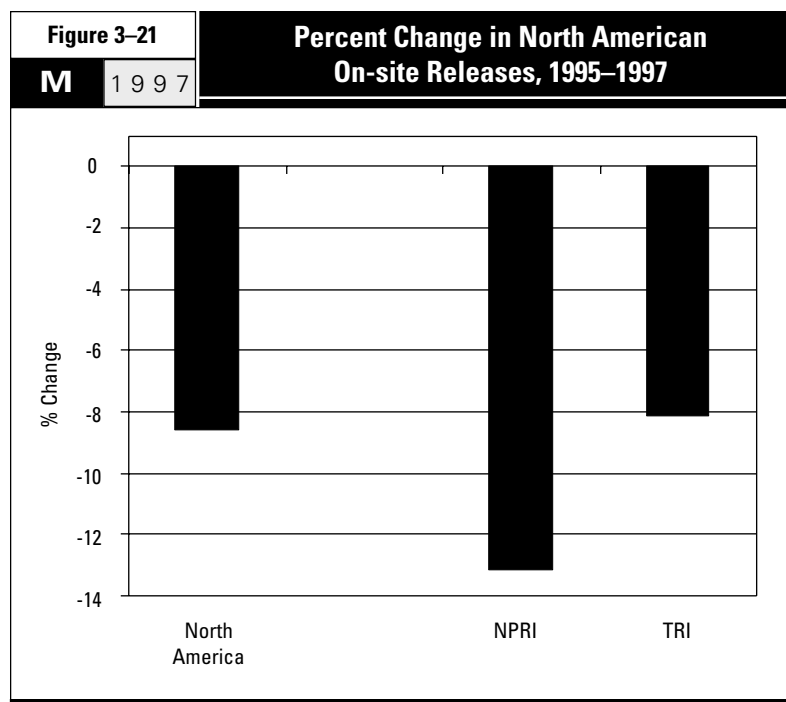
in North American emissions to air over that period. Releases to air decreased 93.8 million kg, from 606.0 million kg to 512.2 million kg, from 1995 to 1997. Underground injection also decreased, from 87.8 million kg to 78.8 million kg, a reduction of 9.0 million kg. However, surface water discharges and on-site land releases both increased. Releases to surface waters increased from 86.9 million kg to 98.8 million kg (a 11.9-million-kg increase), while on-site land releases rose from 146.7 million kg to 157.7 million kg (an 11.0-million-kg increase).

These changes resulted from quite different trends in NPRI and TRI reporting from 1995 to 1997. In both PRTRs, air emissions decreased (by 4.1 million kg or six percent in NPRI and by 89.7 million kg or 17 percent in TRI). However, in all other release categories, NPRI and TRI facilities reported opposing trends. NPRI surface water discharges dropped by two-thirds (66 percent or 8.1 million kg), while surface water discharges in TRI increased by more than one-quarter (27 percent or 20.0 million kg). Underground injection increased in NPRI

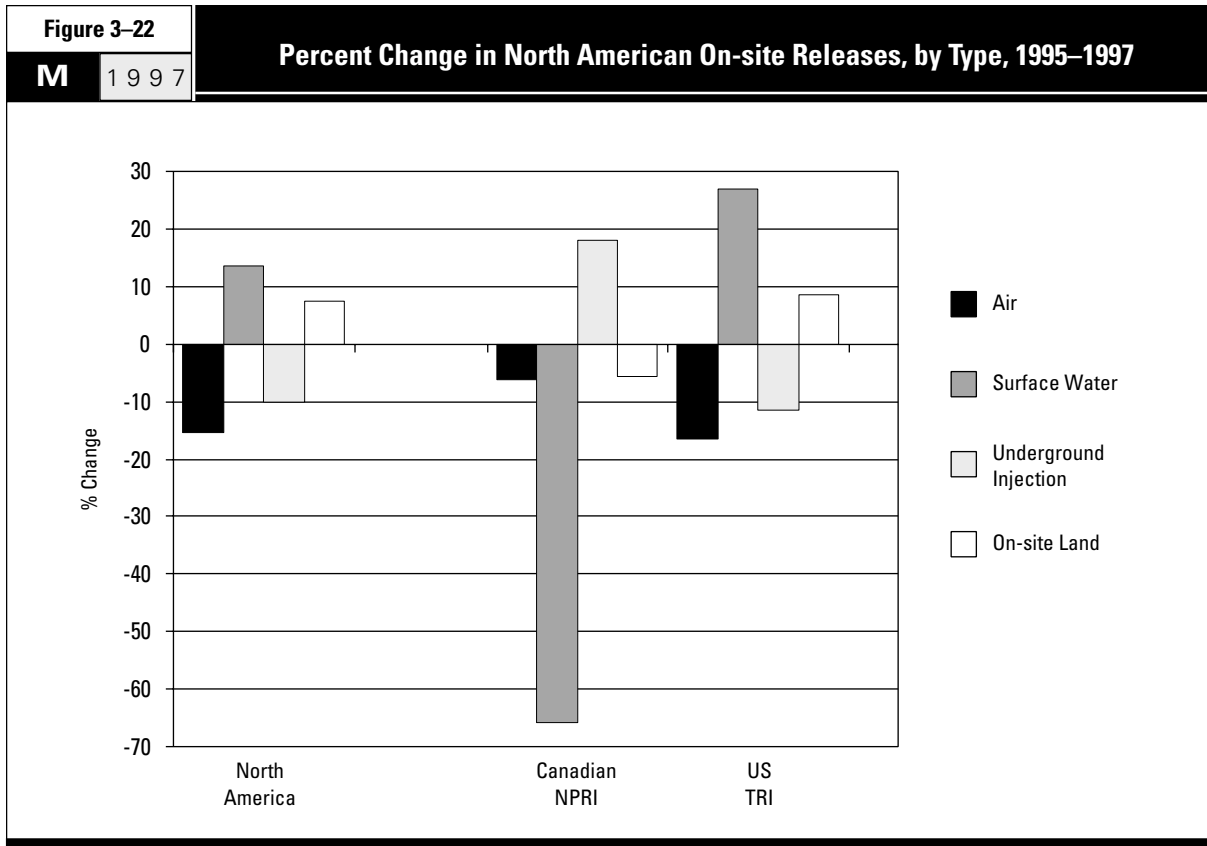
(18 percent or 640,733 kg) and decreased in TRI (11 percent or 9.6 million kg). For on-site land releases, NPRI facilities reported a decrease (6 percent or 545,635 kg) while TRI facilities reported an increase (eight percent or 11.5 million kg).

Overall, North American air emissions decreased 16 percent and underground injection 10 percent, while surface water discharges increased 14 percent and on-site land releases eight percent. These data more closely resemble the pattern of changes in TRI because of the relative sizes of the two PRTRs (**Figure 3–22**).

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
kg	kg	kg	kg	%	kg	kg	kg	kg	%
66,987,712	64,152,247	62,838,622	-4,149,090	-6.2	539,040,146	499,257,498	449,375,340	-89,664,806	-16.6
12,330,846	5,128,041	4,224,169	-8,106,677	-65.7	74,614,177	76,553,054	94,618,694	20,004,517	26.8
3,556,927	4,812,379	4,197,660	640,733	18.0	84,267,092	70,423,117	74,649,654	-9,617,438	-11.4
9,607,743	8,950,491	9,062,108	-545,635	-5.7	137,118,551	144,484,857	148,658,503	11,539,952	8.4
92,620,108	83,171,877	80,448,924	-12,171,184	-13.1	835,039,966	790,718,526	767,302,191	-67,737,775	-8.1



► 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 3-30		NPRI On-site Releases by Province, 1995–1997 (Ordered by Total 1997 Releases)				
Province	1995		1996		1997	
	(kg)	(kg)	(kg)	(kg)	(kg)	(%)
Ontario	45,919,331	38,871,441	39,955,770	-5,963,561	-13.0	
Quebec	17,044,512	15,134,018	14,649,326	-2,395,186	-14.1	
Alberta	15,000,884	14,635,572	11,987,370	-3,013,514	-20.1	
British Columbia	5,438,945	5,710,382	5,459,128	20,183	0.4	
Manitoba	1,530,130	3,062,727	3,397,552	1,867,422	122.0	
New Brunswick	4,792,326	3,277,331	2,357,036	-2,435,290	-50.8	
Nova Scotia	1,583,093	1,278,787	1,063,517	-519,576	-32.8	
Saskatchewan	1,013,664	783,366	946,849	-66,815	-6.6	
Newfoundland	284,203	400,700	412,606	128,403	45.2	
Prince Edward Island	13,020	17,553	219,770	206,750	1,587.9	
Total	92,620,108	83,171,877	80,448,924	-12,171,184	-13.1	

3.3.2 Changes in Releases by State and Province

From 1995 to 1997, facilities in four Canadian provinces reported reductions in releases of more than two million kg each. The largest reduction—6.0 million kg—occurred in Ontario, where releases decreased from 45.9 million kg in 1995 to 40.0 million kg in 1997. This represented a 13 percent decrease in releases in the province that reported the largest total releases in all three years. In Quebec, which ranked second for total releases, the reduction from 1995 to 1997 was 2.4 million kg (from 17.0 million kg to 14.7 million kg). Facilities in Alberta reported a reduction of 3.0 million kg, from 15.0 million kg in 1995 to 12.0 million kg in 1997, a 20 percent decrease. Alberta ranked third for total releases in all three years. With a 51 percent reduction, New Brunswick dropped from fifth among the provinces in 1995 (with total releases of 4.8 million kg) to sixth in 1997 (with 2.4 million kg). This was a reduction of 2.4 million kg in New Brunswick's total releases over the period (Table 3–30).

Manitoba reported the largest increase—1.9 million kg—among Canadian provinces. Releases in Manitoba more than doubled—increasing from 1.5 million kg to 3.4 million kg. Altogether, six Canadian provinces reported decreases and four reported increases in total releases from 1995 to 1997.

In two US states, reductions in TRI releases from 1995 to 1997 exceeded 10 million kg. Texas facilities reported the largest decrease, from 105.8 million kg to 83.9 million kg, a reduction of 22.0 million kg or 21 percent. Texas ranked first among states for total releases in all three years. Alabama releases decreased 11.0 million kg, from 41.2 million kg in 1995 to 30.2 million kg in 1997. This amounted to a 27 percent reduction and lowered Alabama's rank from fourth in 1995 to ninth in 1997. Four states reported decreases of more than five million kg each: Michigan with a 6.7-million-kg decrease (25 percent), Ohio with a 5.6-million-kg reduction (13 percent), North Carolina with a 5.4-million-kg reduction (16 percent) and New Mexico also with a 5.4-million-kg reduction (29 percent). Releases declined in 38 states and territories from 1995 to 1997 (**Table 3-31**).

The largest increase in TRI releases was reported in Utah, where the total rose from 34.1 million kg in 1995 to 41.8 million kg in 1997. This increase of 7.8 million kg (23 percent) brought Utah from eighth among US states and territories in 1995 to third in 1997. Fourteen US states and territories reported increases from 1995 to 1997. The District of Columbia had zero releases in all three years.

From 1995 to 1997, releases decreased by more than 10 percent in 32 states and provinces and rose by more than 10 percent in 11 states and provinces (**Map 3-6**).

Table 3-31		TRI On-site Releases by State, 1995-1997				
M	1997	TRI On-site Releases by State, 1995-1997			(Ordered by Total 1997 Releases)	
State	Total Releases			Change 1995-1997		
	1995 (kg)	1996 (kg)	1997 (kg)	kg	%	
Texas	105,839,053	91,063,071	83,883,000	-21,956,053	-20.7	
Louisiana	61,044,458	64,637,921	63,224,378	2,179,920	3.6	
Utah	34,082,808	36,081,107	41,835,001	7,752,193	22.7	
Ohio	42,573,363	40,360,658	36,992,382	-5,580,981	-13.1	
Tennessee	40,027,685	35,549,923	35,877,974	-4,149,711	-10.4	
Pennsylvania	28,224,217	27,547,979	33,713,706	5,489,489	19.4	
Florida	28,517,751	27,011,094	32,013,775	3,496,024	12.3	
Illinois	34,483,295	32,833,004	31,144,870	-3,338,425	-9.7	
Alabama	41,233,206	36,075,889	30,199,535	-11,033,671	-26.8	
North Carolina	34,432,863	32,574,227	29,035,377	-5,397,486	-15.7	
Indiana	29,939,396	26,908,096	27,811,195	-2,128,201	-7.1	
Mississippi	21,620,941	21,555,477	24,753,247	3,132,306	14.5	
Missouri	21,856,481	21,723,345	22,779,721	923,240	4.2	
Georgia	19,660,127	20,284,240	20,373,823	713,696	3.6	
Michigan	26,697,119	22,628,926	20,000,568	-6,696,551	-25.1	
South Carolina	20,721,736	19,086,974	19,349,981	-1,371,755	-6.6	
Virginia	21,656,488	20,964,942	19,348,059	-2,308,429	-10.7	
Montana	19,379,820	21,433,495	18,699,623	-680,197	-3.5	
Arizona	16,963,419	20,397,574	13,436,541	-3,526,878	-20.8	
New Mexico	18,650,847	17,145,406	13,287,600	-5,363,247	-28.8	
Kentucky	12,210,951	12,656,973	12,243,252	32,301	0.3	
Wisconsin	13,100,770	12,008,575	11,955,575	-1,145,195	-8.7	
New York	14,566,183	12,391,013	11,707,417	-2,858,766	-19.6	
Arkansas	10,452,876	10,079,983	10,227,944	-224,932	-2.2	
Oregon	9,354,325	9,109,687	9,677,021	322,696	3.4	
California	8,906,945	10,196,727	8,921,534	14,589	0.2	
Washington	10,271,201	9,155,119	8,735,877	-1,535,324	-14.9	
West Virginia	11,139,089	9,867,814	7,865,320	-3,273,769	-29.4	
Iowa	10,327,183	8,724,919	7,830,048	-2,497,135	-24.2	
Kansas	6,531,589	6,735,716	7,228,250	696,661	10.7	
Idaho	4,772,712	5,266,030	6,229,364	1,456,652	30.5	
Oklahoma	6,449,451	5,918,768	6,067,878	-381,573	-5.9	
New Jersey	5,336,171	5,558,656	6,022,954	686,783	12.9	
Minnesota	7,230,561	6,262,623	5,371,218	-1,859,343	-25.7	
Maryland	4,704,290	4,181,828	4,446,359	-257,931	-5.5	
Wyoming	4,089,641	3,371,010	3,565,677	-523,964	-12.8	
Maine	3,698,236	3,100,407	2,947,091	-751,145	-20.3	
Puerto Rico	3,540,065	3,197,532	2,894,302	-645,763	-18.2	
Connecticut	3,573,272	2,751,379	2,314,384	-1,258,888	-35.2	
Nebraska	3,255,960	2,222,705	2,140,998	-1,114,962	-34.2	
Massachusetts	3,018,643	2,465,457	2,079,208	-939,435	-31.1	
Nevada	1,494,614	1,464,088	1,821,377	326,763	21.9	
South Dakota	1,675,907	1,429,801	1,343,396	-332,511	-19.8	
Colorado	1,447,568	1,459,968	1,331,351	-116,217	-8.0	
Delaware	1,472,223	1,051,470	1,011,075	-461,148	-31.3	
New Hampshire	1,048,074	997,498	970,539	-77,535	-7.4	
Rhode Island	1,119,455	812,554	705,748	-413,707	-37.0	
Alaska	1,005,984	1,039,876	540,492	-465,492	-46.3	
Virgin Islands	549,643	561,763	537,535	-12,108	-2.2	
North Dakota	659,870	452,287	509,847	-150,023	-22.7	
Vermont	284,806	193,295	174,940	-109,866	-38.6	
Hawaii	146,635	169,657	123,864	-22,771	-15.5	
District of Columbia	0	0	0	0	—	
Total	835,039,966	790,718,526	767,302,191	-67,737,775	-8.1	

Map 3-6





M 1997

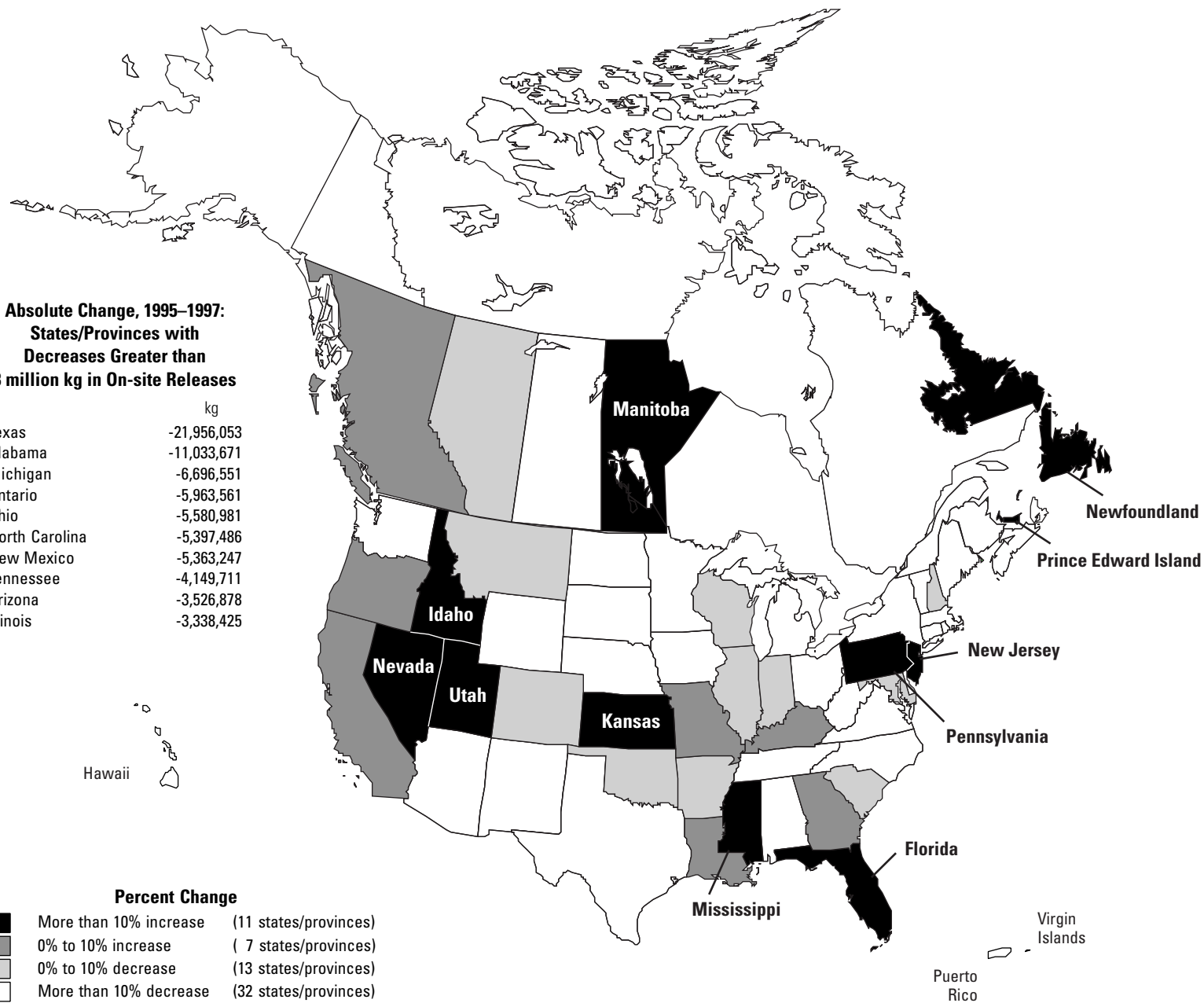
Percent Change in North American Total On-site Releases, 1995-1997

**Absolute Change, 1995-1997:
States/Provinces with
Decreases Greater than
3 million kg in On-site Releases**

	kg
Texas	-21,956,053
Alabama	-11,033,671
Michigan	-6,696,551
Ontario	-5,963,561
Ohio	-5,580,981
North Carolina	-5,397,486
New Mexico	-5,363,247
Tennessee	-4,149,711
Arizona	-3,526,878
Illinois	-3,338,425

Percent Change

	More than 10% increase	(11 states/provinces)
	0% to 10% increase	(7 states/provinces)
	0% to 10% decrease	(13 states/provinces)
	More than 10% decrease	(32 states/provinces)



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

3.3.3 NPRI and TRI Facilities with Largest Changes

A few facilities accounted for large changes in on-site releases from 1995 to 1997. For NPRI, while the overall change from 1995 to 1997 was a net decrease of 12.2 million kg in the matched data set, 50 NPRI facilities reported decreases totaling 24.8 million kg and 50 reported increases of 12.7 million kg. For TRI, the overall change from 1995 to 1997 was a net decrease of 67.7 million kg and the 50 TRI facilities with the largest decreases

reported a total decrease of 80.5 million kg and the 50 with the largest increases reported a total increase of 73.8 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 releases, and one-time remedial efforts to clean-up wastes or spills.

NPRI Facilities with Largest Decreases/Increases

In NPRI, the 50 facilities with the largest reductions made by far the largest contribution to the overall

reduction in releases from 1995 to 1997. Releases by the NPRI facilities that were not among the largest “increasers” or “decreasers” from 1995 to 1997 were essentially level throughout the period (**Figure 3–23**).

The 50 NPRI facilities with the largest reductions in total releases from 1995 to 1997 accomplished a 57 percent reduction, reporting 43.4 million kg in 1995 and 18.5 million kg in 1997. The number of forms they submitted varied from 404 in 1995 to 374 in 1996 to 399 in 1997, indicating that overall the facilities reported smaller amounts, not fewer substances. Seven of the

facilities submitted no reports for chemicals in the matched data set in 1997 (**Table 3–32**).

Total releases of the 50 NPRI facilities with the largest increases from 1995 to 1997 rose from 17.0 million kg to 29.7 million kg, an increase of 74 percent. These facilities also reported on more substances, submitting one-third more forms in 1997 than in 1995 (up from 250 forms to 335 forms). Among them were eight facilities that did not report for chemicals in the matched data set in 1995 but did so in 1997 (**Table 3–33**).

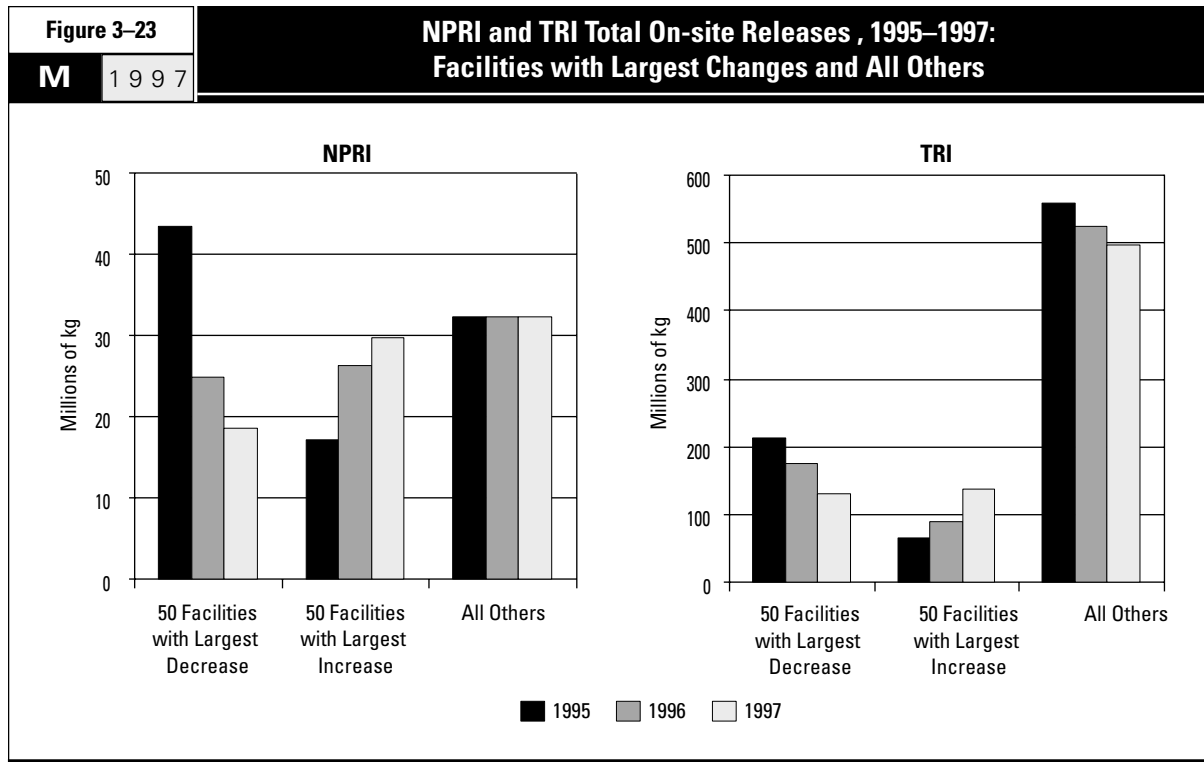


Table 3-32		NPRI Facilities with Largest Decrease in On-site Releases, 1995-1997			
Rank	Facility	City, Province	SIC Codes		
			Canada	US	
1	Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John, NB	27	26	
2	Methanex Corporation	Medicine Hat, AB	37	28	
3	Fort James Corporation, Fort James - Marathon, Ltd.	Marathon, ON	27	26	
4	Sherritt International Corporation	Fort Saskatchewan, AB	37	28	
5	Cartons St-Laurent Inc.	LaTuque, QC	27	26	
6	Domtar Packaging, Red Rock Mill	Red Rock, ON	27	26	
7	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33	
8	Co-Steel Lasco	Whitby, ON	29	33	
9	Bayer Inc., Bayer AG	Sarnia, ON	37	28	
10	Les Papiers Perkins Ltée, Cascades	Candiac, QC	27	26	
11	Standard Products (Canada) Limited, Rubber Plant #1	Stratford, ON	15	30	
12	General Motors of Canada Ltd., Oshawa Truck Assembly Centre	Oshawa, ON	32	37	
13	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37	
14	Norkraft Quévillon Inc., Domtar Inc.	Lebel-sur-Quévillon, QC	27	26	
15	Fonderies canadiennes d'Acier Ltée, Fonderie de Montréal	Montréal, QC	31	35	
16	Pétromont, Société en commandite	Montréal-est, QC	37	28	
17	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	
18	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	
19	Sydney Steel Corporation	Sydney, NS	29	33	
20	Rexam Metallising, Rexam Canada Ltd.	Brantford, ON	27	26	
21	Ford Motor Company, St. Thomas Assembly Plant	St. Thomas, ON	32	37	
22	Cami Automotive Inc.	Ingersoll, ON	32	37	
23	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28	
24	Velcro Canada Inc., Velcro Industries B.V.	Brampton, ON	19	22	
25	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26	
26	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	
27	Imperial Oil, IOL Dartmouth Refinery	Dartmouth, NS	36	29	
28	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28	
29	Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan, QC	27	26	
30	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26	
31	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29	
32	Dofasco Inc.	Hamilton, ON	29	33	
33	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33	
34	3M Canada Company (Perth)	Perth, ON	35	32	
35	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	
36	Dow Chemical Canada Inc.	Sarnia, ON	37	28	
37	Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge, ON	16	30	
38	Petro-Canada, Edmonton Refinery	Edmonton, AB	36	29	
39	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	
40	Formica Canada Inc, Formica Corp.	St-Jean-sur-Richelieu, QC	27	26	
41	Canac Kitchens Limited, Kohler Company	Thornhill, ON	25	24	
42	General Motors of Canada Ltd., Oshawa Car Assembly Plant	Oshawa, ON	32	37	
43	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	
44	Advanced Monobloc Manufacturing, CCL Industries Inc.	Penetanguishene, ON	30	34	
45	Novopharm Limited	Scarborough, ON	37	28	
46	Abitibi-Consolidated Inc.	Kenora, ON	27	26	
47	Plastcoat, Decoma International Inc.	Mississauga, ON	30	34	
48	Imperial Oil, IOL Strathcona Refinery	Edmonton, AB	36	29	
49	loco Refinery — Imperial Oil	Port Moody, BC	36	29	
50	Freightliner of Canada Ltd., St. Thomas Truck Plant	St. Thomas, ON	32	37	
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 Media with Decreases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	4	3,663,623	4	2,183,425	4	1,070,289	-2,593,334	Methanol (water)
2	4	3,353,220	3	1,454,080	3	790,700	-2,562,520	Methanol (air)
3	4	2,215,100	4	149,600	4	153,600	-2,061,500	Methanol (water)
4	13	2,275,064	10	179,700	8	224,280	-2,050,784	Methanol (air)
5	4	2,407,638	8	402,093	8	430,731	-1,976,907	Methanol (water)
6	1	1,900,000	2	235,117	2	273,348	-1,626,652	Methanol (water)
7	17	1,598,360	16	261,169	19	210,235	-1,388,125	Manganese and compounds (land)
8	6	2,411,507	6	1,254,893	6	1,259,869	-1,151,638	Copper and compounds (land)
9	15	2,336,921	16	1,725,826	17	1,421,799	-915,122	Chloromethane, Hydrochloric acid (air)
10	1	793,700	**	**	**	**	-793,700	Xylene (air)
11	3	951,015	3	582,700	3	427,400	-523,615	Xylene (air)
12	12	850,907	11	610,855	14	391,461	-459,446	Xylene, Toluene (air)
13	13	465,482	14	461,699	12	147,592	-317,890	Xylene (air)
14	5	399,568	7	351,160	11	99,375	-300,193	Methanol (air)
15	3	295,200	3	256,000	3	0	-295,200	Chromium and compounds (land)
16	1	350,611	2	131,106	2	63,938	-286,673	Ethylene (air)
17	6	598,950	6	386,122	6	342,683	-256,267	Methanol (water)
18	7	1,123,783	8	767,070	8	874,802	-248,981	Methanol (air)
19	10	533,500	9	331,280	9	290,290	-243,210	Zinc/Manganese/Lead and compounds (land)
20	2	240,000	2	290,100	**	**	-240,000	Methyl ethyl ketone (air)
21	12	626,463	11	543,878	11	386,554	-239,909	Xylene, Methyl isobutyl ketone, Ethylbenzene (air)
22	12	389,808	12	300,226	11	167,483	-222,325	Xylene, Methyl ethyl ketone (air)
23	5	653,459	5	605,923	6	444,335	-209,124	Ethylene glycol (air)
24	3	204,985	3	201,517	**	**	-204,985	Methyl ethyl ketone (air)
25	4	616,600	4	616,600	4	412,600	-204,000	Methanol, Chlorine (air)
26	11	748,235	11	563,787	11	549,017	-199,218	Nitric acid and nitrate compounds (water)
27	13	284,268	13	192,792	14	89,736	-194,532	Xylene, Toluene, 1,2,4-Trimethylbenzene (air)
28	15	566,115	16	579,650	16	375,364	-190,751	Nitric acid and nitrate compounds (water)
29	4	189,126	4	3,877	**	**	-189,126	Formaldehyde (water)
30	4	612,600	4	884,500	4	442,050	-170,550	Methanol (air)
31	15	308,871	15	282,231	19	138,763	-170,108	Sulfuric acid, Xylene, Benzene, Toluene (air)
32	18	591,844	18	586,441	18	431,063	-160,781	Benzene (air)
33	7	153,630	**	**	**	**	-153,630	Nickel/Lead and compounds (air)
34	5	209,287	3	47,137	6	59,047	-150,240	Xylene, Toluene (air)
35	13	663,045	12	693,550	12	515,120	-147,925	Lead and compounds (air)
36	20	482,557	20	411,891	39	336,134	-146,423	Asbestos (land)
37	7	959,979	10	998,783	8	817,865	-142,114	Methyl ethyl ketone, Toluene (air)
38	15	227,200	14	76,415	19	94,301	-132,899	Propylene, Xylene, Toluene (air)
39	4	672,732	6	437,406	5	542,102	-130,630	Chlorine (air)
40	2	420,000	2	339,192	2	290,800	-129,200	Methanol (air)
41	16	205,317	6	129,749	5	80,377	-124,940	Toluene, Xylene, Styrene (air)
42	12	1,412,204	11	1,216,263	13	1,299,855	-112,349	Xylene (air)
43	9	2,156,690	8	2,187,020	7	2,046,380	-110,310	Toluene, Cyclohexane (air)
44	1	109,380	1	87,240	**	**	-109,380	Tetrachloroethylene (air)
45	1	418,410	1	366,565	1	313,250	-105,160	Dichloromethane (air)
46	3	99,783	3	4,501	1	0	-99,783	Methanol (water)
47	3	134,200	3	169,800	3	35,031	-99,169	Methyl ethyl ketone, Xylene (air)
48	21	213,149	20	179,335	21	117,156	-95,993	Xylene, Toluene, 1,2,4-Trimethylbenzene, Ethylene, Naphthalene (air)
49	14	95,310	**	**	**	**	-95,310	Xylene, Toluene, 1,2,4-Trimethylbenzene, Cyclohexane, Propylene (air)
50	4	172,280	4	71,750	4	79,460	-92,820	Toluene (air)
	404	43,361,676	374	24,792,014	399	18,536,235	-24,825,441	

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

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

Table 3-33		NPRI Facilities with Largest Increase in On-site Releases, 1995-1997		
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33
2	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33
3	Ispat Sidbec Inc. Acierie, Ispat Mexicana	Contrecoeur, QC	29	33
4	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28
5	Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga, ON	28	27
6	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28
7	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33
8	Papiers Domtar - Centre d'affaires Windsor	Windsor, QC	27	26
9	International Wallcoverings Ltd.	Brampton, ON	27	26
10	Celanese Canada Inc.	Edmonton, AB	37	28
11	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24
12	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29
13	Pétroles Coastal Canada Inc., Coastal Corporation	Montréal-est, QC	37	28
14	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28
15	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24
16	Emballages Stone (Canada), Div. Chaleurs, Stone Container	New Richmond, QC	27	26
17	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33
18	M.B. Paper, Alberni Specialties Division, MacMillan Bloedel	Port Alberni, BC	27	26
19	Crown Cork & Seal Canada Inc., Plant 244	Concord, ON	30	34
20	Novopharm Limited	Markham, ON	37	28
21	Kitchencraft of Canada Ltd.	Winnipeg, MB	25	24
22	Les Aciers Canam, Le Groupe Canam Manac Inc.	St-Gédéon, QC	30	34
23	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26
24	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28
25	Parmalat Canada	Winchester, ON	10	20
26	Chrysler Canada, Ltd., Bramalea Assembly Plant	Bramalea, ON	32	37
27	McCain Foods (Canada), Borden-Carleton Plants	Carleton, PE	10	20
28	Avenor Inc., Dryden Mill	Dryden, ON	27	26
29	Morbern Incorporated	Cornwall, ON	16	30
30	Secal, usine Vaudreuil	Jonquière, QC	37	28
31	Paintplas Inc.	Ajax, ON	32	30
32	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
33	Western Pulp Limited Partnership, Port Alice Operation	Port Alice, BC	27	26
34	Carpenter Canada Ltd.	Woodbridge, ON	16	30
35	Abitibi-Consolidated Inc.	Fort Frances, ON	27	26
36	Société d'électrolyse et de chimie Alcan, usine Arvida	Jonquière, QC	29	33
37	Palliser Furniture Ltd, Defehr Division	Winnipeg, MB	26	25
38	Western Star Trucks Incorporated	Kelowna, BC	32	37
39	Prévost Car Inc., usine du boulevard Gagnon, Volvo Bus Corp.	Ste-Claire, QC	32	37
40	Canam Steel Works, Le Groupe Canam Manac Inc.	Calgary, AB	30	34
41	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	28
42	Crestbrook Forest Industries, Pulp Division	Cranbrook, BC	27	26
43	Canam Steel Works, Le Groupe Canam Manac Inc.	Mississauga, ON	30	34
44	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26
45	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24
46	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
47	Toyota Motor Manufacturing Canada Inc.	Cambridge, ON	32	37
48	Stelco Inc., Hilton Works	Hamilton, ON	29	33
49	Knoll North America Corp., Main Plant, E.M. Warburg Pincus	Toronto, ON	26	25
50	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24
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 Media with Increases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	7	3,662,640	7	4,773,818	7	4,908,786	1,246,146	Sulfuric acid (air), Chromium and compounds (land)
2	4	762,000	5	2,031,067	7	1,782,947	1,020,947	Zinc and compounds (land)
3	5	1,510,387	5	2,322,985	5	2,349,790	839,403	Zinc and compounds (land)
4	**	**	10	2,121,980	4	762,000	762,000	Methanol (air)
5	1	36,000	1	27,000	2	797,000	761,000	Methanol (air)
6	**	**	**	**	10	750,109	750,109	Methyl ethyl ketone, Methanol, Toluene (air)
7	6	181,387	6	437,092	6	744,572	563,185	Zinc/Lead and compounds (air)
8	5	143,400	4	116,200	6	527,484	384,084	Methanol (air)
9	4	316,000	4	416,300	4	669,500	353,500	Methyl ethyl ketone, Toluene (air)
10	10	3,497,171	10	4,492,813	11	3,836,908	339,737	Methanol (UIJ)
11	2	17,276	2	20,943	2	342,136	324,860	Methanol (air)
12	23	441,713	22	476,826	23	760,113	318,400	Nitric acid and nitrate compounds (water)
13	7	71,398	7	292,217	6	357,878	286,480	Xylene (air)
14	11	651,881	15	956,800	15	935,330	283,449	Nitric acid and nitrate compounds (UIJ, water)
15	**	**	**	**	1	279,000	279,000	Formaldehyde (air)
16	**	**	4	415,000	3	267,000	267,000	Methanol (air)
17	**	**	**	**	11	231,251	231,251	Lead and compounds, Sulfuric acid, Copper and compounds (air)
18	2	0	3	183,718	4	178,359	178,359	Nitric acid and nitrate compounds (water)
19	5	29,956	4	158,412	4	200,925	170,969	n-Butyl alcohol, Xylene (air)
20	1	72,981	1	61,955	2	238,198	165,217	Dichloromethane (air)
21	3	71,000	4	113,000	5	223,000	152,000	Toluene, Xylene, n-Butyl alcohol (air)
22	6	200,100	6	200,100	7	346,800	146,700	Xylene (air)
23	6	815,500	8	845,780	10	956,957	141,457	Zinc and compounds (land), Methanol (air)
24	4	149,778	6	213,487	5	289,000	139,222	Ethylene, Vinyl acetate (air)
25	2	0	2	0	3	137,177	137,177	Nitric acid and nitrate compounds (water)
26	11	153,985	12	407,240	13	284,621	130,636	Methyl ethyl ketone, Toluene (air)
27	**	**	**	**	1	127,540	127,540	Nitric acid and nitrate compounds (water)
28	6	474,560	7	497,880	7	601,092	126,532	Methanol, Chlorine (air)
29	3	632,240	3	746,600	3	757,500	125,260	Methyl ethyl ketone (air)
30	3	99,670	3	166,418	3	209,835	110,165	Hydrochloric acid (air)
31	10	447,900	9	447,160	10	552,000	104,100	Ethylbenzene, Toluene, Methyl ethyl ketone, Methanol (air)
32	6	626,833	6	609,901	6	729,605	102,772	Zinc and compounds (land)
33	3	1,600	3	1,600	4	104,360	102,760	Methanol (air)
34	2	196,585	2	238,953	2	296,925	100,340	Dichloromethane (air)
35	4	3,934	4	4,419	6	101,000	97,066	Methanol (air, water)
36	5	273,990	5	378,600	6	370,920	96,930	Hydrogen fluoride (air)
37	5	152,904	4	176,054	5	248,957	96,053	Toluene, Methyl ethyl ketone (air)
38	1	0	3	38,093	4	94,084	94,084	Toluene, Methanol (air)
39	2	9,800	2	14,580	4	98,825	89,025	Methanol, Xylene (air)
40	**	**	3	300	7	88,400	88,400	Xylene (air)
41	23	273,025	24	400,338	28	359,624	86,599	Ethylene (air)
42	2	160,400	2	158,400	3	246,700	86,300	Methanol (air)
43	4	39,000	4	39,000	7	123,701	84,701	Xylene (air)
44	7	315,900	7	418,300	6	398,400	82,500	Chlorine dioxide (air)
45	**	**	1	40,688	1	82,298	82,298	Formaldehyde (air)
46	5	81,141	5	123,600	7	162,714	81,573	Aluminum oxide (land)
47	9	129,726	9	109,257	9	209,111	79,385	Xylene, Methyl isobutyl ketone (air)
48	21	259,745	21	352,705	21	338,723	78,978	Benzene (air)
49	3	52,670	3	54,400	7	130,406	77,736	Methyl ethyl ketone, Toluene, 2-Methoxyethanol (air)
50	1	0	2	64,800	2	77,100	77,100	Formaldehyde (air)
	250	17,016,176	280	26,166,779	335	29,666,661	12,650,485	

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

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

➤ UIJ=underground injection

TRI Facilities with Largest Decreases/Increases

In TRI, releases decreased not only for the 50 facilities with the largest reductions but also for the facilities that did not report the largest changes (either decreases or increases—**Figure 3–23**).

The 50 TRI facilities with the largest decreases reduced their releases from 212.3 million kg in 1995 to 131.8 million in 1997, a 38 percent reduction. The number of forms these facilities submitted fluctuated from 757 in 1995 to 765 in 1996 to 751 in 1997, again indicating reductions in amounts rather than in the number of substances reported. Four of the facilities filed no reports in 1997 for chemicals in the matched data set (**Table 3–34**).

Releases by the 50 TRI facilities with the largest increases more than doubled from 1995 to 1997, with a 114 percent increase from 65.0 million kg to 138.8 million kg. The number of forms submitted by these facilities rose 13 percent, from 508 in 1995 to 574 in 1997. Four of the facilities did not submit reports in 1995 for chemicals in the matched data set (**Table 3–35**).

Table 3–34		TRI Facilities with Largest Decrease in On-site Releases, 1995–1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28
2	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
3	DuPont	Beaumont, TX	28
4	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28
5	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28
6	Chino Mines Co., Phelps Dodge Corp.	Hurley, NM	33
7	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28
8	Lenzing Fibers Corp.	Lowland, TN	28
9	Sterling Chemicals Inc.	Texas City, TX	28
10	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33
11	Bayer Corp.	New Martinsville, WV	28
12	IMC-Agrico Co., New Wales Plant	Mulberry, FL	Mult.
13	Pharmacia & Upjohn Co.	Portage, MI	28
14	Cabot Corp.	Ville Platte, LA	28
15	Monsanto Co., Chocolate Bayou	Alvin, TX	28
16	BASF Corp.	Freeport, TX	28
17	Witco Corp., Gretna Plant	Harvey, LA	28
18	Cabot Corp., Canal Plant	Franklin, LA	28
19	Osram Sylvania Prods. Inc., Osram GMBH	Versailles, KY	36
20	Reynolds Metals Co.	Sheffield, AL	34
21	Cabot Corp., Cab-o-Sil Div.	Tuscola, IL	28
22	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN	28
23	Gwaltney of Smithfield Ltd., Smithfield Foods Inc.	Smithfield, VA	20
24	Mobil Chemical Co., Mobil Corp.	Beaumont, TX	28
25	Degussa Corp., Ivanhoe	Louisa, LA	28
26	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT	33
27	Flexel Indiana Inc.	Covington, IN	30
28	LTV Steel Co. Inc.	Cleveland, OH	33
29	Craig Ind.	Teresita, MO	28
30	Shell Oil Co.	Deer Park, TX	Mult.
31	Finch Pruyt & Co. Inc.	Glens Falls, NY	26
32	ASARCO Inc.	East Helena, MT	33
33	BP Chemicals Inc., BP America Inc.	Lima, OH	28
34	Tippecanoe Labs., Eli Lilly & Co.	Shadeland, IN	28
35	North American Rayon Corp., North American Corp.	Elizabethton, TN	28
36	Champion Intl. Corp.	Canton, NC	26
37	Fina Oil & Chemical, American Petrofina Inc.	Big Spring, TX	29
38	Wheeling-Pittsburgh Steel Corp., Steubenville East Plant	Follansbee, WV	33
39	Goodyear Tire & Rubber Co.	Lincoln, NE	30
40	Celanese Eng. Resins Inc., Hoechst Corp.	Bishop, TX	28
41	Alcoa	Riverdale, IA	33
42	Corn Prods. & Best Foods, Argo Plants, CPC Intl. Inc.	Bedford Park, IL	20
43	DuPont Sabine River Works	Orange, TX	28
44	O'Sullivan Corp.	Winchester, VA	30
45	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33
46	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28
47	Eastman Kodak Co., Kodak Park	Rochester, NY	38
48	Unocal Molycorp, Unocal Corp.	Mountain Pass, CA	28
49	Chemetals Inc., Comilog	New Johnsonville, TN	28
50	Exxon Chemical, Baton Rouge Chemical Plant, Exxon Corp.	Baton Rouge, LA	28
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 Media with Decreases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	5	15,427,756	4	12,781,207	4	7,033,029	-8,394,727	Carbon disulfide (air)
2	9	7,908,991	9	4,676,363	9	375,009	-7,533,982	Copper/Zinc and compounds (land)
3	27	8,523,823	19	3,900,458	22	2,792,231	-5,731,592	Nitric acid and nitrate compounds, Acetonitrile (UIJ)
4	20	6,171,389	20	3,829,753	20	1,903,636	-4,267,753	Ethylene glycol (UIJ)
5	23	4,326,523	19	4,256,990	19	882,623	-3,443,900	Propylene (air)
6	3	3,233,586	2	3,539,360	**	**	-3,233,586	Copper and compounds (land)
7	22	10,573,159	23	9,372,030	24	7,669,796	-2,903,363	Acetonitrile, Acrylic acid (UIJ)
8	5	10,526,240	5	8,357,877	5	7,764,811	-2,761,429	Carbon disulfide (air)
9	36	5,384,579	36	3,072,310	34	2,872,333	-2,512,246	Nitric acid and nitrate compounds (UIJ)
10	11	14,607,892	11	12,764,989	13	12,345,745	-2,262,147	Zinc and compounds (land)
11	30	3,811,028	29	3,137,198	29	1,562,576	-2,248,452	Nitric acid and nitrate compounds (water)
12	2	3,746,031	2	2,056,689	3	1,631,746	-2,114,285	Phosphoric acid (land)
13	26	3,305,571	23	1,774,718	25	1,408,997	-1,896,574	Methanol (UIJ)
14	3	1,614,127	3	1,518,164	3	78,028	-1,536,099	Carbon disulfide (air)
15	19	1,856,700	17	1,586,005	4	471,070	-1,385,630	Acrylonitrile, Acetonitrile, Phenol, Hydrogen cyanide (UIJ)
16	25	7,853,878	24	6,507,355	26	6,502,858	-1,351,020	Nitric acid and nitrate compounds (water)
17	2	1,763,311	2	1,857,445	1	429,478	-1,333,833	Methanol (UIJ)
18	3	1,905,154	5	1,979,977	3	622,199	-1,282,955	Carbon disulfide, Ethylene (air)
19	6	1,173,335	6	992,874	6	130,704	-1,042,631	Xylene (air)
20	12	1,285,786	11	268,980	12	249,705	-1,036,081	Methyl ethyl ketone, Toluene (air)
21	6	1,121,425	6	946,558	6	123,465	-997,960	Chlorine (air)
22	62	3,627,446	59	2,923,885	63	2,664,613	-962,833	Hydrochloric acid (air)
23	2	936,314	2	463,670	1	0	-936,314	Nitric acid and nitrate compounds (water)
24	23	1,220,267	21	1,151,794	16	286,665	-933,602	Ethylene, Propylene (air)
25	2	929,705	2	671,202	2	30,385	-899,320	Carbon disulfide (air)
26	6	29,168,743	6	29,619,666	6	28,270,233	-898,510	Hydrochloric acid (air)
27	5	861,798	5	1,249,238	**	**	-861,798	Carbon disulfide (air)
28	9	1,176,778	9	382,522	7	316,264	-860,514	Manganese and compounds (land)
29	1	860,082	**	**	**	**	-860,082	Methanol (air)
30	51	1,904,354	93	1,020,507	94	1,052,840	-851,514	Phenol (UIJ)
31	5	1,983,407	5	1,101,449	6	1,203,200	-780,207	Nitric acid and nitrate compounds (water)
32	10	17,921,774	10	20,167,857	10	17,150,080	-771,694	Zinc/Lead and compounds (land)
33	27	5,045,344	27	4,875,406	27	4,289,188	-756,156	Acrylonitrile (UIJ)
34	18	1,090,023	18	498,579	20	369,981	-720,042	Nitric acid and nitrate compounds (water)
35	3	1,276,176	3	1,172,262	2	571,610	-704,566	Carbon disulfide (air)
36	14	1,931,912	14	1,296,197	17	1,233,001	-698,911	Methanol (air)
37	15	830,819	15	239,283	15	143,167	-687,652	Propylene (air)
38	14	700,370	13	131,976	11	25,837	-674,533	Ethylene, Benzene (air)
39	5	1,054,510	5	443,643	7	385,450	-669,060	Toluene (air)
40	17	924,037	20	764,816	20	259,175	-664,862	Formaldehyde, Methanol (UIJ)
41	13	817,375	10	399,687	9	171,141	-646,234	Methyl ethyl ketone, Toluene (air)
42	2	1,021,317	4	234,923	4	384,583	-636,734	Hydrochloric acid (air)
43	33	1,606,323	32	1,335,752	30	973,073	-633,250	Ethylene, Vinyl acetate, Cyclohexane (air)
44	10	848,342	7	316,393	7	228,671	-619,671	Methyl ethyl ketone, Methyl isobutyl ketone (air)
45	17	6,567,613	17	6,407,425	20	5,973,237	-594,376	Zinc and compounds (land)
46	6	4,559,331	6	4,361,486	6	3,969,324	-590,007	Phosphoric acid (land)
47	50	3,637,563	50	3,242,952	46	3,057,892	-579,671	Methanol, Dichloromethane (air)
48	5	576,230	**	**	**	**	-576,230	Nitric acid and nitrate compounds (land)
49	3	2,108,049	2	1,689,015	2	1,540,532	-567,517	Manganese and compounds (land)
50	34	953,396	34	335,426	35	388,830	-564,566	Nitric acid and nitrate compounds (water)
	757	212,259,682	765	175,674,311	751	131,789,011	-80,470,671	

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

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

➤ UIJ=underground injection

Table 3-35		TRI Facilities with Largest Increase in On-site Releases, 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33
2	Armco Inc. (Route 8 S.)	Butler, PA	33
3	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28
4	Solutia Inc.	Gonzalez, FL	28
5	DuPont	Pass Christian, MS	28
6	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33
7	DuPont	New Johnsonville, TN	28
8	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL	28
9	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33
10	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
11	ASARCO Inc., Glover Plant	Annapolis, MO	33
12	Solutia Inc., Chocolate Bayou	Alvin, TX	28
13	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33
14	Monsanto Co.	Luling, LA	28
15	DuPont	Belle, WV	28
16	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22
17	Amoco Petroleum Prods., Amoco Corp.	Texas City, TX	29
18	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA	29
19	P4 Production L.L.C.	Soda Springs, ID	Mult.
20	DuPont Chambers Works	Deepwater, NJ	28
21	Borden Chemicals & Plastics LP	Geismar, LA	28
22	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28
23	Austeel Lemont Co. Inc.	Lemont, IL	33
24	American Synthetic Rubber, Michelin Corp.	Louisville, KY	28
25	Geneva Steel	Vineyard, UT	33
26	Royal Oak Ents. Inc., Kenbridge Kilns	Kenbridge, VA	28
27	GM Nao Mid-Lux Car Div., General Motors Corp.	Doraville, GA	37
28	New Boston Coke Corp.	New Boston, OH	33
29	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33
30	Three Rivers Refy., Ultramar Diamond Shamrock Corp.	Three Rivers, TX	29
31	Gencorp Inc.	Columbus, MS	22
32	International Paper Co., Mansfield Mill	Mansfield, LA	26
33	Imco Recycling Inc.	Morgantown, KY	33
34	IMC-Agrico Co., IMC Global Inc.	Uncle Sam, LA	28
35	Foamex L.P., Div. of Kihl	Corry, PA	30
36	Freeport Brick Co., Freeport Refractories Inc.	Freeport, PA	32
37	Boeing Co.	Wichita, KS	Mult.
38	USS Fairfield Works, USX Corp.	Fairfield, AL	33
39	Armco Inc. (Bantam Ave.)	Butler, PA	33
40	Oregon Metallurgical Corp., Allegheny Teledyne Inc.	Albany, OR	33
41	Angus Chemical Co.	Sterlington, LA	28
42	Vicksburg Chemical Co.	Vicksburg, MS	28
43	Tesa Tape Inc.	Middletown, NY	26
44	Georgia-Pacific Corp.	Palatka, FL	26
45	Aquaglass Corp., Masco Corp.	Adamsville, TN	30
46	BWX Techs., McDermott Intl. Inc.	Lynchburg, VA	34
47	J & L Specialty Steel Inc.	Midland, PA	33
48	Georgia-Pacific Corp.	Ashdown, AR	26
49	Patio Chef Co. LLC	Licking, MO	28
50	Armco Inc.	Coshocton, OH	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 Media with Increases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	14	2,715,080	14	4,239,677	14	11,022,591	8,307,511	Copper/Lead/Arsenic and compounds (land)
2	14	4,728,754	14	5,711,005	14	11,891,923	7,163,169	Nitric acid and nitrate compounds (water)
3	11	6,939,334	11	9,740,677	12	13,827,714	6,888,380	Phosphoric acid (water)
4	21	5,936,347	18	7,808,148	18	9,817,381	3,881,034	Nitric acid and nitrate compounds (UIJ)
5	5	232,766	5	292,680	11	4,091,982	3,859,216	Manganese and compounds (UIJ)
6	29	3,462,571	34	3,389,124	33	7,254,469	3,791,898	Zinc and compounds (land)
7	6	160,851	6	65,227	11	3,583,542	3,422,691	Manganese and compounds (UIJ)
8	4	13,514	4	11,156	4	3,183,329	3,169,815	Phosphoric acid (water)
9	11	204,604	7	2,562,032	13	2,889,134	2,684,530	Copper and compounds (air)
10	2	4,266,281	2	5,127,596	2	6,578,798	2,312,517	Chromium and compounds (land)
11	6	2,959,545	6	4,030,227	7	4,921,195	1,961,650	Zinc/Lead and compounds (land)
12	**	**	**	**	16	1,803,515	1,803,515	Acrylonitrile, Hydrogen cyanide, Phenol (UIJ)
13	13	7,066,233	13	11,590,932	13	8,596,464	1,530,231	Copper and compounds (land)
14	13	1,978,881	13	2,673,597	14	3,406,590	1,427,709	Formaldehyde (UIJ)
15	25	116,311	25	336,545	24	1,209,295	1,092,984	Nitric acid and nitrate compounds (water)
16	**	**	1	0	11	1,083,600	1,083,600	Zinc/Chromium and compounds (air)
17	32	630,312	33	1,713,945	33	1,709,465	1,079,153	Methanol (air)
18	30	1,253,307	30	1,303,901	32	2,231,062	977,755	Nitric acid and nitrate compounds (water)
19	2	37,152	3	51,930	7	995,441	958,289	Zinc and compounds (land)
20	47	418,280	43	1,001,751	40	1,354,680	936,400	Nitric acid and nitrate compounds (water)
21	19	284,849	16	407,080	18	1,164,851	880,002	Benzene (air)
22	2	3,313,375	2	4,084,753	1	4,129,841	816,466	Chromium and compounds (land)
23	4	24,748	5	668,314	5	778,886	754,138	Zinc and compounds (land)
24	6	727,995	6	619,324	6	1,442,907	714,912	Toluene (air)
25	20	338,396	21	544,065	22	1,030,210	691,814	Nitric acid and nitrate compounds (water)
26	**	**	1	597,739	1	674,939	674,939	Methanol (air)
27	11	127,930	12	177,815	19	790,372	662,442	Xylene, n-Butyl alcohol, Methyl isobutyl ketone (air)
28	2	58,268	10	544,918	10	720,110	661,842	Ethylene (air)
29	1	547,715	1	922,590	1	1,097,645	549,930	Nickel and compounds (land)
30	22	58,796	20	505,230	20	594,781	535,985	Toluene, o-Xylene (land)
31	7	1,135,155	7	1,726,992	7	1,659,872	524,717	Methyl ethyl ketone, Toluene (air)
32	8	1,400,789	7	1,519,581	10	1,912,480	511,691	Hydrochloric acid, Manganese and compounds (land)
33	4	281,499	5	621,453	4	754,027	472,528	Aluminum (land)
34	3	978,002	3	1,617,102	3	1,440,174	462,172	Phosphoric acid (water)
35	4	448,338	3	756,420	2	903,448	455,110	Dichloromethane (air)
36	1	0	1	453,514	1	453,514	453,514	Phosphoric acid (land)
37	29	432,708	20	564,842	20	885,604	452,896	Tetrachloroethylene (air)
38	9	1,845,966	12	1,999,073	15	2,290,529	444,563	Zinc and compounds (land), 1,2,4-Trimethylbenzene (air)
39	5	1,319,634	5	1,399,377	6	1,763,799	444,165	Nitric acid and nitrate compounds (water)
40	6	32,763	4	31,928	5	464,241	431,478	Nitric acid and nitrate compounds (water)
41	11	2,529,837	11	2,835,644	11	2,957,484	427,647	Nitric acid and nitrate compounds (UIJ)
42	3	3,279,594	3	2,746,967	3	3,703,331	423,737	Nitric acid and nitrate compounds (water)
43	1	231,146	1	448,854	1	626,608	395,462	Toluene (air)
44	8	443,033	8	443,415	13	838,486	395,453	Methanol (air)
45	1	665,652	4	1,048,317	2	1,057,867	392,215	Styrene (air)
46	6	278	5	307	6	390,778	390,500	Nitric acid and nitrate compounds (water)
47	9	405,480	9	455,503	9	789,590	384,110	Nitric acid and nitrate compounds (water)
48	15	361,250	15	391,185	17	740,061	378,811	Manganese and compounds (land)
49	**	**	**	**	1	367,216	367,216	Methanol (air)
50	6	577,167	6	600,922	6	926,509	349,342	Nitric acid and nitrate compounds (water)
	508	64,970,486	505	90,383,374	574	138,802,330	73,831,844	

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

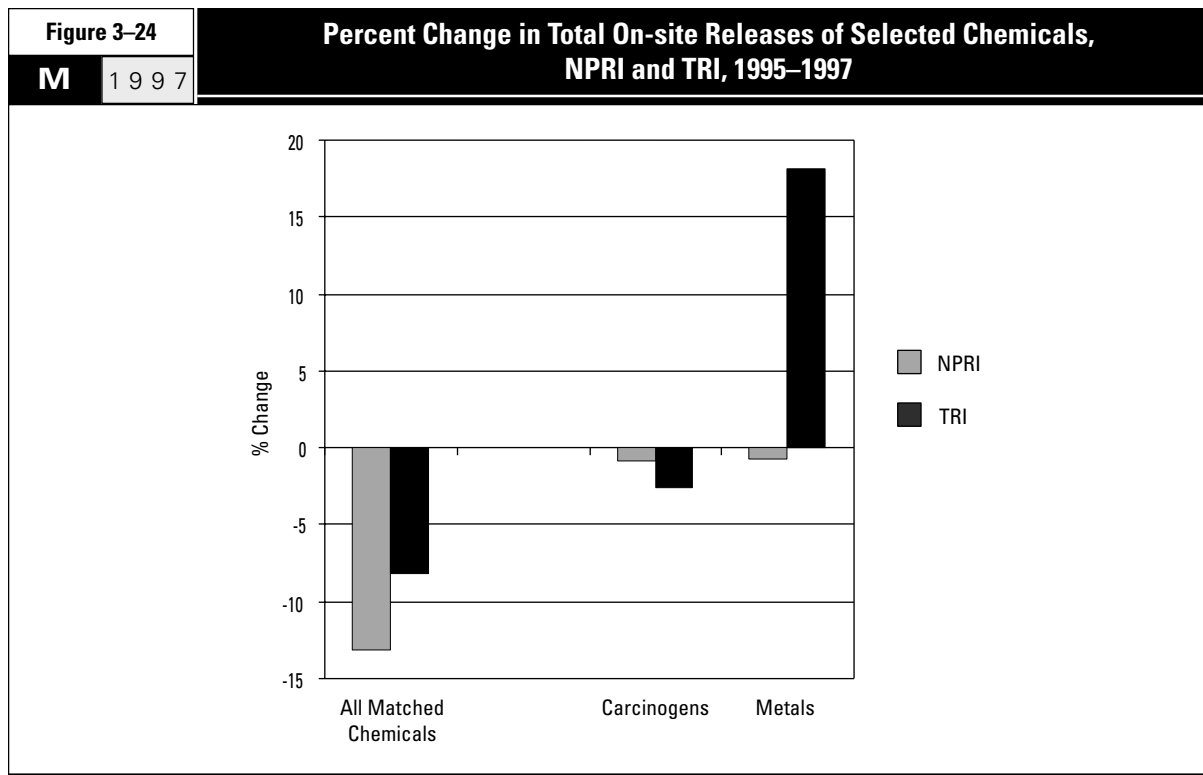
** Indicates facility did not report any matched chemicals that year.

➤ UIJ=underground injection

3.3.4 Changes in Releases by Chemical

Although releases of all chemicals in the matched data set decreased nine percent from 1995 to 1997, the picture for carcinogens and metals differed strikingly from the overall pattern. While NPRI facilities reported 13 percent fewer releases of all matched chemicals, their reductions in releases of designated carcinogens and of metals and metal compounds were less than one percent. At the same time, TRI facilities, with an eight percent overall reduction in releases, reported a three percent decrease in releases of designated carcinogens and an 18 percent increase in releases of metals and metal compounds (Figure 3–24).

In both NPRI and TRI, methanol had the largest reductions in releases from 1995 to 1997. Despite this, methanol still ranked first for total releases in both PRTRs in all three years.



- 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 3-36		The 10 Chemicals with the Largest Decrease in NPRI Releases, 1995–1997				
M		1997				
CAS Number	Chemical	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
67-56-1	Methanol	30,029,869	21,113,142	19,031,512	-10,998,357	-36.6
1330-20-7	Xylene (mixed isomers)	7,968,505	6,187,036	6,401,451	-1,567,054	-19.7
—	Copper (and its compounds)	1,682,999	684,342	660,947	-1,022,052	-60.7
—	Manganese (and its compounds)	2,639,005	1,882,345	1,909,572	-729,433	-27.6
74-87-3	Chloromethane	970,846	648,505	434,586	-536,260	-55.2
—	Nickel (and its compounds)	752,118	396,159	364,094	-388,024	-51.6
74-85-1	Ethylene	2,325,160	2,246,030	1,992,363	-332,797	-14.3
71-43-2	Benzene	1,809,253	1,796,748	1,479,788	-329,465	-18.2
7782-50-5	Chlorine	1,237,753	904,783	917,863	-319,890	-25.8
115-07-1	Propylene	1,248,941	995,162	972,363	-276,578	-22.1

Table 3-37		The 10 Chemicals with the Largest Increase in NPRI Releases, 1995–1997				
M		1997				
CAS Number	Chemical	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Zinc (and its compounds)	4,122,249	5,647,993	5,813,918	1,691,669	41.0
—	Nitric acid and nitrate compounds	1,969,928	2,859,452	3,089,698	1,119,770	56.8
7664-93-9	Sulfuric acid	3,660,258	4,944,817	4,463,666	803,408	21.9
50-00-0	Formaldehyde	1,153,288	1,406,018	1,828,117	674,829	58.5
—	Chromium (and its compounds)	503,603	493,593	776,821	273,218	54.3
1344-28-1	Aluminum oxide (fibrous forms)	3,424	325	192,424	189,000	5,519.9
78-93-3	Methyl ethyl ketone	4,958,690	5,728,682	5,133,281	174,591	3.5
10049-04-4	Chlorine dioxide	1,062,318	1,169,215	1,199,244	136,926	12.9
7647-01-0	Hydrochloric acid	1,272,821	1,336,809	1,401,424	128,603	10.1
75-09-2	Dichloromethane	2,178,740	2,198,402	2,303,223	124,483	5.7

NPRI Chemicals with Largest Decreases/Increases

NPRI facilities reported a reduction in methanol releases from 30.0 million kg to 19.0 million kg or 37 percent. NPRI facilities reported reductions exceeding one million kg in two other substances: xylene (from 8.0 million kg to 6.4 million kg, a 20 percent reduction) and copper and its compounds (from 1.7 million kg to 660,947 kg, a 61 percent reduction—**Table 3-36**).

The chemical with the largest absolute increase in NPRI releases was zinc and its compounds, rising from 4.1 million kg in 1995 to 5.8 million kg in 1997, a 41 percent increase. The only other chemical with more than a one-million-kg increase in NPRI reporting of releases was nitric acid and nitrate compounds, increasing from 2.0 million kg in 1995 to 3.1 million kg in 1997, or 57 percent (**Table 3-37**).

Among the top 10 chemicals in NPRI for reduced releases were two carcinogens (nickel and its compounds and benzene) and three metals (copper, manganese and nickel, with their compounds). Three of the 10 NPRI chemicals with the largest 1995–1997 increases in releases were carcinogens: formaldehyde, chromium and its compounds and dichloromethane.

Two also were metals: zinc and chromium (and their compounds). Releases of chemicals in these groups are further examined in subsequent sections of this chapter.

TRI Chemicals with Largest Decreases/Increases

In TRI, methanol releases declined from 114.8 million kg to 99.4 million kg or 14 percent. TRI facilities reported a reduction in toluene releases nearly equaling the reduction for methanol. TRI releases of toluene decreased from 66.8 million kg to 51.6 million kg (23 percent). Carbon disulfide ranked third for TRI decreases with releases of 38.2 million kg in 1995 and 23.4 million kg in 1997 (a 39 percent reduction—**Table 3–38**).

TRI facilities reported a larger increase in releases of manganese and its compounds than of any other chemical in the matched data set. Releases of manganese and its compounds rose from 25.0 million kg in 1995 to 36.8 million kg in 1997, a 47 percent increase. Phosphoric acid ranked second for TRI increases, from 26.1 million kg to 34.3 million kg, a 31 percent increase (**Table 3–39**).

The top 10 chemicals for TRI reductions included one carcinogen (dichloromethane) but no metals. Six of the top 10 TRI chemicals for increases were carcinogens and six were metals. Of these, four appear in both categories: chromium, arsenic, nickel and lead (with their compounds). The two remaining carcinogens were styrene and formaldehyde, and the two remaining metals were manganese and zinc (and their compounds). These chemical groups are discussed in the following sections of this chapter.

Table 3–38

The 10 Chemicals with Largest Decrease in TRI On-site Releases, 1995–1997

CAS Number	Chemical	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
67-56-1	Methanol	114,832,463	108,833,037	99,355,089	-15,477,374	-13.5
108-88-3	Toluene	66,817,960	57,366,276	51,645,746	-15,172,214	-22.7
75-15-0	Carbon disulfide	38,169,907	33,039,827	23,370,147	-14,799,760	-38.8
1330-20-7	Xylene (mixed isomers)	44,026,068	37,660,822	33,620,731	-10,405,337	-23.6
78-93-3	Methyl ethyl ketone	31,708,522	27,184,989	24,088,906	-7,619,616	-24.0
115-07-1	Propylene	12,413,182	11,992,443	7,379,468	-5,033,714	-40.6
107-21-1	Ethylene glycol	9,486,605	6,613,450	4,513,272	-4,973,333	-52.4
7647-01-0	Hydrochloric acid	30,967,552	28,838,728	26,161,189	-4,806,363	-15.5
75-09-2	Dichloromethane	26,191,163	24,277,712	21,506,464	-4,684,699	-17.9
75-05-8	Acetonitrile	13,087,292	10,816,369	8,976,372	-4,110,920	-31.4

Table 3–39

The 10 Chemicals with Largest Increase in TRI On-site Releases, 1995–1997

CAS Number	Chemical	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Manganese (and its compounds)	25,047,476	25,006,199	36,787,267	11,739,791	46.9
7664-38-2	Phosphoric acid	26,118,439	27,863,741	34,265,979	8,147,540	31.2
—	Nitric acid and nitrate compounds	91,401,095	85,954,606	97,316,227	5,915,132	6.5
—	Chromium (and its compounds)	11,133,551	13,052,706	14,485,603	3,352,052	30.1
—	Zinc (and its compounds)	55,911,373	57,400,317	59,247,400	3,336,027	6.0
—	Arsenic (and its compounds)	855,366	989,070	2,742,175	1,886,809	220.6
100-42-5	Styrene	18,871,150	19,263,600	20,309,017	1,437,867	7.6
50-00-0	Formaldehyde	8,783,564	9,641,204	9,884,585	1,101,021	12.5
—	Nickel (and its compounds)	1,634,152	2,218,571	2,551,439	917,287	56.1
—	Lead (and its compounds)	7,991,107	7,971,606	8,818,161	827,054	10.3

Table 3-40

Change in NPRI On-site Releases of Known or Suspected Carcinogens[†], 1995–1997

M 1997

CAS Number	Chemical	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Nickel (and its compounds)	752,118	396,159	364,094	-388,024	-51.6
71-43-2	Benzene	1,809,253	1,796,748	1,479,788	-329,465	-18.2
1332-21-4	Asbestos (friable)	223,307	155,193	53,026	-170,281	-76.3
106-99-0	1,3-Butadiene	222,979	124,455	105,819	-117,160	-52.5
127-18-4	Tetrachloroethylene	148,626	131,990	52,407	-96,219	-64.7
—	Lead (and its compounds)	1,345,674	1,392,954	1,251,363	-94,311	-7.0
79-01-6	Trichloroethylene	783,072	837,874	695,270	-87,802	-11.2
117-81-7	Di(2-ethylhexyl) phthalate	54,329	29,042	19,849	-34,480	-63.5
75-07-0	Acetaldehyde	302,525	427,394	268,195	-34,330	-11.3
67-66-3	Chloroform	238,583	208,161	221,835	-16,748	-7.0
75-21-8	Ethylene oxide	26,204	23,094	16,159	-10,045	-38.3
107-13-1	Acrylonitrile	16,322	10,775	6,469	-9,853	-60.4
—	Cobalt (and its compounds)	29,129	25,646	20,614	-8,515	-29.2
56-23-5	Carbon tetrachloride	7,769	489	336	-7,433	-95.7
79-06-1	Acrylamide	6,214	1,086	527	-5,687	-91.5
123-91-1	1,4-Dioxane	7,059	6,054	3,998	-3,061	-43.4
106-46-7	1,4-Dichlorobenzene	9,864	9,200	8,100	-1,764	-17.9
140-88-5	Ethyl acrylate	1,090	280	161	-929	-85.2
26471-62-5	Toluenediisocyanate (mixed isomers)	1,111	930	774	-337	-30.3
584-84-9	Toluene-2,4-diisocyanate	300	2	10	-290	-96.7
106-89-8	Epichlorohydrin	133	127	4	-129	-97.0
79-46-9	2-Nitropropane	125	125	0	-125	-100.0
101-77-9	4,4'-Methylenedianiline	100	0	0	-100	-100.0
91-08-7	Toluene-2,6-diisocyanate	0	0	0	0	—
62-56-6	Thiourea	0	0	0	0	—
302-01-2	Hydrazine	0	0	0	0	—
77-78-1	Dimethyl sulfate	8	11	10	2	25.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	4	5	6	2	50.0
121-14-2	2,4-Dinitrotoluene	700	2,350	816	116	16.6
96-09-3	Styrene oxide	100	537	297	197	197.0
139-13-9	Nitrotriacetic acid	626	646	2,868	2,242	358.1
—	Cadmium (and its compounds)	38,829	18,952	41,353	2,524	6.5
75-56-9	Propylene oxide	10,469	11,448	13,005	2,536	24.2
107-06-2	1,2-Dichloroethane	6,168	17,316	19,603	13,435	217.8
75-01-4	Vinyl chloride	18,136	20,408	43,991	25,855	142.6
108-05-4	Vinyl acetate	244,509	322,740	283,107	38,598	15.8
100-42-5	Styrene	745,807	886,533	818,325	72,518	9.7
—	Arsenic (and its compounds)	57,770	125,128	149,053	91,283	158.0
75-09-2	Dichloromethane	2,178,740	2,198,402	2,303,223	124,483	5.7
—	Chromium (and its compounds)	503,603	493,593	776,821	273,218	54.3
50-00-0	Formaldehyde	1,153,288	1,406,018	1,828,117	674,829	58.5
	Subtotal	10,944,643	11,081,865	10,849,393	-95,250	-0.9
	% of Total	11.8	13.3	13.5		
	Total for Matched NPRI Chemicals	92,620,108	83,171,877	80,448,924	-12,171,184	-13.1

[†] 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 releases of substances designated as known or suspected carcinogens decreased one percent, from 10.9 million kg in 1995 to 10.8 million kg in 1997. This contrasted sharply with a 13 percent overall reduction in NPRI releases. Chemical by chemical, however, NPRI releases of carcinogens varied widely over this period. Of the 41 carcinogens for which NPRI facilities submitted reports in all three years, 33 showed increases or decreases of more than 10 percent (Table 3-40).

Among known or suspected carcinogens, the largest reduction reported by NPRI facilities was for nickel and its compounds, with releases declining from 752,118 kg in 1995 to 364,094 kg in 1997. Benzene releases decreased from 1.8 million kg to 1.5 million kg. These were the only carcinogens with reductions in releases of more than 300,000 kg from 1995 to 1997. Two others decreased by more than 100,000 kg each: asbestos (from 223,307 kg in 1995 to 53,026 kg in 1997) and 1,3-butadiene (from 222,979 kg to 105,819 kg). (The latter is used primarily as a chemical intermediary and polymer component in the manufacture of synthetic rubber, especially for tires, hoses, belts, etc. Other uses are in the manufacture of latex adhesives, various rubber products, nylon carpet backings, paper coatings, pipes, conduits, appliance and electrical equipment components, and luggage.)

NPRI facilities increased their releases of three carcinogens by more than 100,000 kg each from 1995 to 1997: formaldehyde (from 1.2 million kg to 1.8 million kg), chromium and its compounds (from 503,603 kg to 776,821 kg) and dichloromethane (from 2.2 million kg to 2.3 million kg).

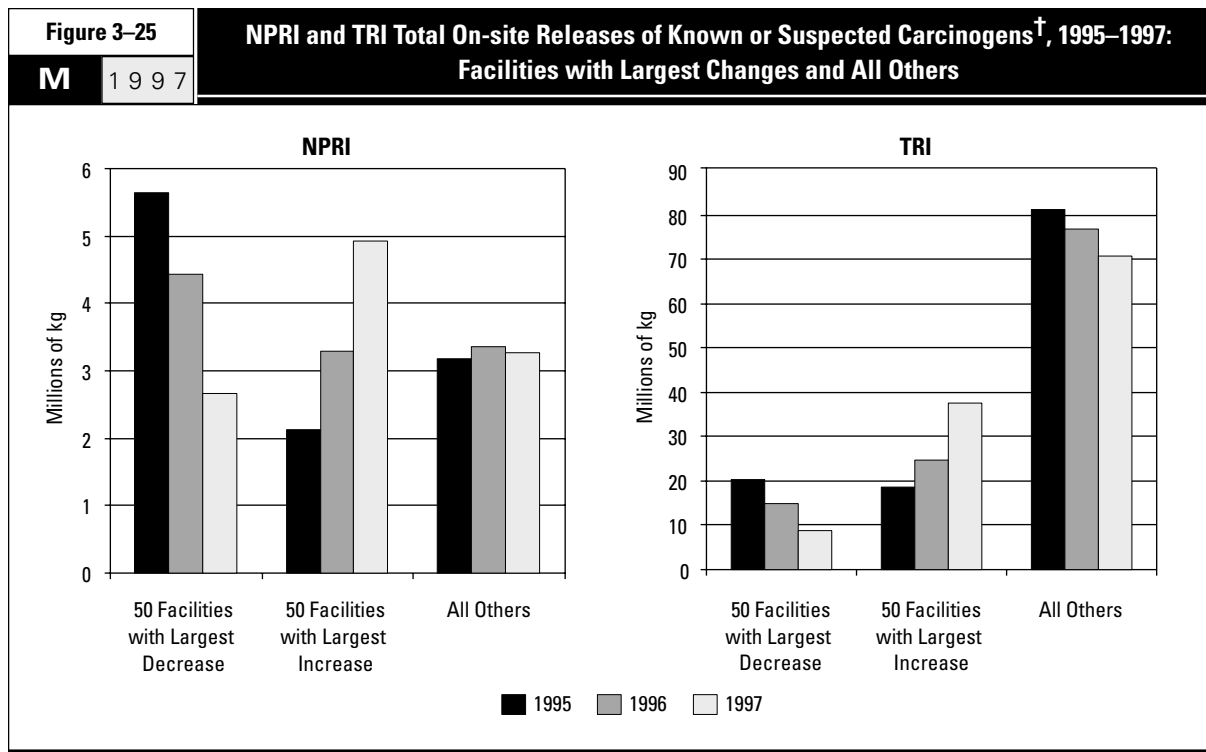
TRI facilities reported 120.3 million kg of releases of known or suspected carcinogens in 1995 and 117.1 million kg in 1997, a reduction of three percent. This was less than half the eight percent reduction in releases achieved for all chemicals in the matched data set. As in NPRI, changes in TRI releases of carcinogens varied widely from 1995 to 1997. Releases increased or decreased by more than 10 percent for 39 of the 48 carcinogens in the matched data set (Table 3-41).

The largest TRI reduction in releases of these substances came in dichloromethane, which decreased from 26.2 million kg in 1995 to 21.5 million kg in 1997, trichloroethylene (from 11.7 million kg to 7.9 million kg), chloroform (from 4.8 million kg to 3.3 million kg), and tetrachloroethylene (from 4.3 million kg to 3.1 million kg). No other carcinogen showed a reduction of more than one million kg in TRI releases from 1995 to 1997. (Chloroform is used in the production of plastics, especially vinyl chloride; as a solvent in the extraction and purification of some antibiotics, alkaloids, vitamins, and flavors; in lacquers, floor polishes, resins, fats, greases, gums, waxes, etc; and in photography and dry cleaning. Tetrachloroethylene is widely used for dry cleaning and metal degreasing. Other uses include rubber coatings, solvent soaps, printing inks, adhesives and glues, sealants, polishes, lubricants, and pesticides. Chloroform and tetrachloroethylene were also used in producing chlorofluorocarbons.)

Table 3-41		Change in TRI On-site Releases of Known or Suspected Carcinogens [†] , 1995-1997				
CAS Number	Chemical	Total Releases			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
75-09-2	Dichloromethane	26,191,163	24,277,712	21,506,464	-4,684,699	-17.9
79-01-6	Trichloroethylene	11,726,040	9,695,181	7,924,638	-3,801,402	-32.4
67-66-3	Chloroform	4,827,141	4,420,834	3,346,096	-1,481,045	-30.7
127-18-4	Tetrachloroethylene	4,270,659	3,480,656	3,054,561	-1,216,098	-28.5
107-13-1	Acrylonitrile	3,050,437	2,217,881	2,384,811	-665,626	-21.8
108-05-4	Vinyl acetate	2,206,641	1,869,501	1,563,459	-643,182	-29.1
75-07-0	Acetaldehyde	6,429,508	6,023,380	6,063,429	-366,079	-5.7
71-43-2	Benzene	4,384,312	3,912,699	4,148,494	-235,818	-5.4
107-06-2	1,2-Dichloroethane	573,327	477,003	418,669	-154,658	-27.0
106-99-0	1,3-Butadiene	1,385,187	1,261,319	1,231,099	-154,088	-11.1
75-56-9	Propylene oxide	408,181	290,935	262,657	-145,524	-35.7
117-81-7	Di(2-ethylhexyl) phthalate	236,857	227,905	139,264	-97,593	-41.2
75-01-4	Vinyl chloride	474,023	462,891	417,294	-56,729	-12.0
123-91-1	1,4-Dioxane	202,076	160,216	155,170	-46,906	-23.2
56-23-5	Carbon tetrachloride	203,562	179,401	177,280	-26,282	-12.9
106-89-8	Epichlorohydrin	166,558	168,423	151,045	-15,513	-9.3
140-88-5	Ethyl acrylate	94,407	84,881	83,209	-11,198	-11.9
101-77-9	4,4'-Methylenedianiline	15,197	23,087	11,050	-4,147	-27.3
79-46-9	2-Nitropropane	15,540	16,816	12,026	-3,514	-22.6
302-01-2	Hydrazine	6,090	4,636	5,181	-909	-14.9
77-78-1	Dimethyl sulfate	2,918	2,627	2,042	-876	-30.0
62-56-6	Thiourea	3,790	3,084	3,004	-786	-20.7
584-84-9	Toluene-2,6-diisocyanate	3,539	3,383	2,954	-585	-16.5
90-94-8	Michler's ketone	715	0	182	-533	-74.5
96-45-7	Ethylene thiourea	351	234	130	-221	-63.0
91-08-7	Toluene-2,6-diisocyanate	1,380	6,219	1,271	-109	-7.9
121-14-2	2,4-Dinitrotoluene	954	1,015	858	-96	-10.1
606-20-2	2,6-Dinitrotoluene	270	257	210	-60	-22.2
96-09-3	Styrene oxide	6	14	5	-1	-16.7
94-59-7	Safrole	116	229	229	113	97.4
64-67-5	Diethyl sulfate	3,165	2,556	3,365	200	6.3
75-21-8	Ethylene oxide	410,392	330,559	410,700	308	0.1
95-80-7	2,4-Diaminotoluene	227	714	888	661	291.2
101-14-4	4,4'-Methylenebis(2-chloroaniline)	118	569	1,028	910	771.2
26471-62-5	Toluenediisocyanate (mixed isomers)	22,332	20,720	23,777	1,445	6.5
139-13-9	Nitrilotriacetic acid	1,330	720	4,478	3,148	236.7
106-46-7	1,4-Dichlorobenzene	111,910	109,234	121,521	9,611	8.6
—	Cobalt (and its compounds)	306,039	300,054	357,314	51,275	16.8
—	Cadmium (and its compounds)	259,358	314,128	415,845	156,487	60.3
98-95-3	Nitrobenzene	161,809	105,151	318,675	156,866	96.9
1332-21-4	Asbestos (friable)	62,291	213,955	236,623	174,332	279.9
79-06-1	Acrylamide	2,785,147	2,681,483	3,357,462	572,315	20.5
—	Lead (and its compounds)	7,991,107	7,971,606	8,818,161	827,054	10.3
—	Nickel (and its compounds)	1,634,152	2,218,571	2,551,439	917,287	56.1
50-00-0	Formaldehyde	8,783,564	9,641,204	9,884,585	1,101,021	12.5
100-42-5	Styrene	18,871,150	19,263,600	20,309,017	1,437,867	7.6
—	Arsenic (and its compounds)	855,366	989,070	2,742,175	1,886,809	220.6
—	Chromium (and its compounds)	11,133,551	13,052,706	14,485,603	3,352,052	30.1
	Subtotal	120,273,953	116,489,019	117,109,437	-3,164,516	-2.6
	% of Total	14.4	14.7	15.3		
	Total for Matched TRI Chemicals	835,039,966	790,718,526	767,302,191	-67,737,775	-8.1

[†] 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.



Reporting of TRI releases increased by more than one million kg each for four carcinogens: chromium and its compounds (from 11.1 million kg to 14.5 million kg), arsenic and its compounds (from 855,366 kg to 2.7 million kg), styrene (18.9 million kg to 20.3 million kg), and formaldehyde (8.8 million kg to 9.9 million kg). (Largely a byproduct of copper and lead smelting, arsenic is primarily used as a wood preservative. Arsenic is also used in agricultural products, in glass, and in nonferrous alloys.)

The facilities with the largest decreases from 1995 to 1997 in carcinogen releases cut these releases by more than half in both NPRI and TRI, while the facilities with the largest increases more than doubled their releases in both NPRI and TRI (Figure 3-25).

[†] 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

In NPRI, the reduction by the facilities with the largest decreases in releases of carcinogenic substances slightly outpaced the increase by the facilities with the largest increases. NPRI facilities that were not among the largest “decreasers” or “increasers” showed essentially no change over the 1995–1997 period (**Figure 3–25**).

The 50 NPRI facilities with the largest reductions in releases of carcinogenic substances released 5.6 million kg of these substances in 1995 and 2.7 million kg in 1997. Nine of these facilities submitted forms for carcinogens in the matched data set in 1995 but not in 1997 (**Table 3–42**).

The 50 NPRI facilities with the largest increases reported releasing 2.1 million kg of designated carcinogens in 1995 and 4.9 million kg in 1997. A total of 23 of these facilities did not report carcinogens in the matched data set in 1995 but did so in 1997 (**Table 3–43**).

Table 3–42		NPRI Facilities with Largest Decrease in On-site Releases of Known or Suspected Carcinogens†, 1995–1997				
M	1997	Rank	Facility	City, Province	SIC Codes	
					Canada	US
		1	Fonderies canadiennes d’Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
		2	Bayer Inc., Bayer AG	Sarnia, ON	37	28
		3	Co-Steel Lasco	Whitby, ON	29	33
		4	Dow Chemical Canada Inc.	Sarnia, ON	37	28
		5	Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan, QC	27	26
		6	Dofasco Inc.	Hamilton, ON	29	33
		7	Celanese Canada Inc.	Edmonton, AB	37	28
		8	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33
		9	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33
		10	Advanced Monobloc Manufacturing, CCL Industries Inc.	Penetanguishene, ON	30	34
		11	Novopharm Limited	Scarborough, ON	37	28
		12	Sydney Steel Corporation	Sydney, NS	29	33
		13	Wolverine Tube (Canada) Inc.	London, ON	29	33
		14	MAAX Inc., Division fibre de verre moderne - usine 4	Tring-Jonction, QC	37	28
		15	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
		16	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33
		17	Bombardier Inc., Bombardier Produits récréatifs	St-Antoine-de-Tilly, QC	16	30
		18	Blount Canada Ltd., Blount Inc.	Guelph, ON	30	34
		19	E.B. Eddy Forest Products Ltd., George Weston Ltd.	Espanola, ON	27	26
		20	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33
		21	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28
		22	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26
		23	Camoplast Inc, Division Roski I	Roxton Falls, QC	32	37
		24	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29
		25	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29
		26	Malette Québec Inc., Panneaux Malette OSB	St-Georges de Champlain, QC	25	24
		27	Inco Limited, Manitoba Division	Thompson, MB	29	33
		28	Suzorite Mica Products Inc., Mica Plant, Zemex Corp.	Boucherville, QC	35	32
		29	Bombardier Inc., Bombardier Produits récréatifs	Valcourt, QC	32	37
		30	Wyeth - Ayerest, Canada Inc., American Home Products	St-Laurent, QC	37	28
		31	Woodbridge Foam Corporation, Kipling Plant, Woodbridge Group	Woodbridge, ON	16	30
		32	Neste Resins, Neste Resins Canada	North Bay, ON	37	28
		33	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
		34	Canac Kitchens Limited, Kohler Company	Thornhill, ON	25	24
		35	Pétromont, Société en commandite	Varenes, QC	37	28
		36	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
		37	Norkraft Quévillon Inc., Domtar Inc.	Lebel-sur-Quévillon, QC	27	26
		38	Sandvik Steel Canada, Sandvik Steel, Inc.	Arnprior, ON	29	33
		39	Crown Packaging Ltd., Paper Mill Division	Burnaby, BC	27	26
		40	Delhi Industries Inc.	Delhi, ON	30	34
		41	CCL Industries Ltd., KG Packaging	Concord, ON	37	28
		42	Norbord Industries Inc., Noranda Forest Inc.	La Sarre, QC	25	24
		43	Inco Limited, Central Mills	Copper Cliff, ON	29	33
		44	AOC Canada, Inc., Alpha/Owens-Corning (Canada) Inc.	Guelph, ON	37	28
		45	Produits American Biltrite Ltée., American Biltrite Inc.	Sherbrooke, QC	15	30
		46	Techno Caoutchouc Inc., Soucy International Inc.	Rock Forest, QC	15	26
		47	Owens-Corning Canada Inc., Owens Corning Fiberglas Corp.	Candiac, QC	35	32
		48	Long Manufacturing Ltd., Echlin Inc.	Mississauga, ON	30	34
		49	Valle Foam Industries Inc., Valle 2	Brampton, ON	16	30
		50	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	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 TRI.

Rank	1995		1996		1997		Change 95-97 Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)		
1	2	290,100	2	251,600	2	0	-290,100	Chromium and compounds (land)
2	5	361,475	5	162,400	5	82,673	-278,802	Benzene, 1,3-Butadiene (air)
3	3	334,898	3	233,261	3	92,573	-242,325	Lead and compounds (land)
4	8	248,425	8	214,262	17	100,758	-147,667	Asbestos (land)
5	1	147,397	1	3,135	**	**	-147,397	Formaldehyde (water)
6	5	460,142	5	457,530	5	316,496	-143,646	Benzene (air)
7	5	507,498	5	570,772	6	378,422	-129,076	Acetaldehyde (UIJ)
8	5	126,800	**	**	**	**	-126,800	Nickel and compounds (air)
9	6	398,980	5	393,700	5	281,030	-117,950	Lead and compounds (air)
10	1	109,380	1	87,240	**	**	-109,380	Tetrachloroethylene (air)
11	1	418,410	1	366,565	1	313,250	-105,160	Dichloromethane (air)
12	3	105,200	3	33,180	3	29,120	-76,080	Lead/Cadmium and compounds (land)
13	1	133,212	1	133,212	1	62,500	-70,712	Trichloroethylene (air)
14	1	91,820	1	19,373	1	22,200	-69,620	Styrene (air)
15	2	60,019	2	114,557	2	699	-59,320	Chromium and compounds (land)
16	5	53,000	4	0	4	0	-53,000	Styrene (air)
17	1	90,000	1	82,000	1	47,600	-42,400	Styrene (air)
18	3	40,943	3	74,616	**	**	-40,943	Trichloroethylene (air)
19	2	63,345	2	44,149	2	22,421	-40,924	Chloroform, Acetaldehyde (air)
20	3	102,969	4	59,558	4	63,977	-38,992	Benzene (air)
21	5	49,240	5	10,600	5	10,837	-38,403	Asbestos (land)
22	3	54,270	1	14,000	1	18,000	-36,270	Chloroform (air)
23	1	80,000	1	69,000	1	44,600	-35,400	Styrene (air)
24	5	81,863	4	78,614	4	52,160	-29,703	Benzene (air)
25	2	69,284	2	63,938	3	39,615	-29,669	Benzene (air)
26	1	96,380	1	55,108	1	66,857	-29,523	Formaldehyde (air)
27	3	114,525	3	92,844	3	85,303	-29,222	Nickel and compounds (air)
28	1	60,000	1	60,000	1	33,000	-27,000	Dichloromethane (air)
29	1	26,033	**	**	2	0	-26,033	Dichloromethane (air)
30	1	43,419	1	23,017	1	18,579	-24,840	Dichloromethane (air)
31	2	48,008	2	58,809	2	24,001	-24,007	Dichloromethane (air)
32	2	33,600	1	37,220	1	10,770	-22,830	Formaldehyde (air)
33	3	46,270	3	23,190	3	23,870	-22,400	Chromium/Nickel and compounds (water)
34	4	21,522	1	12,148	**	**	-21,522	Styrene (air)
35	3	55,080	3	37,466	3	33,802	-21,278	Benzene (air, water)
36	2	21,149	2	12,423	**	**	-21,149	Trichloroethylene (air)
37	1	28,900	1	19,360	2	8,854	-20,046	Chloroform (air)
38	1	223,200	1	246,420	1	203,760	-19,440	Trichloroethylene (air)
39	1	19,170	**	**	**	**	-19,170	Formaldehyde (water)
40	2	17,711	2	93	2	96	-17,615	Trichloroethylene (air)
41	3	32,100	3	16,334	3	15,131	-16,969	Dichloromethane (air)
42	1	26,800	1	14,300	1	11,204	-15,596	Formaldehyde (air)
43	1	14,453	1	29,851	**	**	-14,453	Nickel and compounds (water)
44	1	14,257	1	0	1	0	-14,257	Styrene (air)
45	1	17,900	1	4,300	1	3,800	-14,100	Di(2-ethylhexyl) phthalate (land)
46	2	14,000	**	**	**	**	-14,000	Di(2-ethylhexyl) phthalate (air)
47	2	37,153	2	22,993	2	23,222	-13,931	Formaldehyde (air)
48	2	13,800	1	0	1	0	-13,800	Trichloroethylene (air)
49	2	99,876	2	102,021	2	86,518	-13,358	Dichloromethane (air)
50	11	40,852	12	38,764	13	27,596	-13,256	Formaldehyde (air)
	133	5,644,828	116	4,443,923	122	2,655,294	-2,989,534	

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

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

► UIJ=underground injection

Table 3-43		NPRI Facilities with Largest Increase in On-site Releases of Known or Suspected Carcinogens [†] , 1995-1997			
M	1997				
Rank	Facility	City, Province	SIC Codes		
			Canada	US	
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	
2	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24	
3	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	
4	Novopharm Limited	Markham, ON	37	28	
5	Carpenter Canada Ltd.	Woodbridge, ON	16	30	
6	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	
7	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	
8	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	
9	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24	
10	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24	
11	René Matériaux composites Ltée	St-Ephrem-de-Beauce, QC	32	37	
12	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	
13	Stelco Inc., Hilton Works	Hamilton, ON	29	33	
14	MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction, QC	16	30	
15	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	
16	Domfoam International Inc.	St-Léonard, QC	16	30	
17	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28	
18	Beauce Composites Inc., ADS Groupe Composites Inc.	Ste-Clotilde-de-Beauce, QC	32	37	
19	Louisiana-Pacific Canada Ltd., Dawson Creek OSB	Dawson Creek, BC	25	24	
20	Ranger Board Ltd., West Fraser Mills Ltd.	Blue Ridge, AB	25	24	
21	Bonar Inc, Plastics Division, Low & Bonar PLC	Burlington/Halton, ON	16	26	
22	Ispat Sidbec Inc. Acierie, Ispat Mexicana	Contrecoeur, QC	29	33	
23	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37	
24	West Fraser Mills Ltd., Westpine, MDF	Quesnel, BC	25	24	
25	Frank Fair Industries Ltd., Motor Coach Industries Ltd.	Winnipeg, MB	32	30	
26	Cartons St-Laurent Inc.	LaTuque, QC	27	26	
27	Macmillan Bloedel, North Superior Forest Products	Wawa, ON	25	24	
28	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	37	39	
29	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	
30	Grant Forest Products Corp., OSB Plant	Englehart, ON	25	24	
31	De Havilland Inc., Bombardier Inc.	Downsview, ON	32	35	
32	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37	
33	Carpenter Canada Ltd., Calgary Division	Calgary, AB	16	30	
34	Fleet Industries Ltd., Magellan Aerospace Corp.	Fort Erie, ON	32	37	
35	Kimberly-Clark Corporation	Terrace Bay, ON	27	26	
36	MAAX Inc., Division Acrylica	Ste-Marie, QC	37	30	
37	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28	
38	Avenor Inc., Gold River Operations	Gold River, BC	27	26	
39	Weyerhaeuser Canada Ltd., Slave Lake O.S.B. Mill	Slave Lake, AB	25	24	
40	Domtar Packaging, Red Rock Mill	Red Rock, ON	27	26	
41	Pétroles Coastal Canada Inc., Coastal Corporation	Montréal-est, QC	37	28	
42	Reinforced Plastic Systems Inc., Mahone Bay Plant	Mahone Bay, NS	16	30	
43	Foamex Canada Inc., Foamex L.P.	Toronto, ON	16	30	
44	Abitibi-Consolidated, Division Laurentide	Grand-Mere, QC	27	26	
45	Avenor Inc., Dryden Mill	Dryden, ON	27	26	
46	Unicell Limited	Toronto, ON	32	37	
47	Lilly Industries, Inc.	Cornwall, ON	37	28	
48	Norbord Industries Inc., Val d'Or Division	Val-d'Or, QC	25	24	
49	Smith & Nephew Inc.	Lachine, QC	37	28	
50	Vitafoam Products Canada Ltd.	Winnipeg, MB	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 Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)		
1	4	498,950	4	215,858	4	897,650	398,700	Chromium and compounds (land)
2	**	**	**	**	1	279,000	279,000	Formaldehyde (air)
3	3	41,177	3	166,644	3	234,454	193,277	Lead and compounds (air)
4	1	72,981	1	61,955	1	226,993	154,012	Dichloromethane (air)
5	2	196,585	2	238,953	2	296,925	100,340	Dichloromethane (air)
6	**	**	1	104,411	1	100,003	100,003	Benzene (air)
7	1	80,000	1	217,440	2	169,273	89,273	Lead and compounds (land)
8	1	129,500	1	229,000	2	212,430	82,930	Formaldehyde (water)
9	**	**	1	40,688	1	82,298	82,298	Formaldehyde (air)
10	**	**	1	64,800	1	77,100	77,100	Formaldehyde (air)
11	**	**	2	144,000	2	71,000	71,000	Styrene, Dichloromethane (air)
12	**	**	**	**	4	69,999	69,999	Lead and compounds (air)
13	6	174,590	6	234,615	6	242,390	67,800	Benzene (air)
14	**	**	1	58,119	1	66,510	66,510	Styrene (air)
15	1	3,323	1	3,582	1	62,136	58,813	Formaldehyde (air)
16	2	195,472	2	230,802	2	245,996	50,524	Dichloromethane (air)
17	1	36,083	1	85,914	1	84,600	48,517	Vinyl acetate (air)
18	**	**	2	43,536	2	43,536	43,536	Styrene (air)
19	**	**	1	36,598	1	41,712	41,712	Formaldehyde (air)
20	1	24,455	1	16,508	1	64,585	40,130	Formaldehyde (air)
21	**	**	1	29,300	1	36,000	36,000	Trichloroethylene (air)
22	2	202,179	2	230,540	2	234,792	32,613	Lead and compounds (land)
23	**	**	**	**	2	31,920	31,920	Chromium and compounds, Trichloroethylene (air)
24	**	**	**	**	1	31,134	31,134	Formaldehyde (air)
25	1	14,533	1	11,861	1	45,200	30,667	Styrene (air)
26	**	**	2	30,034	2	29,283	29,283	Chloroform, Acetaldehyde (air)
27	**	**	1	35,400	1	29,230	29,230	Formaldehyde (air)
28	1	6,000	1	6,000	2	34,960	28,960	Lead and compounds (land)
29	**	**	2	28,140	2	28,584	28,584	Acetaldehyde, Chloroform (air)
30	**	**	1	81,800	1	28,370	28,370	Formaldehyde (air)
31	1	44,470	1	44,278	1	72,200	27,730	Trichloroethylene (air)
32	1	0	2	20,800	2	27,082	27,082	Formaldehyde (air)
33	2	76,086	2	92,783	2	103,060	26,974	Dichloromethane (air)
34	**	**	1	30,970	1	26,250	26,250	Trichloroethylene (air)
35	**	**	**	**	1	22,530	22,530	Chloroform (air)
36	1	27,000	1	30,085	1	45,850	18,850	Styrene (air)
37	3	37,590	3	43,300	3	56,400	18,810	Styrene (air)
38	**	**	1	18,400	1	18,400	18,400	Acetaldehyde (air)
39	2	59,420	2	85,930	2	76,330	16,910	Formaldehyde (air)
40	**	**	1	14,117	1	16,348	16,348	Acetaldehyde (air)
41	1	1,690	1	5,798	1	17,948	16,258	Benzene (air)
42	1	5,955	1	4,200	1	21,900	15,945	Styrene (air)
43	2	141,169	2	137,960	2	157,075	15,906	Dichloromethane (air)
44	**	**	**	**	1	15,690	15,690	Formaldehyde (air)
45	**	**	1	14,800	1	15,630	15,630	Acetaldehyde (air)
46	**	**	**	**	1	15,390	15,390	Styrene (air)
47	3	1,769	2	11,700	2	16,977	15,208	Styrene (air)
48	1	31,700	1	43,020	1	46,489	14,789	Formaldehyde (air)
49	1	12,120	1	23,500	1	26,873	14,753	Dichloromethane (air)
50	1	4,780	1	12,556	1	19,500	14,720	Dichloromethane (air)
	47	2,119,577	67	3,280,695	81	4,915,985	2,796,408	

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

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

► UIJ=underground injection

TRI Facilities with Largest Decreases/Increases

In TRI, both the largest decreasing facilities and the facilities that did not report large changes contributed reductions in releases from 1995 to 1997. However, releases reported by the 50 facilities with the largest increases minimized the TRI reduction in these substances from 1995 to 1997 (**Figure 3-25**).

Among TRI facilities, the 50 with the largest reductions in releases of designated carcinogens reported 20.4 million kg of such releases in 1995 and 8.8 million kg in 1997. Eight of these facilities did not submit reports for any of the matched carcinogens in 1997 (**Table 3-44**).

TRI facilities with the largest increases reported releasing 18.7 million kg of these substances in 1995 and 37.6 million kg in 1997. Eleven of them had not filed reports for the carcinogens in 1995 (**Table 3-45**).

Table 3-44		TRI Facilities with Largest Decrease in On-site Releases of Known or Suspected Carcinogens [†] , 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
2	BP Chemicals Inc., BP America Inc.	Lima, OH	28
3	Monsanto Co., Chocolate Bayou	Alvin, TX	28
4	Heatcraft Inc., Lennox Intl. Inc.	Grenada, MS	Mult.
5	Pharmacia & Upjohn Co.	Portage, MI	28
6	Piper Impact Inc.	New Albany, MS	34
7	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28
8	Celanese Eng. Resins Inc., Hoechst Corp.	Bishop, TX	28
9	Eastman Kodak Co., Kodak Park	Rochester, NY	38
10	GE Plastics Co., GE Co.	Mount Vernon, IN	28
11	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26
12	DuPont	Towanda, PA	38
13	DuPont	Beaumont, TX	28
14	Gaska Tape Inc.	Elkhart, IN	30
15	Trinity American Corp.	High Point, NC	30
16	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33
17	Vitafoam Inc., British Vita PLC	Tupelo, MS	30
18	Weyerhaeuser Co.	Longview, WA	Mult.
19	Foamex L.P., Foamex Intl. Inc.	La Porte, IN	30
20	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28
21	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33
22	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28
23	Celanese Ltd.	Bay City, TX	28
24	Tokico USA Inc.	Berea, KY	37
25	ASARCO Inc.	East Helena, MT	33
26	Dow Chemical Co.	Freeport, TX	28
27	Vitafoam Inc.	High Point, NC	30
28	Hoechst-Celanese Corp., Hoechst Corp.	Spartanburg, SC	Mult.
29	Great Lakes Chemical Corp.	El Dorado, AR	28
30	Willamette Ind. Inc.	Bennettsville, SC	24
31	International Paper Co., Natchez Mill	Natchez, MS	26
32	Texas Fibers, Leggett & Platt Inc.	Brenham, TX	30
33	Fort James Camas LLC, Fort James Corp.	Camas, WA	Mult.
34	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Latrobe, PA	33
35	Crest Foam, Leggett & Platt Inc.	Newburyport, MA	30
36	Ford Motor Co., Sheldon Rd. Plant	Plymouth, MI	37
37	Louisiana Pigment Co. L.P.	Westlake, LA	28
38	Electronic Concepts Inc.	Lee, MA	30
39	Schering-Plough Prods. Inc., Schering-Plough Corp.	Las Piedras, PR	28
40	Tippecanoe Labs., Eli Lilly & Co.	Shadeland, IN	28
41	DuPont Sabine River Works	Orange, TX	28
42	Karo Mfg. Inc.	Naugatuck, CT	34
43	DuPont Cape Fear	Leland, NC	28
44	Hexcel Corp.	Salt Lake City, UT	28
45	Pro-Line Boats Inc., American Marine Holdings	Homosassa, FL	37
46	Bayer Corp.	Orange, TX	28
47	Lukens Steel Co., Lukens Inc.	Coatesville, PA	33
48	Armco Inc. (Route 8 S.)	Butler, PA	33
49	Wheatland Tube Co., John Maneely Co.	Chicago, IL	33
50	General Foam Corp.	Bridgeview, IL	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 NPRI.

Rank	1995		1996		1997		Change 95-97	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Releases (kg)	
1	4	1,237,100	4	945,577	4	56,321	-1,180,779	Lead and compounds (land)
2	10	1,821,315	10	1,195,459	10	992,438	-828,877	Acrylonitrile (UIJ)
3	4	801,396	3	657,431	1	43,284	-758,112	Acrylonitrile (UIJ)
4	1	447,951	1	164,902	1	48,202	-399,749	Trichloroethylene (air)
5	5	430,090	4	114,818	4	65,320	-364,770	Dichloromethane (air)
6	2	358,617	2	127,778	2	227	-358,390	Tetrachloroethylene (air)
7	6	404,831	6	128,816	6	61,319	-343,512	Vinyl acetate (UIJ)
8	4	447,212	5	385,525	5	106,392	-340,820	Formaldehyde (UIJ)
9	10	1,352,547	9	1,142,344	9	1,013,355	-339,192	Dichloromethane, Acetaldehyde (air)
10	4	698,118	7	569,534	4	392,448	-305,670	Dichloromethane (air)
11	2	287,075	2	286,168	2	39,455	-247,620	Chloroform (air)
12	1	244,898	1	222,222	**	**	-244,898	Dichloromethane (air)
13	9	341,818	4	107,635	5	98,399	-243,419	Acrylonitrile, Nitrobenzene, Carbon tetrachloride (air)
14	2	252,550	2	33,149	2	18,301	-234,249	Dichloromethane, Tetrachloroethylene (air)
15	2	276,214	1	160,100	2	53,574	-222,640	Dichloromethane (air)
16	7	891,992	7	1,321,135	7	680,183	-211,809	Lead and compounds (land)
17	2	205,427	3	352,260	**	**	-205,427	Dichloromethane (air)
18	6	537,293	6	402,497	5	339,823	-197,470	Chloroform (air, water), Acetaldehyde (air)
19	2	196,516	2	45,972	**	**	-196,516	Dichloromethane (air)
20	2	590,522	2	409,501	2	396,123	-194,399	Dichloromethane (air)
21	6	785,764	6	689,212	5	594,782	-190,982	Lead and compounds (land)
22	5	295,193	4	214,753	4	106,712	-188,481	Benzene (air)
23	5	191,243	3	35,597	3	11,550	-179,693	Vinyl acetate (UIJ, air), Acetaldehyde (UIJ)
24	2	167,659	2	75,799	1	116	-167,543	Trichloroethylene (air)
25	4	1,931,363	4	1,896,534	4	1,763,895	-167,468	Lead and compounds (land)
26	21	462,411	21	406,386	21	297,191	-165,220	Propylene oxide, Dichloromethane, Benzene, 1,3-Butadiene (air)
27	3	338,776	3	201,395	2	174,720	-164,056	Dichloromethane (air)
28	5	177,338	5	38,575	5	13,822	-163,516	Acetaldehyde (air)
29	2	391,977	2	299,060	2	228,899	-163,078	Dichloromethane (UIJ)
30	1	148,190	**	**	**	**	-148,190	Formaldehyde (air)
31	4	222,506	3	161,507	3	76,523	-145,983	Chloroform, Dichloromethane (air)
32	2	208,390	2	61,429	2	65,102	-143,288	Dichloromethane (air)
33	4	260,551	4	152,519	5	118,730	-141,821	Chloroform (air)
34	3	147,927	3	155,124	3	7,890	-140,037	Chromium and compounds (land)
35	2	138,165	2	45,125	1	227	-137,938	Dichloromethane (air)
36	1	137,596	1	3,583	**	**	-137,596	Trichloroethylene (air)
37	1	131,804	**	**	**	**	-131,804	Chromium and compounds (land)
38	2	127,309	2	72,391	**	**	-127,309	Dichloromethane (air)
39	2	253,660	2	205,587	2	128,277	-125,383	Dichloromethane (air)
40	3	180,159	3	85,490	4	60,045	-120,114	Dichloromethane (air)
41	8	259,681	8	253,256	6	139,938	-119,743	Vinyl acetate (air)
42	1	127,438	1	63,946	1	10,612	-116,826	Tetrachloroethylene (air)
43	4	255,215	4	148,634	4	141,702	-113,513	Acetaldehyde (air)
44	2	134,516	1	35,311	1	21,887	-112,629	Dichloromethane (air)
45	2	176,616	1	73,197	1	64,844	-111,772	Styrene (air)
46	1	174,655	1	145,238	2	63,605	-111,050	1,3-Butadiene (air)
47	3	170,168	3	120,151	3	59,905	-110,263	Chromium/Nickel and compounds (land)
48	3	111,859	3	117,260	3	2,997	-108,862	Chromium/Nickel and compounds (land)
49	2	104,582	1	32,508	**	**	-104,582	Dichloromethane (air)
50	3	323,982	3	322,330	3	219,477	-104,505	Dichloromethane (air)
	192	20,360,175	179	14,884,720	162	8,778,612	-11,581,563	

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

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

► UIJ=underground injection

Table 3-45		TRI Facilities with Largest Increase in On-site Releases of Known or Suspected Carcinogens [†] , 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33
2	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
3	Monsanto Co.	Luling, LA	28
4	Solutia Inc., Chocolate Bayou	Alvin, TX	28
5	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28
6	Borden Chemicals & Plastics LP	Geismar, LA	28
7	ASARCO Inc., Glover Plant	Annapolis, MO	33
8	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33
9	Foamex L.P., Div. of Kihl	Corry, PA	30
10	Aquaglass Corp., Masco Corp.	Adamsville, TN	30
11	Boeing Co.	Wichita, KS	Mult.
12	DuPont	Pass Christian, MS	28
13	Vitafoam Inc., British Vita PLC	Tupelo, MS	30
14	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28
15	DuPont	New Johnsonville, TN	28
16	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33
17	Carpenter Co.	Russellville, KY	Mult.
18	Rubicon Inc.	Geismar, LA	28
19	3V Inc.	Georgetown, SC	28
20	Tennessee Mat Co.	Nashville, TN	30
21	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN	30
22	Burkart Foam Inc., Ohio Decorative Prods. Inc.	Cairo, IL	30
23	Shell Chemical Co., Shell Oil Co.	Geismar, LA	28
24	Plum Creek Mfg. LP, Plum Creek Timber Co. LP	Columbia Falls, MT	24
25	Eastman Chocolate Bayou	Alvin, TX	28
26	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22
27	Firestone Synthetic Rubber & Latex, Bridgestone/Firestone Inc.	Sulphur, LA	28
28	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR	28
29	Pioga LLC, Creative Design & Mfg., Pioneer Intl. Inc.	Nashville, GA	37
30	Dow Chemical Co.	Plaquemine, LA	Mult.
31	Universal-Rundle Corp., Nortek Inc.	Ottumwa, IA	30
32	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA	30
33	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33
34	DuPont	Circleville, OH	28
35	Carpenter Co.	Elkhart, IN	Mult.
36	Selmer Co. Inc., Vincent Bach Div.	Elkhart, IN	39
37	Future Foam Inc.	Middleton, WI	30
38	Cleveland Laminating Corp.	Cleveland, OH	26
39	Star Enterprise	Delaware City, DE	29
40	DuPont Chambers Works	Deepwater, NJ	28
41	Foamex Intl. Inc.	Milan, TN	30
42	Carpenter Co., Tupelo Div.	Verona, MS	30
43	Georgia-Pacific Corp.	Big Island, VA	26
44	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33
45	P4 Production L.L.C.	Soda Springs, ID	Mult.
46	Lee-Var Inc.	Andrews, TX	30
47	Chaparral Boats Inc., RPC Energy Services Inc.	Nashville, GA	37
48	Flexible Foam Prods. Inc., Ohio Decorative Prods. Inc.	Miami, FL	30
49	DuPont	Old Hickory, TN	Mult.
50	Albemarle Corp.	Orangeburg, SC	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	Major Chemicals Reported with Increases (Primary Media with Increases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	5	759,954	5	741,870	5	4,101,067	3,341,113	Lead/Arsenic and compounds (land)
2	1	4,265,578	1	5,126,893	1	6,578,095	2,312,517	Chromium and compounds (land)
3	2	1,823,991	2	2,549,116	2	3,236,644	1,412,653	Formaldehyde (UIJ)
4	**	**	**	**	3	1,039,050	1,039,050	Acrylonitrile (UIJ)
5	1	3,313,374	1	4,084,751	1	4,129,841	816,467	Chromium and compounds (land)
6	7	38,378	6	77,681	7	815,745	777,367	Benzene (air)
7	4	960,950	4	1,445,774	4	1,603,364	642,414	Lead and compounds (land)
8	1	547,715	1	922,590	1	1,097,645	549,930	Nickel and compounds (land)
9	2	448,333	2	756,420	2	903,448	455,115	Dichloromethane (air)
10	1	665,652	1	1,046,797	1	1,057,867	392,215	Styrene (air)
11	9	230,411	6	350,371	6	596,395	365,984	Tetrachloroethylene (air)
12	**	**	**	**	4	358,277	358,277	Chromium and compounds (UIJ)
13	2	98,199	2	35,755	3	425,644	327,445	Dichloromethane (air)
14	5	1,398,049	5	1,243,881	5	1,711,337	313,288	Acrylamide (UIJ)
15	**	**	**	**	2	296,145	296,145	Chromium and compounds (UIJ)
16	5	22,155	4	60,361	7	291,902	269,747	Arsenic and compounds (land)
17	3	353,610	3	374,128	5	571,776	218,166	Dichloromethane (air)
18	9	106,728	9	110,086	9	308,696	201,968	Nitrobenzene (UIJ)
19	4	120,369	4	168,468	4	319,397	199,028	Dichloromethane (air)
20	**	**	1	4	1	198,200	198,200	Dichloromethane (air)
21	1	206,396	1	269,465	1	404,393	197,997	Styrene (air)
22	2	684	2	278,642	2	189,911	189,227	Dichloromethane (air)
23	4	34,607	5	75,637	5	222,355	187,748	Ethylene oxide (air)
24	1	17,460	1	16,440	1	201,020	183,560	Formaldehyde (air)
25	**	**	1	194,105	1	182,358	182,358	Dichloromethane (air)
26	**	**	1	0	4	181,137	181,137	Chromium/Lead and compounds (air)
27	2	29,513	2	16,701	2	209,167	179,654	1,3-Butadiene (air)
28	1	520,117	1	585,261	1	689,524	169,407	Dichloromethane (air)
29	**	**	1	156,546	1	164,296	164,296	Styrene (air)
30	18	138,667	20	248,455	18	298,840	160,173	Asbestos (land)
31	**	**	1	114,131	1	156,537	156,537	Styrene (air, land)
32	1	192,302	1	309,375	1	347,116	154,814	Styrene (air)
33	2	151,141	2	296,726	2	300,835	149,694	Chromium and compounds (land)
34	**	**	3	77,419	3	148,784	148,784	Acetaldehyde (air)
35	2	260,674	3	293,377	3	408,975	148,301	Dichloromethane (air)
36	1	0	1	0	1	147,846	147,846	Trichloroethylene (air)
37	1	227	2	130,359	2	145,352	145,125	Dichloromethane (air)
38	1	208,617	1	292,063	1	346,032	137,415	Dichloromethane (air)
39	3	6,914	2	15,374	5	138,019	131,105	Nickel and compounds (land)
40	13	32,126	10	91,385	8	158,080	125,954	Acrylamide (land)
41	2	396,587	1	457,282	2	521,285	124,698	Dichloromethane (air)
42	2	580,417	2	689,399	2	704,215	123,798	Dichloromethane (air)
43	1	45,576	1	41,814	2	164,158	118,582	Benzene, Acetaldehyde (air)
44	1	247,306	1	232,185	1	365,394	118,088	Nickel and compounds (land)
45	**	**	**	**	3	114,781	114,781	Cadmium and compounds (land)
46	**	**	1	11,338	1	113,379	113,379	Styrene (air)
47	2	123,322	2	142,678	3	229,342	106,020	Styrene (air)
48	2	163,929	2	192,064	2	266,521	102,592	Dichloromethane (air)
49	4	109,478	4	109,389	4	210,408	100,930	Acetaldehyde (air)
50	2	103,143	2	246,979	2	203,446	100,303	Dichloromethane (air)
	130	18,722,649	134	24,679,535	158	37,574,041	18,851,392	

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

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

► UIJ=underground injection

Metals

NPRI facilities reported almost no change in the amount of metals and their compounds they released from 1995 to 1997. NPRI releases of metals and metal compounds totaled 11.84 million kg in 1995 and 11.76 million kg in 1997, a reduction of less than one percent. Because releases of other substances decreased much more substantially (a 13 percent reduction), metals occupied an increasing portion of total NPRI releases, rising from 13 percent of all releases in 1995 to 15 percent in 1997 (Table 3-46).

The metal with the largest absolute reduction achieved in this period was copper and its compounds, with releases of 1.7 million kg in 1995 and 660,947 kg in 1997. This reduction amounted to a 61 percent decrease. At the same time, NPRI facilities reported increasing releases of zinc and its compounds from 4.1 million kg in 1995 to 5.8 million kg in 1997, a 41 percent increase. NPRI facilities reported increases for nine of the 15 metals.

TRI facilities reported a substantial increase in their releases of metals and metal compounds from 1995 to 1997—from 126.3 million kg to 149.2 million kg. This amounted to an 18 percent increase, a sharp reversal of the eight percent reduction for all chemicals in the matched data set. As releases of other chemicals decreased, the proportion of metals in TRI total releases increased from 15 percent in 1995 to 20 percent in 1997 (Table 3-47).

Table 3-46		Change in NPRI On-site Releases of Metals and Their Compounds, 1995-1997				
CAS Number	Chemical	Total Releases			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Copper (and its compounds)	1,682,999	684,342	660,947	-1,022,052	-60.7
—	Manganese (and its compounds)	2,639,005	1,882,345	1,909,572	-729,433	-27.6
—	Nickel (and its compounds)	752,118	396,159	364,094	-388,024	-51.6
—	Lead (and its compounds)	1,345,674	1,392,954	1,251,363	-94,311	-7.0
—	Cobalt (and its compounds)	29,129	25,646	20,614	-8,515	-29.2
—	Antimony (and its compounds)	10,049	9,516	7,301	-2,748	-27.3
—	Mercury (and its compounds)	46	34	244	198	430.4
—	Silver (and its compounds)	903	1,203	1,479	576	63.8
—	Cadmium (and its compounds)	38,829	18,952	41,353	2,524	6.5
—	Selenium (and its compounds)	3,913	5,490	9,280	5,367	137.2
7440-62-2	Vanadium (fume or dust)	170,862	189,526	215,356	44,494	26.0
7429-90-5	Aluminum (fume or dust)	485,916	499,143	534,619	48,703	10.0
—	Arsenic (and its compounds)	57,770	125,128	149,053	91,283	158.0
—	Chromium (and its compounds)	503,603	493,593	776,821	273,218	54.3
—	Zinc (and its compounds)	4,122,249	5,647,993	5,813,918	1,691,669	41.0
	Subtotal	11,843,065	11,372,024	11,756,014	-87,051	-0.7
	% of Total	12.8	13.7	14.6		
	Total for Matched NPRI Chemicals	92,620,108	83,171,877	80,448,924	-12,171,184	-13.1

Table 3-47

Change in TRI On-site Releases of Metals and Their Compounds, 1995–1997

M 1997

CAS Number	Chemical	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Antimony (and its compounds)	819,752	994,015	632,239	-187,513	-22.9
7429-90-5	Aluminum (fume or dust)	1,764,092	1,820,272	1,743,571	-20,521	-1.2
7440-62-2	Vanadium (fume or dust)	71,991	56,879	59,254	-12,737	-17.7
—	Silver (and its compounds)	30,511	38,274	28,548	-1,963	-6.4
—	Mercury (and its compounds)	8,005	8,243	10,327	2,322	29.0
—	Selenium (and its compounds)	134,449	119,624	184,615	50,166	37.3
—	Cobalt (and its compounds)	306,039	300,054	357,314	51,275	16.8
—	Cadmium (and its compounds)	259,358	314,128	415,845	156,487	60.3
—	Copper (and its compounds)	20,369,958	26,105,906	21,179,453	809,495	4.0
—	Lead (and its compounds)	7,991,107	7,971,606	8,818,161	827,054	10.3
—	Nickel (and its compounds)	1,634,152	2,218,571	2,551,439	917,287	56.1
—	Arsenic (and its compounds)	855,366	989,070	2,742,175	1,886,809	220.6
—	Zinc (and its compounds)	55,911,373	57,400,317	59,247,400	3,336,027	6.0
—	Chromium (and its compounds)	11,133,551	13,052,706	14,485,603	3,352,052	30.1
—	Manganese (and its compounds)	25,047,476	25,006,199	36,787,267	11,739,791	46.9
	Subtotal	126,337,180	136,395,864	149,243,211	22,906,031	18.1
	% of Total	15.1	17.2	19.5		
	Total for Matched TRI Chemicals	835,039,966	790,718,526	767,302,191	-67,737,775	-8.1

The largest reduction by TRI facilities in metals releases was reported for antimony and its compounds, from 819,752 kg in 1995 to 632,239 kg in 1997. By far the largest increase occurred in releases of manganese and its compounds—from 25.0 million kg in 1995 to 36.8 in 1997. TRI facilities reported increases for 11 of the 15 metals.

NPRI Facilities with Largest Decreases/Increases

In NPRI, virtually all releases of metals for 1995 through 1997 were reported by the 50 facilities making the largest reductions in such releases and the 50 facilities making the largest increases in such releases. Overall, their respective decreases and increases effected very little net change during this period (Figure 3-26).

The 50 NPRI facilities with the largest reductions in releases of metals and their compounds reported 6.3 million kg of such releases in 1995 and 2.5 million kg in 1997. Their 3.8-million-kg reduction amounted to a percentage decrease of 61 percent. Thirteen of the 50 facilities did not report metals releases in 1997. The number of forms the top 50 facilities submitted for metals declined from 168 in 1995 to 132 in 1997 (Table 3-48).

For the 50 NPRI facilities reporting the largest increases, the releases of metals rose from 5.4 million kg in 1995 to 9.1 million kg in 1997. This amounted to an increase of 3.7 million kg, or 69 percent. Twenty-three facilities in this group did not report for the metals and their compounds in 1995 (Table 3-49).

Figure 3-26

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

M 1997

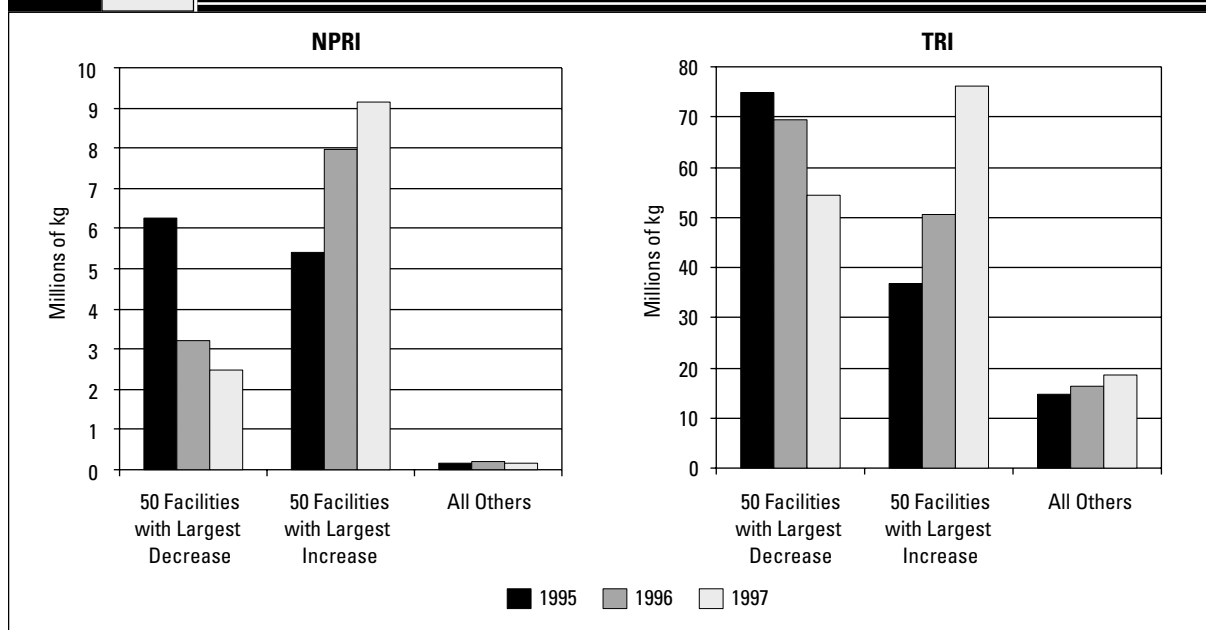


Table 3-48		NPRI Facilities with Largest Decrease in On-site Releases of Metals and Their Compounds, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33
2	Co-Steel Lasco	Whitby, ON	29	33
3	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
4	Sydney Steel Corporation	Sydney, NS	29	33
5	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33
6	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33
7	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
8	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33
9	Riverside Brass, Riverside Brass & Aluminum Foundry	New Hamburg, ON	29	33
10	Inco Limited, Manitoba Division	Thompson, MB	29	33
11	Inco Limited, Copper Refinery	Copper Cliff, ON	29	33
12	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
13	Inco Limited, Central Mills	Copper Cliff, ON	29	33
14	Esco Limited	Port Coquitlam, BC	29	33
15	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33
16	Metalex Products Ltd.	Richmond, BC	29	33
17	Wolverine Tube (Canada) Inc., Strip Operation	Fergus, ON	29	33
18	Kronos Canada, Inc.	Varenes, QC	37	28
19	Owens-Corning Canada Inc., Guelph Glass Plant	Guelph, ON	35	32
20	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc	Salaberry-de-Valleyfield, QC	29	33
21	Ivaco Rolling Mills	L'Orignal, ON	29	33
22	Nova Chemicals (Canada) Ltd.	Corunna, ON	36	29
23	Sherritt International Corporation	Fort Saskatchewan, AB	37	28
24	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26
25	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29
26	Produits American Biltrite Ltée., American Biltrite Inc.	Sherbrooke, QC	15	30
27	Goodyear Canada Inc., Goodyear Tire and Rubber Co.	Medicine Hat, AB	15	30
28	Ford Motor Company of Canada Ltd., Windsor Aluminum Plant	Windsor, ON	29	33
29	Vintex Inc.	Mount Forest, ON	16	30
30	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37
31	Maritime Electric Company Ltd., Thermal Generating Station	Charlottetown, PE	31	35
32	Mondo America Inc.	Laval, QC	15	30
33	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29
34	General Motors of Canada Limited, Oshawa Battery Plant	Oshawa, ON	33	36
35	Norcast Division de Trittech Precision Inc., fonderie Norcast	Mont-Joli, QC	30	34
36	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
37	Dana Canada Inc., Barrie Axle Plant, Dana US Inc.	Barrie, ON	32	37
38	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33
39	Goodyear Canada Inc., Goodyear Tire & Rubber Co.	St-Jean-sur-Richelieu, QC	15	30
40	General Motors of Canada Limited, St. Catharines Foundry	St. Catharines, ON	32	37
41	Henkel Canada Ltd., Henkel Surface Technologies	Toronto, ON	37	28
42	Sifto Canada Inc., North American Salt Co.	Unity, SK	35	28
43	Rockwell International of Canada, Tilbury Brake Plant	Tilbury, ON	32	37
44	Cadorath Plating Co. Ltd.	Winnipeg, MB	30	34
45	Fisher Controls Inc., Emerson Electric Company	Woodstock, ON	30	34
46	ETI Canada Inc., Canadian Investment Capital Ltd.	North Bay, ON	37	28
47	Brunswick Smelting Division, Fertilizer Operation	Belledune, NB	37	28
48	Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock, ON	29	33
49	Celanese Canada Inc.	Edmonton, AB	37	28
50	Alcatel Canada Wire	Fergus, ON	33	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 Total Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)		
1	6	1,401,740	5	5,499	7	7,628	-1,394,112	Manganese and compounds (land)
2	6	2,411,507	6	1,254,893	6	1,259,869	-1,151,638	Copper and compounds (land)
3	3	295,200	3	256,000	3	0	-295,200	Chromium and compounds (land)
4	8	530,500	8	331,280	8	290,290	-240,210	Zinc/Manganese/Lead and compounds (land)
5	7	153,630	**	**	**	**	-153,630	Nickel/Lead and compounds (air)
6	11	648,045	10	676,550	11	498,120	-149,925	Lead and compounds (air)
7	4	70,041	4	115,351	6	2,443	-67,598	Chromium and compounds (land)
8	5	66,670	5	53,530	5	5,942	-60,728	Zinc and compounds (water)
9	4	52,000	1	500	4	6,818	-45,182	Copper/Zinc and compounds (air)
10	4	130,315	4	104,466	4	93,777	-36,538	Nickel/Copper and compounds (air)
11	7	30,090	**	**	**	**	-30,090	Copper and compounds (air)
12	4	27,640	4	1,820	4	1,420	-26,220	Chromium/Nickel and compounds (water)
13	2	17,310	2	36,430	**	**	-17,310	Nickel and compounds (water)
14	2	79,213	2	65,720	2	64,495	-14,718	Manganese and compounds (land)
15	6	21,240	3	12,900	2	6,660	-14,580	Zinc and compounds (water, air), Aluminum (air)
16	4	10,250	5	24,229	5	371	-9,879	Lead/Copper and compounds (land)
17	3	15,423	3	14,495	3	5,885	-9,538	Zinc/Copper and compounds (land)
18	2	40,700	2	45,350	2	32,500	-8,200	Manganese and compounds (water)
19	1	7,728	1	1,250	**	**	-7,728	Zinc and compounds (air)
20	8	115,361	8	118,880	8	107,762	-7,599	Zinc and compounds (air)
21	5	16,256	7	11,020	7	9,447	-6,809	Zinc and compounds (air)
22	7	6,671	2	1,462	**	**	-6,671	Zinc/Nickel and compounds (land)
23	4	7,336	4	1,990	4	1,190	-6,146	Nickel and compounds (air, water)
24	2	14,300	2	10,600	2	9,500	-4,800	Manganese and compounds (water)
25	3	33,087	3	28,925	3	28,836	-4,251	Vanadium, Nickel and compounds (air)
26	1	4,100	1	0	1	0	-4,100	Zinc and compounds (land)
27	1	3,834	1	619	1	301	-3,533	Zinc and compounds (air)
28	2	3,591	2	141	2	135	-3,456	Aluminum (air)
29	1	3,100	1	10	1	12	-3,088	Antimony and compounds (land)
30	3	4,910	4	1,774	3	2,008	-2,902	Copper and compounds (air)
31	1	2,800	**	**	**	**	-2,800	Vanadium (air)
32	1	2,268	1	0	1	0	-2,268	Zinc and compounds (land)
33	1	13,400	1	12,300	2	11,190	-2,210	Vanadium (air)
34	2	2,503	2	228	2	329	-2,174	Lead and compounds (air)
35	4	2,534	4	4,062	4	491	-2,043	Chromium/Manganese and compounds (land)
36	2	1,489	2	287	**	**	-1,489	Lead/Zinc and compounds (land)
37	3	3,640	3	1,900	4	2,300	-1,340	Manganese/Chromium and compounds (air)
38	5	11,928	5	11,754	5	10,608	-1,320	Zinc/Lead and compounds (air)
39	1	1,344	1	1,318	1	30	-1,314	Zinc and compounds (land)
40	4	1,303	**	**	**	**	-1,303	Manganese/Copper/Chromium and compounds (air)
41	3	1,300	3	900	3	1	-1,299	Zinc/Manganese and compounds (total releases)
42	1	1,330	1	150	1	110	-1,220	Zinc and compounds (UIJ)
43	1	1,165	1	34	**	**	-1,165	Manganese and compounds (water)
44	1	1,000	1	1,000	**	**	-1,000	Chromium and compounds (air)
45	4	920	4	760	**	**	-920	Copper/Manganese/Nickel and compounds (land)
46	1	904	1	964	**	**	-904	Aluminum (total releases)
47	2	900	2	360	**	**	-900	Vanadium, Chromium and compounds (total releases)
48	1	1,582	1	1,433	1	688	-894	Manganese and compounds (air)
49	1	1,080	1	208	1	230	-850	Chromium and compounds (air)
50	3	900	3	700	3	300	-600	Antimony/Lead and compounds (total releases)
	168	6,276,078	140	3,214,042	132	2,461,686	-3,814,392	

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

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

➤ UIJ=underground injection

Table 3-49		NPRI Facilities with Largest Increase in On-site Releases of Metals and Their Compounds, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33
2	Ispat Sidbec Inc. Acierie, Ispat Mexicana	Contrecoeur, QC	29	33
3	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33
4	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33
5	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33
6	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
7	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26
8	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29
9	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37
10	Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour, QC	29	33
11	Cartons St-Laurent Inc.	LaTuque, QC	27	26
12	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33
13	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26
14	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26
15	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37
16	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26
17	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	37	28
18	Falconbridge Limited, Smelter Complex	Falconbridge, ON	29	33
19	Industries James Maclaren Inc., Division de la pâte kraft	Thurso, QC	27	26
20	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33
21	Weyerhaeuser Canada Ltd.	Grande Prairie, AB	04	24
22	Inco Limited, Port Colborne Refinery	Port Colborne, ON	29	33
23	NRI Industries Inc., Cawthra Plant	Toronto, ON	15	30
24	Irving Oil Limited, Refining Division	Saint John, NB	36	29
25	Spruce Falls Inc., Tembec Inc.	Kapuskasing/O'Brien, ON	27	26
26	North Atlantic Refining Ltd.	Come By Chance, NF	36	29
27	Crestbrook Forest Industries, Pulp Division	Cranbrook, BC	27	26
28	Recyclage d'aluminium Québec Inc., Philip Services Corp.	Bécancour, QC	29	33
29	Recyclage d'aluminium Québec, Ragueneau, Philip Services Corp.	Baie-Comeau, QC	29	33
30	Produits Shell Canada Ltée., Raffinerie de Montréal-est	Montréal-est, QC	36	29
31	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33
32	Long Manufacturing Inc., Echlin Corporation	Cambridge, ON	32	34
33	NRI Industries Inc.	Toronto, ON	15	30
34	Dofasco Inc.	Hamilton, ON	29	33
35	I-XL Industries Ltd., Medicine Hat Brick & Tile Plant	Medicine Hat, AB	35	32
36	NRI Industries Inc., Symington Plant	Toronto, ON	15	30
37	General Motors of Canada Limited, London Diesel Division	London, ON	32	37
38	Michelin North America (Canada) Inc.	Bridgewater, NS	15	30
39	Riverside Brass Ltd.	New Hamburg, ON	29	33
40	Krupp Fabco Company, Krupp Hoesch Automotive of America Inc.	Dresden, ON	32	37
41	Burlington Technologies Inc., Burlington Division	Burlington, ON	30	34
42	Trentonworks Ltd., Greenbrier Companies	Trenton, NS	32	37
43	Alcatel Cable	Montréal-est, QC	29	33
44	Vulcan Containers Ltd., Metal Decorating Lithographers	Toronto, ON	28	27
45	Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan, AB	29	33
46	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28
47	Esco Limited, Poho Foundry	Port Hope, ON	29	33
48	Can Mar Manufacturing Ltd. Inc.	Niagara Falls, ON	39	39
49	Motor Coach Industries, Fort Garry Plants 4&5, MCIL Holdings	Winnipeg, MB	32	37
50	Friede Goldman Newfoundland Limited	Marystown, NF	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 Media with Increases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	3	762,000	4	2,031,067	5	1,752,614	990,614	Zinc and compounds (land)
2	5	1,510,387	5	2,322,985	5	2,349,790	839,403	Zinc and compounds (land)
3	5	161,217	5	416,922	5	710,354	549,137	Zinc/Lead and compounds (air)
4	6	621,640	6	427,818	6	1,014,986	393,346	Chromium and compounds (land)
5	**	**	**	**	9	169,168	169,168	Lead/Copper and compounds (air)
6	5	624,322	5	608,341	6	729,605	105,283	Zinc and compounds (land)
7	**	**	**	**	2	103,137	103,137	Zinc and compounds (land)
8	4	42,330	4	79,116	4	92,846	50,516	Vanadium (air)
9	**	**	**	**	3	44,898	44,898	Aluminum (air)
10	2	0	2	0	2	40,000	40,000	Manganese and compounds (land)
11	**	**	2	33,811	2	38,366	38,366	Manganese and compounds (water)
12	5	371,800	5	457,180	5	402,950	31,150	Zinc/Lead and compounds (land)
13	**	**	1	31,300	1	28,500	28,500	Manganese and compounds (water)
14	2	177,200	2	214,600	2	202,200	25,000	Manganese and compounds (water)
15	**	**	**	**	1	21,505	21,505	Chromium and compounds (air)
16	**	**	1	22,200	1	20,700	20,700	Manganese and compounds (water)
17	2	5,330	2	8,350	2	25,800	20,470	Lead and compounds (land)
18	8	38,754	8	45,771	9	57,748	18,994	Zinc and compounds (air)
19	**	**	**	**	1	18,970	18,970	Manganese and compounds (land)
20	6	446,525	7	481,240	6	462,724	16,199	Manganese and compounds (land)
21	**	**	1	19,370	1	14,200	14,200	Manganese and compounds (water)
22	5	42,462	5	57,397	5	55,896	13,434	Copper/Nickel and compounds (land)
23	**	**	1	200	1	13,000	13,000	Zinc and compounds (land)
24	**	**	**	**	3	12,470	12,470	Vanadium, Nickel and compounds (air)
25	**	**	1	10,501	1	11,430	11,430	Manganese and compounds (land)
26	4	122,723	4	130,507	4	132,922	10,199	Vanadium (air)
27	**	**	**	**	1	10,100	10,100	Manganese and compounds (water)
28	1	265,000	1	275,000	1	275,000	10,000	Aluminum (land)
29	1	175,000	1	185,000	1	185,000	10,000	Aluminum (land)
30	2	20	2	0	4	7,950	7,930	Vanadium (air)
31	5	10,030	5	17,410	5	17,750	7,720	Zinc and compounds (air)
32	2	158	2	7,818	2	7,818	7,660	Copper and compounds (air)
33	**	**	1	200	1	6,800	6,800	Zinc and compounds (land)
34	6	16,617	6	15,909	6	22,931	6,314	Zinc and compounds (air)
35	**	**	2	4,700	2	5,000	5,000	Chromium/Manganese and compounds (land)
36	**	**	1	200	1	4,800	4,800	Zinc and compounds (land)
37	4	1,951	4	3,486	4	5,836	3,885	Chromium/Manganese/Nickel and compounds (air)
38	6	5,354	2	12,712	2	9,234	3,880	Zinc/Copper and compounds (land)
39	**	**	3	13,000	3	3,740	3,740	Copper and compounds (air)
40	**	**	3	6,668	4	3,499	3,499	Zinc and compounds (air)
41	**	**	**	**	3	3,222	3,222	Aluminum (air)
42	**	**	2	950	2	3,210	3,210	Manganese and compounds (land)
43	1	0	1	2,000	1	2,650	2,650	Copper and compounds (air)
44	**	**	**	**	1	2,370	2,370	Aluminum (air)
45	**	**	4	11,260	4	2,094	2,094	Nickel/Zinc and compounds (land)
46	3	8,170	3	7,892	3	10,107	1,937	Copper and compounds (water), Cobalt and compounds (air)
47	3	2,432	3	2,322	3	4,290	1,858	Manganese/Chromium and compounds (land)
48	1	5,930	1	5,300	1	7,750	1,820	Chromium and compounds (land)
49	2	1,100	2	1,000	3	2,903	1,803	Manganese and compounds, Aluminum (air)
50	**	**	**	**	1	1,456	1,456	Manganese and compounds (land)
	99	5,418,452	120	7,971,503	151	9,132,289	3,713,837	

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

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

TRI Facilities with Largest Decreases/Increases

In TRI, reductions in releases of metals and their compounds by the facilities reporting the largest decreases were more than offset by the largest “increasers.” At the same time, releases of metals by the facilities that did not report large changes also increased (Figure 3–26).

TRI’s 50 facilities with the largest decreases reduced their metals releases from 74.9 million kg in 1995 to 54.5 million kg in 1997. The 20.4-million-kg reduction amounted to a 27 percent decrease. Seven of the 50 facilities reported metals releases in 1995 but not in 1997 (Table 3–50).

The 50 TRI facilities that reported the largest increases had releases of 36.8 million kg in 1995 and 76.1 million in 1997. In both absolute and percentage terms, these increases outstripped the largest reductions by TRI facilities. The 50 largest increases together amounted to a 39.3-million-kg or 107 percent increase. Sixteen of the facilities did not report metals releases in 1995 (Table 3–51).

Table 3–50		TRI Facilities with Largest Decrease in On-site Releases of Metals and Their Compounds, 1995–1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
2	Chino Mines Co., Phelps Dodge Corp.	Hurley, NM	33
3	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33
4	LTV Steel Co. Inc.	Cleveland, OH	33
5	ASARCO Inc.	East Helena, MT	33
6	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33
7	Chemetals Inc., Comilog	New Johnsonville, TN	28
8	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI	33
9	Northwestern Steel & Wire Co.	Sterling, IL	33
10	Elkem Metals Co.	Marietta, OH	33
11	Gulf States Steel Inc., GSS Holding Corp.	Gadsden, AL	33
12	Imco Recycling Inc.	Sapulpa, OK	33
13	North Star Recycling, Cargill Inc.	Saint Paul, MN	33
14	FMC Corp.	Pocatello, ID	28
15	Intermet Corp., Archer Creek Plant	Lynchburg, VA	33
16	Georgia-Pacific Paper Ops., Georgia-Pacific Corp.	Crossett, AR	26
17	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Latrobe, PA	33
18	Armco Inc. (Route 8 S.)	Butler, PA	33
19	DuPont Chambers Works	Deepwater, NJ	28
20	Lukens Steel Co., Lukens Inc.	Coatesville, PA	33
21	North Star Steel Houston, Cargill Inc.	Houston, TX	34
22	American Racing Equipment, Plant I, Noranda Aluminum Inc.	Rancho Dominguez, CA	Mult.
23	U.S. Sugar Corp.	Bryant, FL	20
24	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28
25	R.J. Reynolds Tobacco, Avoca Div., RJR Nabisco Holding Corp.	Merry Hill, NC	20
26	GMC Powertrain Div., General Motors Corp.	Danville, IL	33
27	Bethlehem Steel Corp.	Burns Harbor, IN	33
28	Kemira Pigments Inc., Kemira Holdings Inc.	Savannah, GA	28
29	ASARCO Inc.	El Paso, TX	33
30	Hayes-Albion Corp., Harvard Ind. Inc.	Albion, MI	33
31	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33
32	Behlen Mfg. Co.	Columbus, NE	34
33	U.S. Sugar Corp./Western Div.	Clewiston, FL	20
34	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Leavenworth, KS	36
35	Schuykill Metals Corp., Exide Corp.	Baton Rouge, LA	33
36	Wabash Alloys L.L.C., Connell LP	Wabash, IN	33
37	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33
38	Champion Intl. Corp.	Bucksport, ME	26
39	Pharmacia & Upjohn Co.	Portage, MI	28
40	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33
41	American Alloys Inc.	New Haven, WV	33
42	GE Co., Silicone Prods.	Waterford, NY	28
43	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33
44	Keymark Corp.	Fonda, NY	33
45	USS/Kobe Steel Co.	Lorain, OH	33
46	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33
47	F.W. Winter Inc. & Co.	Camden, NJ	33
48	Caterpillar Inc.	Mapleton, IL	33
49	Magotteaux Corp., Magotteaux Intl.	Pulaski, TN	33
50	Clinton Labs., Eli Lilly & Co.	Clinton, IN	28
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 Media with Decreases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	8	7,854,444	8	4,618,520	8	318,428	-7,536,016	Copper/Zinc and compounds (land)
2	2	3,169,958	1	3,476,043	**	**	-3,169,958	Copper and compounds (land)
3	10	14,457,959	10	12,606,649	10	12,186,098	-2,271,861	Zinc and compounds (land)
4	5	1,151,427	5	360,980	5	294,568	-856,859	Manganese and compounds (land)
5	9	17,914,439	9	20,160,568	9	17,143,072	-771,367	Zinc/Lead and compounds (land)
6	6	6,229,325	6	6,042,825	6	5,599,833	-629,492	Zinc and compounds (land)
7	2	2,108,027	1	1,685,692	1	1,539,949	-568,078	Manganese and compounds (land)
8	6	1,125,076	6	1,019,211	6	576,725	-548,351	Zinc and compounds (land)
9	4	7,126,231	4	6,545,333	4	6,772,540	-353,691	Zinc and compounds (land)
10	5	5,379,659	5	5,308,851	5	5,132,439	-247,220	Manganese and compounds (water, land)
11	6	488,078	6	337,532	6	277,605	-210,473	Zinc/Lead and compounds (land)
12	5	218,825	4	8,331	5	12,883	-205,942	Aluminum (land)
13	6	200,408	6	0	6	0	-200,408	Copper/Zinc and compounds (land)
14	9	2,371,621	9	2,588,613	9	2,172,640	-198,981	Zinc and compounds (land)
15	5	219,214	3	27,005	3	20,420	-198,794	Zinc/Manganese and compounds (land)
16	1	276,746	1	236,125	2	108,033	-168,713	Zinc and compounds (air, land)
17	5	164,888	5	170,702	5	12,538	-152,350	Chromium and compounds (land)
18	6	160,403	6	164,798	6	10,198	-150,205	Chromium/Nickel and compounds (land)
19	5	157,213	4	58,873	5	32,724	-124,489	Zinc and compounds (land)
20	6	203,887	6	150,202	6	81,153	-122,734	Chromium/Nickel and compounds (land)
21	3	114,740	3	44,344	3	0	-114,740	Manganese/Chromium and compounds (land)
22	1	101,209	1	112,098	**	**	-101,209	Aluminum (air)
23	2	92,137	2	58,026	**	**	-92,137	Manganese and compounds (land)
24	2	260,681	1	218,032	1	184,594	-76,087	Zinc and compounds (land)
25	1	69,587	1	11,368	1	0	-69,587	Manganese and compounds (land)
26	6	66,848	**	**	**	**	-66,848	Zinc/Manganese and compounds (land)
27	5	277,394	5	255,761	5	210,614	-66,780	Manganese and compounds (land)
28	3	208,526	3	175,465	3	144,989	-63,537	Chromium and compounds (land)
29	6	84,925	6	93,033	6	22,241	-62,684	Copper and compounds (air)
30	4	201,488	3	236,857	3	139,718	-61,770	Manganese and compounds (land)
31	4	68,933	4	4,551	4	7,500	-61,433	Chromium and compounds (air)
32	2	60,204	2	1,221	2	1,053	-59,151	Zinc and compounds (land)
33	2	58,193	1	34,412	**	**	-58,193	Manganese and compounds (land)
34	1	57,197	1	54	1	59	-57,138	Lead and compounds (land)
35	3	134,465	3	110,560	3	80,807	-53,658	Lead/Antimony and compounds (land)
36	3	100,342	3	60,340	3	49,937	-50,405	Copper and compounds (land)
37	3	85,614	3	763,440	5	35,600	-50,014	Zinc/Lead and compounds (land)
38	1	119,698	1	79,076	1	73,384	-46,314	Zinc and compounds (land)
39	3	64,854	4	40,844	4	19,406	-45,448	Zinc and compounds (UIJ)
40	5	528,953	5	502,006	5	484,028	-44,925	Aluminum (land)
41	2	43,504	2	145,434	2	962	-42,542	Manganese and compounds (land)
42	2	492,814	2	436,287	2	452,109	-40,705	Copper and compounds (land)
43	10	265,389	9	220,257	9	225,113	-40,276	Zinc and compounds (air)
44	1	39,730	**	**	**	**	-39,730	Aluminum (air)
45	5	42,194	5	4,241	5	4,266	-37,928	Manganese and compounds (land)
46	4	37,386	5	3,027	**	**	-37,386	Chromium and compounds (air)
47	5	40,244	4	12,663	2	3,704	-36,540	Chromium and compounds (air)
48	6	114,965	4	101,360	4	79,138	-35,827	Chromium and compounds (land)
49	7	41,177	5	5,394	5	6,193	-34,984	Aluminum (air)
50	3	56,717	3	96,697	3	22,203	-34,514	Zinc and compounds (land)
	216	74,907,936	196	69,393,701	189	54,539,464	-20,368,472	

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

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

➤ UIJ=underground injection

Table 3-51		TRI Facilities with Largest Increase in On-site Releases of Metals and Their Compounds, 1995-1997	
M	1997		
Rank	Facility	City, State	US SIC Code
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33
2	DuPont	Pass Christian, MS	28
3	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33
4	DuPont	New Johnsonville, TN	28
5	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33
6	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
7	ASARCO Inc., Glover Plant	Annapolis, MO	33
8	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33
9	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22
10	P4 Production L.L.C.	Soda Springs, ID	Mult.
11	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28
12	Austeel Lemont Co. Inc.	Lemont, IL	33
13	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33
14	Imco Recycling Inc.	Morgantown, KY	33
15	Georgia-Pacific Corp.	Ashdown, AR	26
16	Granite City Steel, National Steel Corp.	Granite City, IL	33
17	USS Fairfield Works, USX Corp.	Fairfield, AL	33
18	Alabama River Pulp Co. Inc., Parsons & Whittemore Inc.	Perdue Hill, AL	26
19	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33
20	Louisiana Pigment Co. L.P.	Westlake, LA	28
21	Kerr-McGee Chemical LLC	Henderson, NV	28
22	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.
23	Champion Intl. Corp., Donohue Inc.	East Houston, TX	26
24	TXI Ops. L.P.	Midlothian, TX	32
25	Griffin Pipe Prods. Co., Amsted Ind. Inc.	Florence, NJ	33
26	Weyerhaeuser Co.	Valliant, OK	26
27	Alcoa	Rockdale, TX	33
28	Tenneco Packaging, Tenneco Inc.	Tomahawk, WI	26
29	Georgia-Pacific Corp.	Zachary, LA	26
30	Mead Coated Board Inc., Mead Corp.	Cottonton, AL	26
31	Nutra-Flo Co.	Sergeant Bluff, IA	Mult.
32	International Paper Co., Natchez Mill	Natchez, MS	26
33	International Paper Co., Texarkana Mill	Domino, TX	26
34	International Paper Co., Mansfield Mill	Mansfield, LA	26
35	International Paper Co.	Augusta, GA	26
36	Union Camp Corp.	Eastover, SC	Mult.
37	Eagle Zinc Co., T. L. Diamond & Co. Inc.	Hillsboro, IL	28
38	Riverwood Intl. Corp.	Macon, GA	26
39	International Paper Co., Pineville Mill	Pineville, LA	26
40	Geneva Steel	Vineyard, UT	33
41	Holnam Inc., Holdernam Inc.	Clarksville, MO	32
42	Lenzing Fibers Corp.	Lowland, TN	28
43	Bowater Inc., Coated Paper & Pulp Div.	Catawba, SC	26
44	International Paper Co., Mobile Mill	Mobile, AL	26
45	Star Enterprise	Delaware City, DE	29
46	Beta Steel Corp.	Portage, IN	33
47	McQuay Intl.	Scottsboro, AL	35
48	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33
49	International Paper Co.	Riegelwood, NC	26
50	Willamette Ind. Inc.	Campti, LA	26
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 Media with Increases)*
	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Number of Forms	Total Releases (kg)	Total Releases (kg)	
1	8	2,674,512	8	4,188,084	8	10,976,578	8,302,066	Copper/Lead/Arsenic and compounds (land)
2	**	**	**	**	6	3,809,524	3,809,524	Manganese and compounds (UIJ)
3	9	2,954,636	11	2,730,167	11	6,598,692	3,644,056	Zinc and compounds (land)
4	**	**	**	**	5	3,516,553	3,516,553	Manganese and compounds (UIJ)
5	9	204,604	5	2,562,032	11	2,889,134	2,684,530	Copper and compounds (air)
6	1	4,265,578	1	5,126,893	1	6,578,095	2,312,517	Chromium and compounds (land)
7	6	2,959,545	6	4,030,227	7	4,921,195	1,961,650	Zinc/Lead and compounds (land)
8	11	7,015,825	11	11,478,460	11	8,522,088	1,506,263	Copper and compounds (land)
9	**	**	**	**	7	969,901	969,901	Zinc and compounds (air)
10	**	**	**	**	4	941,741	941,741	Zinc and compounds (land)
11	1	3,313,374	1	4,084,751	1	4,129,841	816,467	Chromium and compounds (land)
12	4	24,748	5	668,314	5	778,886	754,138	Zinc and compounds (land)
13	1	547,715	1	922,590	1	1,097,645	549,930	Nickel and compounds (land)
14	4	281,499	5	621,453	4	754,027	472,528	Aluminum (land)
15	1	16,336	1	19,379	3	381,829	365,493	Manganese and compounds (land)
16	6	2,359,007	6	2,619,943	6	2,695,735	336,728	Zinc and compounds (land)
17	7	1,822,917	7	1,868,437	8	2,140,356	317,439	Zinc and compounds (land)
18	**	**	**	**	3	314,653	314,653	Manganese and compounds (land)
19	9	3,676,472	9	3,573,720	8	3,958,805	282,333	Zinc and compounds (land)
20	2	1,128,410	1	1,269,959	1	1,406,027	277,617	Manganese and compounds (land)
21	2	886,203	2	955,375	2	1,158,458	272,255	Manganese and compounds (land)
22	3	1,811,170	3	2,350,576	3	2,077,165	265,995	Manganese and compounds (land)
23	1	6,498	1	80,459	2	251,010	244,512	Zinc and compounds (land)
24	2	47,114	3	12,003	4	286,915	239,801	Manganese and compounds (land)
25	2	17,111	2	41,281	2	234,153	217,042	Manganese and compounds (land)
26	**	**	**	**	2	204,647	204,647	Manganese and compounds (land)
27	4	17,844	4	17,196	7	221,580	203,736	Manganese/Copper and compounds (land)
28	1	99,100	1	139,599	2	295,189	196,089	Zinc and compounds (land)
29	**	**	**	**	2	195,510	195,510	Manganese and compounds (land, water)
30	**	**	**	**	3	193,679	193,679	Manganese and compounds (land)
31	1	0	2	0	2	191,605	191,605	Zinc and compounds (land)
32	**	**	**	**	2	179,547	179,547	Manganese and compounds (land)
33	**	**	**	**	2	175,853	175,853	Manganese and compounds (land)
34	**	**	**	**	1	173,736	173,736	Manganese and compounds (land)
35	1	4,136	1	8,120	3	175,231	171,095	Manganese and compounds (land, water)
36	1	9,075	2	42,698	2	172,086	163,011	Manganese and compounds (land)
37	1	24,208	1	27,276	1	184,356	160,148	Zinc and compounds (land)
38	**	**	1	0	2	155,873	155,873	Manganese and compounds (land)
39	**	**	**	**	2	151,292	151,292	Manganese/Zinc and compounds (land)
40	7	296,213	8	494,417	8	439,640	143,427	Zinc and compounds (land)
41	3	2,276	3	40,396	5	145,571	143,295	Zinc and compounds (land)
42	2	4,580	2	149,206	2	145,532	140,952	Zinc and compounds (land)
43	1	86,706	2	196,204	2	219,907	133,201	Manganese and compounds (water, land), Zinc and compounds (land, air)
44	**	**	**	**	2	132,426	132,426	Manganese and compounds (land)
45	4	7,052	1	0	4	136,705	129,653	Nickel and compounds (land)
46	**	**	**	**	12	126,579	126,579	Zinc and compounds (land)
47	1	340	1	22,222	3	119,728	119,388	Zinc and compounds, Aluminum (air)
48	1	247,306	1	232,185	1	365,394	118,088	Nickel and compounds (land)
49	1	20,227	**	**	1	138,186	117,959	Manganese and compounds (land)
50	**	**	**	**	2	115,691	115,691	Manganese and compounds (land)
	118	36,832,337	119	50,573,622	199	76,144,549	39,312,212	

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

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

➤ UIJ=underground injection

3.3.5 Changes in Releases by Industry

Two of the three industries with the largest releases in both NPRI and TRI—chemical manufacturing and paper products—reduced their releases from 1995 to 1997. The primary metals industry, however, which ranked first in NPRI and second in TRI for total releases, increased those releases from 1995 to 1997. (Chapter 7 takes a closer look at the primary metals industry and its PRTR reporting in North America.)

In the three industries, percentage changes in reporting to NPRI represented larger reductions/smaller increases than those reported to TRI. Chemical manufacturing releases decreased 20 percent in NPRI and 10 percent in TRI from 1995 to 1997. An even larger difference appeared in reporting by the paper products sector—reductions of 35 percent in NPRI and five percent in TRI. (A special chapter in *Taking Stock 1995* examined the pulp and paper industry and its PRTR reporting and identified influences that have contributed to this trend.) While the increase in NPRI releases by the primary metals industry was two percent, the industry’s releases increased seven percent in TRI (Figure 3–27).

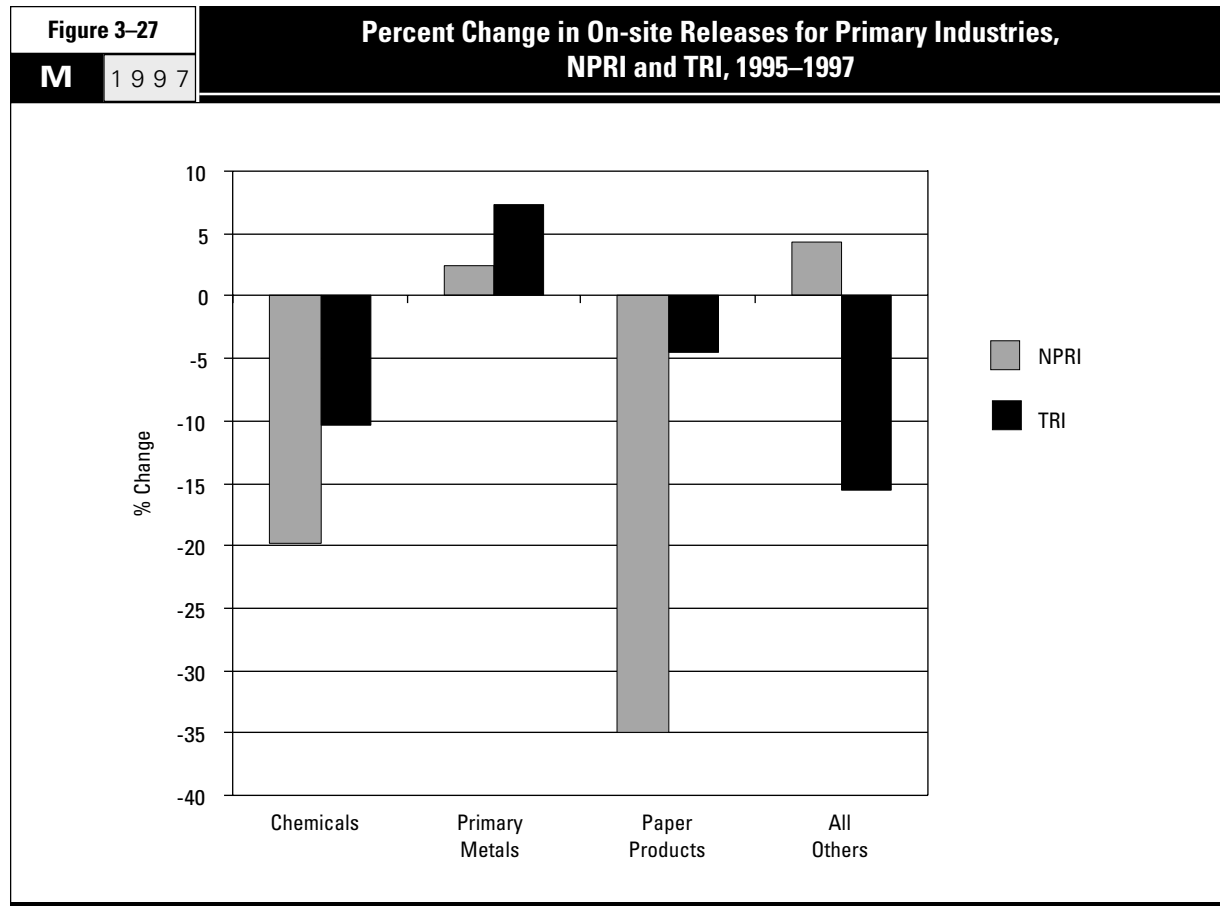


Table 3-52

Change in NPRI On-site Releases by Industry (US SIC Code), 1995–1997

M 1997

US SIC Code	Industry	Total Releases			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
20	Food Products	35,513	369,250	503,468	467,955	1,317.7
22	Textile Mill Products	918,196	533,168	281,192	-637,004	-69.4
23	Apparel and Other Textile Products	860	740	280	-580	-67.4
24	Lumber and Wood Products	1,211,133	1,734,425	2,219,981	1,008,848	83.3
25	Furniture and Fixtures	486,807	475,075	788,675	301,868	62.0
26	Paper Products	26,270,269	17,858,690	17,068,622	-9,201,647	-35.0
27	Printing and Publishing	766,524	671,354	1,609,267	842,743	109.9
28	Chemicals	22,852,744	21,282,041	18,334,510	-4,518,234	-19.8
29	Petroleum and Coal Products	4,903,716	4,703,762	4,671,163	-232,553	-4.7
30	Rubber and Plastics Products	6,325,235	5,964,113	5,945,315	-379,920	-6.0
31	Leather Products	17,858	5,900	23,680	5,822	32.6
32	Stone/Clay/Glass Products	1,062,555	917,908	868,511	-194,044	-18.3
33	Primary Metals	18,575,952	19,240,477	19,025,036	449,084	2.4
34	Fabricated Metals Products	1,779,841	2,037,404	2,039,537	259,696	14.6
35	Industrial Machinery	464,018	419,754	269,113	-194,905	-42.0
36	Electronic/Electrical Equipment	225,527	85,985	82,010	-143,517	-63.6
37	Transportation Equipment	6,599,971	6,334,159	6,147,046	-452,925	-6.9
38	Measurement/Photographic Instruments	1	5	0	-1	-100.0
39	Misc. Manufacturing Industries	123,388	537,667	571,518	448,130	363.2
Total		92,620,108	83,171,877	80,448,924	-12,171,184	-13.1

In NPRI, paper products manufacturing (US SIC code 26) accounted for 26.3 million kg of releases in 1995 and 17.1 million kg in 1997. The largest absolute decrease among NPRI industrial sectors, this 9.2-million-kg decrease represented more than a one-third reduction in the paper products sector's releases. Paper products ranked third in NPRI for total releases in 1997. With a 4.5-million-kg reduction, the

chemical manufacturing sector (US SIC code 28) reported the second-largest NPRI reduction, from 22.9 million kg to 18.3 million kg. Chemical manufacturing, which ranked second for NPRI releases in 1997, decreased 20 percent over the 1995–1997 period (Table 3-52).

The primary metals industry (US SIC code 33) reported 18.6 million kg of total releases to NPRI in 1995 and

19.0 million kg in 1997. This 449,084-kg increase placed primary metals fourth among all industries for increased NPRI releases. The largest NPRI increases came principally from industries that have not ranked high for total releases. The largest increase—1.0 million kg—was reported by the lumber and wood products industry (US SIC code 24). The second- and third-largest increases were printing

and publishing (US SIC code 27)—842,743 kg—and food products (US SIC code 20)—467,955 kg. Among the 19 industries in the matched data set, these industries ranked seventh, ninth and thirteenth, respectively, for total NPRI releases in 1997.

Table 3-53		Change in TRI On-site Releases by Industry (US SIC Code), 1995-1997				
M 1997						
US SIC Code	Industry	Total Releases			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
20	Food Products	12,153,180	10,746,739	11,024,132	-1,129,048	-9.3
21	Tobacco Products	469,506	634,847	662,668	193,162	41.1
22	Textile Mill Products	6,776,812	6,670,103	7,536,066	759,254	11.2
23	Apparel and Other Textile Products	443,240	400,673	251,153	-192,087	-43.3
24	Lumber and Wood Products	13,891,478	12,411,876	10,867,571	-3,023,907	-21.8
25	Furniture and Fixtures	17,900,746	15,465,510	10,588,626	-7,312,120	-40.8
26	Paper Products	99,829,242	95,964,680	95,270,022	-4,559,220	-4.6
27	Printing and Publishing	13,421,828	11,685,250	10,582,679	-2,839,149	-21.2
28	Chemicals	284,082,530	262,100,541	254,570,269	-29,512,261	-10.4
29	Petroleum and Coal Products	21,169,073	23,371,219	23,348,244	2,179,171	10.3
30	Rubber and Plastics Products	43,825,986	42,375,154	39,109,825	-4,716,161	-10.8
31	Leather Products	770,966	542,092	464,848	-306,118	-39.7
32	Stone/Clay/Glass Products	9,127,252	11,484,064	11,182,122	2,054,870	22.5
33	Primary Metals	159,411,557	170,189,594	171,007,781	11,596,224	7.3
34	Fabricated Metals Products	26,482,991	22,282,709	20,721,712	-5,761,279	-21.8
35	Industrial Machinery	7,988,220	6,896,090	6,249,781	-1,738,439	-21.8
36	Electronic/Electrical Equipment	9,704,981	8,295,914	6,638,547	-3,066,434	-31.6
37	Transportation Equipment	41,701,697	37,806,703	36,551,961	-5,149,736	-12.3
38	Measurement/Photographic Instruments	6,092,644	5,479,760	4,676,856	-1,415,788	-23.2
39	Misc. Manufacturing Industries	4,852,821	3,916,149	3,863,478	-989,343	-20.4
	Multiple Codes 20-39	54,943,216	41,998,859	42,133,850	-12,809,366	-23.3
	Total	835,039,966	790,718,526	767,302,191	-67,737,775	-8.1

In TRI, chemical manufacturing (US SIC code 28) accounted for the largest absolute reduction (29.5 million kg), from 284.1 million kg in 1995 to 254.6 million kg in 1997. This industry reported TRI's largest releases in 1997. The second-largest reduction (12.8 million kg) occurred in the group of forms that reported more than one SIC code to identify their activities. This group

occurs only in TRI because NPRI facilities report only one industry or business activity. The multiple-codes group in TRI reported 54.9 million kg of releases in 1995 and 42.1 million in 1997 (the fourth-largest TRI total in 1997—Table 3-53).

TRI's primary metals industry (US SIC code 33, ranking second in TRI for total releases in 1997), reported the

largest 1995-1997 increase. In 1995, primary metals reported releases of 159.4 million kg, and in 1997 the industry's total was 171.0 million kg, an increase of 11.6 million kg. Petroleum and coal products (US SIC code 29), with 21.2 million kg of releases in 1995 and 23.3 million kg in 1997, had an increase of 2.2 million kg, followed by stone/clay/glass produc-

tion (US SIC code 32), with 9.1 million kg in 1995 and 11.2 million in 1997, an increase of 2.1 million kg. Petroleum refining and stone/clay/glass manufacture ranked seventh and ninth, respectively, for TRI releases in 1997.

Chapter 4: Off-site Transfers

M Matched chemicals/industries

A All chemicals/industries

	Key Findings	143		4.3	Changes in Transfers, 1995–1997 (cont.)	
4.1	Introduction	143		4.3.3	NPRI and TRI Facilities with Largest Changes	202
					NPRI Facilities with Largest Decreases/Increases	202
					TRI Facilities with Largest Decreases/Increases	202
4.2	1997 Off-site Transfers	144		4.3.4	Changes in Transfers by Chemical	212
4.2.1	North American Transfers	144			NPRI Chemicals with Largest Decreases/Increases	212
	Transfers by State and Province	146			TRI Chemicals with Largest Decreases/Increases	214
	Top Facilities	150			Carcinogens	215
	Transfers by Chemical	152			Metals	226
	Carcinogens	155		4.3.5	Changes in Transfers by Industry	236
	Metals	160				
	Transfers by Industry	164				
4.2.2	NPRI and TRI Transfers	166		4.4	Transfers across Borders	239
	Top Facilities	167		4.4.1	Transfers Outside the Country	240
	Transfers by Chemical	174		4.4.2	Transfers across North American Borders	241
	Carcinogens	177		4.4.3	Transfers between US States and Canadian Provinces	244
	Metals	184		4.4.4	US-Canadian Cross-Border Transfers by Industry	250
	Transfers by Industry	190		4.4.5	US-Canada Cross-Border Transfers by Chemical	252
	Average Transfers	193		4.4.6	US-Mexican Cross-Border Transfers	254
4.3	Changes in Transfers, 1995–1997	196				
4.3.1	Overview	196				
4.3.2	Changes in Transfers by State and Province	199				

M Matched chemicals/industries

Off-site Transfers, 1997

Figures

4-1	North American Off-site Transfers by Type, NPRI and TRI	145
4-2	Distribution of North American Off-site Transfers, NPRI and TRI	145
4-3	North American Transfers, Top 50 Facilities and All Others	152
4-4	Distribution of North American Transfers, Top 50 Facilities and All Others	152
4-5	Distribution of North American Transfers, Top 25 Chemicals and All Others	154
4-6	Distribution of North American Transfers, Known or Suspected Carcinogens and All Others	157
4-7	North American Transfers of Known or Suspected Carcinogens, Top 50 Facilities and All Others	157
4-8	North American Transfers of Metals and Their Compounds, Top 50 Facilities and All Others	161
4-9	North American Top Three Industries for Total Transfers	165
4-10	Distribution of Off-site Transfers, NPRI and TRI	166
4-11	NPRI and TRI Total Off-site Transfers, Top 50 Facilities and All Others	167
4-12	Distribution of Total Off-site Transfers of Top 50 Facilities, NPRI and TRI	167
4-13	Comparisons for Top Five Chemicals under NPRI and TRI for Total Off-site Transfers	176
4-14	Distribution of NPRI and TRI Off-site Transfers of Known or Suspected Carcinogens	179
4-15	NPRI and TRI Total Off-site Transfers of Known or Suspected Carcinogens, Top 50 Facilities and All Others	179
4-16	NPRI and TRI Off-site Transfers of Metals and Their Compounds, Top 50 Facilities and All Others	185
4-17	Industries with Largest Off-site Transfers, NPRI and TRI	190
4-18	Average Off-site Transfers per Form by Industry, NPRI and TRI	194

Maps

4-1	North American Off-site Transfers: States and Provinces	147
4-2	North American Off-site Transfers to Treatment (Except Metals): States and Provinces	148
4-3	North American Off-site Transfers to Sewage/POTWs (Except Metals): States and Provinces	148
4-4	North American Off-site Transfers to Disposal (Except Metals): States and Provinces	149
4-5	North American Off-site Transfers of Metals to Treatment/Sewage/Disposal: States and Provinces	149

Tables

4-1	North American Off-site Transfers	144
4-2	North American Off-site Transfers, by Province and State	146
4-3	The 50 North American Facilities with the Largest Total Off-site Transfers	150
4-4	The 25 Chemicals with the Largest Transfers in North America	153
4-5	Transfers in North America of Known or Suspected Carcinogens	156
4-6	The 50 North American Facilities with the Largest Total Off-site Transfers of Known or Suspected Carcinogens	158
4-7	Transfers in North America of Metals and Their Compounds	160
4-8	The 50 North American Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds	162
4-9	Transfers in North America by Industry	164
4-10	Off-site Transfers, NPRI and TRI	166
4-11	The 50 NPRI Facilities with the Largest Total Off-site Transfers	168
4-12	The 50 TRI Facilities with the Largest Total Off-site Transfers	170

M Matched chemicals/industries

4-13	NPRI Total Off-site Transfers by All Facilities and by Facilities with Largest Amounts, by Province	172	4-20	The 50 TRI Facilities with the Largest Total Off-site Transfers of Known or Suspected Carcinogens	182
4-14	TRI Total Off-site Transfers by All Facilities and by Facilities with Largest Amounts, by State	173	4-21	NPRI Off-site Transfers of Metals and Their Compounds	184
4-15	The 25 NPRI Chemicals with the Largest Total Off-site Transfers	174	4-22	TRI Off-site Transfers of Metals and Their Compounds	185
4-16	The 25 TRI Chemicals with the Largest Total Off-site Transfers	175	4-23	The 50 NPRI Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds	186
4-17	NPRI Off-site Transfers of Known or Suspected Carcinogens	177	4-24	The 50 TRI Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds	188
4-18	TRI Off-site Transfers of Known or Suspected Carcinogens	178	4-25	NPRI Off-site Transfers by Industry	191
4-19	The 50 NPRI Facilities with the Largest Total Off-site Transfers of Known or Suspected Carcinogens	180	4-26	TRI Off-site Transfers by Industry	192
			4-27	Average Off-site Transfers per Form, by Industry, NPRI and TRI	193
			4-28	Average Off-site Transfers per Form, NPRI and TRI	195

Changes in Off-site Transfers, 1995–1997**Figures**

4-19	Percent Change in North American Off-site Transfers	197
4-20	Percent Change in North American Off-site Transfers, by Type	198
4-21	NPRI and TRI Total Off-site Transfers: Facilities with Largest Changes and All Others	203
4-22	Percent Change in Total Off-site Transfers of Selected Chemicals, NPRI and TRI	212
4-23	NPRI and TRI Total Off-site Transfers of Known or Suspected Carcinogens: Facilities with Largest Changes and All Others	217
4-24	NPRI and TRI Total Off-site Transfers of Metals and Their Compounds: Facilities with Largest Changes and All Others	227
4-25	Percent Change in Off-site Transfers for Primary Industries, NPRI and TRI	236

Map

4-6	Percent Change in North American Total Off-site Transfers	201
-----	---	-----

Tables

4-29	North American Off-site Transfers	196
4-30	NPRI Off-site Transfers by Province	199
4-31	TRI Off-site Transfers by State	200
4-32	NPRI Facilities with Largest Decrease in Off-site Transfers	204
4-33	NPRI Facilities with Largest Increase in Off-site Transfers	206
4-34	TRI Facilities with Largest Decrease in Off-site Transfers	208
4-35	TRI Facilities with Largest Increase in Off-site Transfers	210
4-36	The 10 Chemicals with the Largest Decrease in NPRI Off-site Transfers	213
4-37	The 10 Chemicals with the Largest Increase in NPRI Off-site Transfers	213
4-38	The 10 Chemicals with the Largest Decrease in TRI Off-site Transfers	214
4-39	The 10 Chemicals with the Largest Increase in TRI Off-site Transfers	214
4-40	Change in NPRI Off-site Transfers of Known or Suspected Carcinogens	215

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

Changes in Off-site Transfers, 1995–1997 (cont.)

4-41	Change in TRI Off-site Transfers of Known or Suspected Carcinogens	216	4-47	Change in TRI Off-site Transfers of Metals and Their Compounds	227
4-42	NPRI Facilities with Largest Decrease in Off-site Transfers of Known or Suspected Carcinogens	218	4-48	NPRI Facilities with Largest Decrease in Off-site Transfers of Metals and Their Compounds	228
4-43	NPRI Facilities with Largest Increase in Off-site Transfers of Known or Suspected Carcinogens	220	4-49	NPRI Facilities with Largest Increase in Off-site Transfers of Metals and Their Compounds	230
4-44	TRI Facilities with Largest Decrease in Off-site Transfers of Known or Suspected Carcinogens	222	4-50	TRI Facilities with Largest Decrease in Off-site Transfers of Metals and Their Compounds	232
4-45	TRI Facilities with Largest Increase in Off-site Transfers of Known or Suspected Carcinogens	224	4-51	TRI Facilities with Largest Increase in Off-site Transfers of Metals and Their Compounds	234
4-46	Change in NPRI Off-site Transfers of Metals and Their Compounds	226	4-52	Change in NPRI Off-site Transfers by Industry	237
			4-53	Change in TRI Off-site Transfers by Industry	238

Transfers across Borders, 1997

Map

A	4-7	Off-site Transfers across North American Borders	239
----------	-----	--	-----

Tables

A	4-54	NPRI Off-site Transfers within Canada and to Other Countries	240
A	4-55	TRI Off-site Transfers within United States and to Other Countries	241
A	4-56	NPRI Off-site Transfers to Other Countries from Canada	242
A	4-57	TRI Off-site Transfers to Other Countries from the United States	243
	4-58	Off-site Transfers across National Boundaries, between United States and Canada	244
	4-59	Transfers to Sites in Quebec that Receive Transfers from both TRI and NPRI Facilities	246
	4-60	Transfers to Sites in Ontario that Receive Transfers from both TRI and NPRI Facilities	246

	4-61	Transfers to Sites in Michigan that Receive Transfers from both NPRI and TRI Facilities	248
	4-62	Transfers to Sites in Illinois that Receive Transfers from both NPRI and TRI Facilities	248
	4-63	Industries Reporting Transfers to US from Canadian NPRI Facilities	250
	4-64	Industries Reporting Transfers to Canada from US TRI Facilities	251
	4-65	Chemicals in Transfers to US from Canadian NPRI Facilities	252
	4-66	Chemicals in Transfers to Canada from US TRI Facilities	253
A	4-67	Industries Reporting Transfers to Mexico from US TRI Facilities	255
A	4-68	Chemicals in Transfers to Mexico from US TRI Facilities	255
A	4-69	RCRA Hazardous Waste Sent from Mexican Maquiladoras to US	256
A	4-70	Estimated North American PRTR Chemicals in RCRA Hazardous Waste Sent from Mexican Maquiladoras to US	258

■ 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

[continued on page 144]

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

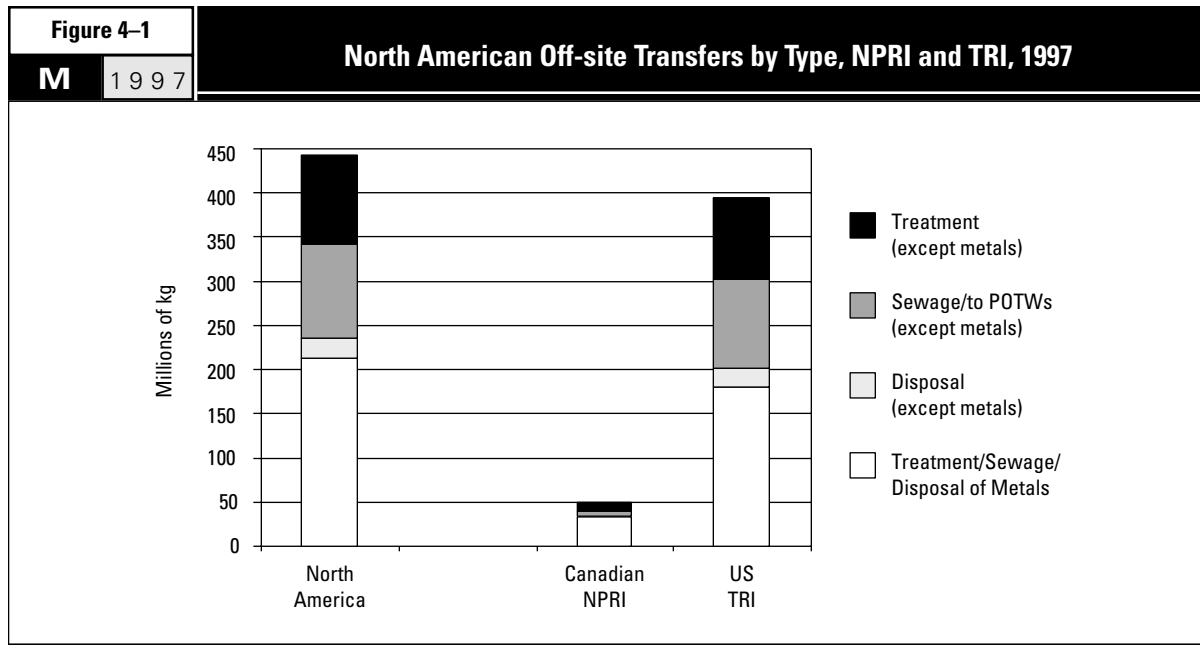
Off-site transfers in North America totaled 443.5 million kg in 1997 for the matched data set. NPRI facilities transferred 49.5 million kg and TRI facilities 394.0 million kg (**Table 4-1**). With seven percent of the facilities and forms, NPRI accounted for 11 percent of total transfers. TRI facilities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

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

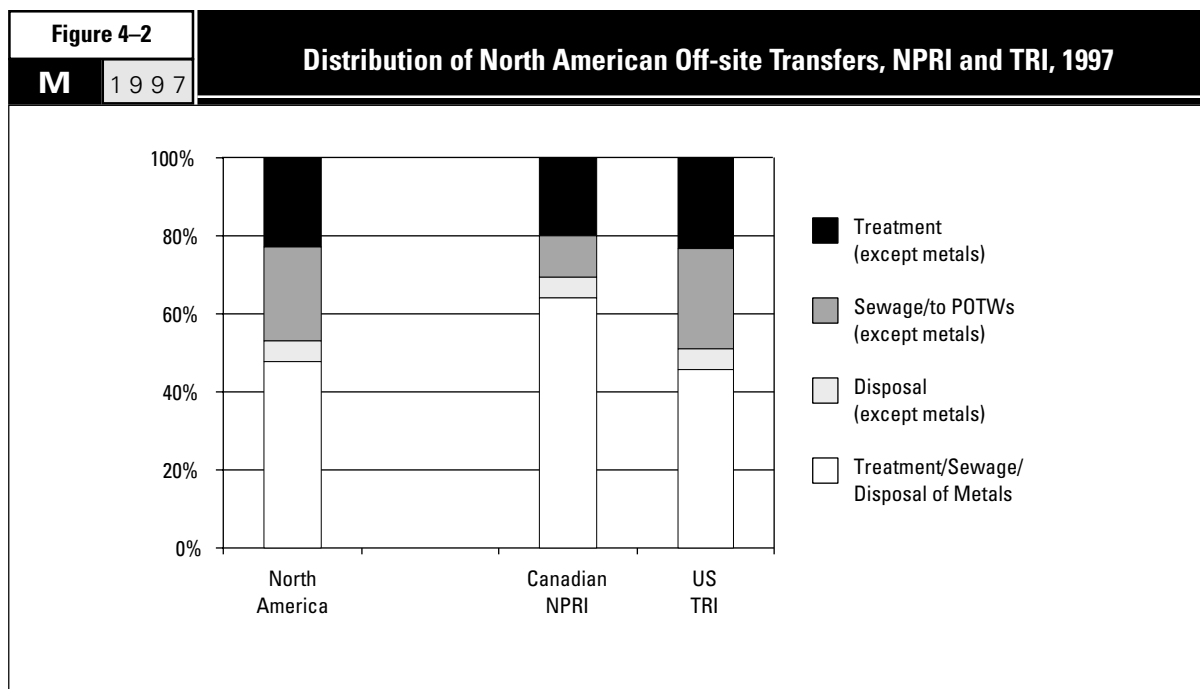
Transfers of metals amounted to 212.3 million kg, the largest transfer category at 48 percent of the North American total. Reported transfers to treatment of nonmetals amounted to 102.0 million kg, 23 percent of all transfers. Transfers to sewage/POTWs (except metals) equaled 106.2 million kg, or 24 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

[continued on page 146]



► 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.

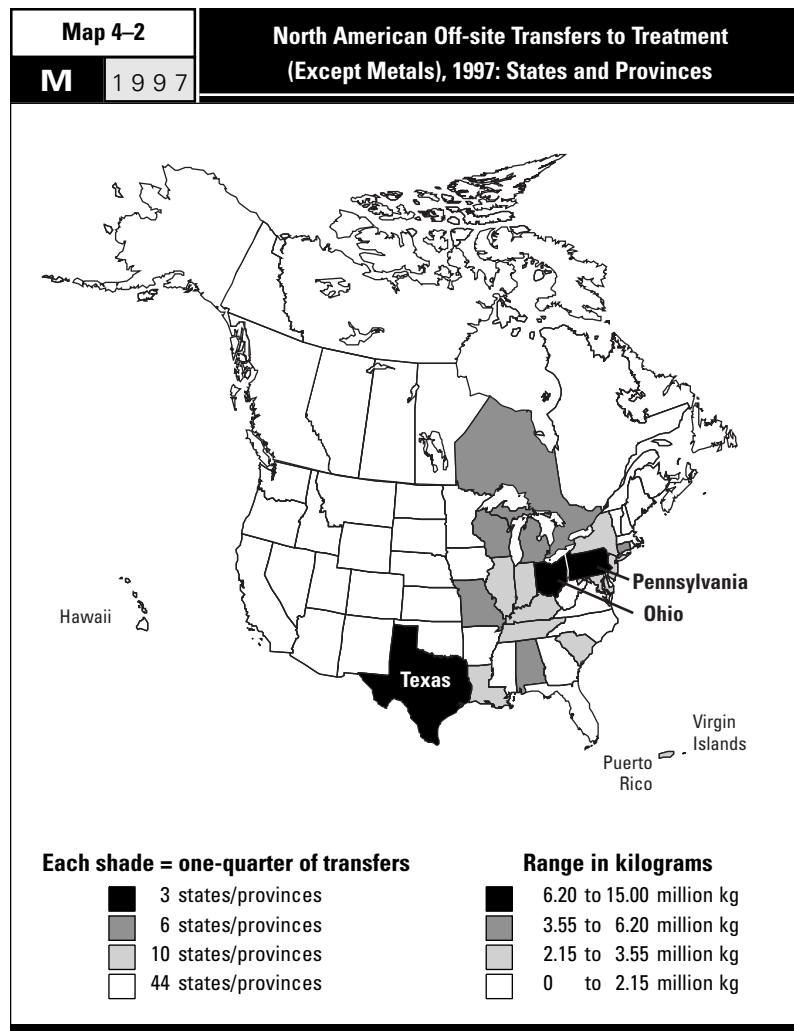
Map 4-1

M 1997

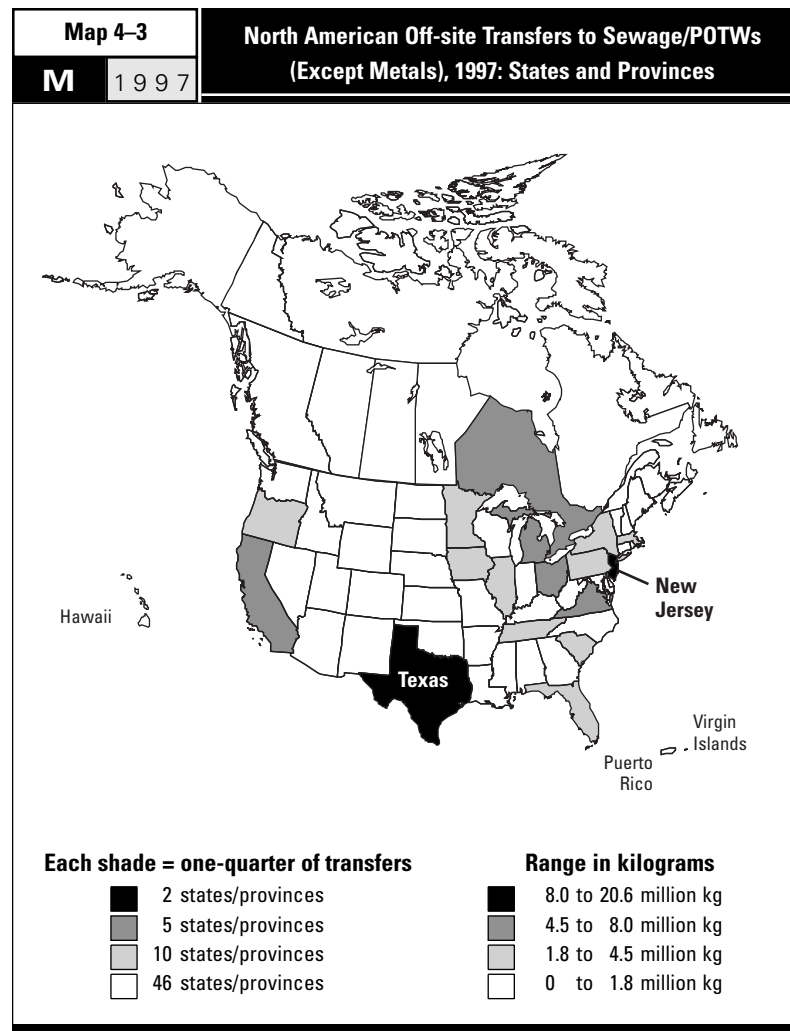
North American Off-site Transfers, 1997: States and Provinces



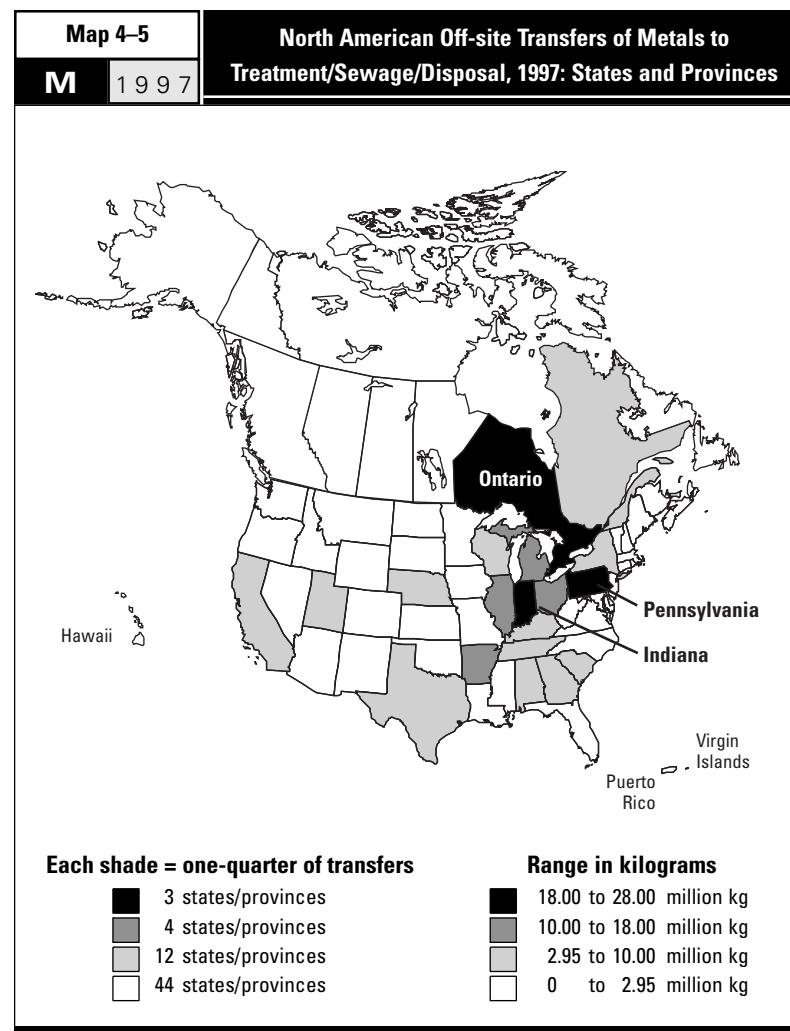
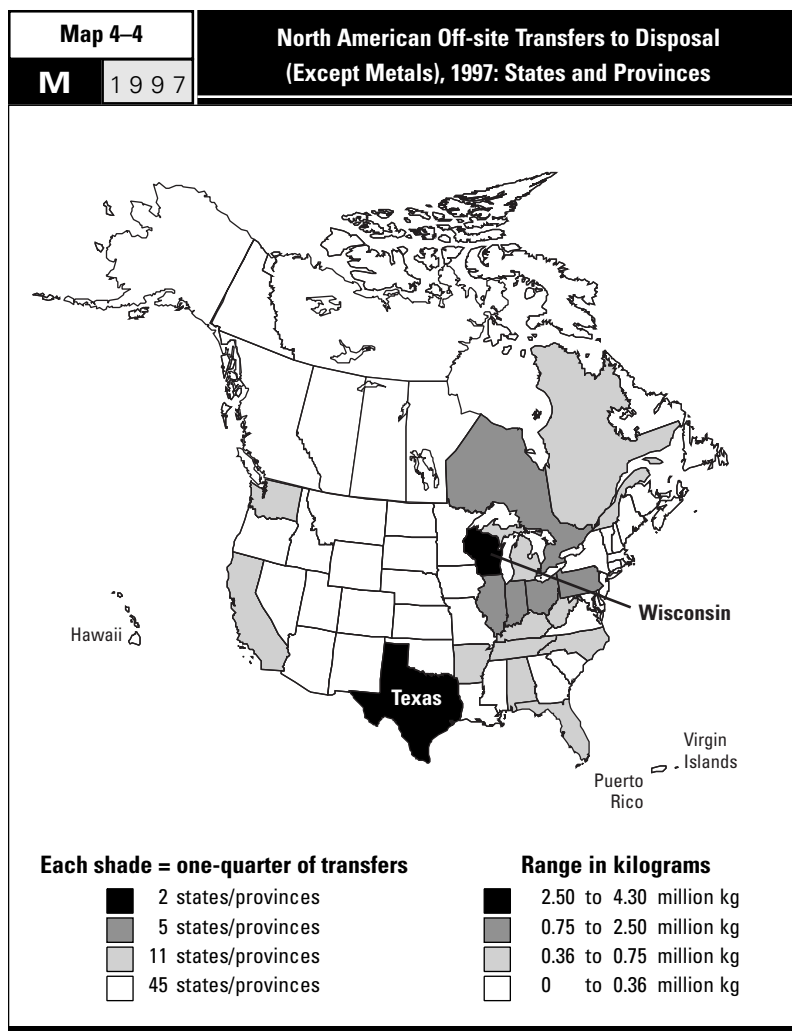
► Canada and US data only. Mexico data not collected for 1997.



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



► 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).

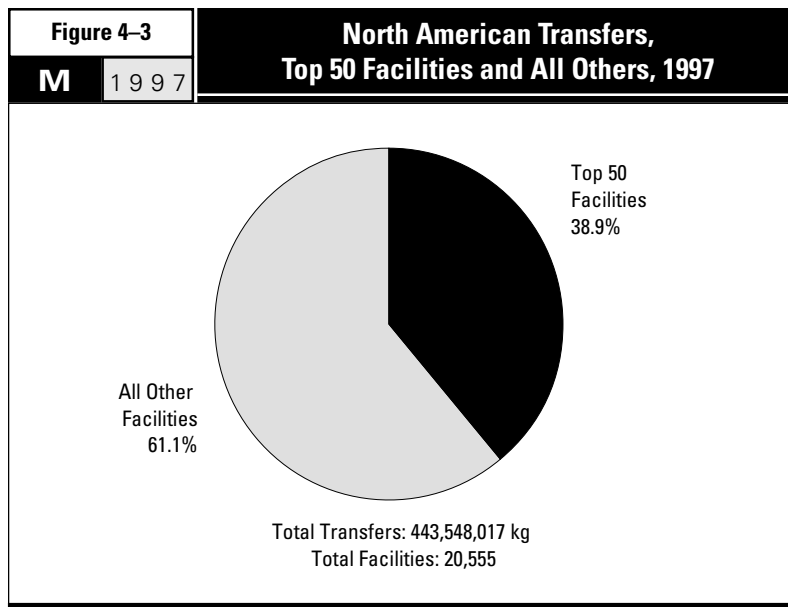
The top 50 facilities transferred a larger proportion of metals (57 percent of their transfers) than did the other North American facilities as a whole (42 percent). They were less likely to make transfers of nonmetals to treatment—16 percent of the top facilities' transfers, versus 27 percent for all 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.

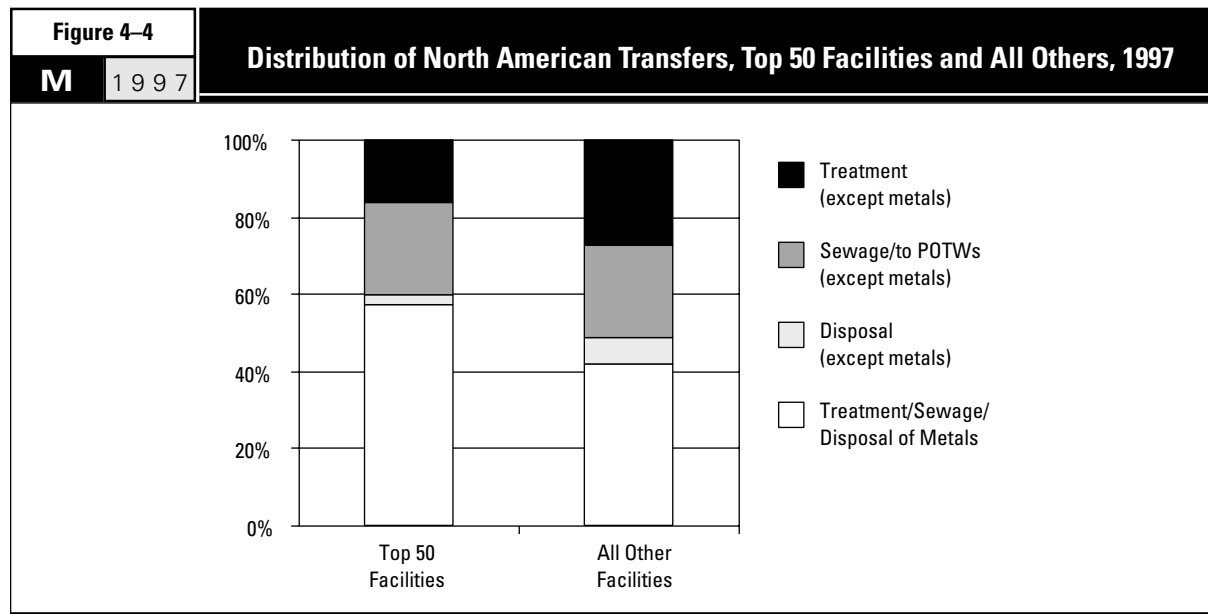
Transfers by Chemical

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

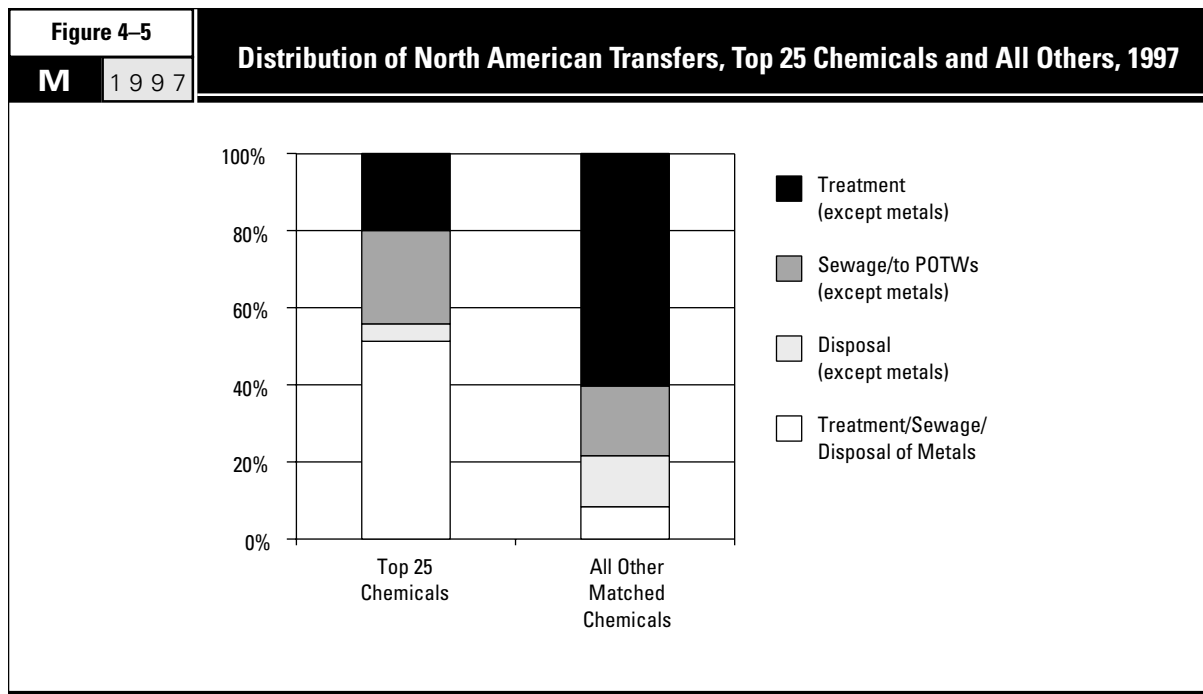
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/Disposal of Metals (kg)	Total Transfers (kg)	NPRI/TRI as % of Total				
							Treatment (except metals) (%)	Sewage/POTWs (except metals) (%)	Disposal (except metals) (%)	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**).

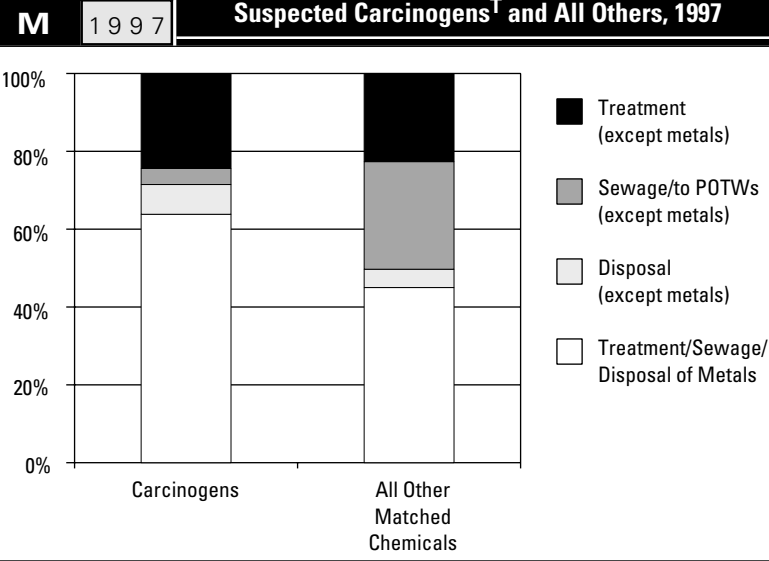
Table 4-5		Transfers in North America of Known or Suspected Carcinogens [†] , 1997				
M	1997					
CAS Number	Chemical	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Sewage/ Disposal of Metals (kg)	Total Transfers (kg)
—	Lead (and its compounds)	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	Nitilotriacetic 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
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
— / —	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

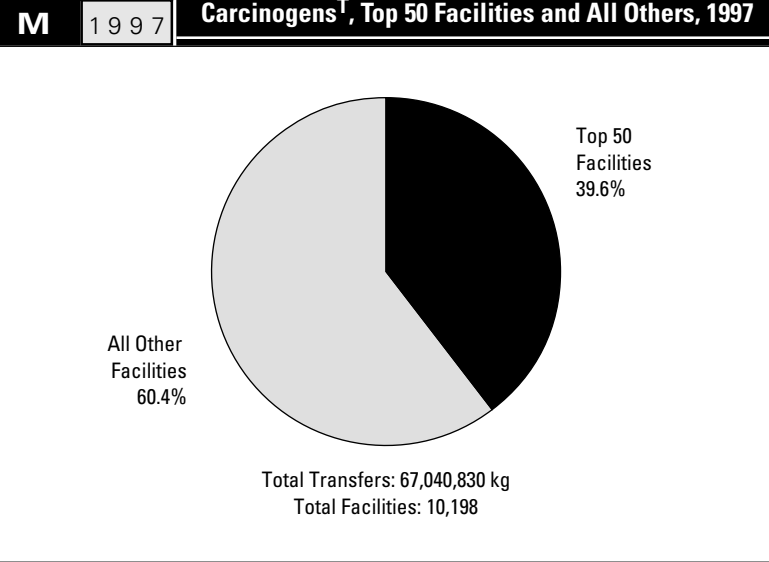
Figure 4-6 Distribution of North American Transfers, Known or Suspected Carcinogens[†] and All Others, 1997



[†] 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 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 Ent's. 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	

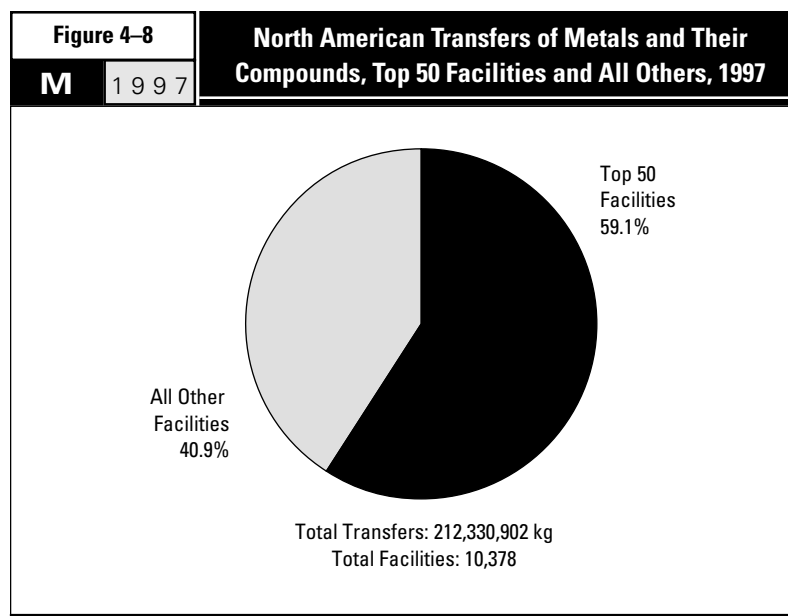
* Chemicals accounting for more than 70% of total transfers of carcinogens from the facility.

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					
M		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.

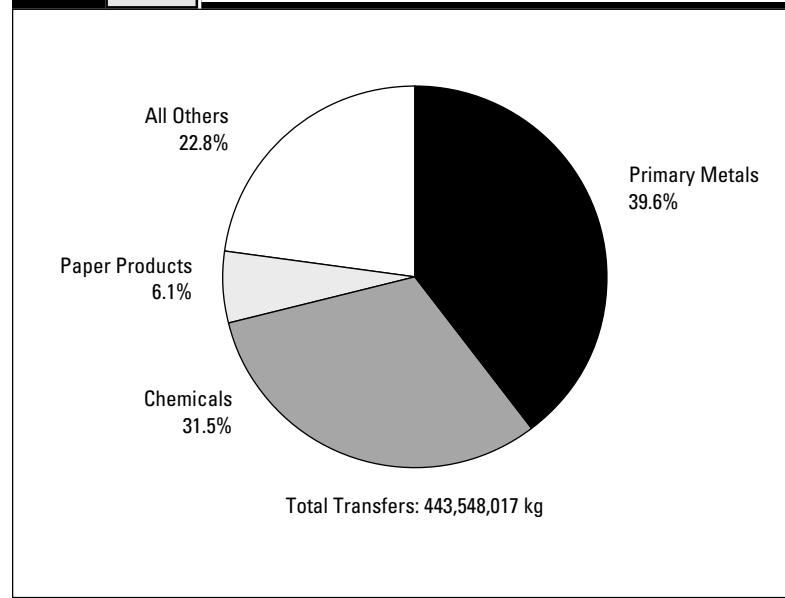
► Canada and US data only. Mexico data not collected for 1997.

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

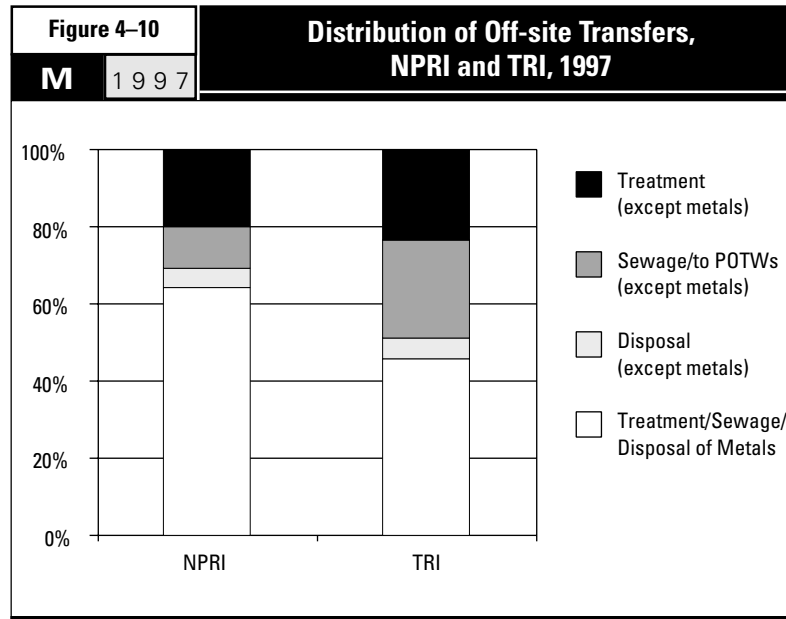
This section compares reporting of off-site transfers by Canadian and US facilities for 1997. It notes significant similarities and differences between the two PRTRs for the matched data set.

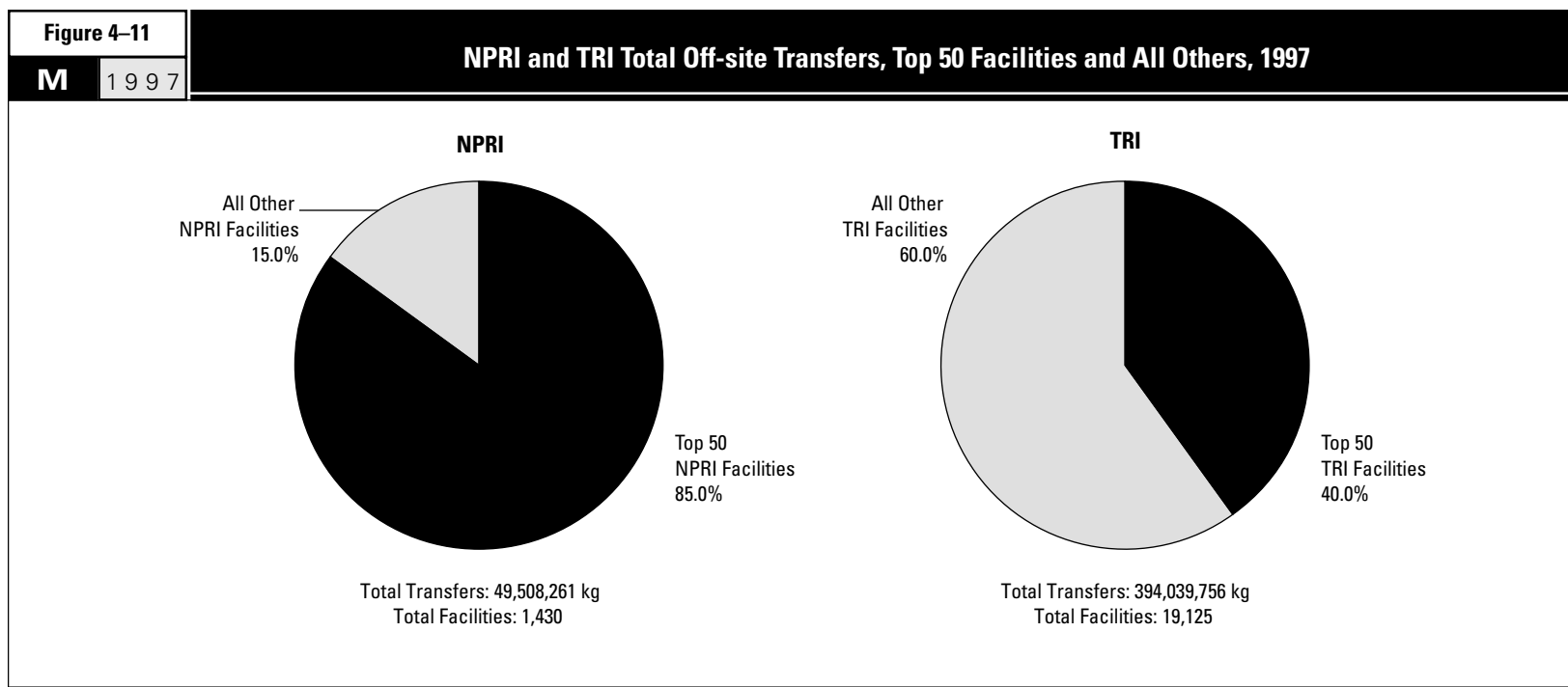
Overview

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**).

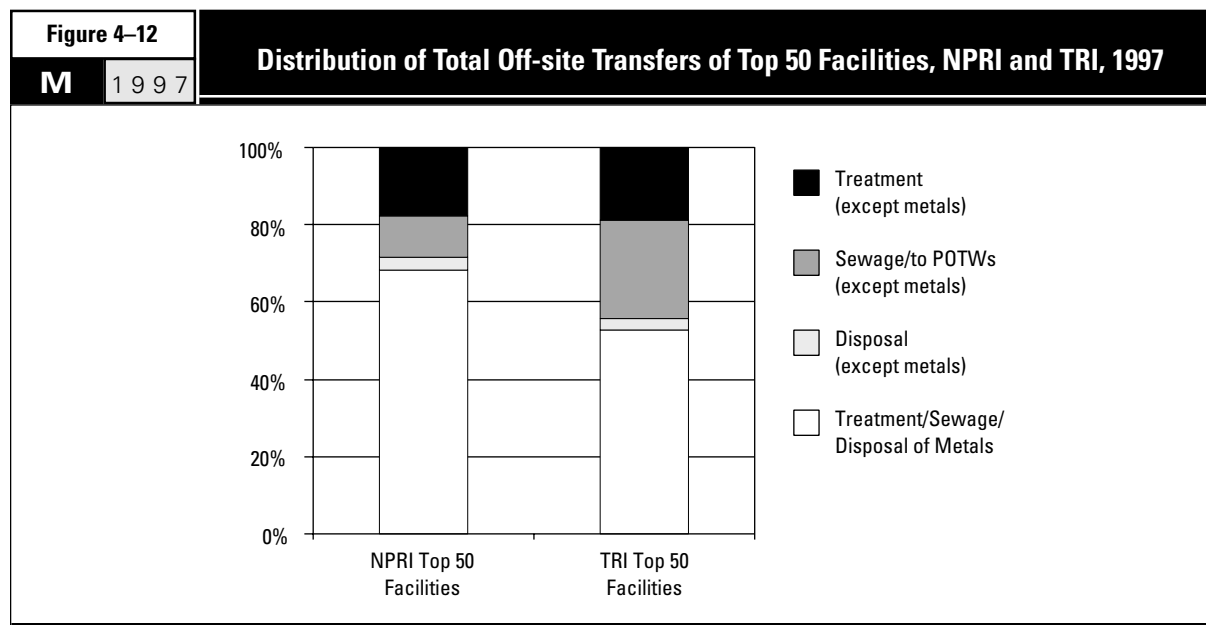


Table 4-11		The 50 NPRI Facilities with the Largest Total Off-site Transfers, 1997			
Rank	Facility	City, Province	SIC Codes		Number of Forms
			Canada	US	
1	Dofasco Inc.	Hamilton, ON	29	33	18
2	Co-Steel Lasco	Whitby, ON	29	33	6
3	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	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		NPRI Total Off-site Transfers by All Facilities and by Facilities with Largest Amounts, by Province, 1997								
M 1997		All NPRI Facilities					Top 50 Facilities		Top 50 Facilities as % of All Facilities	
Province	Number of Facilities	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/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

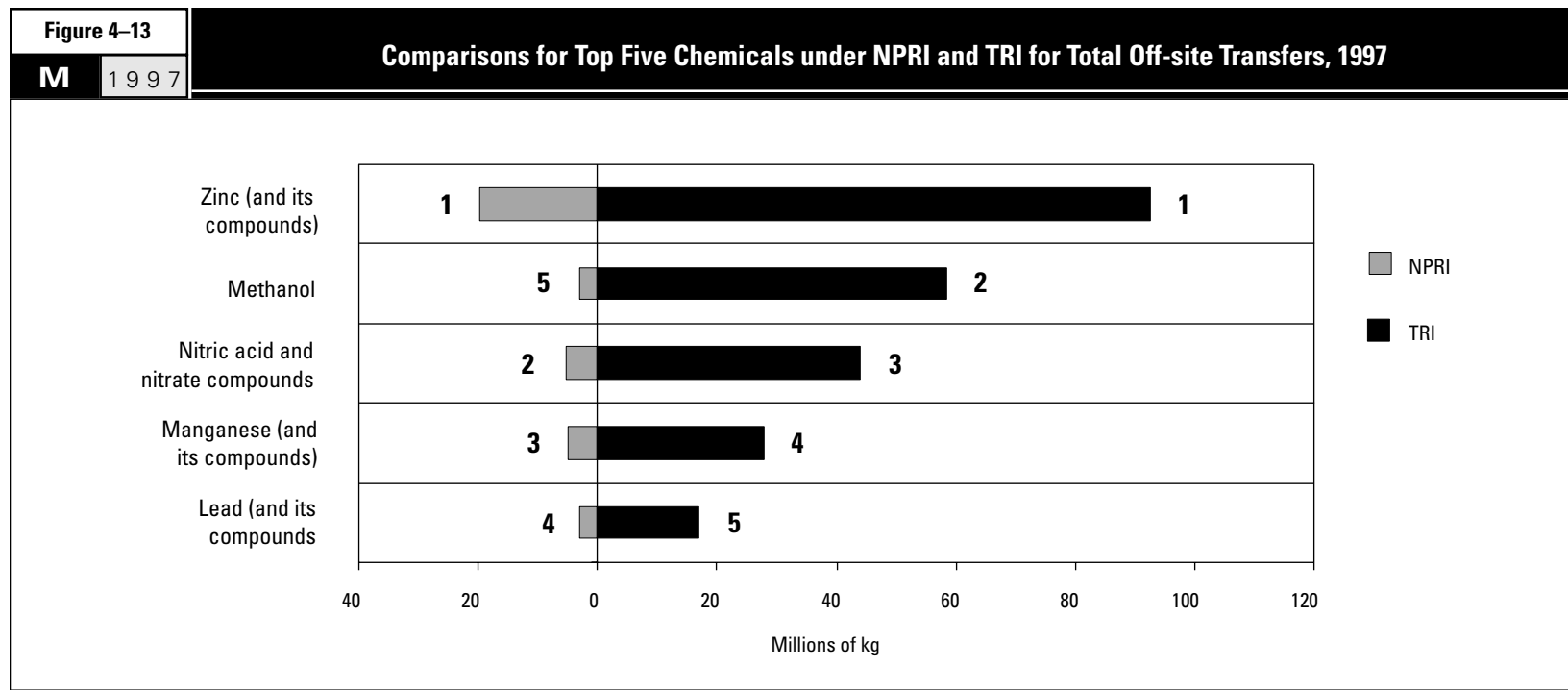
Table 4-16

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).

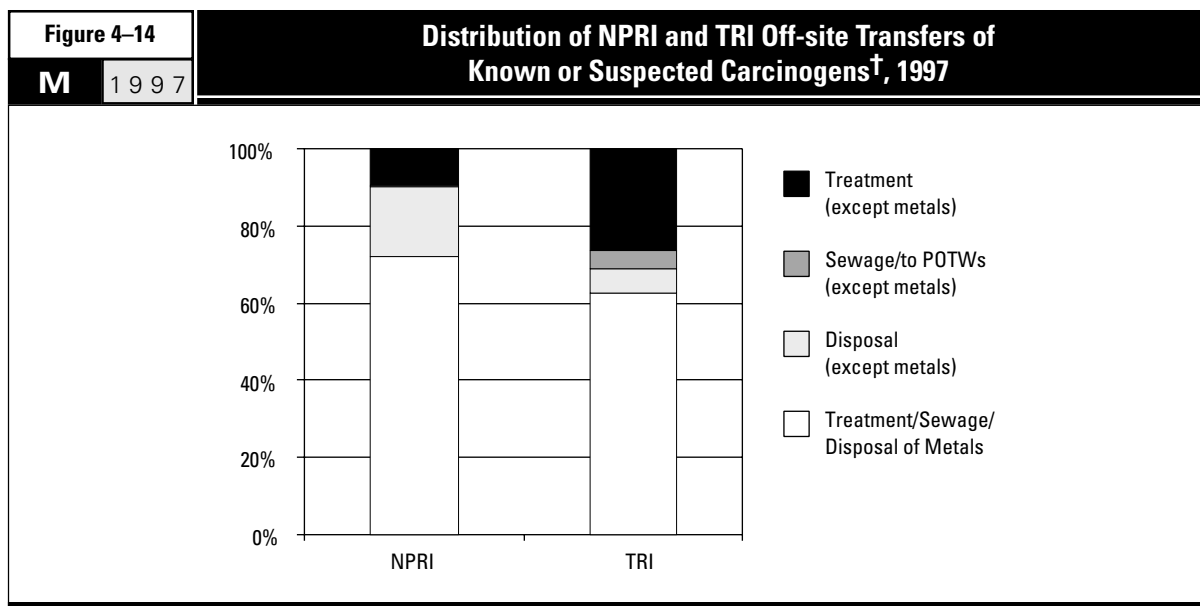
For NPRI, the top 50 facilities reported 90 percent of the total off-site transfers of designated carcinogens, equal to 7.0 million kg. The top nine facilities reported the largest amounts of such transfers for carcinogenic metals (Figure 4-15 and Table 4-19).

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	

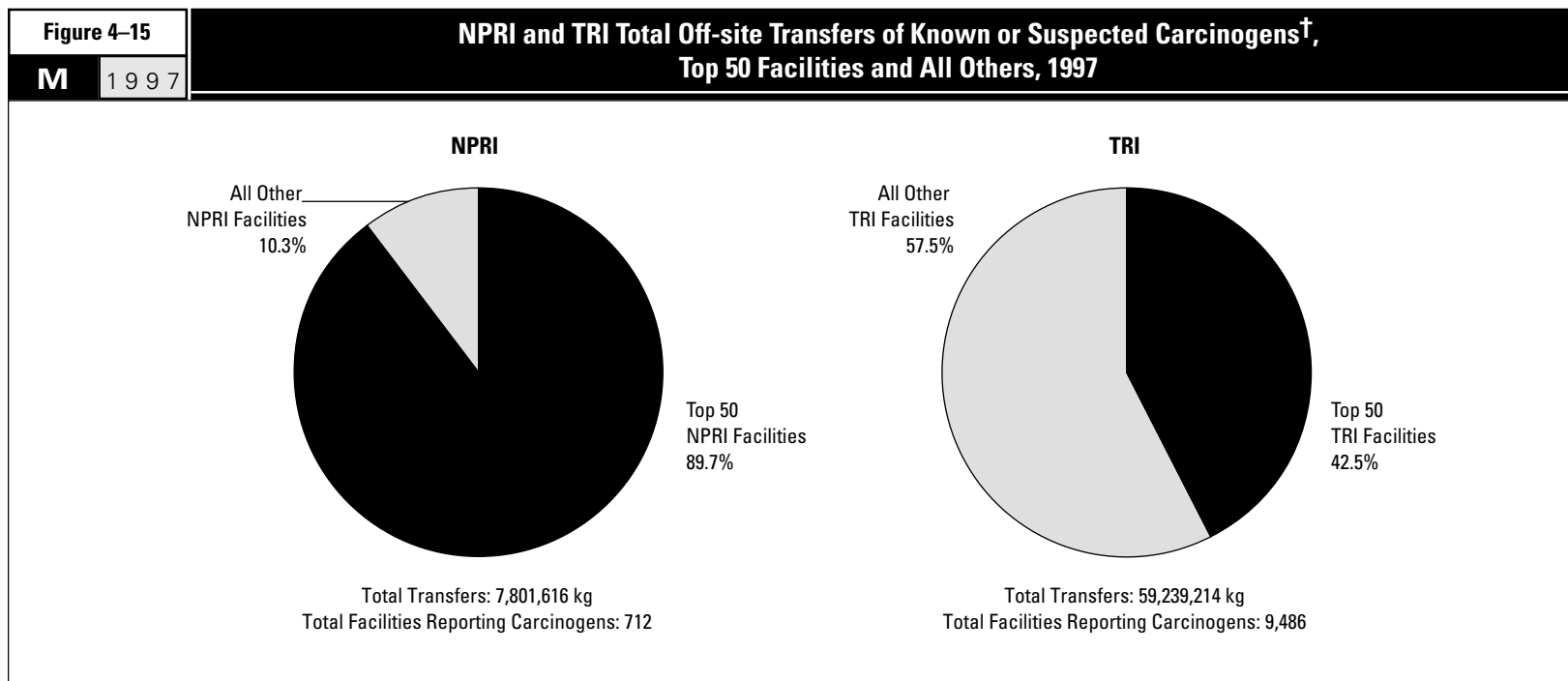
† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ 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.

➤ 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.

➤ 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 Ent's. 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

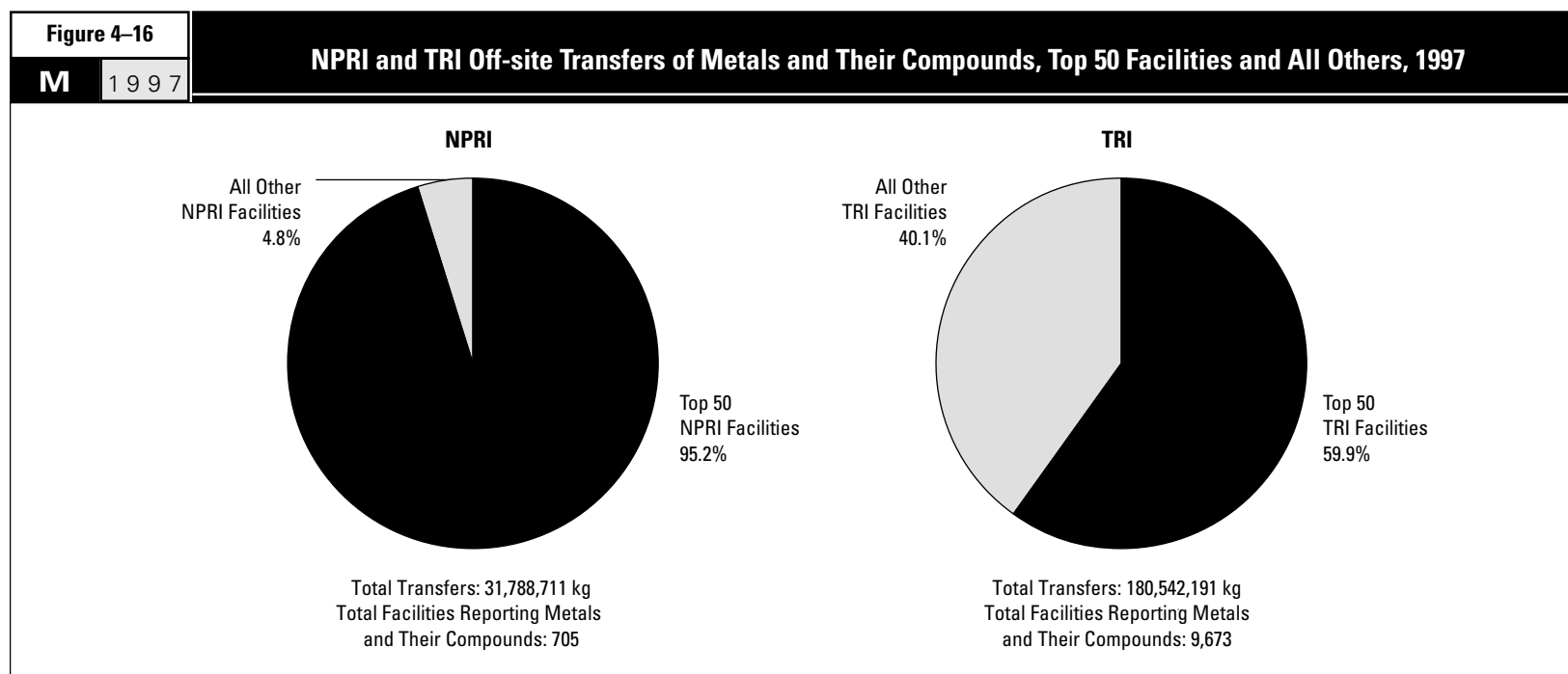


Table 4-23		The 50 NPRI Facilities with the Largest Total Off-site Transfers of Metals and Their Compounds, 1997			
M	1997				
Rank	Facility	City, Province	SIC Codes		Number of Forms
			Canada	US	
1	Dofasco Inc.	Hamilton, ON	29	33	6
2	Co-Steel Lasco	Whitby, ON	29	33	6
3	Stelco McMaster Ltée, Stelco Inc.	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

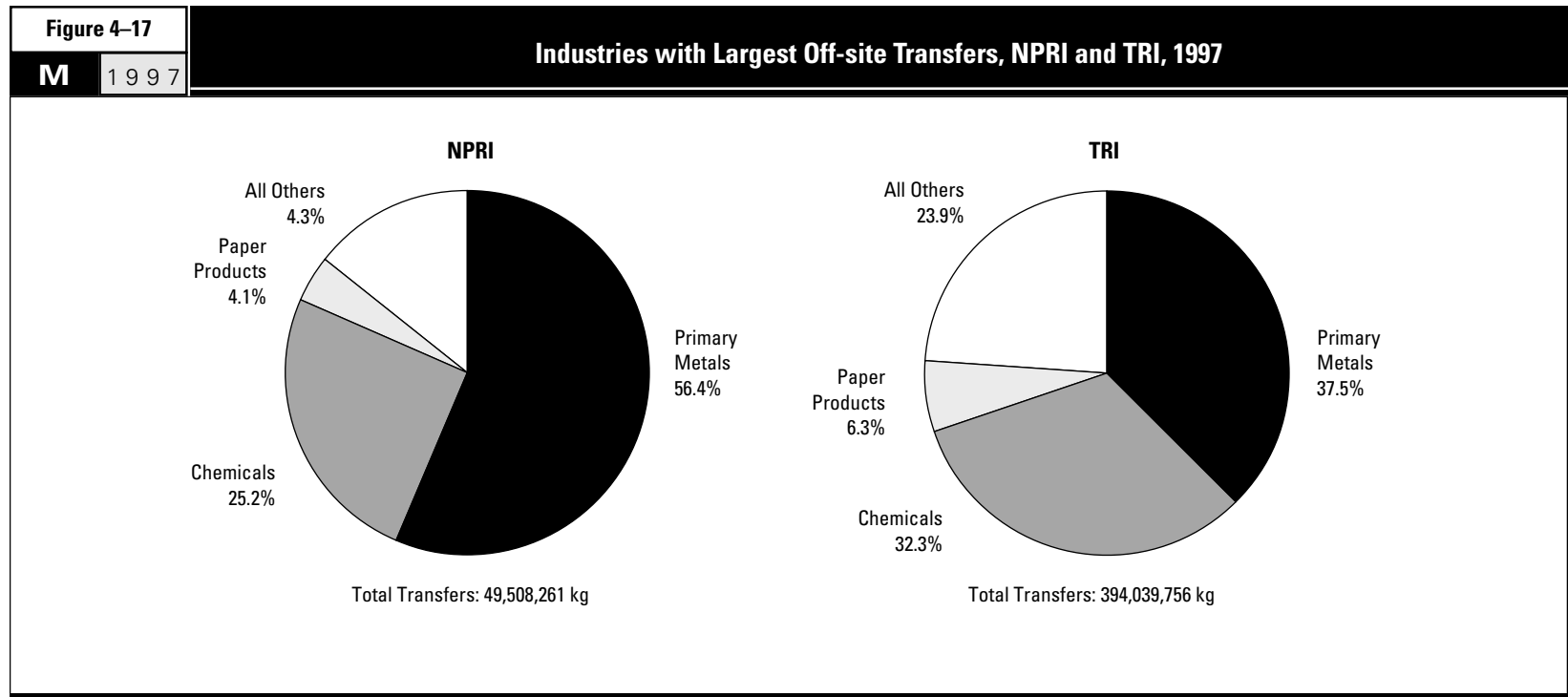
Rank	Treatment/ Sewage/Disposal of Metals (kg)	Major Chemicals Reported (Primary Transfers)*
1	8,168,440	Zinc/Manganese and compounds (transfers of metals)
2	5,799,885	Zinc and compounds (transfers of metals)
3	2,298,300	Zinc and compounds (transfers of metals)
4	1,647,700	Zinc and compounds (transfers 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.	Wilders, 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

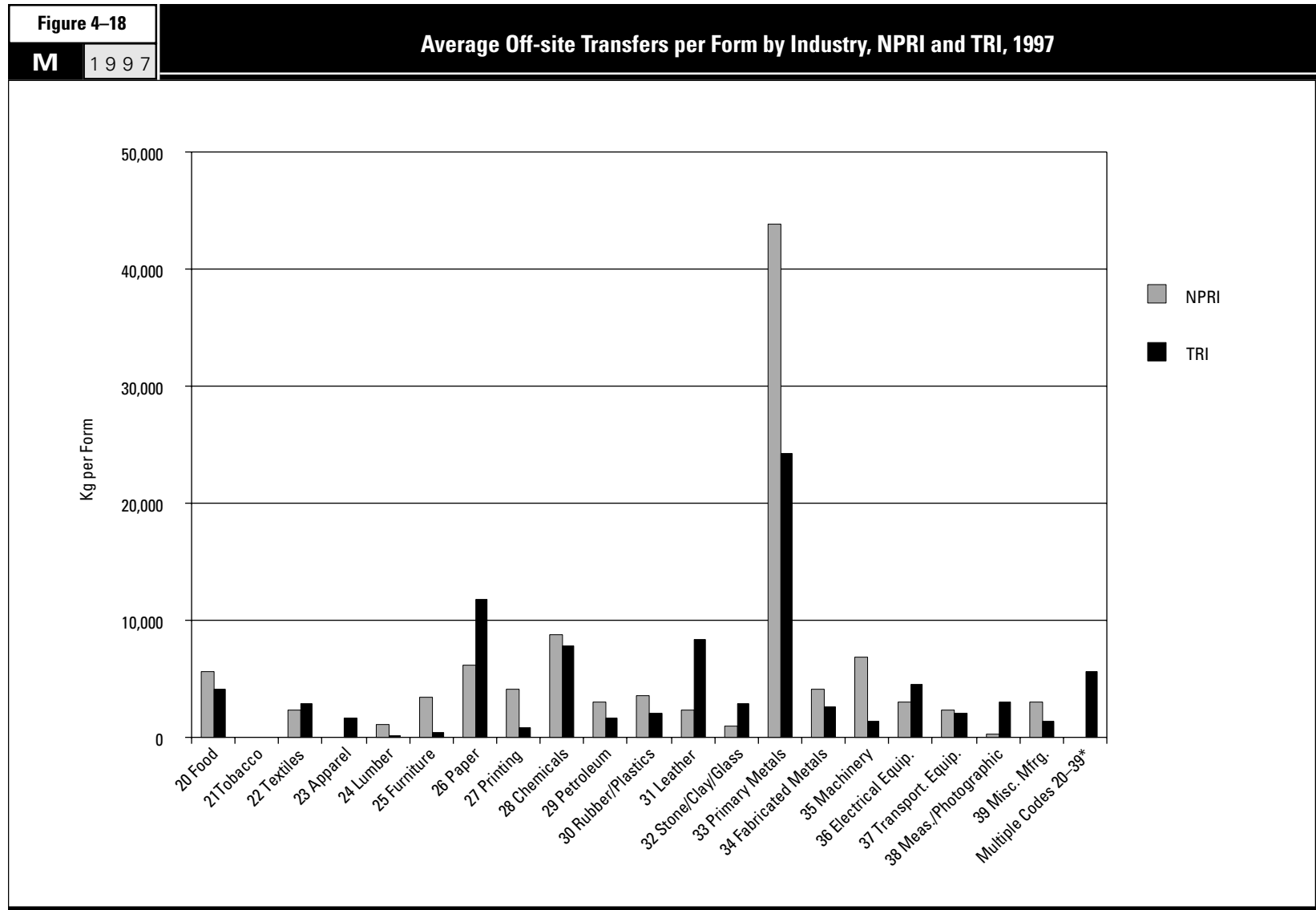
Table 4-26		TRI Off-site Transfers by Industry (US SIC Code), 1997						
M	1997							
Rank	US SIC Code	Industry	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/ Disposal of Metals (kg)	Total Transfers (kg)	% of Total
1	33	Primary Metals	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

* Multiple SIC codes reported only in TRI data.

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.

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

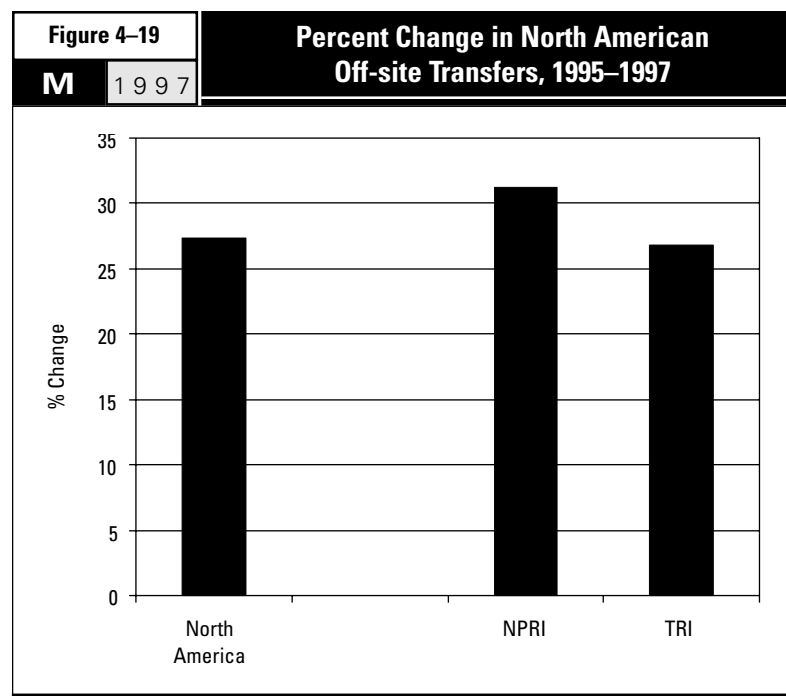
1997. The result was increases in all North American transfer types for the 1995–1997 period.

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-

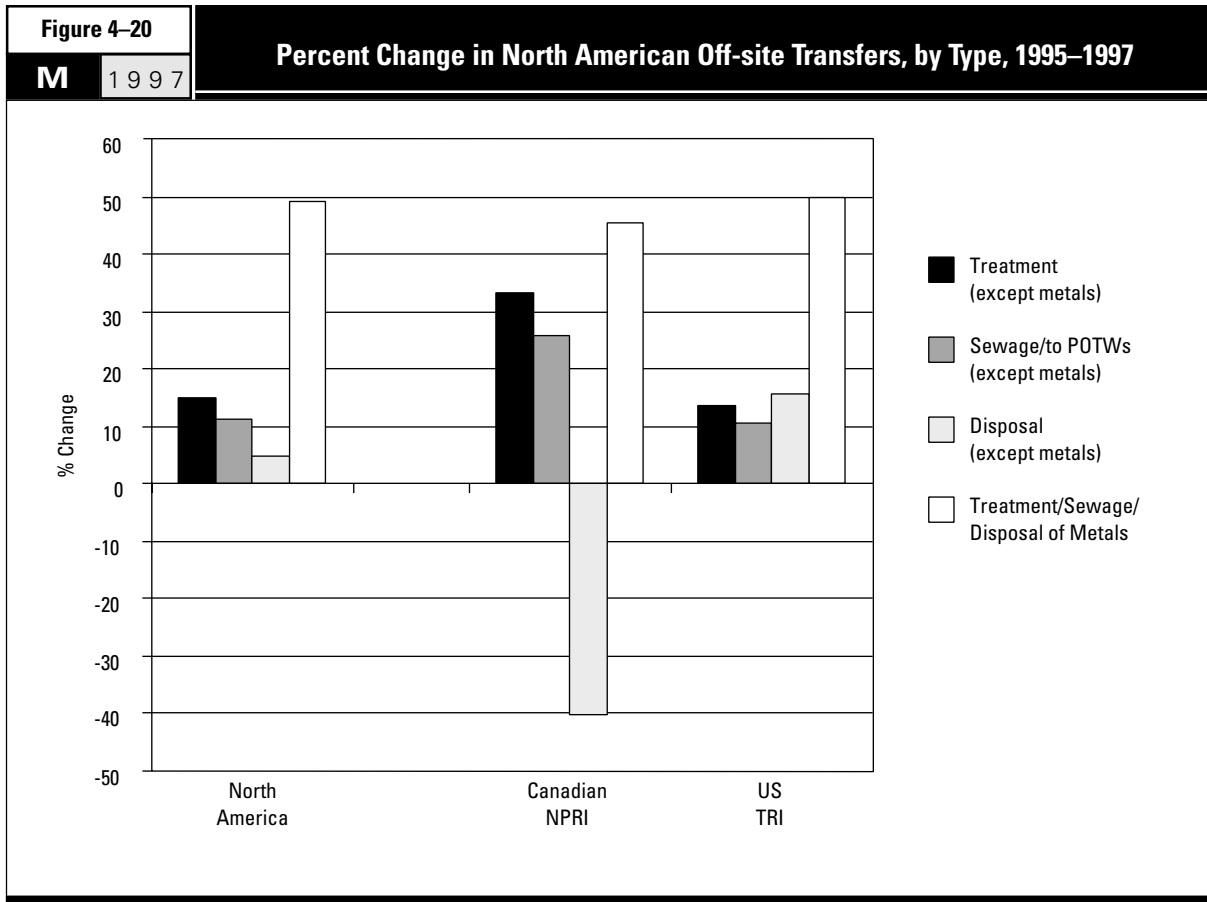
gory. The 1.1-million-kg increase brought transfers to disposal to 23.0 million kg in 1997.

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)				
Province	Total Transfers			Change 1995–1997		
	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

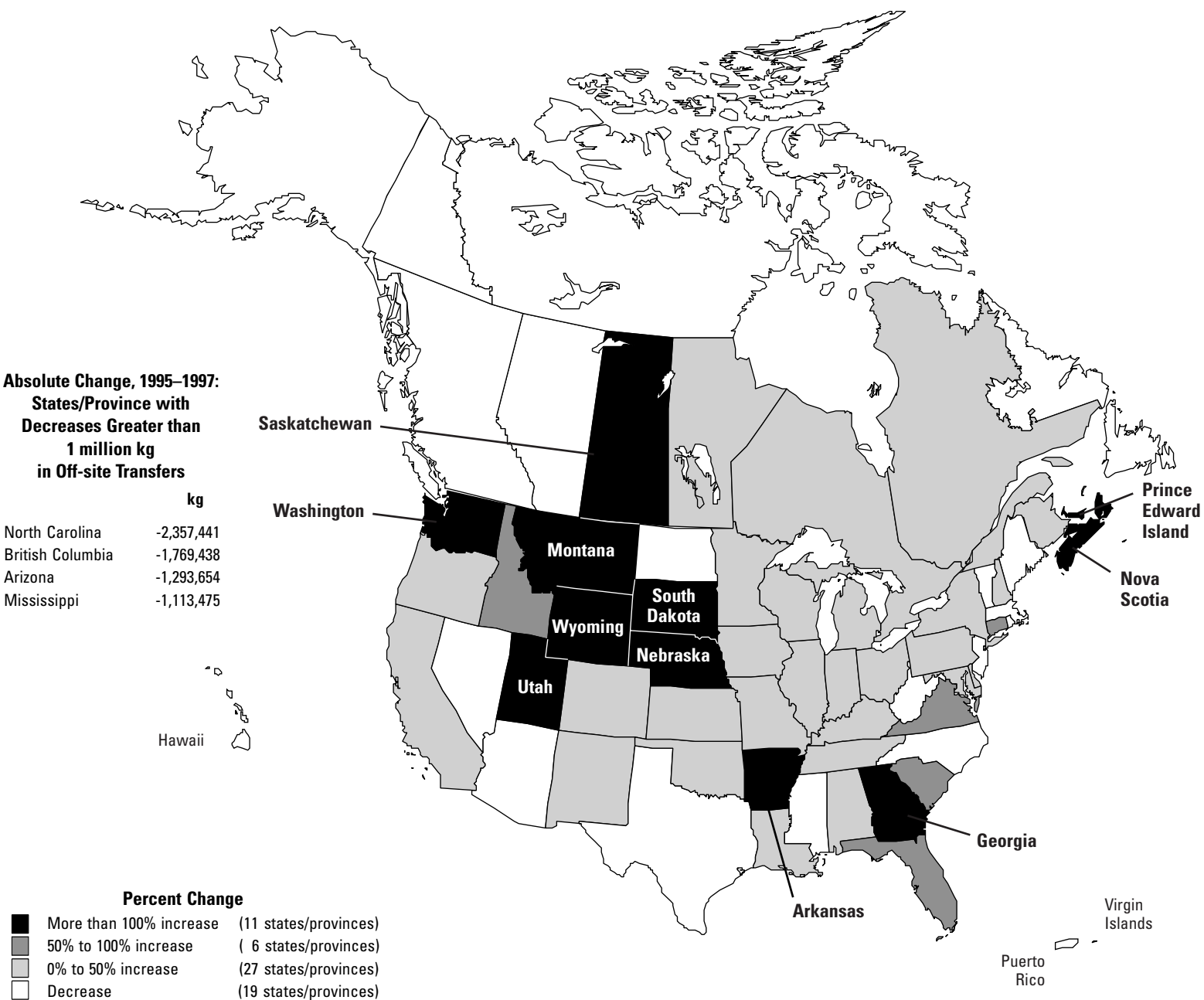
Map 4-6

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**).

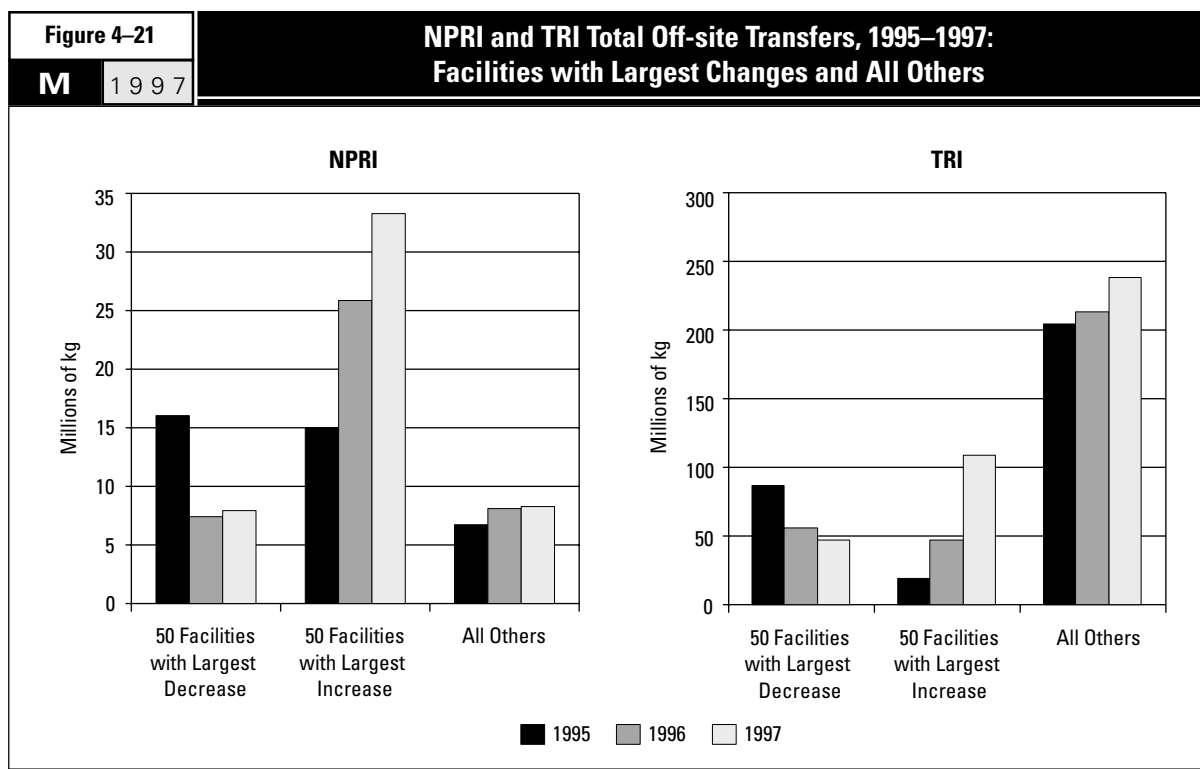


Table 4-32		NPRI Facilities with Largest Decrease in Off-site Transfers, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	CXY Chemicals LP, Canadian Occidental Petroleum	Nanaimo, BC	37	28
2	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33
3	AT Plastics Inc., Edmonton Site	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.	Wilders, 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 Ents. 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.

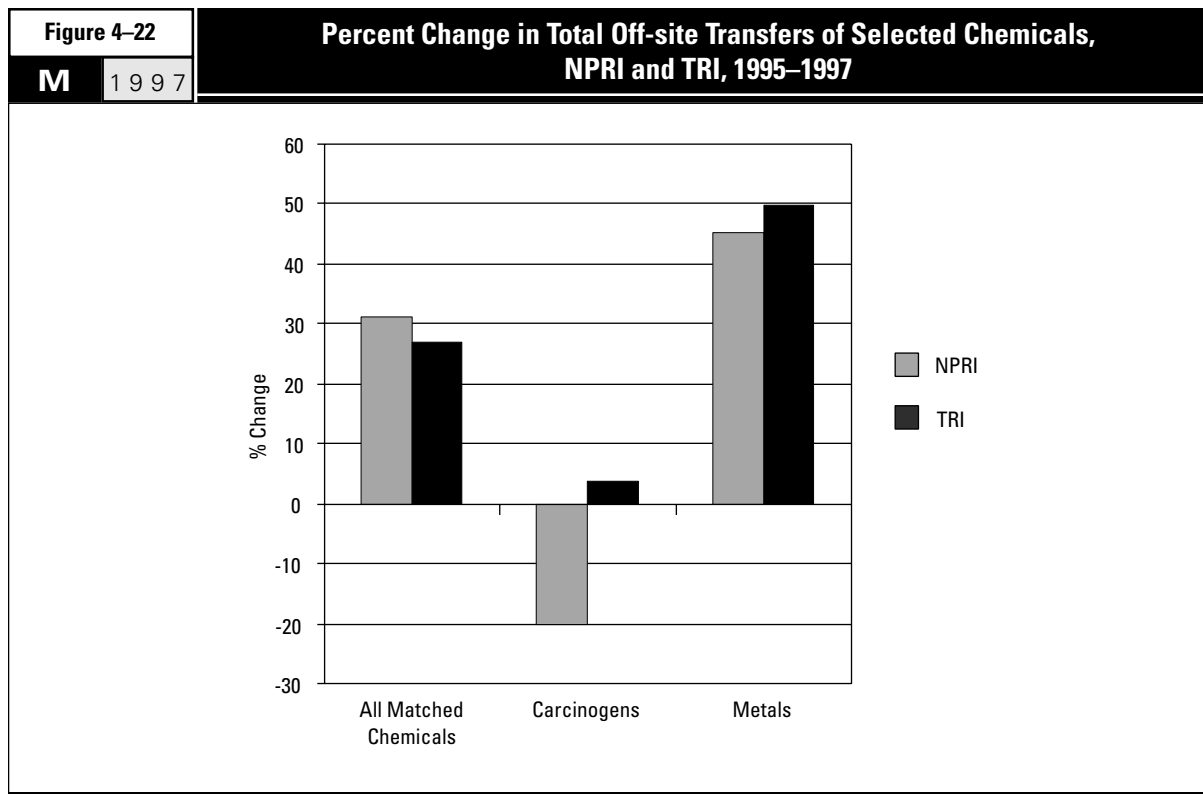
** Indicates facility did not report any matched chemicals that year.

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	Nitritotriacetic 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).

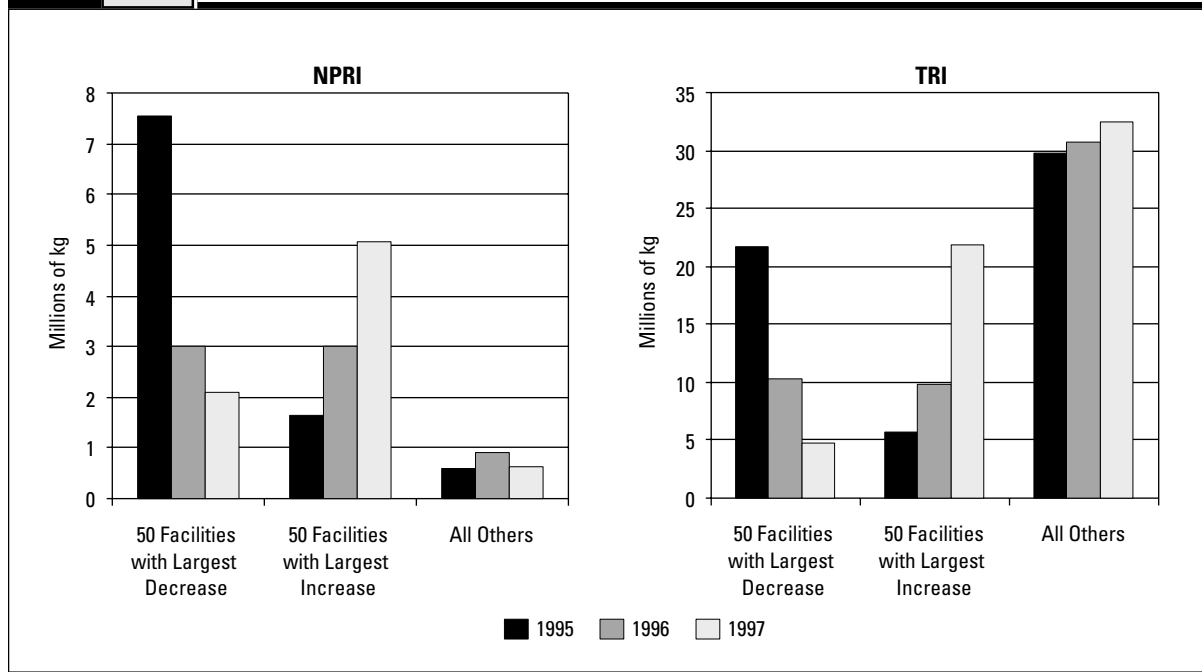
One carcinogen (lead and its compounds) showed an increase of more than 1 million kg in transfers reported to TRI. Transfers of lead increased by 5.6 million kg (47 percent), from 12.0 million kg to 17.6 million kg. The next largest increases occurred in transfers of dichloromethane and nickel: from 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.	Brackensridge, 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	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	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				
CAS Number	Chemical	Total Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
7440-62-2	— 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
	— 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
7429-90-5	— 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
	— 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

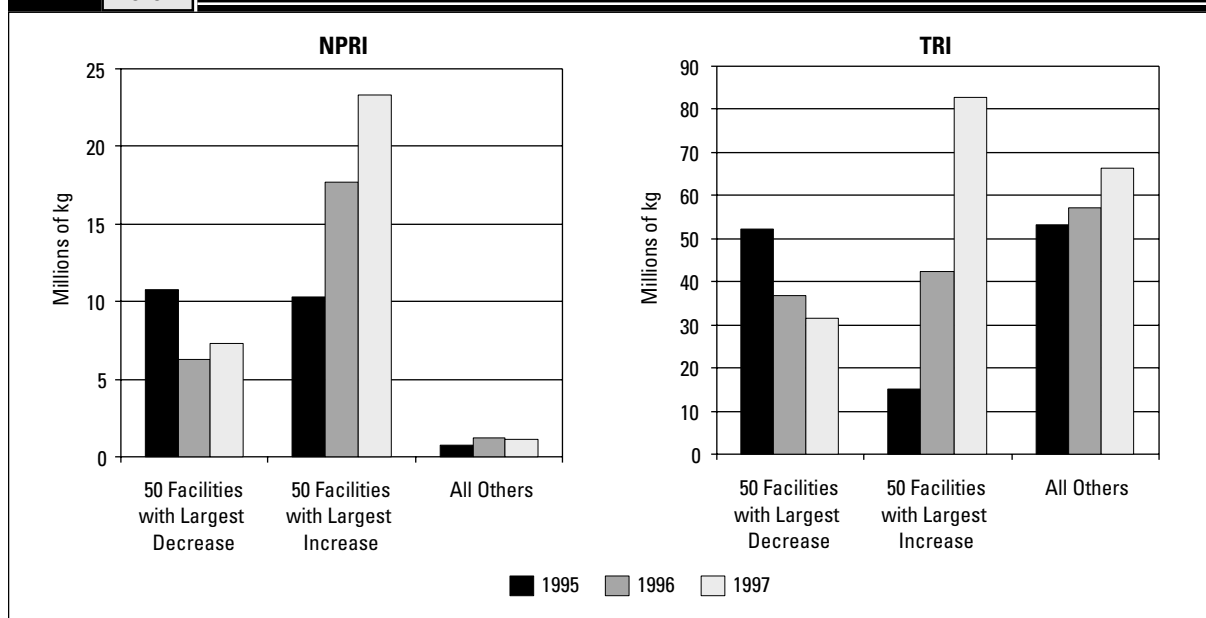


Table 4-48		NPRI Facilities with Largest Decrease in Off-site Transfers of Metals and Their Compounds, 1995-1997		
M	1997			
Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33
2	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33
3	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 Ent's. 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 Ent's. 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.

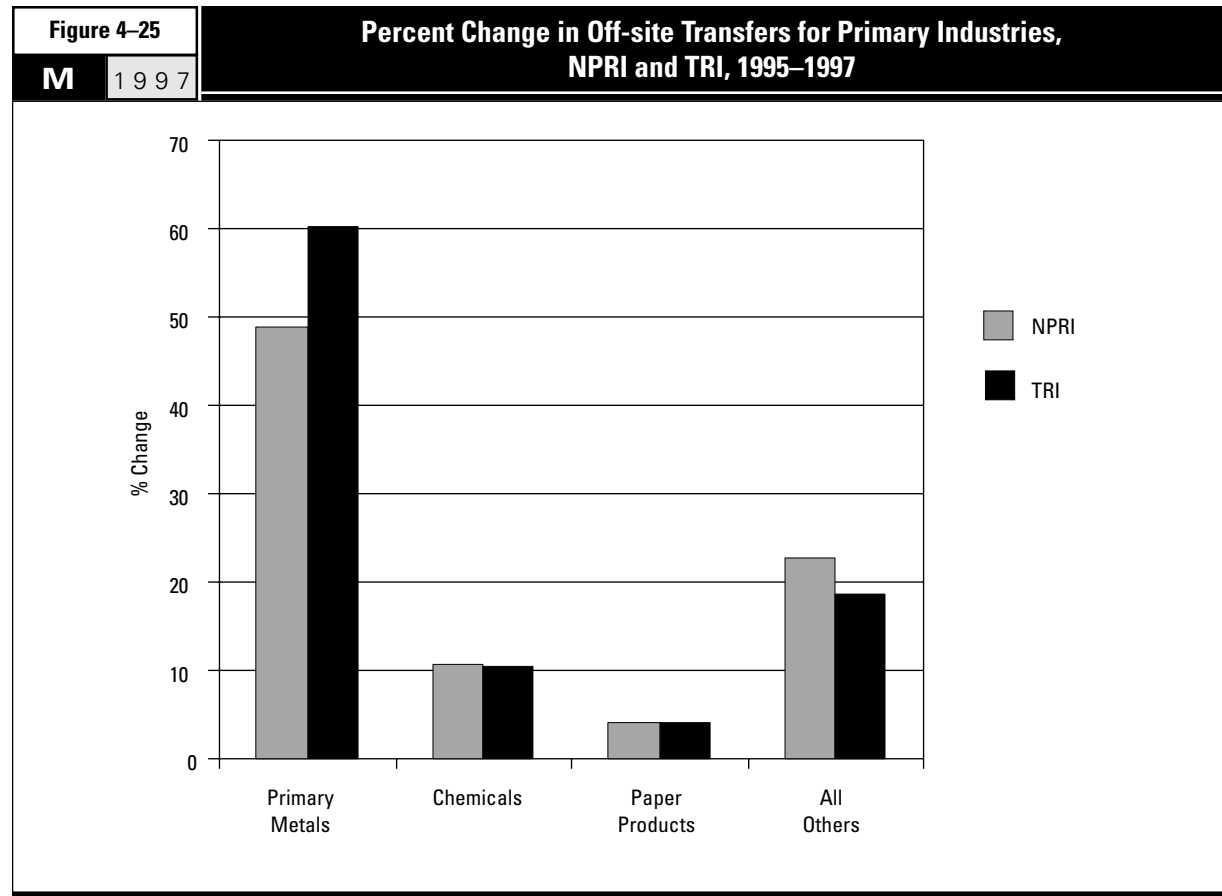
** Indicates facility did not report any matched metals that year.

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

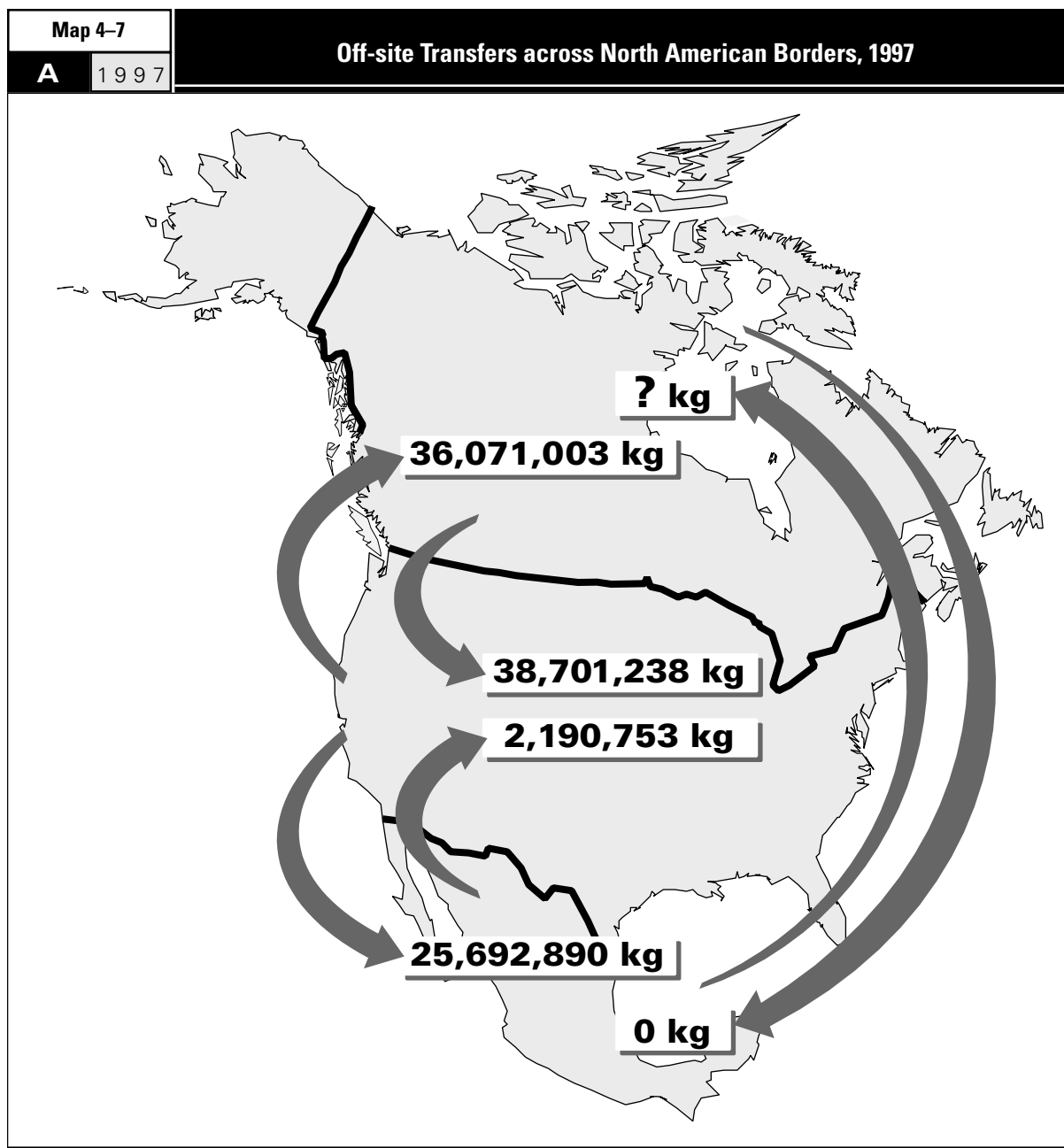
M 1997

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	%
		26,476,915	68.4	86,084,271	49.9	112,561,186	53.3
		3,257,502	8.4	8,927,672	5.2	12,185,174	5.8
		3,020,688	7.8	16,309,845	9.5	19,330,533	9.2
		3,628,853	9.4	9,146,233	5.3	12,775,086	6.1
		2,339,232	6.0	51,931,427	30.1	54,270,659	25.7
		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 US State	To/From Canadian Province						Total Cross-Boundary Transfers	
	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	Portelands 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	

TAKING STOCK: North American Pollutant Releases and Transfers

Table 4-69		RCRA Hazardous Waste Sent from Mexican Maquiladoras to US, 1997								
A	1997									
RCRA Waste Code	Type of Waste(kg)	(kg)	(kg)	(kg)	(kg)	Cities with Maquiladoras Reporting Waste Sent to US				
						Tijuana	Mexicali	San Luis	Nogales	Agua Prieta
82,830	62,984	1,605	5,705	4,871						
93,134	24,263	3,002	8,617	0						
1,152,010	191,202	27,937	24,653	41,859						
1,206	1,533	0	0	0						
685,161	0	0	0	0						
129,569	11,782	0	3,138	0						
12,336	62,531	0	109	0						
2,278,405	737,343	10,866	14,122	136						
4,898	0	0	499	0						
0	190	0	0	0						
2,268	0	0	0	0						
0	0	0	0	0						
2,603	1,324	10,558	0	0						
0	118	0	0	0						
1,252	0	0	0	0						
1,043	0	0	0	0						
18,095	1,633	0	417	0						
52,925	4,463	0	2,086	0						
81,352	4,780	2,558	9,415	5,533						
290	0	2,476	22,912	0						
58,268	209	26,794	0	0						
0	0	0	0	0						
0	0	0	0	0						
0	1,923	0	0	0						
281	0	0	0	0						
4,657,926	1,106,277	85,796	91,674	52,399						
3,574	3,066	0	0	0						
415,039	58,095	32,064	30,113	0						
184,889	18,050	0	2,467	1,787						
1,950	408	0	0	0						
601,878	76,553	32,064	32,581	1,787						
5,263,377	1,185,896	117,859	124,254	54,186						

Source: Haztracks US Manifest Database, October 1998 <www.epa.gov/earth1/r6/6en/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.

Chapter 5: Releases and Transfers

M

All tables and figures in Chapter 5 are from the 1997 Matched Data Set

	Key Findings	263		5.3	Changes in Releases and Transfers, 1995–1997, and Projections for 1998–1999 (cont.)	
5.1	Introduction	263			Actual and Projected Changes, 1995–1999	321
5.2	1997 Releases and Transfers	264			Average Releases and Transfers	322
5.2.1	North American Releases and Transfers	264			Overall Change by Facilities with Increases and Facilities with Decreases	324
	Releases and Transfers by State and Province	267		5.3.2	Changes in Releases and Transfers by State and Province	329
	Top Facilities	269			Releases and Transfers, 1995–1997	329
	Releases and Transfers by Chemical	272			Actual and Projected Changes in Releases and Transfers, 1995–1999	335
	Carcinogens	275		5.3.3	NPRI and TRI Facilities with Largest Changes, 1995–1997	337
	Metals	280			NPRI Facilities with Largest Decreases/Increases	337
	Releases and Transfers by Industry	284			TRI Facilities with Largest Decreases/Increases	337
5.2.2	NPRI and TRI Releases and Transfers	287		5.3.4	Changes in Releases and Transfers by Chemical, 1995–1997	346
	Top Facilities	288			NPRI Chemicals with Largest Decreases/Increases	346
	Releases and Transfers by Chemical	296			TRI Chemicals with Largest Decreases/Increases	348
	Carcinogens	299			Carcinogens	349
	Metals	306			Metals	360
	Releases and Transfers by Industry	312		5.3.5	Changes in Releases and Transfers by Industry	372
	Average Releases and Transfers	315			Releases and Transfers, 1995–1997	372
5.3	Changes in Releases and Transfers, 1995–1997, and Projections for 1998–1999	318			Actual and Projected Changes, 1995–1999	375
5.3.1	Overview	318				
	Changes in Releases and Transfers, 1995–1997	318				

M

All tables and figures in Chapter 5 are from the 1997 Matched Data Set

Total Releases and Transfers, 1997

Figures

5-1	North American Total Releases and Transfers by Type	266
5-2	Distribution of North American Total Releases and Transfers	266
5-3	North American Total Releases and Transfers, Top 50 Facilities and All Others	269
5-4	Distribution of North American Releases, Top 50 Facilities and All Others	272
5-5	North American Releases and Transfers, Top 25 Chemicals and All Others	274
5-6	North American Total Releases and Transfers, Known or Suspected Carcinogens and All Others	277
5-7	North American Total Releases and Transfers of Known or Suspected Carcinogens, Top 50 Facilities and All Others	277
5-8	North American Total Releases and Transfers of Metals and Their Compounds, Top 50 Facilities and All Others	281
5-9	North American Top Three Industries for Total Releases and Transfers	285
5-10	Releases and Transfers by North American Top Industries	286
5-11	Distribution of Total Releases and Transfers, NPRI and TRI	288
5-12	NPRI and TRI Total Releases and Transfers, Top 50 Facilities and All Others	289
5-13	Distribution of Total Releases and Transfers of Top 50 Facilities, NPRI and TRI	289
5-14	Comparisons for Top Five Chemicals under NPRI and TRI for Total Releases and Transfers	298
5-15	Distribution of NPRI and TRI Total Releases and Transfers of Known or Suspected Carcinogens	298
5-16	NPRI and TRI Total Releases and Transfers of Known or Suspected Carcinogens, Top 50 Facilities and All Others	301
5-17	NPRI and TRI Total Releases and Transfers of Metals and Their Compounds	306

5-18	NPRI and TRI Total Releases and Transfers of Metals and Their Compounds, Top 50 Facilities and All Others	307
5-19	Industries with Largest Total Releases and Transfers, NPRI and TRI	312
5-20	Average Total Releases and Transfers per Form by Industry, NPRI and TRI	316

Map

5-1	North American Total Releases and Transfers: States and Provinces	268
-----	---	-----

Tables

5-1	North American Total Releases and Transfers, NPRI and TRI	265
5-2	North American Total Releases and Transfers, by Province and State	267
5-3	The 50 North American Facilities with the Largest Total Releases and Transfers	270
5-4	The 25 Chemicals with the Largest Total Releases and Transfers in North America	273
5-5	Total Releases and Transfers in North America of Known or Suspected Carcinogens	276
5-6	The 50 North American Facilities with the Largest Total Releases and Transfers of Known or Suspected Carcinogens	278
5-7	Total Releases and Transfers in North America of Metals and Their Compounds	280
5-8	The 50 North American Facilities with the Largest Total Releases and Transfers of Metals and Their Compounds	282
5-9	Total Releases and Transfers in North America by Industry	284
5-10	Total Releases and Transfers, NPRI and TRI	287
5-11	The 50 NPRI Facilities with the Largest Total Releases and Transfers	290

M All tables and figures in Chapter 5 are from the 1997 Matched Data Set

5-12	The 50 TRI Facilities with the Largest Total Releases and Transfers	292	5-20	The 50 TRI Facilities with the Largest Total Releases and Transfers of Known or Suspected Carcinogens	304
5-13	NPRI Total Releases and Transfers by All Facilities and by Facilities with Largest Amounts, by Province	294	5-21	NPRI Total Releases and Transfers of Metals and Their Compounds	306
5-14	TRI Total Releases and Transfers by All Facilities and by Facilities with Largest Amounts, by State	295	5-22	TRI Total Releases and Transfers of Metals and Their Compounds	307
5-15	The 25 NPRI Chemicals with the Largest Total Releases and Transfers	296	5-23	The 50 NPRI Facilities with the Largest Total Releases and Transfers of Metals and Their Compounds	308
5-16	The 25 TRI Chemicals with the Largest Total Releases and Transfers	297	5-24	The 50 TRI Facilities with the Largest Total Releases and Transfers of Metals and Their Compounds	310
5-17	NPRI Total Releases and Transfers of Known or Suspected Carcinogens	299	5-25	NPRI Total Releases and Transfers by Industry	313
5-18	TRI Total Releases and Transfers of Known or Suspected Carcinogens	300	5-26	TRI Total Releases and Transfers by Industry	314
5-19	The 50 NPRI Facilities with the Largest Total Releases and Transfers of Known or Suspected Carcinogens	302	5-27	Average Total Releases and Transfers per Form, by Industry, NPRI and TRI	315
			5-28	Average Releases and Transfers per Form and per Facility, NPRI and TRI	317

Changes in Total Releases and Transfers, 1995–1997, and Projections for 1998–1999

Figures

5-21	Percent Change in North American Total Releases and Transfers, 1995–1997	320	5-28	NPRI and TRI Total Releases and Transfers of Metals and Their Compounds: Facilities with Largest Changes and All Others, 1995–1997	363
5-22	Percent Change in North American Releases and Transfers, 1995–1997	320	5-29	Percent Change in Total Releases and Transfers for Primary Industries, NPRI and TRI, 1995–1997	372
5-23	Percent Change in North American Releases and Transfers, Actual and Projected, 1995–1999	321	5-30	Projected Change in NPRI and TRI Total Releases and Transfers by Primary Industries, 1997–1999	375
5-24	Distribution of NPRI and TRI Total Releases and Transfers, 1995–1997: Facilities with Increases, Facilities with Decreases and Others	328			
5-25	NPRI and TRI Total Releases and Transfers, 1995–1997: Facilities with Largest Changes and All Others	337	Map		
5-26	NPRI and TRI Total Releases and Transfers of Selected Chemicals, 1995–1997	346	5-2	Percent Change in North American Total Releases and Transfers, 1995–1997: States and Provinces	334
5-27	NPRI and TRI Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997: Facilities with Largest Changes and All Others	351	Tables		
			5-29	North American Total Releases and Transfers, 1995–1997	318
			5-30	North American Total Releases and Transfers, Actual and Projected, 1995–1999	322

M

All tables and figures in Chapter 5 are from the 1997 Matched Data Set

Changes in Total Releases and Transfers, 1995–1997, and Projections for 1998–1999 (cont.)

5–31	Average Releases and Transfers per Form and per Facility, NPRI and TRI, 1995 and 1997	323	5–49	The 50 NPRI Facilities with Largest Decrease in Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997	352
5–32	NPRI Releases and Transfers, 1995 and 1997	324	5–50	The 50 NPRI Facilities with Largest Increase in Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997	354
5–33	TRI Releases and Transfers, 1995 and 1997	326	5–51	The 50 TRI Facilities with Largest Decrease in Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997	356
5–34	North American States and Provinces with Largest Total Releases and Transfers, 1995 and 1997	329	5–52	The 50 TRI Facilities with Largest Increase in Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997	358
5–35	NPRI Total Releases and Transfers, by Province, 1995 and 1997	331	5–53	Change in NPRI Total Releases and Transfers of Metals and Their Compounds, 1995–1997	360
5–36	TRI Total Releases and Transfers, by State, 1995 and 1997	332	5–54	Change in TRI Total Releases and Transfers of Metals and Their Compounds, 1995–1997	361
5–37	NPRI Actual and Projected Total Releases and Transfers, by Province, 1995–1999	335	5–55	The 50 NPRI Facilities with Largest Decrease in Total Releases and Transfers of Metals and Their Compounds, 1995–1997	364
5–38	TRI Actual and Projected Total Releases and Transfers, by State, 1995–1999	336	5–56	The 50 NPRI Facilities with Largest Increase in Total Releases and Transfers of Metals and Their Compounds, 1995–1997	366
5–39	The 50 NPRI Facilities with Largest Decrease in Total Releases and Transfers, 1995–1997	338	5–57	The 50 TRI Facilities with Largest Decrease in Total Releases and Transfers of Metals and Their Compounds, 1995–1997	368
5–40	The 50 NPRI Facilities with Largest Increase in Total Releases and Transfers, 1995–1997	340	5–58	The 50 TRI Facilities with Largest Increase in Total Releases and Transfers of Metals and Their Compounds, 1995–1997	370
5–41	The 50 TRI Facilities with Largest Decrease in Total Releases and Transfers, 1995–1997	342	5–59	Change in NPRI Total Releases and Transfers by Industry, 1995–1997	373
5–42	The 50 TRI Facilities with Largest Increase in Total Releases and Transfers, 1995–1997	344	5–60	Change in TRI Total Releases and Transfers by Industry, 1995–1997	374
5–43	The 10 Chemicals with the Largest Decrease in NPRI Total Releases and Transfers, 1995–1997	347	5–61	NPRI Actual and Projected Total Releases and Transfers, by Industry, 1995–1999	376
5–44	The 10 Chemicals with the Largest Increase in NPRI Total Releases and Transfers, 1995–1997	347	5–62	TRI Actual and Projected Total Releases and Transfers, by Industry, 1995–1999	377
5–45	The 10 Chemicals with Largest Increase in TRI Total Releases and Transfers, 1995–1997	348			
5–46	The 10 Chemicals with Largest Decrease in TRI Total Releases and Transfers, 1995–1997	348			
5–47	Change in NPRI Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997	349			
5–48	Change in TRI Total Releases and Transfers of Known or Suspected Carcinogens, 1995–1997	350			

■ Key Findings

- In 1997, North American facilities released and transferred a total of 1.29 billion kg of substances listed in a matched data set of chemicals and industries covered by both Canada's NPRI and the US TRI. Two-thirds of the total consisted of on-site releases.
- The 50 facilities with the largest total releases and transfers reported 27 percent (353.5 million kg) of the North American total, although they represented only one-quarter of one percent (0.24 percent) of all facilities in the matched data set.
- Fifteen percent of the releases and transfers consisted of known or suspected carcinogens, a total of 195.0 million kg. Twenty-nine percent consisted of metals and their compounds—373.3 million kg. (These amounts overlap, as carcinogens include six of the 15 metals and/or their compounds.)
- Among the industry sectors with the largest total releases and transfers, the primary metals industry reported increasing its releases and transfers by more than 25 percent from 1995 to 1997 in both NPRI and TRI. (This sector is examined in more detail in **Chapter 7**.) In contrast, the chemical manufacturing and paper products industries both showed decreases, including a reduction of 32 percent in the paper products industry's NPRI totals.
- Releases and transfers reported to NPRI decreased slightly (0.3 percent) from 1995 to 1997, although the number of NPRI facilities and forms increased by 10 percent in the matched data set. Conversely, TRI releases and transfers rose 1.4 percent, despite a four percent decline in facilities and forms. The result was a 1.2 percent increase in North American total releases and transfers from 1995 to 1997.
- Although North American total releases and transfers increased from 1995 to 1997, from 1995 to 1996 they actually declined—this reduction, however, was outweighed by a larger increase in 1997.
- The difference between NPRI and TRI for average releases and transfers per form and per facility continues, but is diminishing. In 1995, NPRI facilities averaged total releases and transfers per form and per facility that were 1.7 times higher than those in TRI. For 1997, the average was 1.5. The change was due to NPRI averages decreasing and TRI averages increasing.
- Changes in releases and transfers have led to changes in the rankings of the states and provinces. Texas remained first with the largest total releases and transfers in all three years (1995 through 1997), despite a 22.2-million-kg reduction over the period, primarily in on-site releases. The other three states and provinces (Pennsylvania, Ontario, and Ohio) with the largest total releases and transfers in 1997 all reported increases from 1995 to 1997.

5.1 Introduction

This chapter examines North American total releases and transfers for PRTR-listed substances. Facilities may release—to air, water, land, or underground injection wells—the substances on-site within the boundaries of their facility, or they may send or transfer PRTR-listed substances in waste off-site to other locations for treatment or disposal. The previous two chapters have looked at on-site releases and off-site transfers separately. This chapter looks at total releases and transfers, that is, information as found in the PRTRs on the amount of substances in waste generated at the facilities. Tracking total releases and transfers can help explore how much of the substance is being generated in waste, and thereby highlight opportunities for pollution prevention and the need for waste management activities.

As explained in **Chapter 2**, this chapter analyzes data for industries and chemicals that must be reported in both the US and Canada (the matched data set). Mexican data are not available for the 1997 reporting year. The data on releases and transfers for 1997 are presented first: those for the combined North American data are followed by sections devoted to NPRI and TRI reporting for 1997 in the matched data set. Then there is a section on actual and projected changes in releases and transfers from 1995 to 1997. Each part presents geographic data for states and provinces; then data by chemical for

[continued on page 264]

substances with the largest amounts, for designated carcinogens and for metals; and finally data by industry sector.

5.2 1997 Releases and Transfers

In 1997, a total of 20,555 facilities submitted 62,851 forms that are included in the matched data set for North America. The 1,430 Canadian facilities filed 4,599 NPRI forms and the 19,125 US facilities filed 58,252 TRI forms (**Table 5-1**). As noted in earlier chap-

ters, NPRI reporting supplied seven percent and TRI reporting supplied 93 percent of the facilities and forms in the matched data set.

NPRI facilities reported 10 percent of North American releases and transfers, while TRI facilities reported 90 percent. NPRI reporting included more than 10 percent of North American on-site releases to air, off-site transfers of nonmetals to disposal, and off-site transfers of metals to treatment/sewage/disposal. TRI facilities reported more than 90 percent of all other types of releases and transfers.

5.2.1 North American Releases and Transfers

Overview

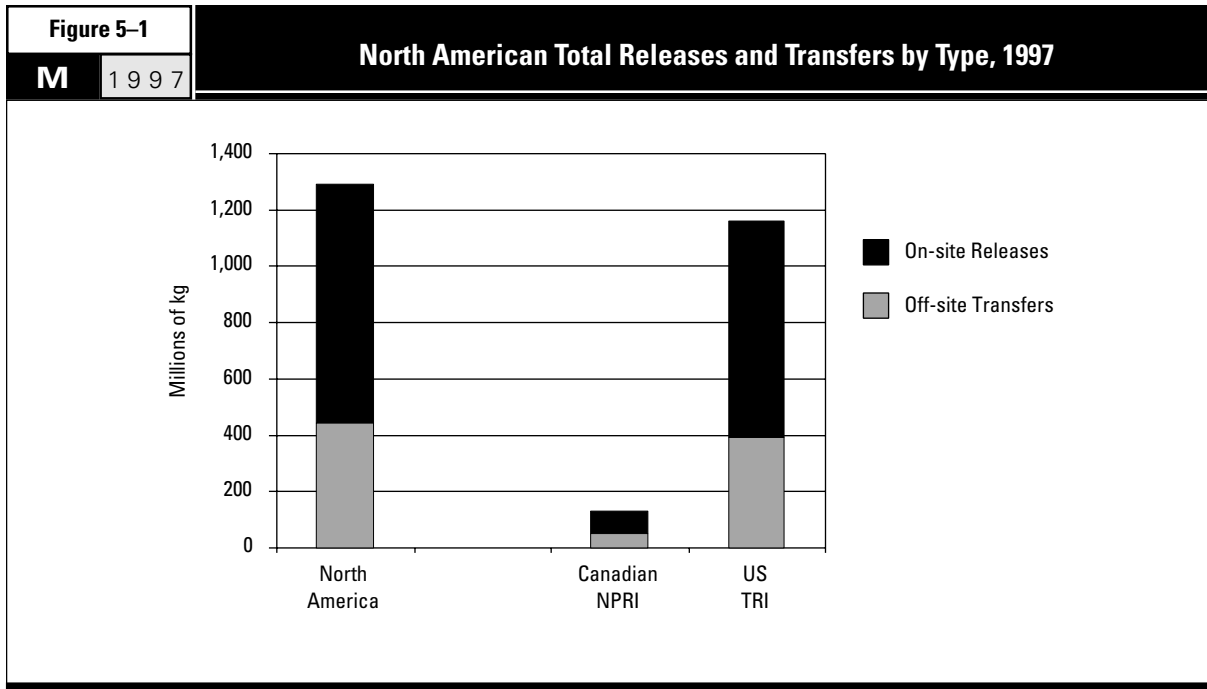
Releases and transfers in North America totaled 1.29 billion kg in 1997 for the matched data set. NPRI facilities reported 130.0 million kg, while TRI facilities reported 1.16 billion kg. North American facilities released 847.8 million kg of listed substances on-site—66 percent of the total—and transferred 443.5 million kg off-site (**Table 5-1** and **Figures 5-1** and **5-2**).

Overall, NPRI facilities reported 10 percent of North American total releases and transfers and TRI facilities reported 90 percent. However, NPRI facilities accounted for 15 percent of off-site transfers of metals to treatment/sewage/disposal and 12 percent of on-site releases to air. On the other hand, TRI facilities accounted for 96 percent of on-site releases to surface waters and 95 percent of on-site underground injection and off-site transfers to sewage of nonmetals.

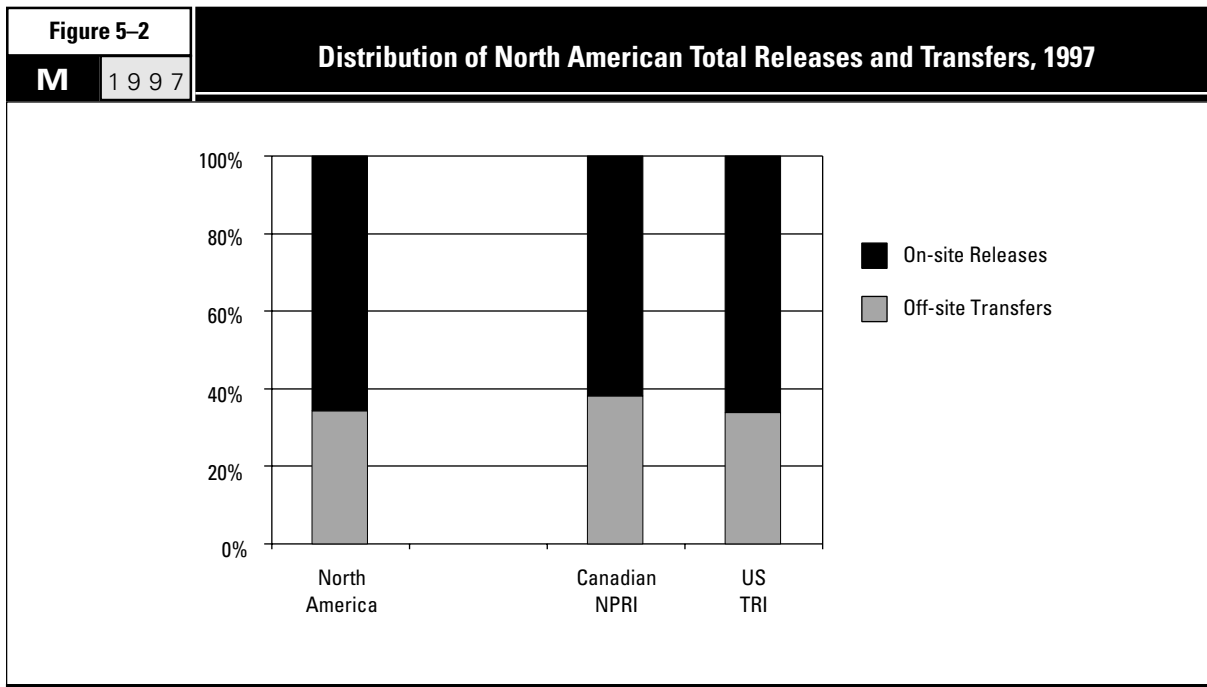
Table 5-1		North American Total Releases and Transfers, NPRI and TRI, 1997							
M	1997	North America		Canadian NPRI*		US TRI		NPRI as % of North American Total	TRI as % of North American Total
		Number		Number		Number			
Total Facilities		20,555		1,430		19,125		7.0	93.0
Total Forms		62,851		4,599		58,252		7.3	92.7
On-site Releases		kg	%	kg	%	kg	%		
Total Air Emissions		512,213,962	39.7	62,838,622	48.4	449,375,340	38.7	12.3	87.7
Surface Water Discharges		98,842,863	7.7	4,224,169	3.3	94,618,694	8.1	4.3	95.7
Underground Injection		78,847,314	6.1	4,197,660	3.2	74,649,654	6.4	5.3	94.7
On-site Land Releases		157,720,611	12.2	9,062,108	7.0	148,658,503	12.8	5.7	94.3
Total Releases		847,751,115	65.7	80,448,924	61.9	767,302,191	66.1	9.5	90.5
Off-site Transfers									
Treatment (except metals)		101,983,917	7.9	9,925,693	7.6	92,058,224	7.9	9.7	90.3
Sewage/POTWs (except metals)		106,215,580	8.2	5,260,842	4.0	100,954,738	8.7	5.0	95.0
Disposal (except metals)		23,017,618	1.8	2,533,015	1.9	20,484,603	1.8	11.0	89.0
Treatment/Sewage/Disposal of Metals		212,330,902	16.4	31,788,711	24.5	180,542,191	15.5	15.0	85.0
Total Transfers		443,548,017	34.3	49,508,261	38.1	394,039,756	33.9	11.2	88.8
Total Releases and Transfers		1,291,299,132	100.0	129,957,185	100.0	1,161,341,947	100.0	10.1	89.9

* The sum of individual release types for NPRI will not equal total releases because total releases of less than 1 tonne may be reported as total releases only.

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



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



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

Releases and Transfers by State and Province

For total releases and transfers, the largest sources by state and province were Texas, Pennsylvania, Ontario and Ohio (**Table 5–2**). More than one-quarter of all North American releases and transfers in the matched data set originated in these top four states and province. Overall, total releases and transfers were concentrated in eastern and southwestern North America (**Map 5–1**).

Texas facilities released and transferred a total of 120.9 million kg. The majority was releases, which amounted to 83.9 million kg. Off-site transfers by Texas facilities totaled 37.0 million kg. Texas ranked first for releases and second for transfers among all states and provinces.

In contrast to most states and all provinces, Pennsylvania facilities transferred a larger amount than they released, 46.1 million kg versus 33.7 million, for a total of 79.8 million kg. Pennsylvania ranked first for off-site transfers but seventh for on-site releases.

Ontario facilities released 40.0 million kg on-site and transferred 35.4 million kg off-site. The total of 75.4 million kg placed Ontario third among states and provinces. The amount of off-site transfers led Ontario to rank third for transfers, higher than its fourth-place ranking for on-site releases.

Ohio facilities, ranking fourth overall, released 37.0 million kg and transferred 31.8 million kg, for a total of 68.8 million kg. Ohio's transfers also gave the state a higher ranking for off-site transfers—fourth among all states and provinces—than its ranking for on-site releases (fifth).

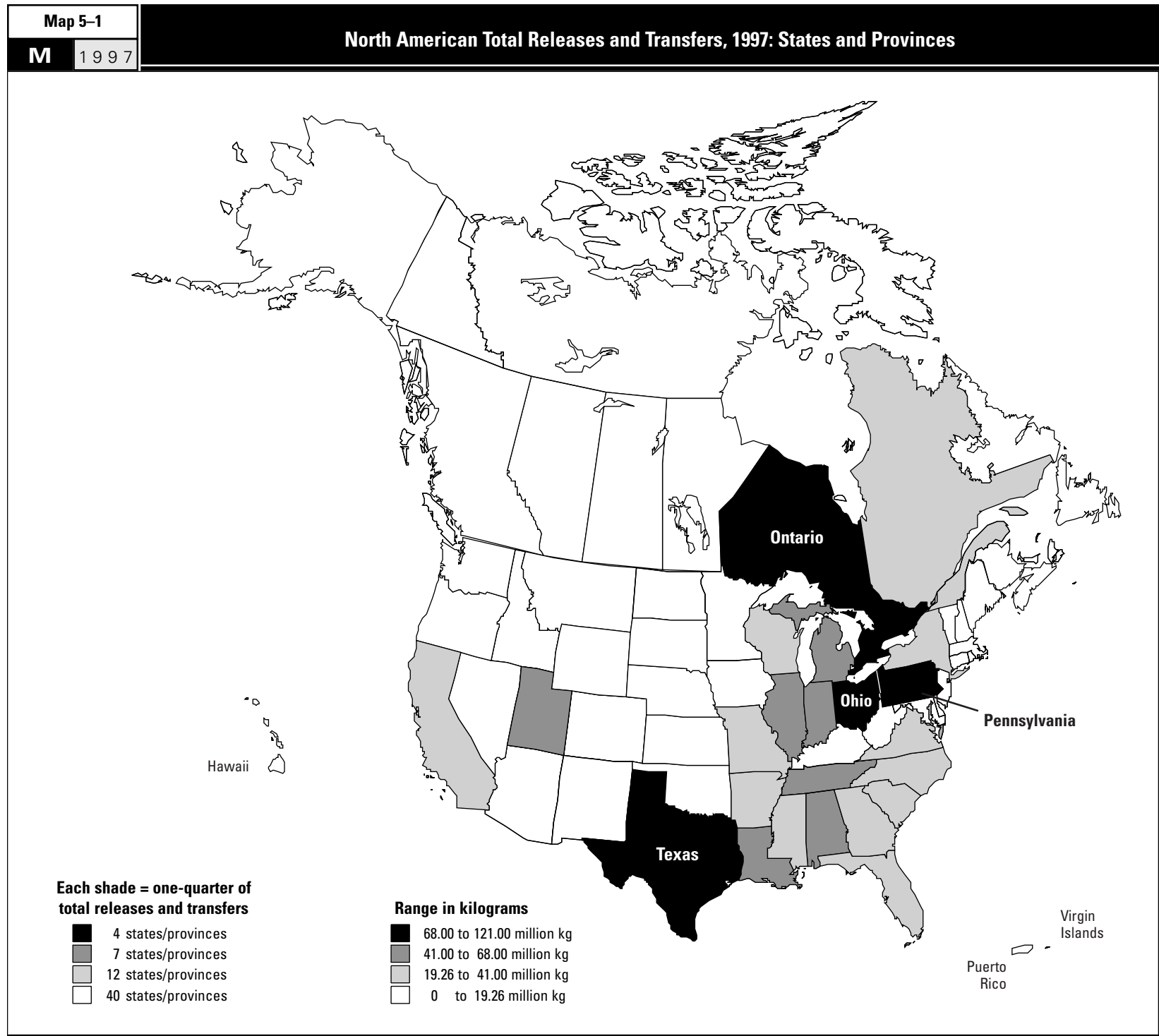
Table 5–2

North American Total Releases and Transfers, by Province and State, 1997

M 1997

Province/State	On-site Releases		Off-site Transfers		Total Releases and Transfers	
	(kg)	Rank	(kg)	Rank	(kg)	Rank
Texas	83,883,000	1	37,017,533	2	120,900,533	1
Pennsylvania	33,713,706	7	46,128,523	1	79,842,229	2
Ontario	39,955,770	4	35,395,295	3	75,351,065	3
Ohio	36,992,382	5	31,794,582	4	68,786,964	4
Louisiana	63,224,378	2	4,373,587	30	67,597,965	5
Indiana	27,811,195	12	23,853,714	6	51,664,909	6
Illinois	31,144,870	9	19,112,546	7	50,257,416	7
Utah	41,835,001	3	4,582,453	28	46,417,454	8
Michigan	20,000,568	16	26,034,295	5	46,034,863	9
Tennessee	35,877,974	6	8,553,230	17	44,431,204	10
Alabama	30,199,535	10	11,316,489	12	41,516,024	11
Florida	32,013,775	8	8,217,166	18	40,230,941	12
North Carolina	29,035,377	11	4,973,031	27	34,008,408	13
Virginia	19,348,059	18	10,668,654	13	30,016,713	14
Missouri	22,779,721	14	6,806,404	22	29,586,125	15
Georgia	20,373,823	15	8,596,443	16	28,970,266	16
South Carolina	19,349,981	17	8,850,818	15	28,200,799	17
Wisconsin	11,955,575	25	14,882,171	8	26,837,746	18
Mississippi	24,753,247	13	1,232,243	40	25,985,490	19
Quebec	14,649,326	20	9,078,464	14	23,727,790	20
Arkansas	10,227,944	27	12,860,185	10	23,088,129	21
California	8,921,534	29	11,897,413	11	20,818,947	22
New York	11,707,417	26	7,565,135	19	19,272,552	23
Montana	18,699,623	19	553,382	46	19,253,005	24
Kentucky	12,243,252	23	6,808,052	21	19,051,304	25
New Jersey	6,022,954	36	12,863,215	9	18,886,169	26
Oregon	9,677,021	28	7,336,782	20	17,013,803	27
Arizona	13,436,541	21	1,765,417	38	15,201,958	28
New Mexico	13,287,600	22	231,464	52	13,519,064	29
Iowa	7,830,048	32	5,641,192	24	13,471,240	30
Alberta	11,987,370	24	1,166,942	42	13,154,312	31
Washington	8,735,877	30	4,246,444	31	12,982,321	32
West Virginia	7,865,320	31	4,221,960	32	12,087,280	33
Kansas	7,228,250	33	3,879,211	34	11,107,461	34
Minnesota	5,371,218	38	5,314,124	25	10,685,342	35
Oklahoma	6,067,878	35	2,510,321	36	8,578,199	36
Connecticut	2,314,384	45	6,184,467	23	8,498,851	37
Maryland	4,446,359	39	3,923,483	33	8,369,842	38
Massachusetts	2,079,208	47	5,029,094	26	7,108,302	39
Idaho	6,229,364	34	340,740	51	6,570,104	40
Nebraska	2,140,998	46	4,410,219	29	6,551,217	41
Puerto Rico	2,894,302	43	3,615,562	35	6,509,864	42
British Columbia	5,459,128	37	890,409	44	6,349,537	43
New Brunswick	2,357,036	44	2,098,146	37	4,455,182	44
Maine	2,947,091	42	849,997	45	3,797,088	45
Manitoba	3,397,552	41	357,194	50	3,754,746	46
Wyoming	3,565,677	40	28,174	57	3,593,851	47
South Dakota	1,343,396	49	1,189,050	41	2,532,446	48
Delaware	1,011,075	52	1,502,816	39	2,513,891	49
Colorado	1,331,351	50	970,229	43	2,301,580	50
Nevada	1,821,377	48	13,540	59	1,834,917	51
Nova Scotia	1,063,517	51	472,606	48	1,536,123	52
New Hampshire	970,539	53	417,204	49	1,387,743	53
Rhode Island	705,748	55	500,366	47	1,206,114	54
Saskatchewan	946,849	54	14,511	58	961,360	55
Virgin Islands	537,535	57	159,608	53	697,143	56
North Dakota	509,847	58	85,306	55	595,153	57
Alaska	540,492	56	1,133	61	541,625	58
Newfoundland	412,606	59	0	—	412,606	59
Vermont	174,940	61	127,329	54	302,269	60
Prince Edward Island	219,770	60	34,694	56	254,464	61
Hawaii	123,864	62	3,258	60	127,122	62
District of Columbia	0	—	2	62	2	63
Total	847,751,115		443,548,017		1,291,299,132	

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



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

Notably, although Louisiana ranked second for releases, it ranked thirtieth for transfers. A total of 67.6 million placed Louisiana fifth for total releases and transfers.

As noted in **Chapter 4**, the four top states and province also reported the largest transfers in 1997, although there they ranked in different order (Pennsylvania, Texas, Ontario, and Ohio). Two of them also ranked among the top four for releases, as seen in **Chapter 3**: Texas (first for releases) and Ontario (fourth).

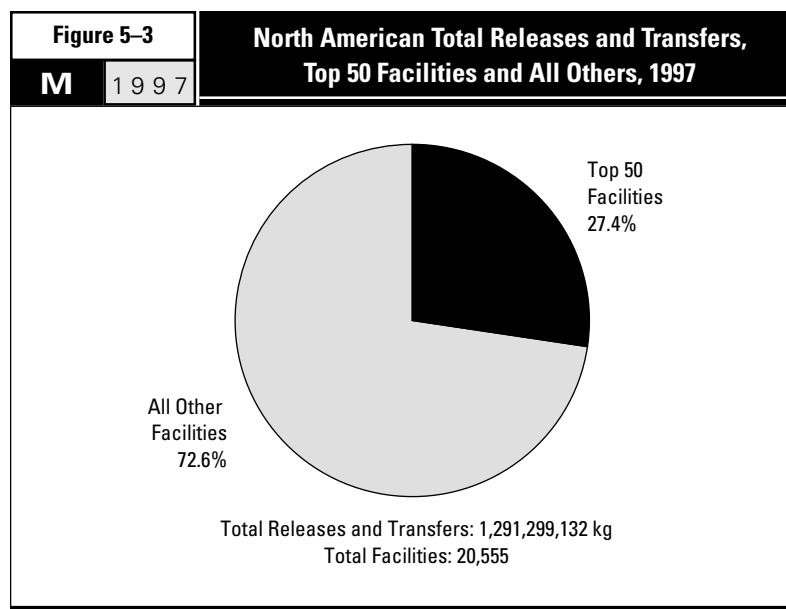
Top Facilities

The 50 North American facilities with the largest totals in the matched data set for 1997 reported 27 percent of all North American releases and transfers, although they represented only 0.24 percent of all facilities in the matched data set. These facilities released 242.9 million kg and transferred 110.6 million kg, for a total of 353.5 million kg (**Figure 5-3** and **Table 5-3**). Releases were a larger percentage (69

percent) of their total than was the case for other facilities (65 percent—see **Figure 5-4**).

The 50 facilities were responsible for nearly two-thirds of the underground injection (51.5 million kg) and on-site land releases (98.0 million kg) in the matched data set, and they reported a little more than one-third of the surface water discharges (36.0 million kg). They reported less than one-third of all transfer types, although transfers exceeded releases for 19 of them.

Twenty-three of the 50 facilities belonged to the primary metals industry (US SIC code 33). This subgroup reported 202.7 million kg of releases and transfers in the matched data set reported by all North American facilities. Twenty-one of the 50 facilities belonged to the chemical manufacturing industry (US SIC code 28) and they reported 127.6 million kg of releases and transfers, 10 percent of the North American total.



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

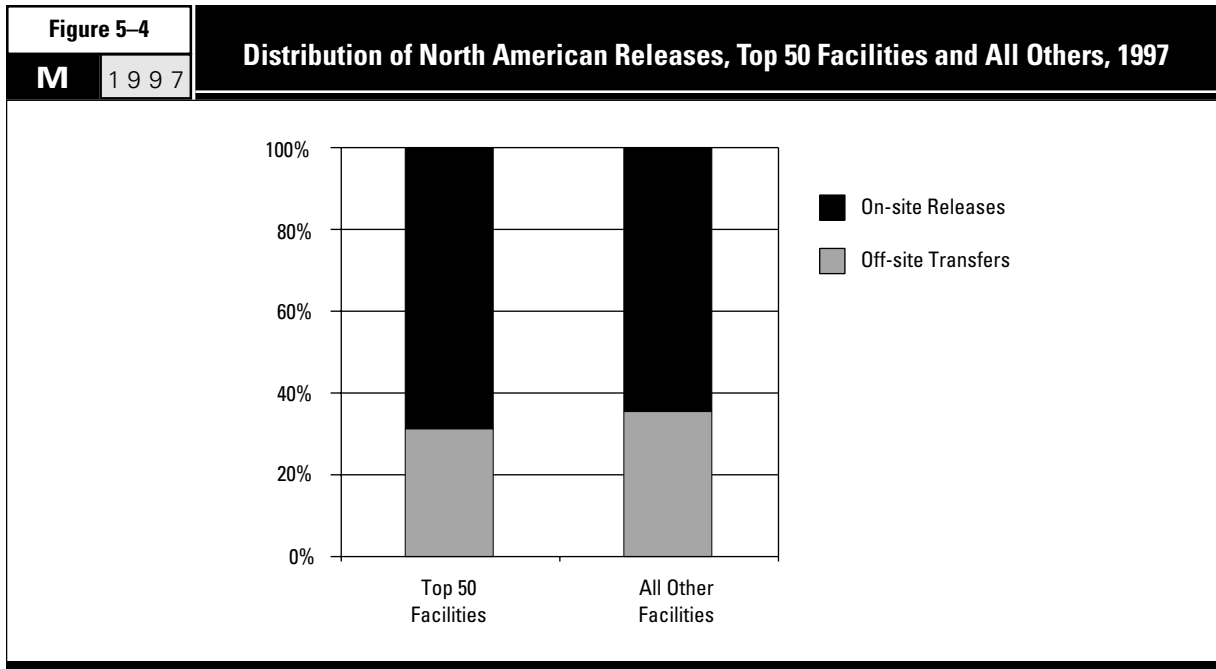
Table 5-3		The 50 North American Facilities with the Largest Total Releases and Transfers, 1997								
Rank	Facility	City, Province/State	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under- ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT		33	6	28,270,233	0	0	0	28,270,233
2	ASARCO Inc.	East Helena, MT		33	10	47,346	2,280	0	17,100,454	17,150,080
3	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA		33	9	224,918	195	0	0	225,113
4	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA		28	12	48,716	13,487,112	0	291,886	13,827,714
5	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	13	288,368	3,644	0	12,053,733	12,345,745
6	Armco Inc. (Route 8 S.)	Butler, PA		33	14	98,510	11,793,413	0	0	11,891,923
7	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	14	109,489	4,441	0	10,908,661	11,022,591
8	USS Clairton Works, USX Corp.	Clairton, PA		33	19	110,326	51,803	0	0	162,129
9	Solutia Inc.	Gonzalez, FL		28	18	103,557	826	9,712,998	0	9,817,381
10	DuPont	Victoria, TX		28	29	176,213	791	8,861,812	5,445	9,044,261
11	Dofasco Inc.	Hamilton, ON	29	33	18	424,762	6,176	0	125	431,063
12	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	13	92,972	0	0	8,503,492	8,596,464
13	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	2	2,131	703	0	6,575,964	6,578,798
14	Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena, TX		28	12	29,252	0	0	0	29,252
15	Lenzing Fibers Corp.	Lowland, TN		28	5	7,619,166	2,879	0	142,766	7,764,811
16	Cytec Ind. Inc., Fortier Plant	Westwego, LA		28	24	71,934	3,167	7,594,695	0	7,669,796
17	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR		33	8	7,224	0	0	0	7,224
18	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN		33	33	777,508	13,242	0	6,463,719	7,254,469
19	Co-Steel Lasco	Whitby, ON	29	33	6	14,253	362	0	1,245,254	1,259,869
20	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL		28	4	6,848,254	9,265	0	175,510	7,033,029
21	Northwestern Steel & Wire Co.	Sterling, IL		33	6	60,613	7,982	0	6,716,100	6,784,695
22	BASF Corp.	Freeport, TX		28	26	143,873	6,353,578	5,407	0	6,502,858
23	Steel Dynamics Inc.	Butler, IN		33	7	6,642	0	0	0	6,642
24	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI		33	7	33,356	2,111	0	0	35,467
25	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX		28	20	386,059	0	1,517,577	0	1,903,636
26	GM Powertrain Defiance, General Motors Corp.	Defiance, OH		33	20	333,612	18,744	0	5,620,881	5,973,237
27	Nucor Steel, Nucor Corp.	Crawfordsville, IN		33	9	30,560	42	0	660	31,262
28	Elkem Metals Co.	Marietta, OH		33	6	174,841	205,442	0	4,752,382	5,132,665
29	ASARCO Inc., Glover Plant	Annapolis, MO		33	7	28,690	10	0	4,892,495	4,921,195
30	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7	4,259,786	0	0	649,000	4,908,786
31	CPI Kraft Div., Consolidated Papers Inc.	Wisconsin Rapids, WI		26	14	1,154,037	340	0	96,599	1,250,976
32	BP Chemicals Inc., BP America Inc.	Lima, OH		28	27	142,400	0	4,146,788	0	4,289,188
33	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX		28	17	54,412	306	4,198,418	3,985	4,257,121
34	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1	2,843	14	0	4,126,984	4,129,841
35	DuPont	Pass Christian, MS		28	11	282,458	0	3,809,524	0	4,091,982
36	Regal Ware Inc.	Kewaskum, WI		34	6	0	0	0	0	0
37	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC		28	6	163,429	0	0	3,805,895	3,969,324
38	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	9	119,063	183	0	3,839,901	3,959,147
39	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	6	0	0	0	0	29
40	Celanese Canada Inc.	Edmonton, AB	37	28	11	294,315	0	3,542,000	593	3,836,908
41	Nucor Steel	Plymouth, UT		33	7	4,421	0	0	2,334	6,755
42	Stone Container Corp.	Panama City, FL		26	10	793,382	0	0	19,618	813,000
43	Rubicon Inc.	Geismar, LA		28	24	144,879	79	3,274,650	0	3,419,608
44	Pharmacia & Upjohn Co.	Portage, MI		28	25	88,132	38,292	1,282,573	0	1,408,997
45	Vicksburg Chemical Co.	Vicksburg, MS		28	3	34,454	3,668,877	0	0	3,703,331
46	National Steel Corp., Great Lakes Div.	Ecorse, MI		33	18	85,003	16,367	0	0	101,370
47	DuPont	New Johnsonville, TN		28	11	33,946	32,986	3,516,553	57	3,583,542
48	Boise Cascade Corp.	Saint Helens, OR		26	9	240,408	0	0	0	240,408
49	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX		26	8	211,227	0	0	0	211,227
50	Eastman Kodak Co., Kodak Park	Rochester, NY		38	46	2,750,339	288,950	0	18,603	3,057,892
Subtotal					653	57,422,312	36,014,602	51,462,995	98,013,096	242,913,034
% of Total					1.0	11.2	36.4	65.3	62.1	28.7
Total					62,851	512,213,962	98,842,863	78,847,314	157,720,611	847,751,115

► 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)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	0	0	28,270,233	Chlorine (air)
2	0	0	0	547,191	547,191	17,697,271	Zinc and compounds (land)
3	0	0	0	13,855,648	13,855,648	14,080,761	Zinc and compounds (transfers of metals)
4	0	0	0	0	0	13,827,714	Phosphoric acid (water)
5	0	0	0	113	113	12,345,858	Zinc/Copper and compounds (land)
6	22,976	0	544	131,125	154,645	12,046,568	Nitric acid and nitrate compounds (water)
7	0	0	0	192,057	192,057	11,214,648	Copper/Zinc/Lead and compounds (land)
8	9,944,975	0	58	0	9,945,033	10,107,162	Ethylene (transfers to treatment)
9	0	0	10	1,584	1,594	9,818,975	Nitric acid and nitrate compounds (UIJ)
10	345,419	0	0	196	345,615	9,389,876	Nitric acid and nitrate compounds (UIJ)
11	865	123	50	8,168,440	8,169,478	8,600,541	Zinc/Manganese and compounds (transfers of metals)
12	0	0	0	0	0	8,596,464	Copper and compounds (land)
13	0	0	0	1,434,288	1,434,288	8,013,086	Chromium and compounds (land)
14	183,178	7,767,699	11	13,156	7,964,044	7,993,296	Nitric acid and nitrate compounds (transfers to sewage)
15	0	0	0	0	0	7,764,811	Carbon disulfide (air)
16	2,944	0	109	18,662	21,715	7,691,511	Acetonitrile, Acrylic acid, Acrylamide (UIJ)
17	0	0	0	7,543,045	7,543,045	7,550,269	Zinc and compounds (transfers of metals)
18	0	0	118	294,304	294,422	7,548,891	Zinc and compounds (land)
19	0	0	0	5,799,885	5,799,885	7,059,754	Zinc and compounds (transfers of metals)
20	0	0	0	0	0	7,033,029	Carbon disulfide (air)
21	0	0	0	30,658	30,658	6,815,353	Zinc/Manganese and compounds (land)
22	116,507	0	8,555	6,738	131,800	6,634,658	Nitric acid and nitrate compounds (water)
23	0	0	0	6,529,560	6,529,560	6,536,202	Zinc and compounds (transfers of metals)
24	0	0	0	6,086,892	6,086,892	6,122,359	Zinc and compounds (transfers of metals)
25	115,728	3,997,034	195	0	4,112,957	6,016,593	Ethylene glycol (transfers to sewage)
26	3,560	1,734	230	505	6,029	5,979,266	Zinc and compounds (land)
27	14,957	0	0	5,609,771	5,624,728	5,655,990	Zinc and compounds (transfers of metals)
28	0	0	0	56,236	56,236	5,188,901	Manganese and compounds (land)
29	0	0	0	0	0	4,921,195	Zinc/Lead and compounds (land)
30	0	0	0	0	0	4,908,786	Sulfuric acid (air)
31	3,202,562	0	0	35,533	3,238,095	4,489,071	Methanol (transfers to treatment)
32	7,342	0	404	345	8,091	4,297,279	Acetonitrile, Acrylamide, Cyanide compounds (UIJ)
33	1,058	0	3,617	207	4,882	4,262,003	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
34	0	0	0	6,349	6,349	4,136,190	Chromium and compounds (land)
35	8,163	0	0	0	8,163	4,100,145	Manganese and compounds (UIJ)
36	0	0	4,078,005	0	4,078,005	4,078,005	Aluminum oxide (transfers to disposal)
37	0	0	0	0	0	3,969,324	Phosphoric acid (land)
38	0	0	0	451	451	3,959,598	Zinc and compounds (land)
39	0	3,732,000	0	224,300	3,956,300	3,956,329	Nitric acid and nitrate compounds (transfers to sewage)
40	0	0	64,384	41,000	105,384	3,942,292	Methanol, Methyl ethyl ketone (UIJ)
41	0	0	0	3,922,477	3,922,477	3,929,232	Zinc and compounds (transfers of metals)
42	0	3,082,333	0	25,122	3,107,455	3,920,455	Methanol (transfers to sewage)
43	287,265	0	38,984	4	326,253	3,745,861	Nitric acid and nitrate compounds, Methanol, Nitrobenzene (UIJ)
44	1,656,263	655,802	6,191	7,301	2,325,557	3,734,554	Dichloromethane (transfers to treatment), Methanol (UIJ)
45	0	0	0	0	0	3,703,331	Nitric acid and nitrate compounds (water)
46	0	10,970	0	3,497,819	3,508,789	3,610,159	Zinc and compounds (transfers of metals)
47	0	0	0	0	0	3,583,542	Manganese and compounds (UIJ)
48	0	3,327,347	1,280	3,628	3,332,255	3,572,663	Methanol (transfers to sewage)
49	0	3,361,224	0	0	3,361,224	3,572,451	Methanol (transfers to sewage)
50	400,499	569	4,024	24,750	429,842	3,487,734	Dichloromethane, Hydrochloric acid, Methanol (air)
	16,314,261	25,936,835	4,206,769	64,109,340	110,567,205	353,480,239	
	16.0	24.4	18.3	30.2	24.9	27.4	
	101,983,917	106,215,580	23,017,618	212,330,902	443,548,017	1,291,299,132	

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

► UIJ = underground injection



Releases and Transfers by Chemical

Top Chemicals

North American facilities released and transferred 1.14 billion kg of the top 25 chemicals. This amounted to 88 percent of the total for matched chemicals. The chemical with the largest total releases and transfers was methanol, followed by zinc and its compounds. As noted in **Chapters 3 and 4**, methanol ranked first for on-site releases and zinc and its compounds ranked first for off-site transfers (**Table 5-4**).

Releases were 66 percent of totals reported for the top 25 chemicals, the same as for all matched chemicals in 1997 (**Figure 5-5**).

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

Table 5-4

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

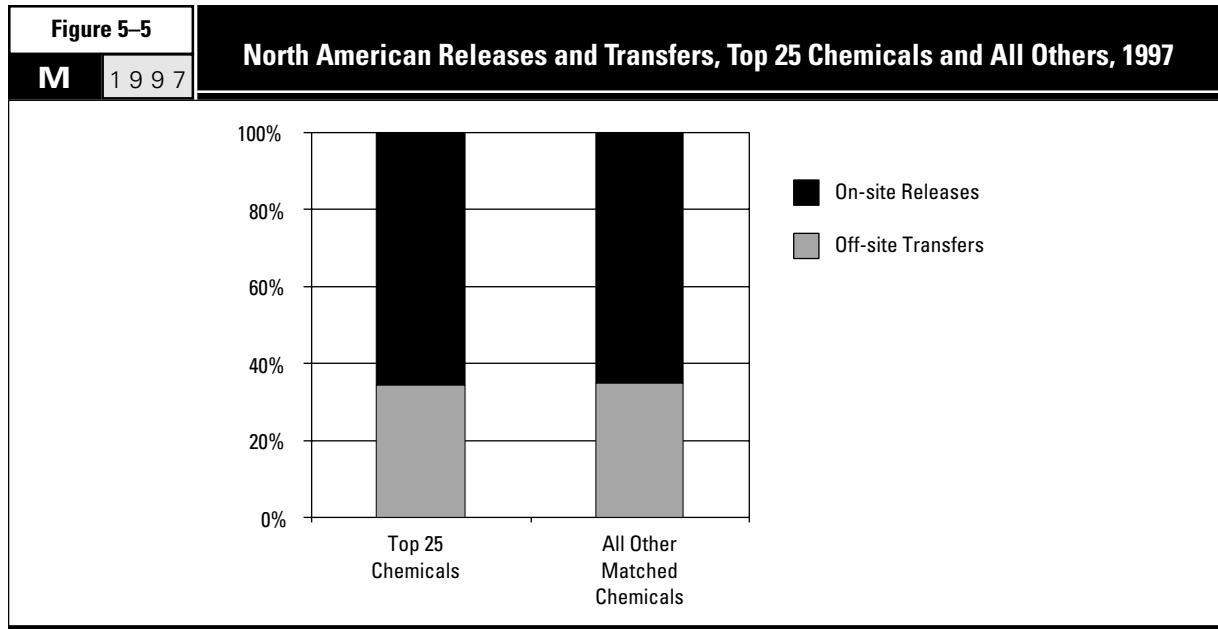
M 1997

CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	NPRI/TRI as % of Total			
						Number of Forms (%)	Total Releases (%)	Total Transfers (%)	Total Releases and Transfers (%)
67-56-1	Methanol	2,477	118,386,601	63,124,935	181,511,536	10.5 / 89.5	16.1 / 83.9	4.6 / 95.4	12.1 / 87.9
—	Zinc (and its compounds)	3,366	65,061,318	114,991,258	180,052,576	9.6 / 90.4	8.9 / 91.1	17.3 / 82.7	14.3 / 85.7
—	Nitric acid and nitrate compounds	2,805	100,405,925	50,406,814	150,812,739	4.9 / 95.1	3.1 / 96.9	10.0 / 90.0	5.4 / 94.6
—	Manganese (and its compounds)	3,084	38,696,839	33,549,526	72,246,365	8.3 / 91.7	4.9 / 95.1	14.5 / 85.5	9.4 / 90.6
108-88-3	Toluene	3,261	57,797,513	12,072,499	69,870,012	7.4 / 92.6	10.6 / 89.4	18.7 / 81.3	12.0 / 88.0
1330-20-7	Xylene (mixed isomers)	3,099	40,022,182	6,905,384	46,927,566	7.5 / 92.5	16.0 / 84.0	24.8 / 75.2	17.3 / 82.7
7664-38-2	Phosphoric acid	2,929	34,298,617	5,332,330	39,630,947	7.1 / 92.9	0.1 / 99.9	9.3 / 90.7	1.3 / 98.7
—	Copper (and its compounds)	4,438	21,840,400	14,647,763	36,488,163	5.9 / 94.1	3.0 / 97.0	7.6 / 92.4	4.9 / 95.1
78-93-3	Methyl ethyl ketone	2,071	29,222,187	4,064,668	33,286,855	6.3 / 93.7	17.6 / 82.4	19.6 / 80.4	17.8 / 82.2
7782-50-5	Chlorine	1,334	30,288,037	629,668	30,917,705	9.0 / 91.0	3.0 / 97.0	0.0 / 100.0	3.0 / 97.0
—	Lead (and its compounds)	1,735	10,069,524	20,515,816	30,585,340	7.4 / 92.6	12.4 / 87.6	14.2 / 85.8	13.6 / 86.4
75-09-2	Dichloromethane	838	23,809,687	6,345,450	30,155,137	6.6 / 93.4	9.7 / 90.3	4.1 / 95.9	8.5 / 91.5
—	Chromium (and its compounds)	3,524	15,262,424	13,717,318	28,979,742	6.7 / 93.3	5.1 / 94.9	14.5 / 85.5	9.5 / 90.5
7647-01-0	Hydrochloric acid	918	27,562,613	0	27,562,613	8.5 / 91.5	5.1 / 94.9	— / —	5.1 / 94.9
74-85-1	Ethylene	344	15,684,983	9,886,644	25,571,627	12.2 / 87.8	12.7 / 87.3	0.0 / 100.0	7.8 / 92.2
100-42-5	Styrene	1,571	21,127,342	3,405,374	24,532,716	5.1 / 94.9	3.9 / 96.1	9.4 / 90.6	4.6 / 95.4
75-15-0	Carbon disulfide	96	23,387,547	139,372	23,526,919	4.2 / 95.8	0.1 / 99.9	0.2 / 99.8	0.1 / 99.9
107-21-1	Ethylene glycol	1,383	4,868,785	15,940,401	20,809,186	10.6 / 89.4	7.3 / 92.7	3.5 / 96.5	4.4 / 95.6
71-36-3	n-Butyl alcohol	1,066	12,347,082	2,374,439	14,721,521	7.3 / 92.7	9.7 / 90.3	16.5 / 83.5	10.8 / 89.2
7664-93-9	Sulfuric acid	612	13,941,694	0	13,941,694	12.7 / 87.3	32.0 / 68.0	— / —	32.0 / 68.0
50-00-0	Formaldehyde	900	11,712,702	1,809,720	13,522,422	10.1 / 89.9	15.6 / 84.4	16.7 / 83.3	15.8 / 84.2
75-05-8	Acetonitrile	101	8,987,554	4,241,538	13,229,092	1.0 / 99.0	0.1 / 99.9	3.1 / 96.9	1.1 / 98.9
79-01-6	Trichloroethylene	649	8,619,908	701,717	9,321,625	4.9 / 95.1	8.1 / 91.9	5.3 / 94.7	7.9 / 92.1
108-10-1	Methyl isobutyl ketone	892	7,990,948	866,510	8,857,458	6.3 / 93.7	9.1 / 90.9	12.5 / 87.5	9.5 / 90.5
108-95-2	Phenol	816	4,997,322	3,725,403	8,722,725	7.5 / 92.5	5.8 / 94.2	7.8 / 92.2	6.6 / 93.4
	Subtotal	44,309	746,389,734	389,394,547	1,135,784,281	7.5 / 92.5	9.0 / 91.0	11.9 / 88.1	10.0 / 90.0
	% of Total	70.5	88.0	87.8	88.0				
	Total	62,851	847,751,115	443,548,017	1,291,299,132	7.3 / 92.7	9.5 / 90.5	11.2 / 88.8	10.1 / 89.9

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

Methanol was released and transferred in the largest amount, with a total of 181.5 million kg, including 118.4 million kg of releases. The total for zinc and its compounds, ranking second, was 180.1 million kg. The majority of the zinc total consisted of 115.0 million kg of transfers. Nitric acid and nitrate compounds ranked third, with releases and transfers of 150.8 million kg, two-thirds of which was released.

NPRI facilities reported nine percent of the releases and 12 percent of the transfers of the top 25 chemicals. This amounted to 10 percent of total releases and transfers. Correspondingly, TRI facilities reported 91 percent of releases of the top chemicals, 88 percent of the transfers, and 90 percent overall. These percentages compare to NPRI's seven percent and TRI's 93 percent of all forms in the matched data set.



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

The proportions of NPRI and TRI reporting varied considerably for individual chemicals. NPRI facilities reported 12 percent of the methanol releases and transfers and 14 percent for zinc and its compounds (compared to 10 percent overall). On the other hand, TRI facilities reported 95 percent of the total for nitric acid and nitrate compounds (compared to 90 percent overall).

(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.)

Carcinogens

North American releases and transfers of the designated carcinogens totaled 195.0 million kg. These substances are 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/>>. Releases of these substances totaled 128.0 million kg, while transfers totaled 67.0 million kg. Fifteen percent of

releases, transfers and total releases and transfers of all matched substances were carcinogens (Table 5-5).

Releases constituted two-thirds of the total amounts reported for carcinogens in 1997, the same as for all matched chemicals (Figure 5-6).

The carcinogens with the largest total releases and transfers were lead and its compounds (30.6 million kg), dichloromethane (30.2 million kg), chromium and its compounds (29.0 million kg) and styrene (24.5 million kg). Releases and transfers of these four substances alone amounted to nine percent of all releases and transfers in the matched data set for 1997.

The 50 North American facilities with the largest total releases and transfers of known carcinogens reported 30 percent (58.9 million kg) of total releases and transfers of these substances (Figure 5-7 and Table 5-6). These facilities reported one-third of the releases and one-quarter of the transfers of carcinogens. This included 86 percent of carcinogen releases to underground injection and 79 percent of on-site land releases. The 50 facilities also reported 30 percent of the transfers of carcinogenic metals to treatment/sewage/disposal and 21 percent of the transfers of nonmetal carcinogens to treatment.

Table 5-5		Total Releases and Transfers in North America of Known or Suspected Carcinogens [†] , 1997			
M	1997				
CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
—	Lead (and its compounds)	1,735	10,069,524	20,515,816	30,585,340
75-09-2	Dichloromethane	838	23,809,687	6,345,450	30,155,137
—	Chromium (and its compounds)	3,524	15,262,424	13,717,318	28,979,742
100-42-5	Styrene	1,571	21,127,342	3,405,374	24,532,716
50-00-0	Formaldehyde	900	11,712,702	1,809,720	13,522,422
79-01-6	Trichloroethylene	649	8,619,908	701,717	9,321,625
—	Nickel (and its compounds)	3,097	2,915,533	5,715,443	8,630,976
75-07-0	Acetaldehyde	266	6,331,624	550,472	6,882,096
71-43-2	Benzene	497	5,628,282	1,072,935	6,701,217
67-66-3	Chloroform	157	3,567,931	845,818	4,413,749
—	Arsenic (and its compounds)	438	2,891,228	1,402,372	4,293,600
127-18-4	Tetrachloroethylene	386	3,106,968	512,823	3,619,791
79-06-1	Acrylamide	82	3,357,989	114,428	3,472,417
1332-21-4	Asbestos (friable)	99	289,649	3,066,684	3,356,333
107-13-1	Acrylonitrile	117	2,391,280	531,447	2,922,727
108-05-4	Vinyl acetate	196	1,846,566	553,319	2,399,885
106-99-0	1,3-Butadiene	197	1,336,918	157,572	1,494,490
107-06-2	1,2-Dichloroethane	84	438,272	869,344	1,307,616
—	Cadmium (and its compounds)	162	457,198	807,736	1,264,934
—	Cobalt (and its compounds)	542	377,928	596,590	974,518
98-95-3	Nitrobenzene	14	318,675	589,636	908,311
106-89-8	Epichlorohydrin	78	151,049	619,602	770,651
117-81-7	Di(2-ethylhexyl) phthalate	329	159,113	605,678	764,791
56-23-5	Carbon tetrachloride	69	177,616	535,635	713,251
75-56-9	Propylene oxide	120	275,662	299,264	574,926
75-01-4	Vinyl chloride	51	461,285	83,378	544,663
75-21-8	Ethylene oxide	156	426,859	60,069	486,928
26471-62-5	Toluenediisocyanate (mixed isomers)	198	24,551	429,873	454,424
123-91-1	1,4-Dioxane	47	159,168	266,885	426,053
106-46-7	1,4-Dichlorobenzene	27	129,621	89,822	219,443
140-88-5	Ethyl acrylate	99	83,370	74,201	157,571
101-77-9	4,4'-Methylenedianiline	27	11,050	39,954	51,004
302-01-2	Hydrazine	43	5,181	20,622	25,803
139-13-9	Nitritotriacetic acid	25	7,346	8,408	15,754
79-46-9	2-Nitropropane	3	12,026	11	12,037
62-56-6	Thiourea	30	3,004	7,083	10,087
584-84-9	Toluene-2,4-diisocyanate	62	2,964	7,013	9,977
96-45-7	Ethylene thiourea	13	130	4,457	4,587
64-67-5	Diethyl sulfate	36	3,365	942	4,307
101-14-4	4,4'-Methylenebis(2-chloroaniline)	25	1,034	3,061	4,095
77-78-1	Dimethyl sulfate	38	2,052	1,056	3,108
91-08-7	Toluene-2,6-diisocyanate	28	1,271	1,429	2,700
121-14-2	2,4-Dinitrotoluene	5	1,674	85	1,759
95-80-7	2,4-Diaminotoluene	3	888	125	1,013
94-59-7	Safrole	2	229	113	342
96-09-3	Styrene oxide	4	302	0	302
606-20-2	2,6-Dinitrotoluene	1	210	50	260
90-94-8	Michler's ketone	1	182	0	182
	Subtotal	17,071	127,958,830	67,040,830	194,999,660
	% of Total	27.2	15.1	15.1	15.1
	Total for All Matched Chemicals	62,851	847,751,115	443,548,017	1,291,299,132

[†] 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.

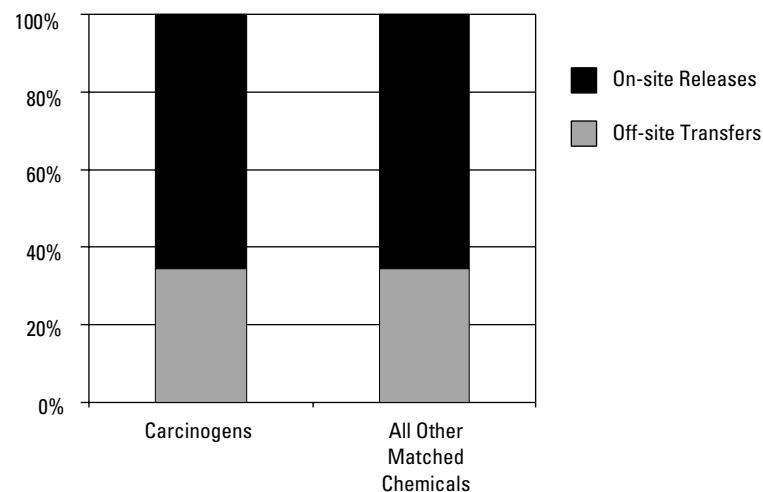
- A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.
- Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total			
Number of Forms (%)	Total Releases (%)	Total Transfers (%)	Total Releases and Transfers (%)
7.4 / 92.6	12.4 / 87.6	14.2 / 85.8	13.6 / 86.4
6.6 / 93.4	9.7 / 90.3	4.1 / 95.9	8.5 / 91.5
6.7 / 93.3	5.1 / 94.9	14.5 / 85.5	9.5 / 90.5
5.1 / 94.9	3.9 / 96.1	9.4 / 90.6	4.6 / 95.4
10.1 / 89.9	15.6 / 84.4	16.7 / 83.3	15.8 / 84.2
4.9 / 95.1	8.1 / 91.9	5.3 / 94.7	7.9 / 92.1
4.8 / 95.2	12.5 / 87.5	9.0 / 91.0	10.2 / 89.8
6.8 / 93.2	4.2 / 95.8	1.3 / 98.7	4.0 / 96.0
9.7 / 90.3	26.3 / 73.7	2.5 / 97.5	22.5 / 77.5
8.9 / 91.1	6.2 / 93.8	0.7 / 99.3	5.2 / 94.8
11.0 / 89.0	5.2 / 94.8	4.8 / 95.2	5.0 / 95.0
7.0 / 93.0	1.7 / 98.3	4.8 / 95.2	2.1 / 97.9
6.1 / 93.9	0.0 / 100.0	2.3 / 97.7	0.1 / 99.9
36.4 / 63.6	18.3 / 81.7	36.0 / 64.0	34.4 / 65.6
6.8 / 93.2	0.3 / 99.7	0.0 / 100.0	0.2 / 99.8
5.1 / 94.9	15.3 / 84.7	0.7 / 99.3	12.0 / 88.0
6.6 / 93.4	7.9 / 92.1	8.0 / 92.0	7.9 / 92.1
7.1 / 92.9	4.5 / 95.5	0.1 / 99.9	1.5 / 98.5
9.3 / 90.7	9.0 / 91.0	15.3 / 84.7	13.0 / 87.0
4.6 / 95.4	5.5 / 94.5	1.7 / 98.3	3.2 / 96.8
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
1.3 / 98.7	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
10.0 / 90.0	12.5 / 87.5	7.5 / 92.5	8.5 / 91.5
5.8 / 94.2	0.2 / 99.8	2.3 / 97.7	1.8 / 98.2
2.5 / 97.5	4.7 / 95.3	0.0 / 100.0	2.3 / 97.7
15.7 / 84.3	9.5 / 90.5	0.0 / 100.0	8.1 / 91.9
5.8 / 94.2	3.8 / 96.2	0.0 / 100.0	3.3 / 96.7
12.1 / 87.9	3.2 / 96.8	1.9 / 98.1	2.0 / 98.0
6.4 / 93.6	2.5 / 97.5	0.0 / 100.0	0.9 / 99.1
14.8 / 85.2	6.2 / 93.8	0.4 / 99.6	3.9 / 96.1
6.1 / 93.9	0.2 / 99.8	0.1 / 99.9	0.2 / 99.8
3.7 / 96.3	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
2.3 / 97.7	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
64.0 / 36.0	39.0 / 61.0	34.5 / 65.5	36.6 / 63.4
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
3.3 / 96.7	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
1.6 / 98.4	0.3 / 99.7	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
4.0 / 96.0	0.6 / 99.4	0.0 / 100.0	0.1 / 99.9
2.6 / 97.4	0.5 / 99.5	0.0 / 100.0	0.3 / 99.7
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
20.0 / 80.0	48.7 / 51.3	0.0 / 100.0	46.4 / 53.6
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
50.0 / 50.0	98.3 / 1.7	— / —	98.3 / 1.7
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
6.8 / 93.2	8.5 / 91.5	11.6 / 88.4	9.6 / 90.4
7.3 / 92.7	9.5 / 90.5	11.2 / 88.8	10.1 / 89.9

Figure 5-6

North American Total Releases and Transfers, Known or Suspected Carcinogens[†] and All Others, 1997

M 1997



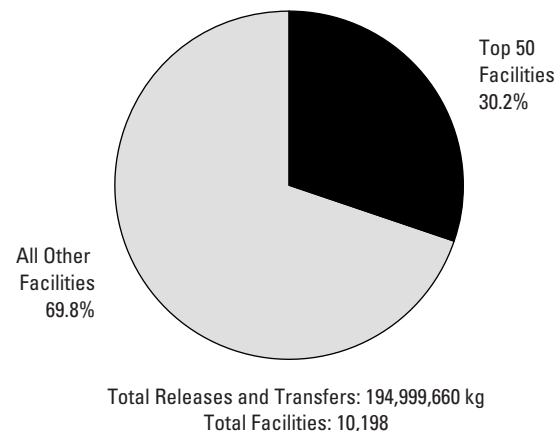
[†] Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

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

Figure 5-7

North American Total Releases and Transfers of Known or Suspected Carcinogens[†], Top 50 Facilities and All Others, 1997

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

Table 5-6		The 50 North American Facilities with the Largest Total Releases and Transfers of Known or Suspected Carcinogens†, 1997								
Rank	Facility	City, Province/State	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1	2,018	113	0	6,575,964	6,578,095
2	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	5	27,487	452	0	4,073,128	4,101,067
3	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1	2,843	14	0	4,126,984	4,129,841
4	Monsanto Co.	Luling, LA		28	2	15,601	0	3,221,043	0	3,236,644
5	ASARCO Inc.	East Helena, MT		33	4	23,355	1,262	0	1,739,278	1,763,895
6	Pharmacia & Upjohn Co.	Portage, MI		28	4	55,706	830	8,784	0	65,320
7	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE		28	2	11	46	0	0	57
8	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX		28	5	20,563	0	1,690,118	656	1,711,337
9	ASARCO Inc., Glover Plant	Annapolis, MO		33	4	21,141	5	0	1,582,218	1,603,364
10	Angus Chemical Co.	Sterlington, LA		28	4	12,481	1,956	1,126,995	0	1,141,432
11	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR		33	1	34,921	7	0	1,062,717	1,097,645
12	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA		33	4	5,149	14	0	0	5,163
13	Aquaglass Corp., Masco Corp.	Adamsville, TN		30	1	1,057,867	0	0	0	1,057,867
14	Solutia Inc., Chocolate Bayou	Alvin, TX		28	3	13,064	0	1,025,986	0	1,039,050
15	Eastman Kodak Co., Kodak Park	Rochester, NY		38	9	980,987	25,565	0	6,803	1,013,355
16	BP Chemicals Inc., BP America Inc.	Lima, OH		28	10	27,171	0	965,267	0	992,438
17	Cytec Ind. Inc., Fortier Plant	Westwego, LA		28	5	4,009	235	979,139	0	983,383
18	Quemetco Inc., RSR Corp.	City of Industry, CA		33	3	722	1	0	0	723
19	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR		28	2	396,123	0	0	0	396,123
20	Foamex L.P., Div. of Kihl	Corry, PA		30	2	903,448	0	0	0	903,448
21	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4	248,650	0	0	649,000	897,650
22	ASARCO Inc.	Omaha, NE		33	2	1,818	338	0	680	2,836
23	Quemetco Inc., RSR Corp.	Indianapolis, IN		33	3	1,416	0	0	0	1,416
24	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	6	13,177	267	0	833,526	846,970
25	Borden Chemicals & Plastics LP	Geismar, LA		28	7	815,549	187	9	0	815,745
26	C & D Techs. Inc.	Conyers, GA		36	1	430	0	0	363	793
27	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR		33	4	663	0	0	0	663
28	Boeing Co.	Wichita, KS		Mult.	6	595,943	452	0	0	596,395
29	Carpenter Co., Tupelo Div.	Verona, MS		30	2	704,215	0	0	0	704,215
30	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR		28	1	689,524	0	0	0	689,524
31	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI		33	5	19,138	2	0	0	19,140
32	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	7	8,074	0	0	672,109	680,183
33	Shell Oil Co.	Deer Park, TX		Mult.	17	90,956	3	0	164	91,123
34	Dofasco Inc.	Hamilton, ON	29	33	5	315,968	446	0	82	316,496
35	Northwestern Steel & Wire Co.	Sterling, IL		33	2	4,921	345	0	593,651	598,917
36	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	5	99,783	98	0	494,901	594,782
37	Co-Steel Lasco	Whitby, ON	29	33	3	1,220	99	0	91,254	92,573
38	Carpenter Co.	Russellville, KY		Mult.	5	571,776	0	0	0	571,776
39	Sterling Chemicals Inc.	Texas City, TX		28	9	67,453	0	481,566	0	549,019
40	Wagner Brake, Cooper Ind. Inc.	Scottsville, KY		37	1	113	0	0	0	113
41	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	2	1,476	100	0	0	1,676
42	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA		33	3	713	251	0	0	964
43	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ		33	4	16,091	0	0	40,230	56,321
44	Foamex Intd. Inc.	Milan, TN		30	2	521,285	0	0	0	521,285
45	Rubicon Inc.	Geismar, LA		28	9	40,207	8	268,481	0	308,696
46	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO		33	3	17,134	226	0	0	17,360
47	Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta, PR		28	1	35,873	0	0	0	35,873
48	Celanese Canada Inc.	Edmonton, AB	37	28	6	151,422	0	227,000	0	378,422
49	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	3	17,150	837	0	0	17,987
50	FMC Corp.	Pocatello, ID		28	4	2,924	0	0	477,785	480,709
Subtotal					204	8,659,729	34,159	9,994,388	23,021,493	41,709,869
% of Total					1.2	10.0	4.0	86.0	78.6	32.6
Total for All Matched Carcinogens					17,071	86,184,372	845,133	11,623,573	29,272,397	127,958,830

† 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/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	1,434,288	1,434,288	8,012,383	Chromium and compounds (land)
2	0	0	0	69,666	69,666	4,170,733	Lead/Arsenic and compounds (land)
3	0	0	0	6,349	6,349	4,136,190	Chromium and compounds (land)
4	6,803	0	0	0	6,803	3,243,447	Formaldehyde (UIJ)
5	0	0	0	279,650	279,650	2,043,545	Lead and compounds (land)
6	1,629,089	126,005	4,526	69	1,759,689	1,825,009	Dichloromethane (transfers to treatment)
7	0	0	0	1,723,356	1,723,356	1,723,413	Lead and compounds (transfers of metals)
8	504	0	0	207	711	1,712,048	Acrylamide, Acrylonitrile (UIJ)
9	0	0	0	0	0	1,603,364	Lead and compounds (land)
10	91	0	0	3,717	3,808	1,145,240	Formaldehyde (UIJ)
11	0	0	0	0	0	1,097,645	Nickel and compounds (land)
12	0	0	0	1,061,318	1,061,318	1,066,481	Lead/Nickel/Cadmium and compounds (transfers of metals)
13	0	0	0	0	0	1,057,867	Styrene (air)
14	0	0	0	0	0	1,039,050	Acrylonitrile (UIJ)
15	17,276	0	544	176	17,996	1,031,351	Dichloromethane (air)
16	2,373	0	177	230	2,780	995,218	Acrylamide (UIJ)
17	31	0	2	22	55	983,438	Acrylamide (UIJ)
18	0	0	0	934,969	934,969	935,692	Lead and compounds (transfers of metals)
19	498,866	38,957	0	0	537,823	933,946	Dichloromethane (transfers to treatment, air)
20	7,126	0	0	0	7,126	910,574	Dichloromethane (air)
21	0	0	0	0	0	897,650	Chromium and compounds (land)
22	0	0	0	893,671	893,671	896,507	Lead and compounds (transfers of metals)
23	0	0	0	879,880	879,880	881,296	Lead and compounds (transfers of metals)
24	0	0	0	113	113	847,083	Lead/Arsenic/Chromium and compounds (land)
25	18,796	0	12	1	18,809	834,554	Benzene (air)
26	0	0	0	810,519	810,519	811,312	Lead and compounds (transfers of metals)
27	0	0	0	735,580	735,580	736,243	Lead and compounds (transfers of metals)
28	33,401	0	0	98,927	132,328	728,723	Tetrachloroethylene (air)
29	992	0	0	0	992	705,207	Dichloromethane (air)
30	0	12	0	0	12	689,536	Dichloromethane (air)
31	0	0	0	666,122	666,122	685,262	Lead/Arsenic/Cobalt and compounds (transfers of metals)
32	0	0	0	0	0	680,183	Lead/Chromium and compounds (land)
33	559,185	0	327	0	559,512	650,635	Epichlorohydrin (transfers to treatment)
34	0	63	0	302,700	302,763	619,259	Benzene (air), Lead and compounds (transfers of metals)
35	0	0	0	2,087	2,087	601,004	Chromium/Lead and compounds (land)
36	0	0	0	368	368	595,150	Lead and compounds (land)
37	0	0	0	496,278	496,278	588,851	Lead and compounds (transfers of metals)
38	4,402	0	0	0	4,402	576,178	Dichloromethane (air)
39	9,324	0	3,363	108	12,795	561,814	Acrylamide (UIJ)
40	0	0	557,771	0	557,771	557,884	Asbestos (transfers to disposal)
41	0	0	0	545,510	545,510	547,186	Chromium and compounds (transfers of metals)
42	0	0	0	545,674	545,674	546,638	Lead and compounds (transfers of metals)
43	0	0	0	478,160	478,160	534,481	Arsenic and compounds (transfers of metals)
44	445	0	0	0	445	521,730	Dichloromethane (air)
45	192,526	0	5,468	4	197,998	506,694	Nitrobenzene (UIJ, transfers to treatment)
46	0	0	0	475,008	475,008	492,368	Lead and compounds (transfers of metals)
47	445,533	7,846	0	0	453,379	489,252	Dichloromethane (transfers to treatment)
48	0	0	64,033	41,000	105,033	483,455	Vinyl acetate, Acetaldehyde, Formaldehyde (UIJ)
49	0	0	0	465,000	465,000	482,987	Lead and compounds (transfers of metals)
50	0	0	0	23	23	480,732	Chromium/Cadmium and compounds (land)
	3,426,763	172,883	636,223	12,950,750	17,186,619	58,896,488	
	21.0	6.2	12.3	30.3	25.6	30.2	
	16,311,305	2,805,020	5,169,230	42,755,275	67,040,830	194,999,660	

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

► UIJ = underground injection

Metals

Releases and transfers of 15 metals (and their compounds) in North America totaled 373.3 million kg. This was 29 percent of the total for all matched chemicals. Zinc and its compounds had the largest total release and transfer amount, 180.1 million kg, followed by manganese and copper (and their compounds) with 72.2 million kg and 36.5 million kg, respectively (Table 5-7).

The 50 North American facilities with the largest releases and transfers of metals and their compounds reported 60 percent of the total in 1997, with 223.5 million kg (Figure 5-8 and Table 5-8).

Releases of metals by the top 50 facilities equaled 119.8 million kg and constituted 74 percent of the total metals released. Similarly, they made three-quarters of the on-site land releases of metals. Their transfers equaled 103.7 million kg, 49 percent of the total metals transferred.

Table 5-7		Total Releases and Transfers in North America of Metals and Their Compounds, 1997			
M	1997				
CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
—	Zinc (and its compounds)	3,366	65,061,318	114,991,258	180,052,576
—	Manganese (and its compounds)	3,084	38,696,839	33,549,526	72,246,365
—	Copper (and its compounds)	4,438	21,840,400	14,647,763	36,488,163
—	Lead (and its compounds)	1,735	10,069,524	20,515,816	30,585,340
—	Chromium (and its compounds)	3,524	15,262,424	13,717,318	28,979,742
—	Nickel (and its compounds)	3,097	2,915,533	5,715,443	8,630,976
7429-90-5	Aluminum (fume or dust)	362	2,278,190	4,069,070	6,347,260
—	Arsenic (and its compounds)	438	2,891,228	1,402,372	4,293,600
—	Antimony (and its compounds)	701	639,540	2,177,176	2,816,716
—	Cadmium (and its compounds)	162	457,198	807,736	1,264,934
—	Cobalt (and its compounds)	542	377,928	596,590	974,518
7440-62-2	Vanadium (fume or dust)	33	274,610	21,369	295,979
—	Selenium (and its compounds)	65	193,895	48,840	242,735
—	Silver (and its compounds)	148	30,027	44,091	74,118
—	Mercury (and its compounds)	32	10,571	26,534	37,105
	Subtotal	21,727	160,999,225	212,330,902	373,330,127
	% of Total	34.6	19.0	47.9	28.9
	Total for All Matched Chemicals	62,851	847,751,115	443,548,017	1,291,299,132

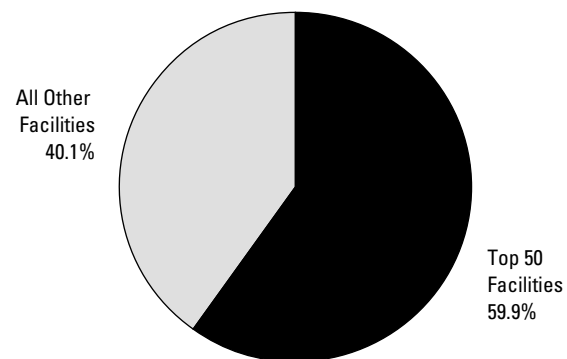
► Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total			
Number of Forms (%)	Total Releases (%)	Total Transfers (%)	Total Releases and Transfers (%)
9.6 / 90.4	8.9 / 91.1	17.3 / 82.7	14.3 / 85.7
8.3 / 91.7	4.9 / 95.1	14.5 / 85.5	9.4 / 90.6
5.9 / 94.1	3.0 / 97.0	7.6 / 92.4	4.9 / 95.1
7.4 / 92.6	12.4 / 87.6	14.2 / 85.8	13.6 / 86.4
6.7 / 93.3	5.1 / 94.9	14.5 / 85.5	9.5 / 90.5
4.8 / 95.2	12.5 / 87.5	9.0 / 91.0	10.2 / 89.8
10.2 / 89.8	23.5 / 76.5	6.3 / 93.7	12.4 / 87.6
11.0 / 89.0	5.2 / 94.8	4.8 / 95.2	5.0 / 95.0
4.3 / 95.7	1.1 / 98.9	0.6 / 99.4	0.7 / 99.3
9.3 / 90.7	9.0 / 91.0	15.3 / 84.7	13.0 / 87.0
4.6 / 95.4	5.5 / 94.5	1.7 / 98.3	3.2 / 96.8
39.4 / 60.6	78.4 / 21.6	7.7 / 92.3	73.3 / 26.7
9.2 / 90.8	4.8 / 95.2	62.2 / 37.8	16.3 / 83.7
6.1 / 93.9	4.9 / 95.1	0.6 / 99.4	2.4 / 97.6
9.4 / 90.6	2.3 / 97.7	13.1 / 86.9	10.1 / 89.9
7.1 / 92.9	7.3 / 92.7	15.0 / 85.0	11.7 / 88.3
7.3 / 92.7	9.5 / 90.5	11.2 / 88.8	10.1 / 89.9

Figure 5-8

North American Total Releases and Transfers of Metals and Their Compounds, Top 50 Facilities and All Others, 1997

M 1997



Total Releases and Transfers: 373,330,127 kg
Total Facilities: 10,378

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

Table 5-8		The 50 North American Facilities with the Largest Total Releases and Transfers of Metals and Their Compounds, 1997								
Rank	Facility	City, Province/State	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	ASARCO Inc.	East Helena, MT		33	9	40,338	2,280	0	17,100,454	17,143,072
2	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA		33	9	224,918	195	0	0	225,113
3	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	10	133,922	3,644	0	12,048,532	12,186,098
4	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	8	71,865	4,215	0	10,900,498	10,976,578
5	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	11	18,596	0	0	8,503,492	8,522,088
6	Dofasco Inc.	Hamilton, ON	29	33	6	16,758	6,173	0	0	22,931
7	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1	2,018	113	0	6,575,964	6,578,095
8	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR		33	7	7,224	0	0	0	7,224
9	Co-Steel Lasco	Whitby, ON	29	33	6	14,253	362	0	1,245,254	1,259,869
10	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN		33	11	140,596	7,755	0	6,450,341	6,598,692
11	Northwestern Steel & Wire Co.	Sterling, IL		33	4	55,261	1,179	0	6,716,100	6,772,540
12	Steel Dynamics Inc.	Butler, IN		33	6	6,612	0	0	0	6,612
13	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI		33	7	33,356	2,111	0	0	35,467
14	Nucor Steel, Nucor Corp.	Crawfordsville, IN		33	6	964	42	0	660	1,666
15	GM Powertrain Defiance, General Motors Corp.	Defiance, OH		33	6	33,575	2,175	0	5,564,083	5,599,833
16	Elkem Metals Co.	Marietta, OH		33	5	174,615	205,442	0	4,752,382	5,132,439
17	ASARCO Inc., Glover Plant	Annapolis, MO		33	7	28,690	10	0	4,892,495	4,921,195
18	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1	2,843	14	0	4,126,984	4,129,841
19	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	8	118,721	183	0	3,839,901	3,958,805
20	Nucor Steel	Plymouth, UT		33	5	4,348	0	0	2,334	6,682
21	DuPont	Pass Christian, MS		28	6	0	0	3,809,524	0	3,809,524
22	National Steel Corp., Great Lakes Div.	Ecorse, MI		33	5	52,446	4,354	0	0	56,800
23	DuPont	New Johnsonville, TN		28	5	0	0	3,516,553	0	3,516,553
24	USS Mon Valley Works, USX Corp.	Braddock, PA		33	5	1,549	465	0	0	2,014
25	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR		33	7	10,868	115	0	0	10,983
26	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ		33	11	2,046,411	0	0	842,723	2,889,134
27	Cerro Wire & Cable Co. Inc.	Hartselle, AL		33	3	120	4	0	0	124
28	Granite City Steel, National Steel Corp.	Granite City, IL		33	6	22,216	5,704	0	2,667,815	2,695,735
29	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL		33	5	34,992	398	0	210	35,600
30	Timken Co., Faircrest Steel Plant	Canton, OH		33	6	5,378	1	0	0	5,379
31	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA		33	5	12,563	0	0	0	12,563
32	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL		33	5	4,231	0	0	0	4,231
33	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5	48,835	550	0	2,300,405	2,349,790
34	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5	16,600	0	0	0	17,750
35	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL		33	6	5,185	0	0	0	5,185
36	FMC Corp.	Pocatello, ID		28	9	4,674	338	0	2,167,628	2,172,640
37	USS Fairfield Works, USX Corp.	Fairfield, AL		33	8	6,353	794	0	2,133,209	2,140,356
38	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS		Mult.	3	4,354	6,145	0	2,066,666	2,077,165
39	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6	18,012	2,682	0	442,030	462,724
40	Southwire Co.	Carrollton, GA		Mult.	29	13,228	1,310	0	0	14,538
41	Bar Techs. Inc.	Johnstown, PA		33	5	4,815	4	0	0	4,819
42	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA		33	5	10,815	0	0	0	10,815
43	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE		28	5	27,463	4,549	0	0	32,012
44	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	5	22,322	152	0	1,730,140	1,752,614
45	ASARCO Inc.	Omaha, NE		33	5	5,008	539	0	1,362	6,909
46	Ameristeel Corp.	Charlotte, NC		33	6	20,292	0	0	0	20,292
47	Ivaco Rolling Mills	L'Orignal, ON	29	33	7	8,552	1	0	0	9,447
48	Oregon Steel Mills Inc.	Portland, OR		33	6	2,737	47	0	0	2,784
49	Chemetals Inc., Comilog	New Johnsonville, TN		28	1	15,556	583	0	1,523,810	1,539,949
50	Acme Steel Co., Acme Metals Inc.	Riverdale, IL		Mult.	6	16,643	681	0	0	17,324
Subtotal					324	3,571,691	265,309	7,326,077	108,595,472	119,760,593
% of Total					1.5	28.7	8.5	96.4	78.8	74.4
Total for All Matched Metals					21,727	12,464,982	3,120,515	7,597,100	137,777,998	160,999,225

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	547,191	547,191	17,690,263	Zinc and compounds (land)
2	0	0	0	13,855,648	13,855,648	14,080,761	Zinc and compounds (transfers of metals)
3	0	0	0	113	113	12,186,211	Zinc/Copper and compounds (land)
4	0	0	0	192,057	192,057	11,168,635	Copper/Zinc/Lead and compounds (land)
5	0	0	0	0	0	8,522,088	Copper and compounds (land)
6	0	0	0	8,168,440	8,168,440	8,191,371	Zinc/Manganese and compounds (transfers of metals)
7	0	0	0	1,434,288	1,434,288	8,012,383	Chromium and compounds (land)
8	0	0	0	7,543,045	7,543,045	7,550,269	Zinc and compounds (transfers of metals)
9	0	0	0	5,799,885	5,799,885	7,059,754	Zinc and compounds (transfers of metals)
10	0	0	0	294,304	294,304	6,892,996	Zinc and compounds (land)
11	0	0	0	30,658	30,658	6,803,198	Zinc/Manganese and compounds (land)
12	0	0	0	6,529,560	6,529,560	6,536,172	Zinc and compounds (transfers of metals)
13	0	0	0	6,086,892	6,086,892	6,122,359	Zinc and compounds (transfers of metals)
14	0	0	0	5,609,771	5,609,771	5,611,437	Zinc and compounds (transfers of metals)
15	0	0	0	505	505	5,600,338	Zinc and compounds (land)
16	0	0	0	56,236	56,236	5,188,675	Manganese and compounds (land)
17	0	0	0	0	0	4,921,195	Zinc/Lead and compounds (land)
18	0	0	0	6,349	6,349	4,136,190	Chromium and compounds (land)
19	0	0	0	451	451	3,959,256	Zinc and compounds (land)
20	0	0	0	3,922,477	3,922,477	3,929,159	Zinc and compounds (transfers of metals)
21	0	0	0	0	0	3,809,524	Manganese and compounds (UIJ)
22	0	0	0	3,497,819	3,497,819	3,554,619	Zinc and compounds (transfers of metals)
23	0	0	0	0	0	3,516,553	Manganese and compounds (UIJ)
24	0	0	0	3,090,268	3,090,268	3,092,282	Zinc and compounds (transfers of metals)
25	0	0	0	2,957,542	2,957,542	2,968,525	Zinc and compounds (transfers of metals)
26	0	0	0	36	36	2,889,170	Copper and compounds (air)
27	0	0	0	2,863,172	2,863,172	2,863,296	Copper and compounds (transfers of metals)
28	0	0	0	24	24	2,695,759	Zinc and compounds (land)
29	0	0	0	2,498,413	2,498,413	2,534,013	Zinc and compounds (transfers of metals)
30	0	0	0	2,486,113	2,486,113	2,491,492	Zinc and compounds (transfers of metals)
31	0	0	0	2,388,657	2,388,657	2,401,220	Zinc and compounds (transfers of metals)
32	0	0	0	2,384,320	2,384,320	2,388,551	Zinc and compounds (transfers of metals)
33	0	0	0	0	0	2,349,790	Zinc and compounds (land)
34	0	0	0	2,298,300	2,298,300	2,316,050	Zinc and compounds (transfers of metals)
35	0	0	0	2,175,039	2,175,039	2,180,224	Zinc and compounds (transfers of metals)
36	0	0	0	790	790	2,173,430	Zinc/Chromium and compounds (land)
37	0	0	0	0	0	2,140,356	Zinc and compounds (land)
38	0	0	0	0	0	2,077,165	Manganese and compounds (land)
39	0	0	0	1,480,000	1,480,000	1,942,724	Zinc and compounds (transfers of metals)
40	0	0	0	1,917,884	1,917,884	1,932,422	Zinc/Lead and compounds (transfers of metals)
41	0	0	0	1,925,941	1,925,941	1,930,760	Zinc and compounds (transfers of metals)
42	0	0	0	1,758,623	1,758,623	1,769,438	Zinc and compounds (transfers of metals)
43	0	0	0	1,723,356	1,723,356	1,755,368	Lead and compounds (transfers of metals)
44	0	0	0	0	0	1,752,614	Zinc and compounds (land)
45	0	0	0	1,742,791	1,742,791	1,749,700	Lead/Zinc and compounds (transfers of metals)
46	0	0	0	1,680,432	1,680,432	1,700,724	Zinc and compounds (transfers of metals)
47	0	0	0	1,647,700	1,647,700	1,657,147	Zinc and compounds (transfers of metals)
48	0	0	0	1,620,869	1,620,869	1,623,653	Zinc and compounds (transfers of metals)
49	0	0	0	0	0	1,539,949	Manganese and compounds (land)
50	0	0	0	1,487,000	1,487,000	1,504,324	Zinc and compounds (transfers of metals)
	0	0	0	103,702,959	103,702,959	223,463,552	
				48.8	48.8	59.9	
	0	0	0	212,330,902	212,330,902	373,330,127	

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

► UIJ=underground injection

Releases and Transfers by Industry

Chemical manufacturing, the primary metals industry and paper products together reported 71 percent of the total releases and transfers in North America in 1997 (Figure 5-9). The chemical manufacturing industry reported the largest amounts, 412.7 million kg, of total releases and transfers. The primary metals industry reported a total of 365.7 million kg, and the paper products industry reported 139.2 million kg (Table 5-9). These top three industries reported 32 percent, 28 percent and 11 percent, respectively, of total releases and transfers in North America.

As discussed in Chapters 3 and 4, chemical manufacturing facilities reported the largest releases (272.9 million kg) and the primary metals industry reported the largest transfers (175.6 million kg) in North America in 1997 (Figure 5-10). The primary metals industry is examined in more detail in Chapter 7.

Table 5-9		Total Releases and Transfers in North America by Industry, 1997			
M	1997				
US SIC Rank Code	Industry	Number of Forms (kg)	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1 28	Chemicals	17,597	272,904,779	139,768,161	412,672,940
2 33	Primary Metals	6,723	190,032,817	175,638,434	365,671,251
3 26	Paper Products	2,423	112,338,644	26,848,124	139,186,768
4	Multiple Codes 20-39*	3,840	42,133,850	21,755,280	63,889,130
5 30	Rubber and Plastics Products	3,264	45,055,140	7,230,381	52,285,521
6 37	Transportation Equipment	4,217	42,699,007	8,933,582	51,632,589
7 34	Fabricated Metals Products	7,085	22,761,249	19,254,312	42,015,561
8 29	Petroleum and Coal Products	3,066	28,019,407	5,513,243	33,532,650
9 20	Food Products	2,834	11,527,600	11,809,279	23,336,879
10 36	Electronic/Electrical Equipment	2,648	6,720,557	11,978,844	18,699,401
11 32	Stone/Clay/Glass Products	1,551	12,050,633	4,333,507	16,384,140
12 24	Lumber and Wood Products	1,728	13,087,552	455,998	13,543,550
13 27	Printing and Publishing	405	12,191,946	438,144	12,630,090
14 25	Furniture and Fixtures	1,033	11,377,301	565,042	11,942,343
15 35	Industrial Machinery	2,521	6,518,894	3,875,330	10,394,224
16 22	Textile Mill Products	500	7,817,258	1,429,283	9,246,541
17 38	Measurement/Photographic Instruments	523	4,676,856	1,606,739	6,283,595
18 39	Misc. Manufacturing Industries	711	4,434,996	1,116,244	5,551,240
19 31	Leather Products	113	488,528	929,012	1,417,540
20 21	Tobacco Products	28	662,668	929	663,597
21 23	Apparel and Other Textile Products	41	251,433	68,149	319,582
Total for All Matched Industries		62,851	847,751,115	443,548,017	1,291,299,132

* Multiple SIC codes reported in TRI only.

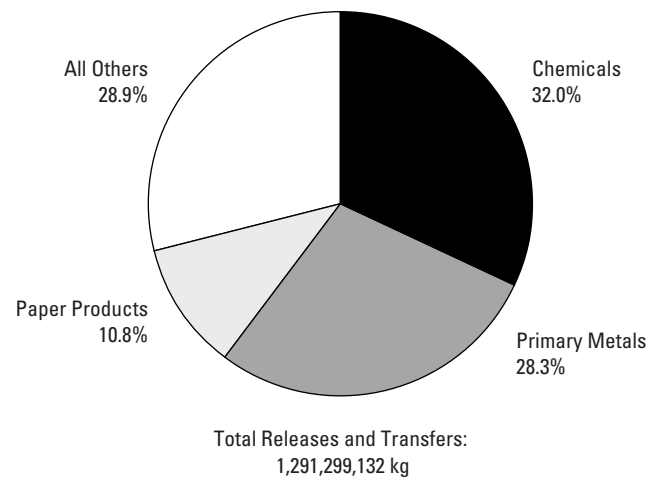
► Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total			
Number of Forms (%)	Total Releases (%)	Total Transfers (%)	Total Releases and Transfers (%)
8.1 / 91.9	6.7 / 93.3	8.9 / 91.1	7.5 / 92.5
9.5 / 90.5	10.0 / 90.0	15.9 / 84.1	12.8 / 87.2
13.6 / 86.4	15.2 / 84.8	7.6 / 92.4	13.7 / 86.3
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
8.1 / 91.9	13.2 / 86.8	12.8 / 87.2	13.1 / 86.9
8.9 / 91.1	14.4 / 85.6	9.8 / 90.2	13.6 / 86.4
5.9 / 94.1	9.0 / 91.0	9.1 / 90.9	9.0 / 91.0
11.9 / 88.1	16.7 / 83.3	20.3 / 79.7	17.3 / 82.7
4.7 / 95.3	4.4 / 95.6	6.4 / 93.6	5.4 / 94.6
3.5 / 96.5	1.2 / 98.8	2.3 / 97.7	1.9 / 98.1
6.6 / 93.4	7.2 / 92.8	2.1 / 97.9	5.9 / 94.1
11.1 / 88.9	17.0 / 83.0	45.3 / 54.7	17.9 / 82.1
9.1 / 90.9	13.2 / 86.8	34.9 / 65.1	14.0 / 86.0
4.0 / 96.0	6.9 / 93.1	24.4 / 75.6	7.8 / 92.2
2.6 / 97.4	4.1 / 95.9	11.6 / 88.4	6.9 / 93.1
2.4 / 97.6	3.6 / 96.4	2.0 / 98.0	3.4 / 96.6
0.2 / 99.8	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
13.9 / 86.1	12.9 / 87.1	26.8 / 73.2	15.7 / 84.3
2.7 / 97.3	4.8 / 95.2	0.8 / 99.2	2.2 / 97.8
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
2.4 / 97.6	0.1 / 99.9	0.0 / 100.0	0.1 / 99.9
7.3 / 92.7	9.5 / 90.5	11.2 / 88.8	10.1 / 89.9

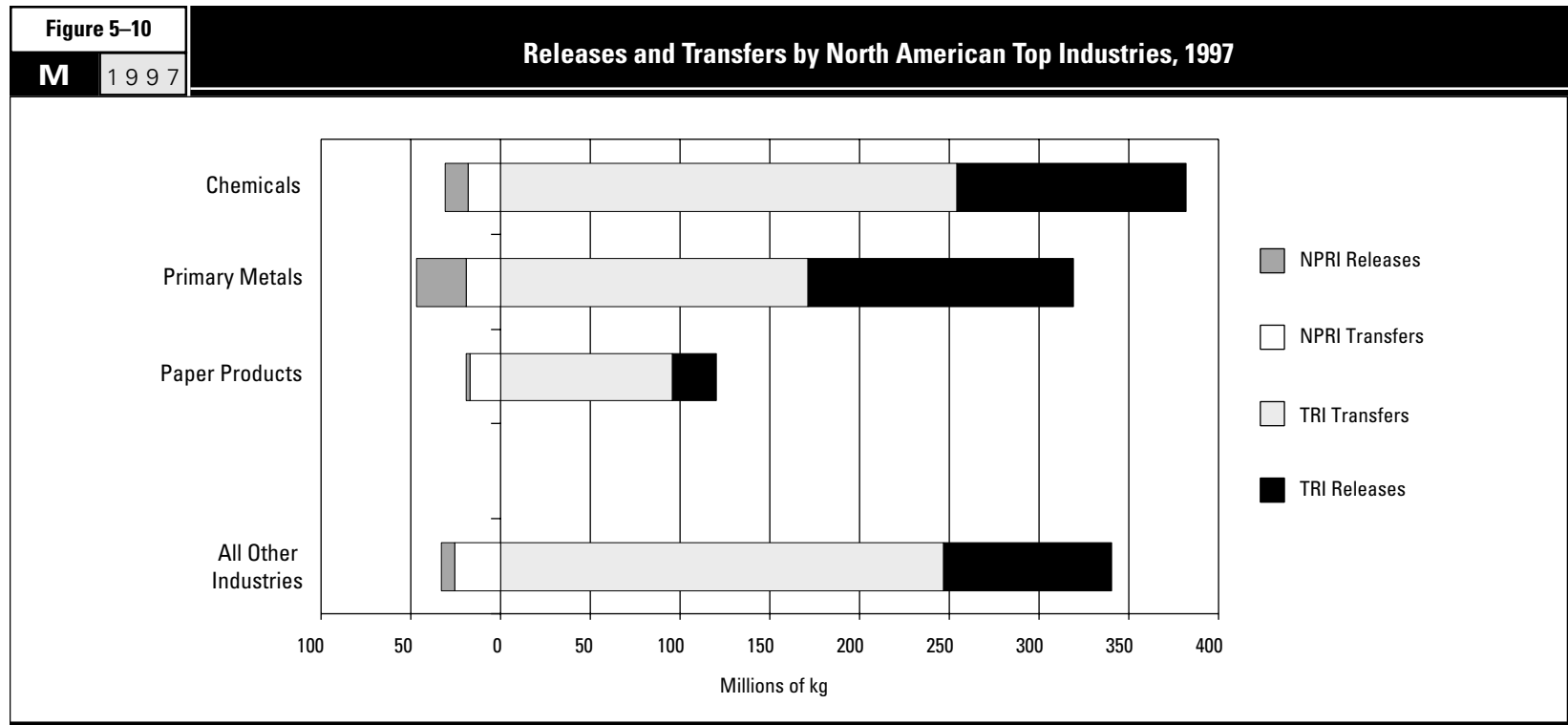
Figure 5-9

North American Top Three Industries for Total Releases and Transfers, 1997

M 1997



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



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

5.2.2 NPRI and TRI Releases and Transfers

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

Overview

Total releases and transfers were 130.0 million kg for NPRI, with on-site releases of 80.4 million kg and off-site transfers of 49.5 million kg. For TRI, total releases and transfers were 1.16 billion kg, with on-site releases of 767.3 million kg and off-site transfers of 394.0 million kg (**Table 5–10**).

NPRI facilities transferred a larger percentage of their total reported amounts than did TRI facilities and, conversely, TRI facilities released a larger percentage. The balance of releases to transfers was 62 percent to 38 percent in NPRI and 66 percent to 34 percent in TRI (**Figure 5–11**).

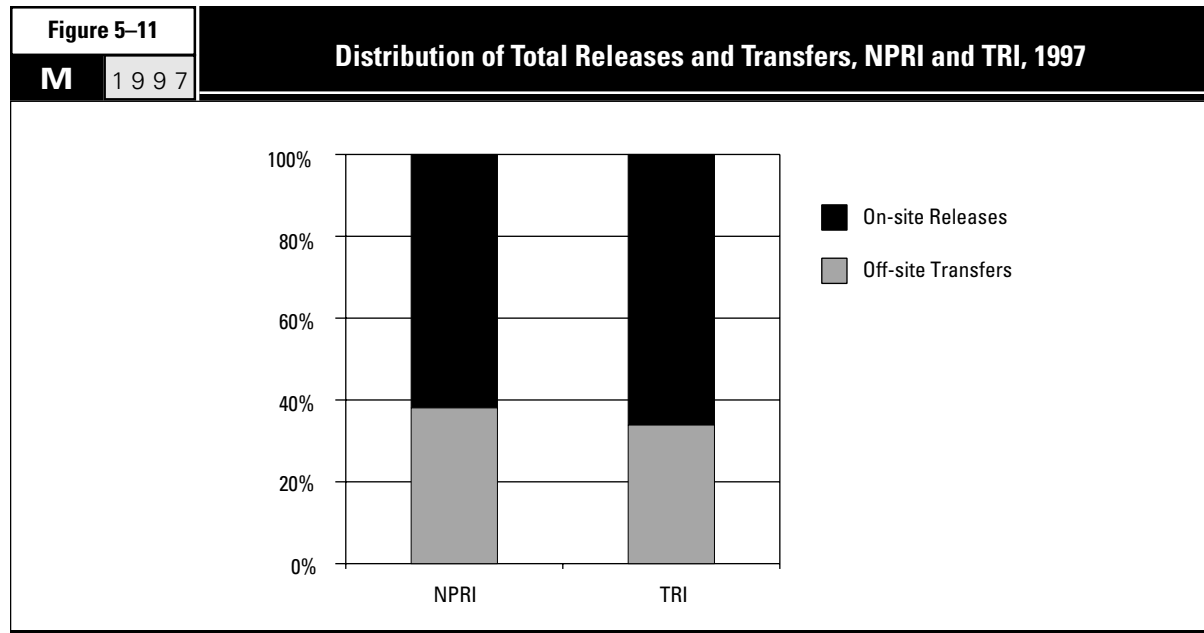
Further NPRI-TRI differences occurred in the distribution of types of releases and transfers. NPRI facilities were much more likely to release listed substances to air and to send metals to treatment/sewage/disposal than were TRI facilities. Air emissions accounted for 48 percent of NPRI's total releases and transfers and 39 percent of the TRI

Table 5–10		Total Releases and Transfers, NPRI and TRI, 1997			
M	1997	NPRI		TRI	
		Number		Number	
Total Facilities		1,430		19,125	
Total Forms		4,599		58,252	
On-site Releases		kg	%	kg	%
Total Air Emissions		62,838,622	48.4	449,375,340	38.7
Surface Water Discharges		4,224,169	3.3	94,618,694	8.1
Underground Injection		4,197,660	3.2	74,649,654	6.4
On-site Land Releases		9,062,108	7.0	148,658,503	12.8
Total Releases		80,448,924	61.9	767,302,191	66.1
Off-site Transfers					
Treatment (except metals)		9,925,693	7.6	92,058,224	7.9
Sewage/To POTWs (except metals)		5,260,842	4.0	100,954,738	8.7
Disposal (except metals)		2,533,015	1.9	20,484,603	1.8
Treatment/Sewage/Disposal of Metals		31,788,711	24.5	180,542,191	15.5
Total Transfers		49,508,261	38.1	394,039,756	33.9
Total Releases and Transfers		129,957,185	100.0	1,161,341,947	100.0

total. In NPRI, 25 percent of all releases and transfers consisted of transfers of metals; in TRI, these were 16 percent of the total.

At the same time, TRI facilities were more than twice as likely to trans-

fer nonmetals off-site to sewage/POTWs than NPRI facilities. These transfers to sewage/POTWs amounted to four percent of NPRI's total releases and transfers and nine percent of TRI's total.



Top Facilities

The top 50 NPRI facilities reported 58 percent of all releases and transfers to that PRTR in 1997. In TRI, the 50 facilities with the largest totals reported 29 percent of the TRI total. As noted in other chapters, these populations of 50 facilities represented 3.5 percent of Canadian facilities but only 0.3 percent of US facilities in the matched data set (**Figure 5-12**).

The top 50 NPRI facilities reported roughly equal amounts of releases and transfers. In TRI, however, releases amounted to 72 percent of the amounts reported by the 50 facilities with the largest total releases and transfers (**Figure 5-13**).

The top 50 NPRI facilities reported releasing on-site 38.5 million kg and transferring off-site 36.5 million kg, for a total of 75.1 million kg (**Table 5-11**). Nearly half of all NPRI releases and three-quarters of all NPRI transfers came from the top 50 facilities. They reported 80 percent (7.2 million kg) of NPRI on-site land releases and 84 percent (26.5 million kg) of transfers of metals to sewage/treatment/disposal. These facilities also reported 98 percent (4.1 million kg) of NPRI's underground injection, which is not widely practiced in Canada.

The top 50 TRI facilities reported releasing on-site 245.5 million kg and transferring off-site 96.4 million kg, for a total of 341.9 million kg (**Table 5-12**). These facilities reported one-third of TRI releases and one-quarter of TRI transfers in the matched data set. These releases included two-thirds of the underground injection (51.2 million kg) and on-site land releases (99.7 million kg) in TRI. These facilities reported less than one-third of all transfer types in TRI.

Figure 5-12

M 1997

NPRI and TRI Total Releases and Transfers, Top 50 Facilities and All Others, 1997

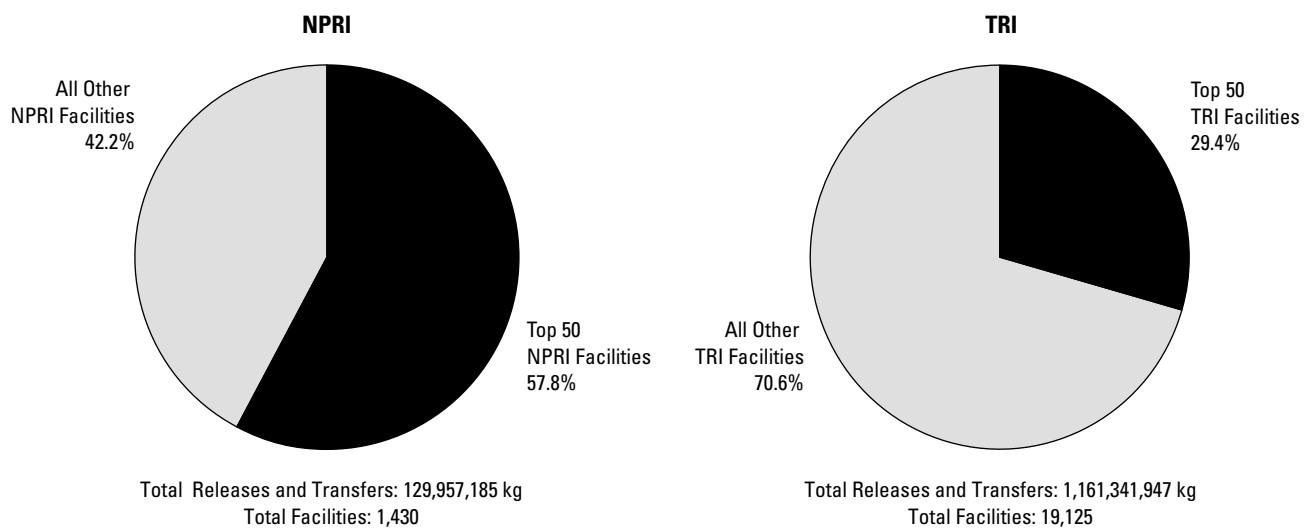


Figure 5-13

M 1997

Distribution of Total Releases and Transfers of Top 50 Facilities, NPRI and TRI, 1997

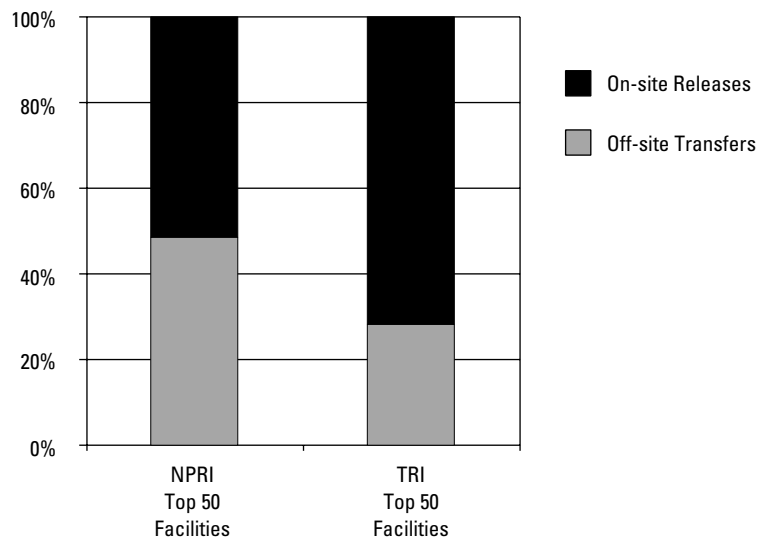


Table 5-11		The 50 NPRI Facilities with the Largest Total Releases and Transfers, 1997								
Rank	Facility	City, Province	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	Dofasco Inc.	Hamilton, ON	29	33	18	424,762	6,176	0	125	431,063
2	Co-Steel Lasco	Whitby, ON	29	33	6	14,253	362	0	1,245,254	1,259,869
3	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7	4,259,786	0	0	649,000	4,908,786
4	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	6	0	0	0	0	29
5	Celanese Canada Inc.	Edmonton, AB	37	28	11	294,315	0	3,542,000	593	3,836,908
6	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5	48,835	550	0	2,300,405	2,349,790
7	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5	16,600	0	0	0	17,750
8	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	7	2,045,900	480	0	0	2,046,380
9	Aimco Solrec Ltd.	Milton, ON	37	28	6	35,641	0	0	0	35,641
10	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	16	103,757	31,645	0	442,030	577,432
11	Bayer Inc., Bayer AG	Sarnia, ON	37	28	17	1,397,853	22,937	0	0	1,421,799
12	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	7	22,992	165	0	1,759,790	1,782,947
13	Fraser Papers Inc., Noranda Forest Inc.	Edmundston, NB	27	26	9	178,060	0	0	0	178,060
14	Ivaco Rolling Mills	L'Original, ON	29	33	7	8,552	1	0	0	9,447
15	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	10	8,721	0	0	200	10,521
16	General Motors of Canada Ltd., Oshawa Car Assembly Plant	Oshawa, ON	32	37	13	1,299,755	0	0	0	1,299,855
17	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	11	24,567	524,450	0	0	549,017
18	Zalev Brothers Limited	Windsor, ON	29	33	8	422	7	0	0	429
19	Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John, NB	27	26	4	246,211	824,078	0	0	1,070,289
20	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28	15	205,010	160,160	570,160	0	935,330
21	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6	12,053	47	0	717,505	729,605
22	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	10	845,060	15,550	0	96,347	956,957
23	Kronos Canada, Inc.	Varenes, QC	37	28	8	15,433	32,500	0	0	47,933
24	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28	10	750,109	0	0	0	750,109
25	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	8	874,078	724	0	0	874,802
26	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28	4	761,100	0	900	0	762,000
27	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1	0	0	0	0	0
28	Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge, ON	16	30	8	817,865	0	0	0	817,865
29	Morbern Incorporated	Cornwall, ON	16	30	3	757,500	0	0	0	757,500
30	Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga, ON	28	27	2	797,000	0	0	0	797,000
31	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	23	474,924	280,405	0	4,784	760,113
32	Methanex Corporation	Medicine Hat, AB	37	28	3	790,620	0	0	80	790,700
33	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	6	740,792	3,780	0	0	744,572
34	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28	4	83,100	0	0	0	83,100
35	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	2	474,000	0	0	0	474,000
36	Sunworthy Wallcoverings, Borden Co. Ltd.	Brampton, ON	27	26	2	707,900	0	0	0	707,900
37	International Wallcoverings Ltd.	Brampton, ON	27	26	4	669,500	0	0	0	669,500
38	Stelco Inc., Hilton Works	Hamilton, ON	29	33	21	312,873	23,490	0	500	338,723
39	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	7	10,782	0	0	0	10,782
40	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	4	588,500	11,130	0	6,870	606,500
41	Avenor Inc., Dryden Mill	Dryden, ON	27	26	7	597,481	1,610	0	2,001	601,092
42	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	4	1,476	100	0	0	1,776
43	Paintplas Inc.	Ajax, ON	32	30	10	552,000	0	0	0	552,000
44	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	5	521,402	20,700	0	0	542,102
45	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	18	391,146	2,259	0	0	393,911
46	Ford Motor Company, Oakville Assembly Plant	Oakville, ON	32	37	11	531,275	0	0	0	531,275
47	Papiers Domtar - Centre d'affaires Windsor	Windsor, QC	27	26	6	470,060	56,100	0	0	527,484
48	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	12	499,280	15,840	0	0	515,120
49	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	6	37,280	968	0	0	38,248
50	Cartons St-Laurent Inc.	LaTuque, QC	27	26	8	391,679	39,052	0	0	430,731
Subtotal					411	25,112,260	2,075,266	4,113,060	7,225,484	38,534,742
% of Total					8.9	40.0	49.1	98.0	79.7	47.9
Total					4,599	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	865	123	50	8,168,440	8,169,478	8,600,541	Zinc/Manganese and compounds (transfers of metals)
2	0	0	0	5,799,885	5,799,885	7,059,754	Zinc and compounds (transfers of metals)
3	0	0	0	0	0	4,908,786	Sulfuric acid (air)
4	0	3,732,000	0	224,300	3,956,300	3,956,329	Nitric acid and nitrate compounds (transfers to sewage)
5	0	0	64,384	41,000	105,384	3,942,292	Methanol, Methyl ethyl ketone (UIJ)
6	0	0	0	0	0	2,349,790	Zinc and compounds (land)
7	0	0	0	2,298,300	2,298,300	2,316,050	Zinc and compounds (transfers of metals)
8	37,400	0	29,390	0	66,790	2,113,170	Cyclohexane (air)
9	2,028,917	0	0	0	2,028,917	2,064,558	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
10	0	0	0	1,480,000	1,480,000	2,057,432	Zinc and compounds (transfers of metals)
11	485,300	0	133,000	0	618,300	2,040,099	Cyclohexane (air, transfers to treatment), Chloromethane (air), Hydrochloric acid (air)
12	0	0	0	0	0	1,782,947	Zinc and compounds (land)
13	1,453,630	0	139,450	0	1,593,080	1,771,140	Methanol (transfers to treatment)
14	0	0	0	1,647,700	1,647,700	1,657,147	Zinc and compounds (transfers of metals)
15	0	15,075	241	1,481,088	1,496,404	1,506,925	Zinc/Lead and compounds (transfers of metals)
16	5,063	0	0	18,402	23,465	1,323,320	Xylene, Toluene (air)
17	38,150	0	0	584,310	622,460	1,171,477	Nitric acid and nitrate compounds (water), Chromium/Nickel and compounds (transfers of metals)
18	0	0	0	1,104,869	1,104,869	1,105,298	Zinc/Copper and compounds (transfers of metals)
19	0	0	0	0	0	1,070,289	Methanol (water)
20	85,133	0	4,580	3,600	93,313	1,028,643	Nitric acid and nitrate compounds (UIJ, water)
21	0	0	0	241,888	241,888	971,493	Zinc/Manganese and compounds (land)
22	0	0	0	0	0	956,957	Methanol (air)
23	0	0	0	855,000	855,000	902,933	Manganese and compounds (transfers of metals)
24	145,965	0	0	0	145,965	896,074	Methyl ethyl ketone, Toluene, Methanol (air)
25	0	0	0	0	0	874,802	Methanol (air)
26	81,600	0	0	0	81,600	843,600	Methanol (air)
27	0	0	0	840,570	840,570	840,570	Zinc and compounds (transfers of metals)
28	11,220	0	1,138	3,034	15,392	833,257	Methyl ethyl ketone (air)
29	60,000	0	0	0	60,000	817,500	Methyl ethyl ketone (air)
30	20,345	0	0	0	20,345	817,345	Methanol (air)
31	633	0	43,642	4	44,279	804,392	Nitric acid and nitrate compounds (water), Methanol, Vanadium, Methyl isobutyl ketone, Methyl ethyl ketone (air), Asbestos (transfers to disposal)
32	640	4,510	0	0	5,150	795,850	Methanol (air)
33	0	0	0	0	0	744,572	Zinc/Lead and compounds (air)
34	639,700	0	0	0	639,700	722,800	Toluene, Methanol (transfers to treatment)
35	0	248,000	0	0	248,000	722,000	Methanol (air, transfers to sewage)
36	0	0	12,800	0	12,800	720,700	Methyl ethyl ketone, Toluene (air)
37	0	0	0	0	0	669,500	Methyl ethyl ketone, Toluene (air)
38	10,300	71,000	237,300	9,900	328,500	667,223	Benzene (air), Asbestos (transfers to disposal), Phenol (transfers to sewage)
39	0	1,320	9,520	621,538	632,378	643,160	Zinc and compounds (transfers of metals)
40	0	0	0	0	0	606,500	Chlorine dioxide, Methanol, Chlorine (air)
41	0	0	0	0	0	601,092	Methanol (air)
42	0	0	0	571,557	571,557	573,333	Chromium and compounds (transfers of metals)
43	0	0	0	0	0	552,000	Xylene, Toluene, Methyl isobutyl ketone (air)
44	0	0	0	0	0	542,102	Methanol, Chlorine (air)
45	0	0	146,560	0	146,560	540,471	Hydrochloric acid (air), Phosphoric acid (transfers to disposal), Ethylene (air)
46	390	190	230	7,580	8,390	539,665	Xylene, 1,2,4-Trimethylbenzene, n-Butyl alcohol (air)
47	0	0	0	0	0	527,484	Methanol (air)
48	0	0	0	0	0	515,120	Lead/Copper/Zinc and compounds (air)
49	0	0	0	467,400	467,400	505,648	Lead/Cadmium and compounds (transfers of metals)
50	0	0	7	71,666	71,673	502,404	Methanol, Manganese and compounds (air)
	5,105,251	4,072,218	822,292	26,542,031	36,541,792	75,076,534	
	51.4	77.4	32.5	83.5	73.8	57.8	
	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	129,957,185	

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

► UIJ=underground injection

Table 5-12		The 50 TRI Facilities with the Largest Total Releases and Transfers, 1997							
M 1997									
Rank	Facility	City, State	US SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT	33	6	28,270,233	0	0	0	28,270,233
2	ASARCO Inc.	East Helena, MT	33	10	47,346	2,280	0	17,100,454	17,150,080
3	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	9	224,918	195	0	0	225,113
4	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28	12	48,716	13,487,112	0	291,886	13,827,714
5	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Pasayas, NM	33	13	288,368	3,644	0	12,053,733	12,345,745
6	Armco Inc. (Route 8 S.)	Butler, PA	33	14	98,510	11,793,413	0	0	11,891,923
7	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	14	109,489	4,441	0	10,908,661	11,022,591
8	USS Clairton Works, USX Corp.	Clairton, PA	33	19	110,326	51,803	0	0	162,129
9	Solutia Inc.	Gonzalez, FL	28	18	103,557	826	9,712,998	0	9,817,381
10	DuPont	Victoria, TX	28	29	176,213	791	8,861,812	5,445	9,044,261
11	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	13	92,972	0	0	8,503,492	8,596,464
12	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	2	2,131	703	0	6,575,964	6,578,798
13	Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena, TX	28	12	29,252	0	0	0	29,252
14	Lenzing Fibers Corp.	Lowland, TN	28	5	7,619,166	2,879	0	142,766	7,764,811
15	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	24	71,934	3,167	7,594,695	0	7,669,796
16	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	8	7,224	0	0	0	7,224
17	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	33	777,508	13,242	0	6,463,719	7,254,469
18	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28	4	6,848,254	9,265	0	175,510	7,033,029
19	Northwestern Steel & Wire Co.	Sterling, IL	33	6	60,613	7,982	0	6,716,100	6,784,695
20	BASF Corp.	Freeport, TX	28	26	143,873	6,353,578	5,407	0	6,502,858
21	Steel Dynamics Inc.	Butler, IN	33	7	6,642	0	0	0	6,642
22	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33	7	33,356	2,111	0	0	35,467
23	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28	20	386,059	0	1,517,577	0	1,903,636
24	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	20	333,612	18,744	0	5,620,881	5,973,237
25	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33	9	30,560	42	0	660	31,262
26	Elkem Metals Co.	Marietta, OH	33	6	174,841	205,442	0	4,752,382	5,132,665
27	ASARCO Inc., Glover Plant	Annapolis, MO	33	7	28,690	10	0	4,892,495	4,921,195
28	CPI Kraft Div., Consolidated Papers Inc.	Wisconsin Rapids, WI	26	14	1,154,037	340	0	96,599	1,250,976
29	BP Chemicals Inc., BP America Inc.	Lima, OH	28	27	142,400	0	4,146,788	0	4,289,188
30	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	17	54,412	306	4,198,418	3,985	4,257,121
31	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,843	14	0	4,126,984	4,129,841
32	DuPont	Pass Christian, MS	28	11	282,458	0	3,809,524	0	4,091,982
33	Regal Ware Inc.	Kewaskum, WI	34	6	0	0	0	0	0
34	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28	6	163,429	0	0	3,805,895	3,969,324
35	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	9	119,063	183	0	3,839,901	3,959,147
36	Nucor Steel	Plymouth, UT	33	7	4,421	0	0	2,334	6,755
37	Stone Container Corp.	Panama City, FL	26	10	793,382	0	0	19,618	813,000
38	Rubicon Inc.	Geismar, LA	28	24	144,879	79	3,274,650	0	3,419,608
39	Pharmacia & Upjohn Co.	Portage, MI	28	25	88,132	38,292	1,282,573	0	1,408,997
40	Vicksburg Chemical Co.	Vicksburg, MS	28	3	34,454	3,668,877	0	0	3,703,331
41	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	18	85,003	16,367	0	0	101,370
42	DuPont	New Johnsonville, TN	28	11	33,946	32,986	3,516,553	57	3,583,542
43	Boise Cascade Corp.	Saint Helens, OR	26	9	240,408	0	0	0	240,408
44	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26	8	211,227	0	0	0	211,227
45	Eastman Kodak Co., Kodak Park	Rochester, NY	38	46	2,750,339	288,950	0	18,603	3,057,892
46	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN	28	63	2,375,308	53,946	0	235,359	2,664,613
47	Monsanto Co.	Luling, LA	28	14	38,598	90,123	3,277,869	0	3,406,590
48	Hercules Inc.	Hopewell, VA	28	12	379,837	0	0	0	379,837
49	FMC Corp.	Pocatello, ID	28	12	13,048	338	0	3,362,448	3,375,834
50	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL	28	4	12,939	3,170,390	0	0	3,183,329
Subtotal				710	55,248,926	39,322,861	51,198,864	99,715,931	245,486,582
% of Total				1.2	12.3	41.6	68.6	67.1	32.0
Total				58,252	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	0	0	28,270,233	Chlorine (air)
2	0	0	0	547,191	547,191	17,697,271	Zinc and compounds (land)
3	0	0	0	13,855,648	13,855,648	14,080,761	Zinc and compounds (transfers of metals)
4	0	0	0	0	0	13,827,714	Phosphoric acid (water)
5	0	0	0	113	113	12,345,858	Zinc/Copper and compounds (land)
6	22,976	0	544	131,125	154,645	12,046,568	Nitric acid and nitrate compounds (water)
7	0	0	0	192,057	192,057	11,214,648	Copper/Zinc/Lead and compounds (land)
8	9,944,975	0	58	0	9,945,033	10,107,162	Ethylene (transfers to treatment)
9	0	0	10	1,584	1,594	9,818,975	Nitric acid and nitrate compounds (UIJ)
10	345,419	0	0	196	345,615	9,389,876	Nitric acid and nitrate compounds (UIJ)
11	0	0	0	0	0	8,596,464	Copper and compounds (land)
12	0	0	0	1,434,288	1,434,288	8,013,086	Chromium and compounds (land)
13	183,178	7,767,699	11	13,156	7,964,044	7,993,296	Nitric acid and nitrate compounds (transfers to sewage)
14	0	0	0	0	0	7,764,811	Carbon disulfide (air)
15	2,944	0	109	18,662	21,715	7,691,511	Acetonitrile, Acrylic acid, Acrylamide (UIJ)
16	0	0	0	7,543,045	7,543,045	7,550,269	Zinc and compounds (transfers of metals)
17	0	0	118	294,304	294,422	7,548,891	Zinc and compounds (land)
18	0	0	0	0	0	7,033,029	Carbon disulfide (air)
19	0	0	0	30,658	30,658	6,815,353	Zinc/Manganese and compounds (land)
20	116,507	0	8,555	6,738	131,800	6,634,658	Nitric acid and nitrate compounds (water)
21	0	0	0	6,529,560	6,529,560	6,536,202	Zinc and compounds (transfers of metals)
22	0	0	0	6,086,892	6,086,892	6,122,359	Zinc and compounds (transfers of metals)
23	115,728	3,997,034	195	0	4,112,957	6,016,593	Ethylene glycol (transfers to sewage)
24	3,560	1,734	230	505	6,029	5,979,266	Zinc and compounds (land)
25	14,957	0	0	5,609,771	5,624,728	5,655,990	Zinc and compounds (transfers of metals)
26	0	0	0	56,236	56,236	5,188,901	Manganese and compounds (land)
27	0	0	0	0	0	4,921,195	Zinc/Lead and compounds (land)
28	3,202,562	0	0	35,533	3,238,095	4,489,071	Methanol (transfers to treatment)
29	7,342	0	404	345	8,091	4,297,279	Acetonitrile, Acrylamide, Cyanide compounds (UIJ)
30	1,058	0	3,617	207	4,882	4,262,003	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
31	0	0	0	6,349	6,349	4,136,190	Chromium and compounds (land)
32	8,163	0	0	0	8,163	4,100,145	Manganese and compounds (UIJ)
33	0	0	4,078,005	0	4,078,005	4,078,005	Aluminum oxide (transfers to disposal)
34	0	0	0	0	0	3,969,324	Phosphoric acid (land)
35	0	0	0	451	451	3,959,598	Zinc and compounds (land)
36	0	0	0	3,922,477	3,922,477	3,929,232	Zinc and compounds (transfers of metals)
37	0	3,082,333	0	25,122	3,107,455	3,920,455	Methanol (transfers to sewage)
38	287,265	0	38,984	4	326,253	3,745,861	Nitric acid and nitrate compounds, Methanol, Nitrobenzene (UIJ)
39	1,656,263	655,802	6,191	7,301	2,325,557	3,734,554	Dichloromethane (transfers to treatment), Methanol (UIJ)
40	0	0	0	0	0	3,703,331	Nitric acid and nitrate compounds (water)
41	0	10,970	0	3,497,819	3,508,789	3,610,159	Zinc and compounds (transfers of metals)
42	0	0	0	0	0	3,583,542	Manganese and compounds (UIJ)
43	0	3,327,347	1,280	3,628	3,332,255	3,572,663	Methanol (transfers to sewage)
44	0	3,361,224	0	0	3,361,224	3,572,451	Methanol (transfers to sewage)
45	400,499	569	4,024	24,750	429,842	3,487,734	Dichloromethane, Hydrochloric acid, Methanol (air)
46	820,875	116	0	0	820,991	3,485,604	Hydrochloric acid, Methanol, Sulfuric acid, Toluene, Hydrogen fluoride (air), Xylene, Acetonitrile (transfers to treatment)
47	9,574	0	0	7,256	16,830	3,423,420	Formaldehyde (UIJ)
48	0	3,022,319	0	0	3,022,319	3,402,156	Nitric acid and nitrate compounds, Ethylene glycol (transfers to sewage)
49	0	0	0	790	790	3,376,624	Zinc and compounds, Phosphorus (land)
50	0	0	0	0	0	3,183,329	Phosphoric acid (water)
	17,143,845	25,227,147	4,142,335	49,883,761	96,397,088	341,883,670	
	18.6	25.0	20.2	27.6	24.5	29.4	
	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	1,161,341,947	

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

► UIJ = underground injection

Table 5-13

NPRI Total Releases and Transfers by All Facilities and by Facilities with Largest Amounts, by Province, 1997

M 1997

Province	All NPRI Facilities			Top 50 Facilities		Top 50 Facilities as % of All Facilities		
	Number of Facilities	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Facilities	Total Releases and Transfers (kg)	Facilities (%)	Total Releases and Transfers (%)
Alberta	107	11,987,370	1,166,942	13,154,312	6	8,538,835	5.6	64.9
British Columbia	77	5,459,128	890,409	6,349,537	0	0	0.0	0.0
Manitoba	44	3,397,552	357,194	3,754,746	2	2,527,519	4.5	67.3
New Brunswick	25	2,357,036	2,098,146	4,455,182	4	3,953,577	16.0	88.7
Newfoundland	8	412,606	0	412,606	0	0	0.0	0.0
Nova Scotia	23	1,063,517	472,606	1,536,123	0	0	0.0	0.0
Ontario	767	39,955,770	35,395,295	75,351,065	28	49,665,873	3.7	65.9
Prince Edward Island	3	219,770	34,694	254,464	0	0	0.0	0.0
Quebec	356	14,649,326	9,078,464	23,727,790	9	9,848,628	2.5	41.5
Saskatchewan	20	946,849	14,511	961,360	1	542,102	5.0	56.4
Total	1,430	80,448,924	49,508,261	129,957,185	50	75,076,534	3.5	57.8

Geographic Distribution of Top Facilities

Twenty-eight of the 50 NPRI facilities reporting the largest transfers and releases were located in Ontario (Table 5-13). Their releases and transfers totaled 49.7 million kg. Nine facilities in Quebec were among the top 50, with

9.8 million kg of releases and transfers. Six facilities in Alberta released and transferred 8.5 million kg. In five provinces, facilities among the top 50 reported more than half of the releases and transfers: Alberta (65 percent), Manitoba (67 percent), New Brunswick (89 percent), Ontario (66 percent) and Saskatchewan (56 percent).

Seven of the top TRI facilities were located in Texas, where they reported releases and transfers of 45.9 million kg, or 38 percent of the state's total (Table 5-14). Four Louisiana facilities were in the top 50 and they reported 28.7 million kg of releases and transfers, 42 percent of the Louisiana total. Altogether, 23 states had one or more

of the top TRI facilities. Facilities among the top 50 in TRI reported more than half of the releases and transfers in five states: Arizona (57 percent), Idaho (51 percent), Montana (92 percent), New Mexico (91 percent) and Utah (94 percent).

Table 5-14

TRI Total Releases and 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	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Facilities	Total Releases and Transfers (kg)	Facilities (%)	Total Releases and Transfers (%)
Alabama	461	30,199,535	11,316,489	41,516,024	1	7,033,029	0.2	16.9
Alaska	6	540,492	1,133	541,625	0	0	0.0	0.0
Arizona	175	13,436,541	1,765,417	15,201,958	1	8,596,464	0.6	56.5
Arkansas	326	10,227,944	12,860,185	23,088,129	1	7,550,269	0.3	32.7
California	1,154	8,921,534	11,897,413	20,818,947	0	0	0.0	0.0
Colorado	151	1,331,351	970,229	2,301,580	0	0	0.0	0.0
Connecticut	278	2,314,384	6,184,467	8,498,851	0	0	0.0	0.0
Delaware	60	1,011,075	1,502,816	2,513,891	0	0	0.0	0.0
District of Columbia	1	0	2	2	0	0	0.0	0.0
Florida	457	32,013,775	8,217,166	40,230,941	3	16,922,759	0.7	42.1
Georgia	609	20,373,823	8,596,443	28,970,266	0	0	0.0	0.0
Hawaii	10	123,864	3,258	127,122	0	0	0.0	0.0
Idaho	50	6,229,364	340,740	6,570,104	1	3,376,624	2.0	51.4
Illinois	1,166	31,144,870	19,112,546	50,257,416	1	6,815,353	0.1	13.6
Indiana	913	27,811,195	23,853,714	51,664,909	3	19,741,083	0.3	38.2
Iowa	356	7,830,048	5,641,192	13,471,240	0	0	0.0	0.0
Kansas	245	7,228,250	3,879,211	11,107,461	0	0	0.0	0.0
Kentucky	380	12,243,252	6,808,052	19,051,304	0	0	0.0	0.0
Louisiana	261	63,224,378	4,373,587	67,597,965	4	28,688,506	1.5	42.4
Maine	75	2,947,091	849,997	3,797,088	0	0	0.0	0.0
Maryland	165	4,446,359	3,923,483	8,369,842	0	0	0.0	0.0
Massachusetts	422	2,079,208	5,029,094	7,108,302	0	0	0.0	0.0
Michigan	786	20,000,568	26,034,295	46,034,863	3	13,467,072	0.4	29.3
Minnesota	429	5,371,218	5,314,124	10,685,342	0	0	0.0	0.0
Mississippi	264	24,753,247	1,232,243	25,985,490	2	7,803,476	0.8	30.0
Missouri	502	22,779,721	6,806,404	29,586,125	2	8,880,793	0.4	30.0
Montana	23	18,699,623	553,382	19,253,005	1	17,697,271	4.3	91.9
Nebraska	141	2,140,998	4,410,219	6,551,217	0	0	0.0	0.0
Nevada	43	1,821,377	13,540	1,834,917	0	0	0.0	0.0
New Hampshire	97	970,539	417,204	1,387,743	0	0	0.0	0.0
New Jersey	498	6,022,954	12,863,215	18,886,169	0	0	0.0	0.0
New Mexico	32	13,287,600	231,464	13,519,064	1	12,345,858	3.1	91.3
New York	600	11,707,417	7,565,135	19,272,552	1	3,487,734	0.2	18.1
North Carolina	736	29,035,377	4,973,031	34,008,408	2	8,105,514	0.3	23.8
North Dakota	29	509,847	85,306	595,153	0	0	0.0	0.0
Ohio	1,464	36,992,382	31,794,582	68,786,964	3	15,465,446	0.2	22.5
Oklahoma	261	6,067,878	2,510,321	8,578,199	0	0	0.0	0.0
Oregon	227	9,677,021	7,336,782	17,013,803	1	3,572,663	0.4	21.0
Pennsylvania	1,120	33,713,706	46,128,523	79,842,229	3	36,234,491	0.3	45.4
Puerto Rico	134	2,894,302	3,615,562	6,509,864	0	0	0.0	0.0
Rhode Island	116	705,748	500,366	1,206,114	0	0	0.0	0.0
South Carolina	439	19,349,981	8,850,818	28,200,799	0	0	0.0	0.0
South Dakota	64	1,343,396	1,189,050	2,532,446	0	0	0.0	0.0
Tennessee	568	35,877,974	8,553,230	44,431,204	3	14,833,957	0.5	33.4
Texas	1,080	83,883,000	37,017,533	120,900,533	7	45,881,963	0.6	38.0
Utah	125	41,835,001	4,582,453	46,417,454	3	43,414,113	2.4	93.5
Vermont	33	174,940	127,329	302,269	0	0	0.0	0.0
Virgin Islands	2	537,535	159,608	697,143	0	0	0.0	0.0
Virginia	387	19,348,059	10,668,654	30,016,713	1	3,402,156	0.3	11.3
Washington	254	8,735,877	4,246,444	12,982,321	0	0	0.0	0.0
West Virginia	125	7,865,320	4,221,960	12,087,280	0	0	0.0	0.0
Wisconsin	798	11,955,575	14,882,171	26,837,746	2	8,567,076	0.3	31.9
Wyoming	27	3,565,677	28,174	3,593,851	0	0	0.0	0.0
Total	19,125	767,302,191	394,039,756	1,161,341,947	50	341,883,670	0.3	29.4

Releases and Transfers by Chemical

Top Chemicals

Releases and transfers of the top 25 chemicals in NPRI totaled 120.6 million kg, 93 percent of the NPRI total (Table 5-15). Zinc and its compounds, with 25.7 million kg, and methanol, with 21.9 million kg, headed the list of top chemicals. Releases and transfers of these two substances amounted to 37 percent of all NPRI releases and transfers in the matched data set. Most of the zinc and its compounds—19.9 million kg—was transferred off-site, while most of the methanol—19.0 million kg—was released on-site. NPRI facilities also released and transferred more than eight million kg each of three other substances: toluene (8.4 million kg), nitric acid and nitrate compounds (8.2 million kg), and xylene (8.1 million kg).

Table 5-15		The 25 NPRI Chemicals with the Largest Total Releases and Transfers, 1997					
M	1997						
Rank	CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	—	Zinc (and its compounds)	322	5,813,918	19,888,014	25,701,932	19.8
2	67-56-1	Methanol	259	19,031,512	2,906,563	21,938,075	16.9
3	108-88-3	Toluene	241	6,151,767	2,260,993	8,412,760	6.5
4	—	Nitric acid and nitrate compounds	138	3,089,698	5,062,691	8,152,389	6.3
5	1330-20-7	Xylene (mixed isomers)	232	6,401,451	1,710,953	8,112,404	6.2
6	—	Manganese (and its compounds)	257	1,909,572	4,862,688	6,772,260	5.2
7	78-93-3	Methyl ethyl ketone	130	5,133,281	795,946	5,929,227	4.6
8	7664-93-9	Sulfuric acid	78	4,463,666	0	4,463,666	3.4
9	—	Lead (and its compounds)	129	1,251,363	2,915,080	4,166,443	3.2
10	110-82-7	Cyclohexane	36	2,893,761	330,714	3,224,475	2.5
11	—	Chromium (and its compounds)	236	776,821	1,990,561	2,767,382	2.1
12	75-09-2	Dichloromethane	55	2,303,223	260,108	2,563,331	2.0
13	50-00-0	Formaldehyde	91	1,828,117	302,732	2,130,849	1.6
14	74-85-1	Ethylene	42	1,992,363	60	1,992,423	1.5
15	—	Copper (and its compounds)	261	660,947	1,111,567	1,772,514	1.4
16	7664-39-3	Hydrogen fluoride	33	1,725,590	29	1,725,619	1.3
17	71-36-3	n-Butyl alcohol	78	1,200,412	391,354	1,591,766	1.2
18	71-43-2	Benzene	48	1,479,788	27,302	1,507,090	1.2
19	7647-01-0	Hydrochloric acid	78	1,401,424	0	1,401,424	1.1
20	10049-04-4	Chlorine dioxide	45	1,199,244	0	1,199,244	0.9
21	1332-21-4	Asbestos (friable)	36	53,026	1,103,142	1,156,168	0.9
22	100-42-5	Styrene	80	818,325	321,545	1,139,870	0.9
23	115-07-1	Propylene	32	972,363	0	972,363	0.7
24	107-21-1	Ethylene glycol	147	355,513	565,199	920,712	0.7
25	7782-50-5	Chlorine	120	917,863	230	918,093	0.7
		Subtotal	3,204	73,825,008	46,807,471	120,632,479	92.8
		% of Total	69.7	91.8	94.5	92.8	
		Total	4,599	80,448,924	49,508,261	129,957,185	100.0

Table 5-16

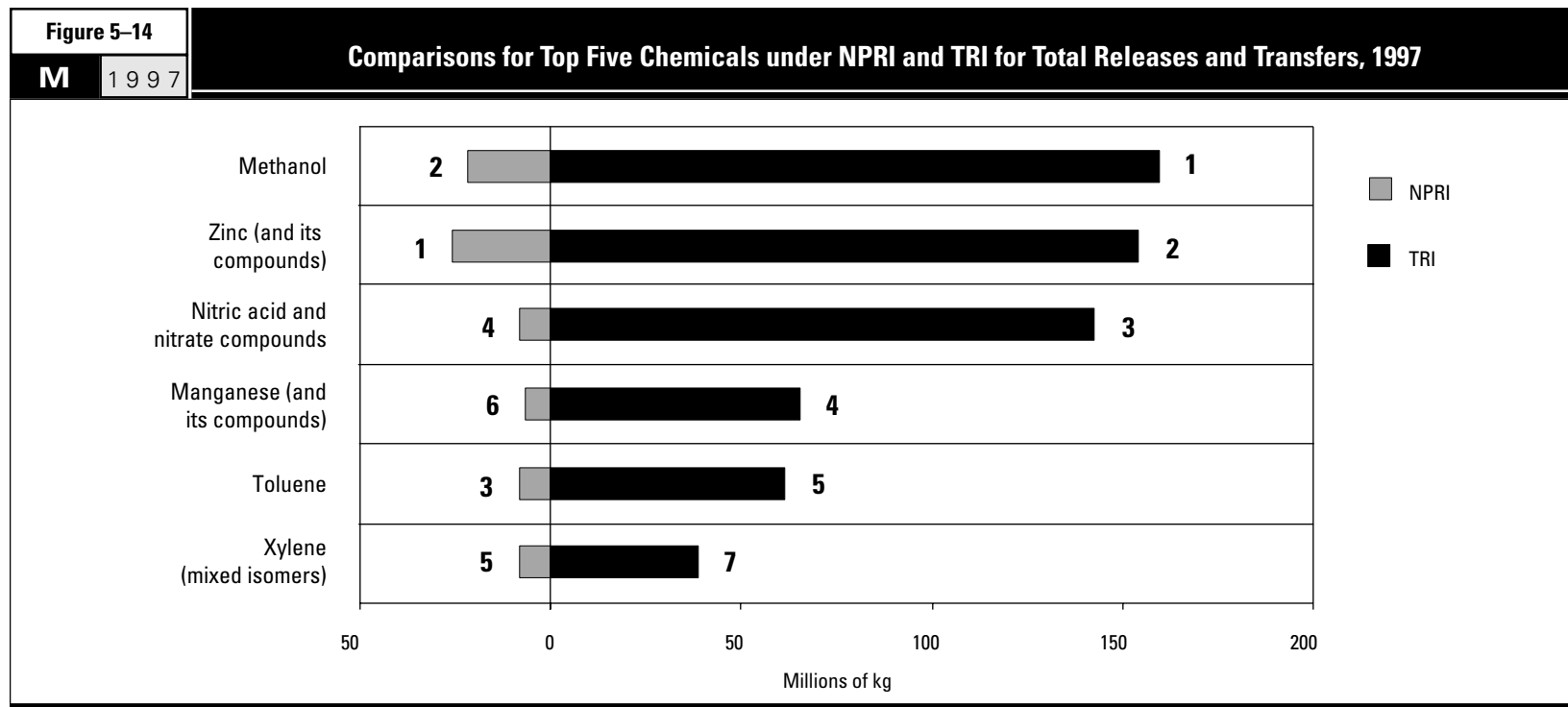
The 25 TRI Chemicals with the Largest Total Releases and Transfers, 1997

M 1997

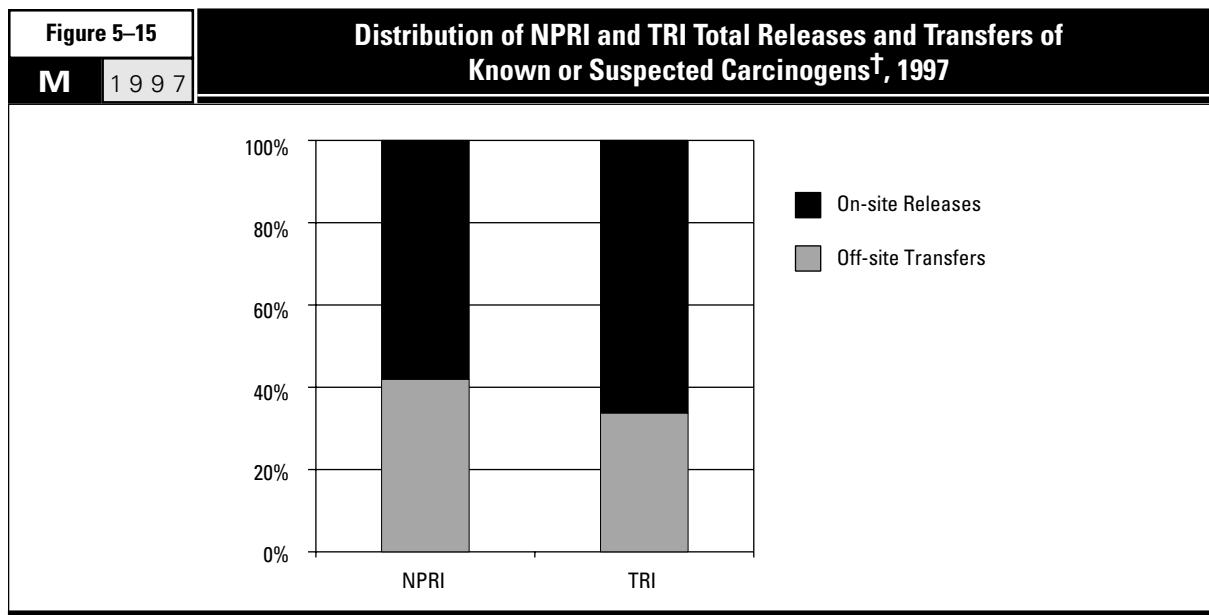
Rank	CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	67-56-1	Methanol	2,218	99,355,089	60,218,372	159,573,461	13.7
2	—	Zinc (and its compounds)	3,044	59,247,400	95,103,244	154,350,644	13.3
3	—	Nitric acid and nitrate compounds	2,667	97,316,227	45,344,123	142,660,350	12.3
4	—	Manganese (and its compounds)	2,827	36,787,267	28,686,838	65,474,105	5.6
5	108-88-3	Toluene	3,020	51,645,746	9,811,506	61,457,252	5.3
6	7664-38-2	Phosphoric acid	2,721	34,265,979	4,835,539	39,101,518	3.4
7	1330-20-7	Xylene (mixed isomers)	2,867	33,620,731	5,194,431	38,815,162	3.3
8	—	Copper (and its compounds)	4,177	21,179,453	13,536,196	34,715,649	3.0
9	7782-50-5	Chlorine	1,214	29,370,174	629,438	29,999,612	2.6
10	75-09-2	Dichloromethane	783	21,506,464	6,085,342	27,591,806	2.4
11	78-93-3	Methyl ethyl ketone	1,941	24,088,906	3,268,722	27,357,628	2.4
12	—	Lead (and its compounds)	1,606	8,818,161	17,600,736	26,418,897	2.3
13	—	Chromium (and its compounds)	3,288	14,485,603	11,726,757	26,212,360	2.3
14	7647-01-0	Hydrochloric acid	840	26,161,189	0	26,161,189	2.3
15	74-85-1	Ethylene	302	13,692,620	9,886,584	23,579,204	2.0
16	75-15-0	Carbon disulfide	92	23,370,147	139,037	23,509,184	2.0
17	100-42-5	Styrene	1,491	20,309,017	3,083,829	23,392,846	2.0
18	107-21-1	Ethylene glycol	1,236	4,513,272	15,375,202	19,888,474	1.7
19	71-36-3	n-Butyl alcohol	988	11,146,670	1,983,085	13,129,755	1.1
20	75-05-8	Acetonitrile	100	8,976,372	4,111,538	13,087,910	1.1
21	50-00-0	Formaldehyde	809	9,884,585	1,506,988	11,391,573	1.0
22	7664-93-9	Sulfuric acid	534	9,478,028	0	9,478,028	0.8
23	79-01-6	Trichloroethylene	617	7,924,638	664,435	8,589,073	0.7
24	108-95-2	Phenol	755	4,709,843	3,435,076	8,144,919	0.7
25	108-10-1	Methyl isobutyl ketone	836	7,262,405	757,957	8,020,362	0.7
		Subtotal	40,973	679,115,986	342,984,975	1,022,100,961	88.0
		% of Total	70.3	88.5	87.0	88.0	
		Total	58,252	767,302,191	394,039,756	1,161,341,947	100.0

Releases and transfers of the top 25 chemicals in TRI totaled 1.02 billion kg, or 88 percent of the TRI total (Table 5-16). Methanol ranked first in TRI with 159.6 million kg, slightly more than the 154.4 million kg of zinc and its compounds, and nitric acid and nitrate compounds ranked third, with 142.7 million kg. Together, these three substances represented 39 percent of TRI total releases and transfers. TRI facilities reported more than 60 million kg each of two more substances: manganese and its compounds (65.5 million kg) and toluene (61.5 million kg).

The top five NPRI and top five TRI chemicals overlapped, with four substances in common: methanol, zinc and its compounds, nitric acid and nitrate compounds and toluene (Figure 5-14).



► Numbers indicate rank for total releases and transfers in matched data set.



† 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 released 58 percent of total releases and transfers of the designated carcinogens, compared to 66 percent in TRI. Correspondingly, transfers of carcinogens represented 42 percent of total releases and transfers as reported to NPRI compared to 34 percent in TRI (Figure 5–15, see previous page).

From NPRI sources, lead and its compounds was the carcinogen with the largest releases and transfers, 4.2 million kg, which came to 22 percent of carcinogens released and transferred. Chromium and its compounds, with 2.8 million kg, was second largest, at 15 percent of the total, and dichloromethane came third, with 14 percent (2.6 million kg). Formaldehyde ranked fourth with 11 percent, or 2.1 million kg (Table 5–17).

Table 5–17		NPRI Total Releases and Transfers of Known or Suspected Carcinogens†, 1997				
M	1997					
CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total for Carcinogens
—	Lead (and its compounds)	129	1,251,363	2,915,080	4,166,443	22.3
—	Chromium (and its compounds)	236	776,821	1,990,561	2,767,382	14.8
75-09-2	Dichloromethane	55	2,303,223	260,108	2,563,331	13.7
50-00-0	Formaldehyde	91	1,828,117	302,732	2,130,849	11.4
71-43-2	Benzene	48	1,479,788	27,302	1,507,090	8.1
1332-21-4	Asbestos (friable)	36	53,026	1,103,142	1,156,168	6.2
100-42-5	Styrene	80	818,325	321,545	1,139,870	6.1
—	Nickel (and its compounds)	150	364,094	515,592	879,686	4.7
79-01-6	Trichloroethylene	32	695,270	37,282	732,552	3.9
108-05-4	Vinyl acetate	10	283,107	4,105	287,212	1.5
75-07-0	Acetaldehyde	18	268,195	7,074	275,269	1.5
67-66-3	Chloroform	14	221,835	5,879	227,714	1.2
—	Arsenic (and its compounds)	48	149,053	67,092	216,145	1.2
—	Cadmium (and its compounds)	15	41,353	123,627	164,980	0.9
106-99-0	1,3-Butadiene	13	105,819	12,621	118,440	0.6
127-18-4	Tetrachloroethylene	27	52,407	24,659	77,066	0.4
117-81-7	Di(2-ethylhexyl) phthalate	33	19,849	45,440	65,289	0.4
75-01-4	Vinyl chloride	8	43,991	1	43,992	0.2
—	Cobalt (and its compounds)	25	20,614	10,372	30,986	0.2
107-06-2	1,2-Dichloroethane	6	19,603	589	20,192	0.1
75-21-8	Ethylene oxide	9	16,159	0	16,159	0.1
75-56-9	Propylene oxide	3	13,005	0	13,005	0.1
56-23-5	Carbon tetrachloride	4	336	12,429	12,765	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	24	774	8,315	9,089	0.0
106-46-7	1,4-Dichlorobenzene	4	8,100	400	8,500	0.0
107-13-1	Acrylonitrile	8	6,469	0	6,469	0.0
139-13-9	Nitrilotriacetic acid	16	2,868	2,902	5,770	0.0
123-91-1	1,4-Dioxane	3	3,998	0	3,998	0.0
79-06-1	Acrylamide	5	527	2,684	3,211	0.0
121-14-2	2,4-Dinitrotoluene	1	816	0	816	0.0
96-09-3	Styrene oxide	2	297	0	297	0.0
140-88-5	Ethyl acrylate	6	161	80	241	0.0
77-78-1	Dimethyl sulfate	1	10	0	10	0.0
584-84-9	Toluene-2,4-diisocyanate	1	10	0	10	0.0
106-89-8	Epichlorohydrin	1	4	3	7	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	1	6	0	6	0.0
302-01-2	Hydrazine	1	0	0	0	0.0
101-77-9	4,4'-Methylenedianiline	1	0	0	0	0.0
62-56-6	Thiourea	1	0	0	0	0.0
	Subtotal	1,166	10,849,393	7,801,616	18,651,009	100.0
	% of Total	25.4	13.5	15.8	14.4	
	Total for All Matched Chemicals	4,599	80,448,924	49,508,261	129,957,185	

† 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.

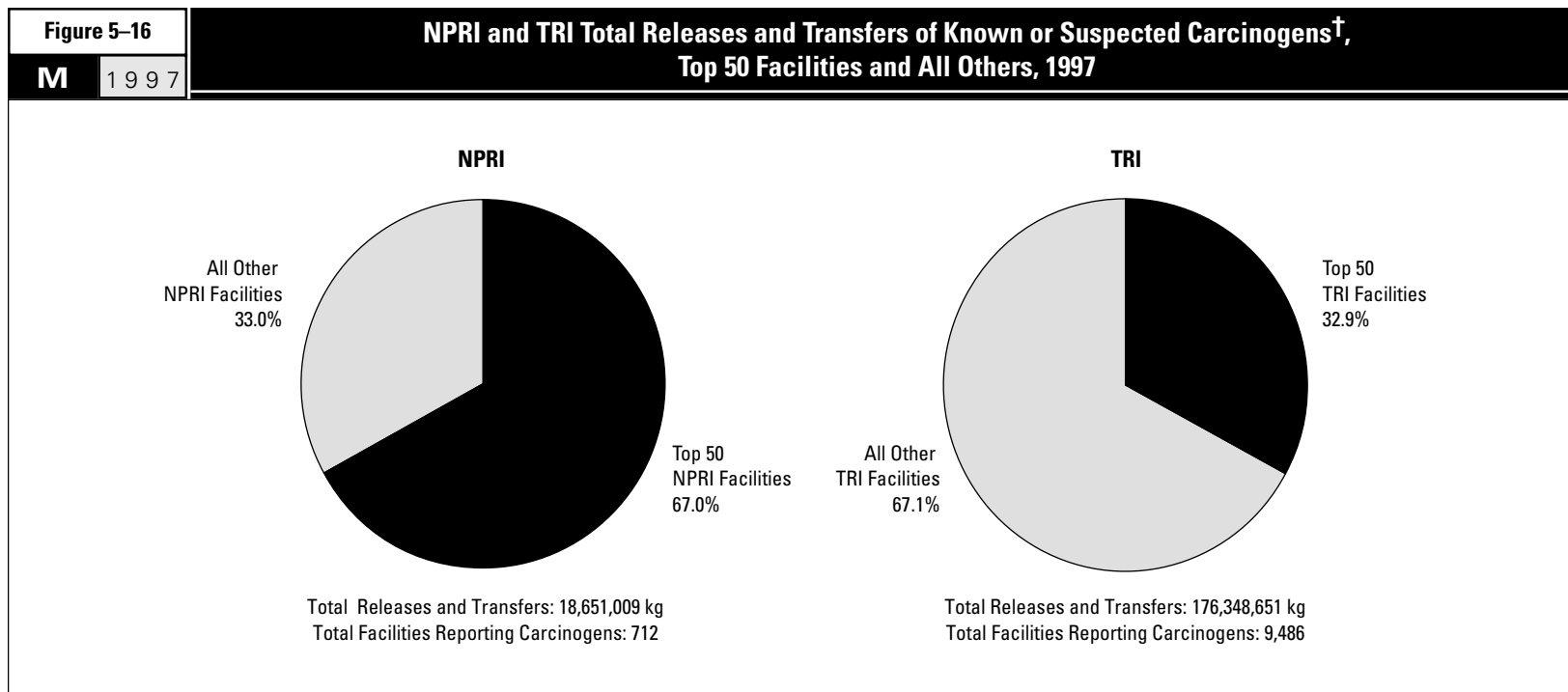
► A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

From TRI sources, dichloromethane had the largest total among carcinogens, with 27.6 million kg, or 16 percent of carcinogen releases and transfers. Lead and its compounds ranked second, with 26.4 million kg, followed closely by chromium and its compounds, with 26.2 million kg. These amounts were each approximately 15 percent of the total for carcinogens. Styrene was fourth, with 13 percent, or 23.4 million kg (Table 5-18).

Table 5-18		TRI Total Releases and Transfers of Known or Suspected Carcinogens [†] , 1997				
M	1997					
CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total Carcinogens
75-09-2	Dichloromethane	783	21,506,464	6,085,342	27,591,806	15.6
—	Lead (and its compounds)	1,606	8,818,161	17,600,736	26,418,897	15.0
—	Chromium (and its compounds)	3,288	14,485,603	11,726,757	26,212,360	14.9
100-42-5	Styrene	1,491	20,309,017	3,083,829	23,392,846	13.3
50-00-0	Formaldehyde	809	9,884,585	1,506,988	11,391,573	6.5
79-01-6	Trichloroethylene	617	7,924,638	664,435	8,589,073	4.9
—	Nickel (and its compounds)	2,947	2,551,439	5,199,851	7,751,290	4.4
75-07-0	Acetaldehyde	248	6,063,429	543,398	6,606,827	3.7
71-43-2	Benzene	449	4,148,494	1,045,633	5,194,127	2.9
67-66-3	Chloroform	143	3,346,096	839,939	4,186,035	2.4
—	Arsenic (and its compounds)	390	2,742,175	1,335,280	4,077,455	2.3
127-18-4	Tetrachloroethylene	359	3,054,561	488,164	3,542,725	2.0
79-06-1	Acrylamide	77	3,357,462	111,744	3,469,206	2.0
107-13-1	Acrylonitrile	109	2,384,811	531,447	2,916,258	1.7
1332-21-4	Asbestos (friable)	63	236,623	1,963,542	2,200,165	1.2
108-05-4	Vinyl acetate	186	1,563,459	549,214	2,112,673	1.2
106-99-0	1,3-Butadiene	184	1,231,099	144,951	1,376,050	0.8
107-06-2	1,2-Dichloroethane	78	418,669	868,755	1,287,424	0.7
—	Cadmium (and its compounds)	147	415,845	684,109	1,099,954	0.6
—	Cobalt (and its compounds)	517	357,314	586,218	943,532	0.5
98-95-3	Nitrobenzene	14	318,675	589,636	908,311	0.5
106-89-8	Epichlorohydrin	77	151,045	619,599	770,644	0.4
56-23-5	Carbon tetrachloride	65	177,280	523,206	700,486	0.4
117-81-7	Di(2-ethylhexyl) phthalate	296	139,264	560,238	699,502	0.4
75-56-9	Propylene oxide	117	262,657	299,264	561,921	0.3
75-01-4	Vinyl chloride	43	417,294	83,377	500,671	0.3
75-21-8	Ethylene oxide	147	410,700	60,069	470,769	0.3
26471-62-5	Toluenediisocyanate (mixed isomers)	174	23,777	421,558	445,335	0.3
123-91-1	1,4-Dioxane	44	155,170	266,885	422,055	0.2
106-46-7	1,4-Dichlorobenzene	23	121,521	89,422	210,943	0.1
140-88-5	Ethyl acrylate	93	83,209	74,121	157,330	0.1
101-77-9	4,4'-Methylenedianiline	26	11,050	39,954	51,004	0.0
302-01-2	Hydrazine	42	5,181	20,622	25,803	0.0
79-46-9	2-Nitropropane	3	12,026	11	12,037	0.0
62-56-6	Thiourea	29	3,004	7,083	10,087	0.0
139-13-9	Nitrilotriacetic acid	9	4,478	5,506	9,984	0.0
584-84-9	Toluene-2,4-diisocyanate	61	2,954	7,013	9,967	0.0
96-45-7	Ethylene thiourea	13	130	4,457	4,587	0.0
64-67-5	Diethyl sulfate	36	3,365	942	4,307	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	24	1,028	3,061	4,089	0.0
77-78-1	Dimethyl sulfate	37	2,042	1,056	3,098	0.0
91-08-7	Toluene-2,6-diisocyanate	28	1,271	1,429	2,700	0.0
95-80-7	2,4-Diaminotoluene	3	888	125	1,013	0.0
121-14-2	2,4-Dinitrotoluene	4	858	85	943	0.0
94-59-7	Safrole	2	229	113	342	0.0
606-20-2	2,6-Dinitrotoluene	1	210	50	260	0.0
90-94-8	Michler's ketone	1	182	0	182	0.0
96-09-3	Styrene oxide	2	5	0	5	0.0
	Subtotal	15,905	117,109,437	59,239,214	176,348,651	100.0
	% of Total	27.3	15.3	15.0	15.2	
	Total for All Matched Chemicals	58,252	767,302,191	394,039,756	1,161,341,947	

[†] 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.

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

The 50 NPRI facilities with the largest amounts for designated carcinogens reported two-thirds of the NPRI total. The 50 TRI facilities with the largest amounts reported one-third of the TRI total (**Figure 5-16**).

NPRI's top facilities for carcinogen releases and transfers reported 12.5 million kg of these substances. By type of release or transfer, the largest amounts were 4.8 million kg released to air and 4.6 million kg of metals transferred to treatment/sewage/dis-

posal. TRI's top facilities for carcinogen releases and transfers reported 58.0 million kg. The largest release/transfer types for the TRI facilities were 22.3 million kg of on-site land releases and 12.5 million kg of metals transfers (**Tables 5-19** and **5-20**).

Table 5-19		The 50 NPRI Facilities with the Largest Total Releases and Transfers of Known or Suspected Carcinogens†, 1997								
Rank	Facility	City, Province	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4	248,650	0	0	649,000	897,650
2	Dofasco Inc.	Hamilton, ON	29	33	5	315,968	446	0	82	316,496
3	Co-Steel Lasco	Whitby, ON	29	33	3	1,220	99	0	91,254	92,573
4	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	2	1,476	100	0	0	1,676
5	Celanese Canada Inc.	Edmonton, AB	37	28	6	151,422	0	227,000	0	378,422
6	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	3	17,150	837	0	0	17,987
7	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6	237,840	2,690	0	0	242,390
8	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	3	23,500	370	0	0	23,870
9	Metalex Products Ltd.	Richmond, BC	29	33	2	342	0	0	0	342
10	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	2	0	0	0	0	0
11	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	5	1,955	0	0	100	2,455
12	Tonolli Canada Limited	Mississauga, ON	29	33	1	2,305	50	0	0	2,355
13	Novopharm Limited	Scarborough, ON	37	28	1	313,250	0	0	0	313,250
14	Carpenter Canada Ltd.	Woodbridge, ON	16	30	2	296,820	0	0	0	296,925
15	Bayer Inc., Bayer AG	Sarnia, ON	37	28	5	81,872	31	0	0	82,673
16	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	5	278,510	2,520	0	0	281,030
17	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24	1	279,000	0	0	0	279,000
18	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29	2	1,308	11	0	0	1,319
19	Domfoam International Inc.	St-Léonard, QC	16	30	2	245,996	0	0	0	245,996
20	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	2	4,625	412	0	229,755	234,792
21	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	3	233,458	996	0	0	234,454
22	Novopharm Limited	Markham, ON	37	28	1	226,993	0	0	0	226,993
23	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	2	0	0	0	0	0
24	Valle Foam Industries Inc., Valle 1	Brampton, ON	16	30	2	218,200	0	0	0	218,252
25	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	2	13,030	199,400	0	0	212,430
26	Sandvik Steel Canada, Sandvik Steel, Inc.	Arnprior, ON	29	33	1	203,760	0	0	0	203,760
27	Vitafoam Products Canada Ltd., Vita-Toronto	Downsview, ON	16	30	3	201,660	0	0	0	202,260
28	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	1	62,136	0	0	0	62,136
29	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	2	2,045	78	0	167,150	169,273
30	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33	6	165,794	2,112	0	0	167,918
31	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	2	0	0	0	0	990
32	Foamex Canada Inc., Foamex L.P.	Toronto, ON	16	30	2	156,995	0	0	0	157,075
33	Dow Chemical Canada Inc.	Varennes, QC	16	30	2	953	0	0	0	953
34	Dow Chemical Canada Inc.	Sarnia, ON	37	28	17	53,503	2	0	46,576	100,758
35	Weyerhæuser Canada Ltd., Edson O.S.B. Mill	Edson, AB	25	24	2	131,500	0	0	0	131,500
36	Ivaco Rolling Mills	L'Orignal, ON	29	33	3	0	0	0	0	579
37	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33	2	236	463	0	0	699
38	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	3	0	0	0	125,530	125,530
39	Mirolin Industries, MRL Incorporated	Toronto, ON	16	30	2	119,860	0	0	0	119,860
40	Weyerhæuser Canada Ltd., Drayton Valley O.S.B. Mill	Drayton Valley, AB	25	24	2	115,430	0	0	0	115,430
41	Chemrec Inc.	Cowansville, QC	37	28	3	1,900	0	0	0	2,700
42	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	3	3,312	5	0	87,410	90,727
43	Carpenter Canada Ltd., Calgary Division	Calgary, AB	16	30	2	103,050	0	0	0	103,060
44	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	1	0	0	0	0	100
45	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	1	100,000	3	0	0	100,003
46	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	4	51,720	12	0	179	52,160
47	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	1	92,090	2,250	0	0	94,340
48	Bombardier Inc., Bombardier Produits récréatifs	St-Antoine-de-Tilly, QC	39	39	1	47,600	0	0	0	47,600
49	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	2	1,569	0	0	0	1,569
50	Zalev Brothers Limited	Windsor, ON	29	33	5	78	0	0	0	78
Subtotal					145	4,810,081	212,887	227,000	1,397,036	6,654,388
% of Total					12.4	54.9	80.2	82.8	91.8	61.3
Total for All NPRI Matched Carcinogens					1,166	8,754,031	265,491	274,086	1,522,430	10,849,393

† 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)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	0	0	897,650	Chromium and compounds (land)
2	0	63	0	302,700	302,763	619,259	Benzene (air), Lead and compounds (transfers of metals)
3	0	0	0	496,278	496,278	588,851	Lead and compounds (transfers of metals)
4	0	0	0	545,510	545,510	547,186	Chromium and compounds (transfers of metals)
5	0	0	64,033	41,000	105,033	483,455	Vinyl acetate, Acetaldehyde, Formaldehyde (UIJ)
6	0	0	0	465,000	465,000	482,987	Lead and compounds (transfers of metals)
7	0	0	230,000	400	230,400	472,790	Benzene (air), Asbestos (transfers to disposal)
8	0	0	0	401,290	401,290	425,160	Chromium/Nickel and compounds (transfers of metals)
9	0	0	0	421,667	421,667	422,009	Lead and compounds (transfers of metals)
10	0	0	0	324,258	324,258	324,258	Chromium and compounds (transfers of metals)
11	0	0	0	316,350	316,350	318,805	Lead and compounds (transfers of metals)
12	0	0	0	311,202	311,202	313,557	Lead and compounds (transfers of metals)
13	0	0	0	0	0	313,250	Dichloromethane (air)
14	0	0	0	0	0	296,925	Dichloromethane (air)
15	67,300	0	133,000	0	200,300	282,973	Asbestos (transfers to disposal), 1,3-Butadiene (air)
16	0	0	0	0	0	281,030	Lead and compounds (air)
17	0	0	0	0	0	279,000	Formaldehyde (air)
18	0	0	271,000	0	271,000	272,319	Asbestos (transfers to disposal)
19	0	0	0	0	0	245,996	Dichloromethane (air)
20	0	0	0	0	0	234,792	Lead and compounds (land)
21	0	0	0	0	0	234,454	Lead and compounds (air)
22	0	0	0	0	0	226,993	Dichloromethane (air)
23	0	0	0	223,000	223,000	223,000	Lead and compounds (transfers of metals)
24	0	0	0	0	0	218,252	Dichloromethane (air)
25	0	0	0	0	0	212,430	Formaldehyde (water)
26	0	0	0	0	0	203,760	Trichloroethylene (air)
27	0	0	0	0	0	202,260	Dichloromethane (air)
28	0	0	127,000	0	127,000	189,136	Formaldehyde (transfers to disposal, air)
29	0	0	0	0	0	169,273	Lead and compounds (land)
30	0	0	0	0	0	167,918	Benzene (air)
31	0	0	0	166,500	166,500	167,490	Lead and compounds (transfers of metals)
32	1	0	0	0	1	157,076	Dichloromethane (air)
33	138,383	0	680	0	139,063	140,016	Styrene (transfers to treatment)
34	30,931	0	0	0	30,931	131,689	Asbestos, Styrene (land), Benzene (air)
35	0	0	0	0	0	131,500	Formaldehyde (air)
36	0	0	0	129,110	129,110	129,689	Lead and compounds (transfers of metals)
37	0	0	0	128,180	128,180	128,879	Chromium and compounds (transfers of metals)
38	0	0	0	0	0	125,530	Lead and compounds (land)
39	0	0	0	0	0	119,860	Dichloromethane, Styrene (air)
40	0	0	0	0	0	115,430	Formaldehyde (air)
41	105,500	0	0	0	105,500	108,200	Dichloromethane, Trichloroethylene (transfers to treatment)
42	0	0	0	17,233	17,233	107,960	Lead and compounds (land)
43	0	0	0	0	0	103,060	Dichloromethane (air)
44	0	0	0	100,000	100,000	100,100	Nickel and compounds (transfers of metals)
45	0	0	0	0	0	100,003	Benzene (air)
46	0	0	43,700	48	43,748	95,908	Asbestos (transfers to disposal), Benzene (air)
47	0	0	0	0	0	94,340	Chloroform (air)
48	22,965	0	23,276	0	46,241	93,841	Styrene (air, transfers to disposal)
49	0	0	0	91,952	91,952	93,521	Lead and compounds (transfers of metals)
50	0	0	0	93,029	93,029	93,107	Lead/Nickel and compounds (transfers of metals)
	365,080	63	892,689	4,574,707	5,832,539	12,486,927	
	49.1	0.2	63.8	81.4	74.8	67.0	
	743,079	37,373	1,398,840	5,622,324	7,801,616	18,651,009	

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

► UIJ = underground injection

Table 5-20		The 50 TRI Facilities with the Largest Total Releases and Transfers of Known or Suspected Carcinogens†, 1997								
M	1997			US SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1	2,018	113	0	6,575,964	6,578,095	
2	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	5	27,487	452	0	4,073,128	4,101,067	
3	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,843	14	0	4,126,984	4,129,841	
4	Monsanto Co.	Luling, LA	28	2	15,601	0	3,221,043	0	3,236,644	
5	ASARCO Inc.	East Helena, MT	33	4	23,355	1,262	0	1,739,278	1,763,895	
6	Pharmacia & Upjohn Co.	Portage, MI	28	4	55,706	830	8,784	0	65,320	
7	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	2	11	46	0	0	57	
8	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	5	20,563	0	1,690,118	656	1,711,337	
9	ASARCO Inc., Glover Plant	Annapolis, MO	33	4	21,141	5	0	1,582,218	1,603,364	
10	Angus Chemical Co.	Sterlington, LA	28	4	12,481	1,956	1,126,995	0	1,141,432	
11	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	34,921	7	0	1,062,717	1,097,645	
12	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	4	5,149	14	0	0	5,163	
13	Aquaglass Corp., Masco Corp.	Adamsville, TN	30	1	1,057,867	0	0	0	1,057,867	
14	Solutia Inc., Chocolate Bayou	Alvin, TX	28	3	13,064	0	1,025,986	0	1,039,050	
15	Eastman Kodak Co., Kodak Park	Rochester, NY	38	9	980,987	25,565	0	6,803	1,013,355	
16	BP Chemicals Inc., BP America Inc.	Lima, OH	28	10	27,171	0	965,267	0	992,438	
17	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	5	4,009	235	979,139	0	983,383	
18	Quemetco Inc., RSR Corp.	City of Industry, CA	33	3	722	1	0	0	723	
19	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28	2	396,123	0	0	0	396,123	
20	Foamex L.P., Div. of Kihl	Corry, PA	30	2	903,448	0	0	0	903,448	
21	ASARCO Inc.	Omaha, NE	33	2	1,818	338	0	680	2,836	
22	Quemetco Inc., RSR Corp.	Indianapolis, IN	33	3	1,416	0	0	0	1,416	
23	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	6	13,177	267	0	833,526	846,970	
24	Borden Chemicals & Plastics LP	Geismar, LA	28	7	815,549	187	9	0	815,745	
25	C & D Techs. Inc.	Conyers, GA	36	1	430	0	0	363	793	
26	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	4	663	0	0	0	663	
27	Boeing Co.	Wichita, KS	Mult.	6	595,943	452	0	0	596,395	
28	Carpenter Co., Tupelo Div.	Verona, MS	30	2	704,215	0	0	0	704,215	
29	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR	28	1	689,524	0	0	0	689,524	
30	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33	5	19,138	2	0	0	19,140	
31	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	7	8,074	0	0	672,109	680,183	
32	Shell Oil Co.	Deer Park, TX	Mult.	17	90,956	3	0	164	91,123	
33	Northwestern Steel & Wire Co.	Sterling, IL	33	2	4,921	345	0	593,651	598,917	
34	Doe Run Co., Renco Group Inc.	Herculanenum, MO	33	5	99,783	98	0	494,901	594,782	
35	Carpenter Co.	Russellville, KY	Mult.	5	571,776	0	0	0	571,776	
36	Sterling Chemicals Inc.	Texas City, TX	28	9	67,453	0	481,566	0	549,019	
37	Wagner Brake, Cooper Ind. Inc.	Scottsville, KY	37	1	113	0	0	0	113	
38	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA	33	3	713	251	0	0	964	
39	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	4	16,091	0	0	40,230	56,321	
40	Foamex Intl. Inc.	Milan, TN	30	2	521,285	0	0	0	521,285	
41	Rubicon Inc.	Geismar, LA	28	9	40,207	8	268,481	0	308,696	
42	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO	33	3	17,134	226	0	0	17,360	
43	Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta, PR	28	1	35,873	0	0	0	35,873	
44	FMC Corp.	Pocatello, ID	28	4	2,924	0	0	477,785	480,709	
45	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	New Castle, IN	33	2	232	226	0	0	458	
46	Shieldalloy Metallurgical, Metallurg Inc.	Newfield, NJ	33	1	174	4	0	0	178	
47	Reichhold Chemicals Inc.	Jacksonville, FL	28	2	3,456	0	0	0	3,456	
48	GE Co.	Ottawa, IL	28	4	446,033	117	0	115	446,265	
49	Maynard Steel Casting Co.	Milwaukee, WI	33	2	454	0	0	0	454	
50	Dow North America, Allyn's Point Plant, Dow Chemical Co.	Gales Ferry, CT	Mult.	3	1,512	0	0	0	1,512	
Subtotal				195	8,375,704	33,024	9,767,388	22,281,272	40,457,388	
% of Total				1.2	10.8	5.7	86.1	80.3	34.5	
Total for All TRI Matched Carcinogens				15,905	77,430,341	579,642	11,349,487	27,749,967	117,109,437	

† 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/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	1,434,288	1,434,288	8,012,383	Chromium and compounds (land)
2	0	0	0	69,666	69,666	4,170,733	Lead/Arsenic and compounds (land)
3	0	0	0	6,349	6,349	4,136,190	Chromium and compounds (land)
4	6,803	0	0	0	6,803	3,243,447	Formaldehyde (UIJ)
5	0	0	0	279,650	279,650	2,043,545	Lead and compounds (land)
6	1,629,089	126,005	4,526	69	1,759,689	1,825,009	Dichloromethane (transfers to treatment)
7	0	0	0	1,723,356	1,723,356	1,723,413	Lead and compounds (transfers of metals)
8	504	0	0	207	711	1,712,048	Acrylamide, Acrylonitrile (UIJ)
9	0	0	0	0	0	1,603,364	Lead and compounds (land)
10	91	0	0	3,717	3,808	1,145,240	Formaldehyde (UIJ)
11	0	0	0	0	0	1,097,645	Nickel and compounds (land)
12	0	0	0	1,061,318	1,061,318	1,066,481	Lead/Nickel/Cadmium and compounds (transfers of metals)
13	0	0	0	0	0	1,057,867	Styrene (air)
14	0	0	0	0	0	1,039,050	Acrylonitrile (UIJ)
15	17,276	0	544	176	17,996	1,031,351	Dichloromethane (air)
16	2,373	0	177	230	2,780	995,218	Acrylamide (UIJ)
17	31	0	2	22	55	983,438	Acrylamide (UIJ)
18	0	0	0	934,969	934,969	935,692	Lead and compounds (transfers of metals)
19	498,866	38,957	0	0	537,823	933,946	Dichloromethane (transfers to treatment, air)
20	7,126	0	0	0	7,126	910,574	Dichloromethane (air)
21	0	0	0	893,671	893,671	896,507	Lead and compounds (transfers of metals)
22	0	0	0	879,880	879,880	881,296	Lead and compounds (transfers of metals)
23	0	0	0	113	113	847,083	Lead/Arsenic/Chromium and compounds (land)
24	18,796	0	12	1	18,809	834,554	Benzene (air)
25	0	0	0	810,519	810,519	811,312	Lead and compounds (transfers of metals)
26	0	0	0	735,580	735,580	736,243	Lead and compounds (transfers of metals)
27	33,401	0	0	98,927	132,328	728,723	Tetrachloroethylene (air)
28	992	0	0	0	992	705,207	Dichloromethane (air)
29	0	12	0	0	12	689,536	Dichloromethane (air)
30	0	0	0	666,122	666,122	685,262	Lead/Arsenic/Cobalt and compounds (transfers of metals)
31	0	0	0	0	0	680,183	Lead/Chromium and compounds (land)
32	559,185	0	327	0	559,512	650,635	Epichlorohydrin (transfers to treatment)
33	0	0	0	2,087	2,087	601,004	Chromium/Lead and compounds (land)
34	0	0	0	368	368	595,150	Lead and compounds (land)
35	4,402	0	0	0	4,402	576,178	Dichloromethane (air)
36	9,324	0	3,363	108	12,795	561,814	Acrylamide (UIJ)
37	0	0	557,771	0	557,771	557,884	Asbestos (transfers to disposal)
38	0	0	0	545,674	545,674	546,638	Lead and compounds (transfers of metals)
39	0	0	0	478,160	478,160	534,481	Arsenic and compounds (transfers of metals)
40	445	0	0	0	445	521,730	Dichloromethane (air)
41	192,526	0	5,468	4	197,998	506,694	Nitrobenzene (UIJ, transfers to treatment)
42	0	0	0	475,008	475,008	492,368	Lead and compounds (transfers of metals)
43	445,533	7,846	0	0	453,379	489,252	Dichloromethane (transfers to treatment)
44	0	0	0	23	23	480,732	Chromium/Cadmium and compounds (land)
45	0	0	0	476,191	476,191	476,649	Chromium/Nickel and compounds (transfers of metals)
46	0	0	0	468,822	468,822	469,000	Chromium and compounds (transfers of metals)
47	462,390	0	0	0	462,390	465,846	Styrene (transfers to treatment)
48	0	0	0	116	116	446,381	Styrene, Acrylonitrile (air)
49	0	0	0	436,890	436,890	437,344	Chromium and compounds (transfers of metals)
50	427,295	0	0	0	427,295	428,807	Styrene (transfers to treatment)
	4,316,448	172,820	572,190	12,482,281	17,543,739	58,001,127	
	27.7	6.2	15.2	33.6	29.6	32.9	
	15,568,226	2,767,647	3,770,390	37,132,951	59,239,214	176,348,651	

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

► UIJ = underground injection

Metals

Transfers were a large majority of total amounts reported to NPRI for metals and their compounds. In TRI, however, transfers were a substantially smaller majority of the total. NPRI facilities transferred 73 percent of total releases and transfers of metals, while TRI facilities transferred 55 percent of their total (Figure 5-17, below).

Releases and transfers of metals and their compounds totaled 43.5 million kg in NPRI and 329.8 million kg in TRI. NPRI facilities released 11.8 million kg and transferred 31.8 million kg of these substances. TRI releases were 149.2 million kg, and transfers were 180.5 million kg (Tables 5-21 and 5-22).

Zinc and manganese and their compounds ranked first and second for total releases and transfers in both NPRI and TRI. Totals in NPRI were 25.7 million kg of zinc and its compounds and 6.8 million kg of manganese and its compounds. TRI facilities reported 154.4 million kg of zinc and its compounds and 65.5 million kg for manganese and its compounds. Lead and its compounds ranked third in NPRI, with 4.2 million kg, while copper and its compounds ranked third in TRI, with 34.7 million kg.

Table 5-21		NPRI Total Releases and Transfers of Metals and Their Compounds, 1997			
M	1997				
CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
—	Zinc (and its compounds)	322	5,813,918	19,888,014	25,701,932
—	Manganese (and its compounds)	257	1,909,572	4,862,688	6,772,260
—	Lead (and its compounds)	129	1,251,363	2,915,080	4,166,443
—	Chromium (and its compounds)	236	776,821	1,990,561	2,767,382
—	Copper (and its compounds)	261	660,947	1,111,567	1,772,514
—	Nickel (and its compounds)	150	364,094	515,592	879,686
7429-90-5	Aluminum (fume or dust)	37	534,619	255,416	790,035
7440-62-2	Vanadium (fume or dust)	13	215,356	1,645	217,001
—	Arsenic (and its compounds)	48	149,053	67,092	216,145
—	Cadmium (and its compounds)	15	41,353	123,627	164,980
—	Selenium (and its compounds)	6	9,280	30,369	39,649
—	Cobalt (and its compounds)	25	20,614	10,372	30,986
—	Antimony (and its compounds)	30	7,301	12,933	20,234
—	Mercury (and its compounds)	3	244	3,486	3,730
—	Silver (and its compounds)	9	1,479	269	1,748
Subtotal		1,541	11,756,014	31,788,711	43,544,725
% of Total		33.5	14.6	64.2	33.5
Total for All Matched NPRI Chemicals		4,599	80,448,924	49,508,261	129,957,185

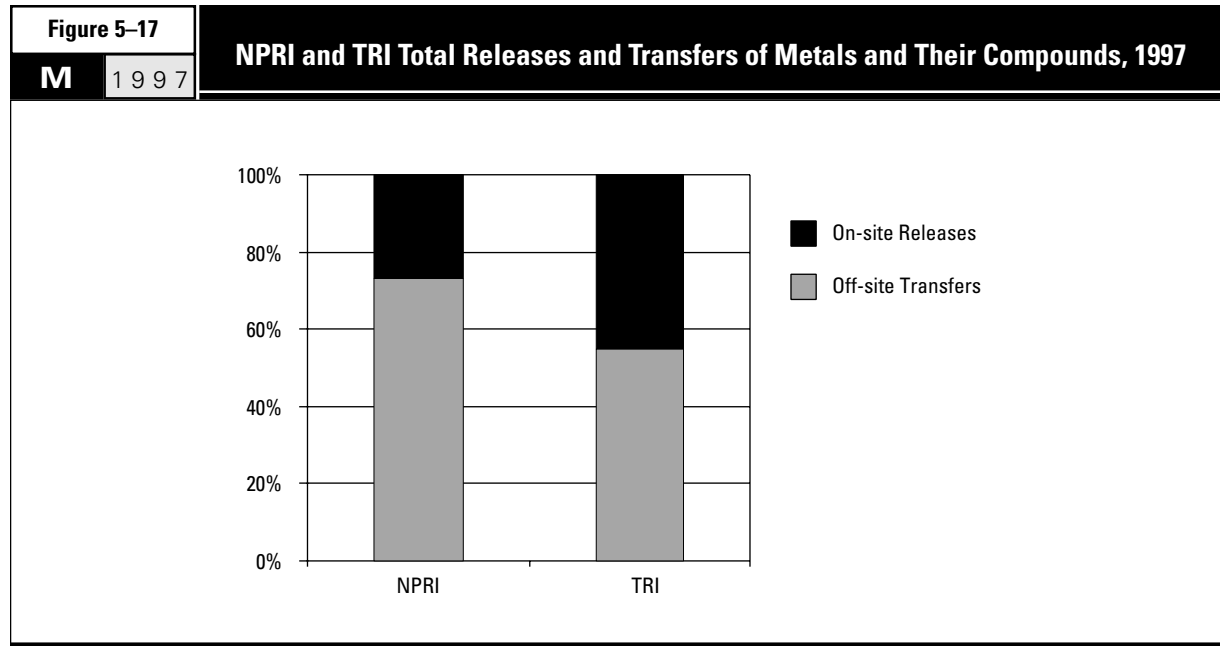


Table 5-22		TRI Total Releases and Transfers of Metals and Their Compounds, 1997			
M		1997			
CAS Number	Chemical	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
—	Zinc (and its compounds)	3,044	59,247,400	95,103,244	154,350,644
—	Manganese (and its compounds)	2,827	36,787,267	28,686,838	65,474,105
—	Copper (and its compounds)	4,177	21,179,453	13,536,196	34,715,649
—	Lead (and its compounds)	1,606	8,818,161	17,600,736	26,418,897
—	Chromium (and its compounds)	3,288	14,485,603	11,726,757	26,212,360
—	Nickel (and its compounds)	2,947	2,551,439	5,199,851	7,751,290
7429-90-5	Aluminum (fume or dust)	325	1,743,571	3,813,654	5,557,225
—	Arsenic (and its compounds)	390	2,742,175	1,335,280	4,077,455
—	Antimony (and its compounds)	671	632,239	2,164,243	2,796,482
—	Cadmium (and its compounds)	147	415,845	684,109	1,099,954
—	Cobalt (and its compounds)	517	357,314	586,218	943,532
—	Selenium (and its compounds)	59	184,615	18,471	203,086
7440-62-2	Vanadium (fume or dust)	20	59,254	19,724	78,978
—	Silver (and its compounds)	139	28,548	43,822	72,370
—	Mercury (and its compounds)	29	10,327	23,048	33,375
Subtotal		20,186	149,243,211	180,542,191	329,785,402
% of Total		34.7	19.5	45.8	28.4
Total for All Matched TRI Chemicals		58,252	767,302,191	394,039,756	1,161,341,947

The 50 NPRI facilities with the largest amounts for metals accounted for 93 percent of the NPRI total. The 50 TRI facilities with the largest amounts for metals reported 63 percent of the TRI total (Figure 5-18).

The top 50 NPRI facilities released and transferred 40.5 million kg of metals and their compounds. The largest components of this total were on-site land releases of 8.5 million kg and transfers to treatment/sewage/disposal of 29.4 million kg. In TRI, the top 50 facilities released and transferred 207.5 million kg of metals and their compounds, including 105.0 million kg released on-site to land and 91.3 million kg transferred off-site to treatment/sewage/disposal (Tables 5-23 and 5-24).

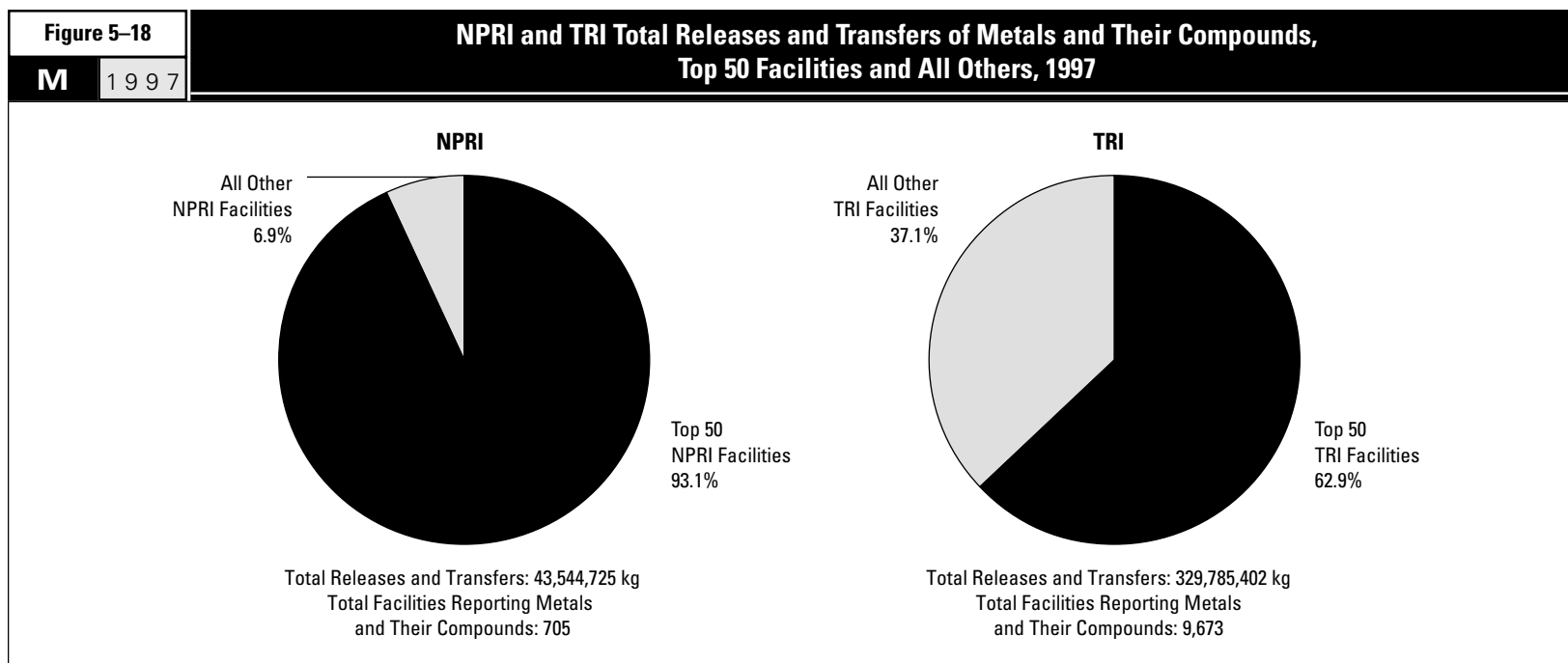


Table 5-23		The 50 NPRI Facilities with the Largest Total Releases and Transfers of Metals and Their Compounds, 1997								
Rank	Facility	City, Province	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	Dofasco Inc.	Hamilton, ON	29	33	6	16,758	6,173	0	0	22,931
2	Co-Steel Lasco	Whitby, ON	29	33	6	14,253	362	0	1,245,254	1,259,869
3	Ispat Sidbec Inc. Acière, Ispat Mexicana	Contrecoeur, QC	29	33	5	48,835	550	0	2,300,405	2,349,790
4	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5	16,600	0	0	0	17,750
5	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6	18,012	2,682	0	442,030	462,724
6	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	5	22,322	152	0	1,730,140	1,752,614
7	Ivaco Rolling Mills	L'Original, ON	29	33	7	8,552	1	0	0	9,447
8	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	8	8,721	0	0	200	10,321
9	Zalev Brothers Limited	Windsor, ON	29	33	8	422	7	0	0	429
10	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6	365,986	0	0	649,000	1,014,986
11	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6	12,053	47	0	717,505	729,605
12	Kronos Canada, Inc.	Varenes, QC	37	28	2	0	32,500	0	0	32,500
13	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1	0	0	0	0	0
14	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	5	706,574	3,780	0	0	710,354
15	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	5	10,608	0	0	0	10,608
16	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	4	970	450	0	0	1,420
17	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	3	1,476	100	0	0	1,776
18	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	11	482,280	15,840	0	0	498,120
19	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	5	17,280	968	0	0	18,248
20	Metalex Products Ltd.	Richmond, BC	29	33	5	371	0	0	0	371
21	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5	0	0	0	402,950	402,950
22	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	5	2,280	3,662	0	0	5,942
23	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	3	0	0	0	0	0
24	Tonlli Canada Limited	Mississauga, ON	29	33	1	2,305	50	0	0	2,355
25	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33	6	395	2,048	0	0	2,443
26	Sydney Steel Corporation	Sydney, NS	29	33	8	0	300	0	289,990	290,290
27	Recyclage d'aluminium Québec Inc., Philip Services Corp.	Bécancour, QC	29	33	1	0	0	0	275,000	275,000
28	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	3	0	0	0	0	0
29	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26	2	0	74,800	0	127,400	202,200
30	Recyclage d'aluminium Québec, Ragueneau, Philip Services Corp.	Baie-Comeau, QC	29	33	1	0	0	0	185,000	185,000
31	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	9	157,755	11,413	0	0	169,168
32	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	4	0	0	0	0	800
33	North Atlantic Refining Ltd.	Come By Chance, NF	36	29	4	132,922	0	0	0	132,922
34	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-de-Valleyfield, QC	29	33	8	93,146	13,328	0	0	107,762
35	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	32	37	2	0	0	0	0	0
36	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26	2	0	9,500	0	0	9,500
37	Stelwire Ltd., Parkdale Works	Hamilton, ON	30	34	3	750	25	0	0	927
38	Coatings 85 Ltd.	Mississauga, ON	30	34	1	0	0	0	0	0
39	Cartons St-Laurent Inc.	LaTuque, QC	27	26	2	1,532	36,834	0	0	38,366
40	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	2	0	6,790	0	96,347	103,137
41	Inco Limited, Manitoba Division	Thompson, MB	29	33	4	75,252	18,525	0	0	93,777
42	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	4	87,952	110	0	4,784	92,846
43	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34	3	0	0	0	0	0
44	Steffil Ltée, Stelco Inc.	Lachine, QC	30	33	2	184	99	0	0	283
45	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26	1	0	28,500	0	0	28,500
46	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37	3	44,898	0	0	0	44,898
47	Metal Koting, Continuous Colour Coat Ltd.	Rexdale, ON	30	34	2	0	0	0	0	301
48	Protec Finishing Ltd.	Mississauga, ON	30	34	1	0	0	0	0	0
49	Michelin North America (Canada) Inc., Granton, NS Plant	New Glasgow, NS	15	30	2	0	63	0	0	63
50	Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est, QC	29	33	9	3,657	0	0	0	4,357
Subtotal					212	2,355,101	269,659	0	8,466,005	11,097,650
% of Total					13.8	90.1	76.9	0.0	96.7	94.4
Total for All NPRI Matched Metals					1,541	2,614,044	350,766	576	8,751,998	11,756,014

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	8,168,440	8,168,440	8,191,371	Zinc/Manganese and compounds (transfers of metals)
2	0	0	0	5,799,885	5,799,885	7,059,754	Zinc and compounds (transfers of metals)
3	0	0	0	0	0	2,349,790	Zinc and compounds (land)
4	0	0	0	2,298,300	2,298,300	2,316,050	Zinc and compounds (transfers of metals)
5	0	0	0	1,480,000	1,480,000	1,942,724	Zinc and compounds (transfers of metals)
6	0	0	0	0	0	1,752,614	Zinc and compounds (land)
7	0	0	0	1,647,700	1,647,700	1,657,147	Zinc and compounds (transfers of metals)
8	0	0	0	1,481,088	1,481,088	1,491,409	Zinc/Lead and compounds (transfers of metals)
9	0	0	0	1,104,869	1,104,869	1,105,298	Zinc/Copper and compounds (transfers of metals)
10	0	0	0	0	0	1,014,986	Chromium/Nickel and compounds (air)
11	0	0	0	241,888	241,888	971,493	Zinc/Manganese and compounds (land)
12	0	0	0	855,000	855,000	887,500	Manganese and compounds (transfers of metals)
13	0	0	0	840,570	840,570	840,570	Zinc and compounds (transfers of metals)
14	0	0	0	0	0	710,354	Zinc/Lead and compounds (air)
15	0	0	0	621,538	621,538	632,146	Zinc and compounds (transfers of metals)
16	0	0	0	584,310	584,310	585,730	Chromium/Nickel/Manganese and compounds (transfers of metals)
17	0	0	0	571,557	571,557	573,333	Chromium and compounds (transfers of metals)
18	0	0	0	0	0	498,120	Lead/Copper/Zinc and compounds (air)
19	0	0	0	467,400	467,400	485,648	Lead and compounds (transfers of metals)
20	0	0	0	484,370	484,370	484,741	Lead and compounds (transfers of metals)
21	0	0	0	0	0	402,950	Zinc/Lead and compounds (land)
22	0	0	0	362,000	362,000	367,942	Zinc/Manganese and compounds (transfers of metals)
23	0	0	0	327,898	327,898	327,898	Chromium and compounds (transfers of metals)
24	0	0	0	311,202	311,202	313,557	Lead and compounds (transfers of metals)
25	0	0	0	305,118	305,118	307,561	Chromium/Zinc/Manganese and compounds (transfers of metals)
26	0	0	0	0	0	290,290	Zinc/Manganese and compounds (land)
27	0	0	0	0	0	275,000	Aluminum (land)
28	0	0	0	224,300	224,300	224,300	Lead and compounds (transfers of metals)
29	0	0	0	0	0	202,200	Manganese and compounds (land, water)
30	0	0	0	0	0	185,000	Aluminum (land)
31	0	0	0	0	0	169,168	Lead/Copper and compounds (air)
32	0	0	0	142,900	142,900	143,700	Nickel/Copper and compounds (transfers of metals)
33	0	0	0	0	0	132,922	Vanadium (air)
34	0	0	0	20,633	20,633	128,395	Zinc and compounds (air)
35	0	0	0	128,300	128,300	128,300	Manganese and compounds (transfers of metals)
36	0	0	0	107,600	107,600	117,100	Aluminum, Manganese and compounds (transfers of metals)
37	0	0	0	115,551	115,551	116,478	Zinc and compounds (transfers of metals)
38	0	0	0	112,972	112,972	112,972	Zinc and compounds (transfers of metals)
39	0	0	0	71,666	71,666	110,032	Manganese and compounds (transfers of metals, water)
40	0	0	0	0	0	103,137	Zinc and compounds (land)
41	0	0	0	0	0	93,777	Nickel and compounds (air)
42	0	0	0	4	4	92,850	Vanadium (air)
43	0	0	0	91,920	91,920	91,920	Chromium/Nickel and compounds (transfers of metals)
44	0	0	0	86,507	86,507	86,790	Zinc and compounds (transfers of metals)
45	0	0	0	52,900	52,900	81,400	Manganese and compounds (transfers of metals, water)
46	0	0	0	36,400	36,400	81,298	Aluminum (air), Copper and compounds (transfers of metals)
47	0	0	0	80,087	80,087	80,388	Zinc and compounds (transfers of metals)
48	0	0	0	78,503	78,503	78,503	Zinc and compounds (transfers of metals)
49	0	0	0	75,441	75,441	75,504	Zinc and compounds (transfers of metals)
50	0	0	0	68,234	68,234	72,591	Arsenic/Selenium and compounds (transfers of metals)
	0	0	0	29,447,051	29,447,051	40,544,701	
				92.6	92.6	93.1	
	0	0	0	31,788,711	31,788,711	43,544,725	

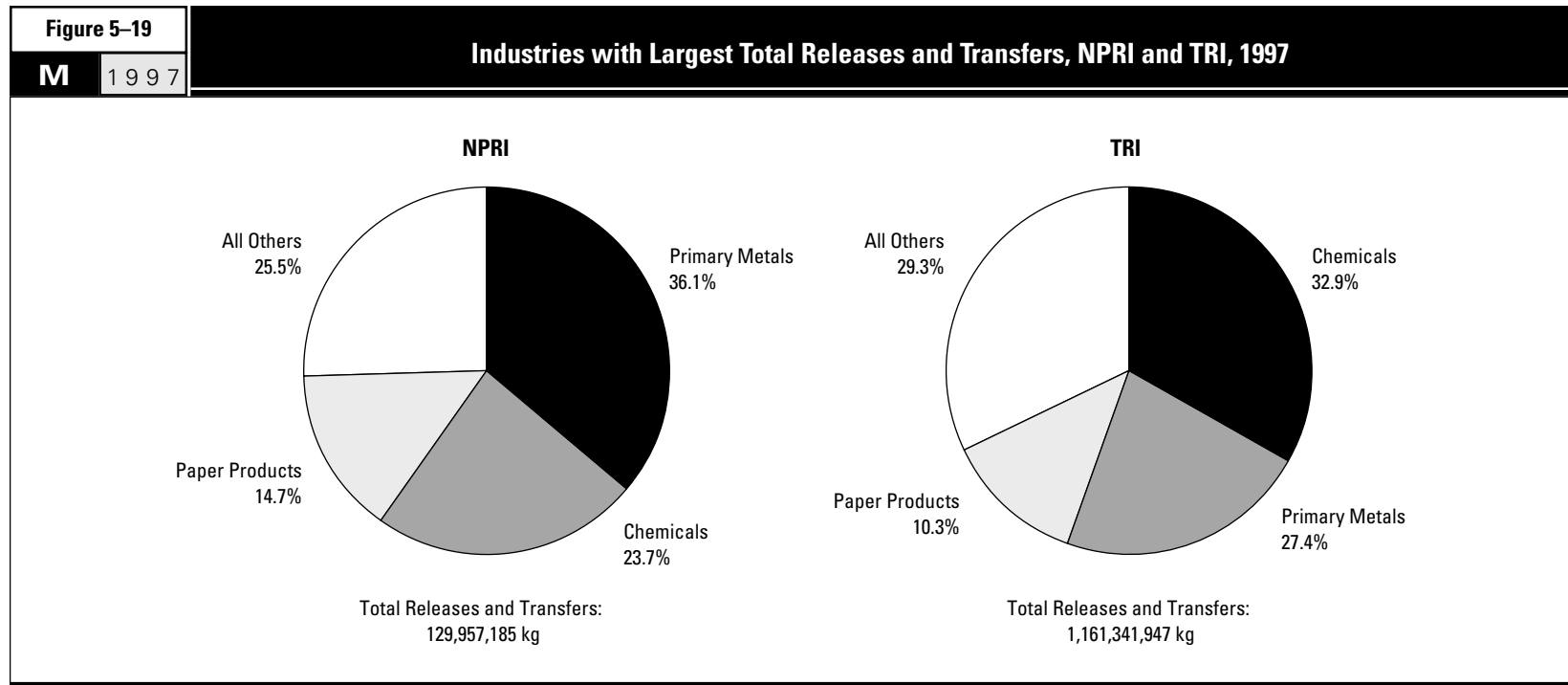
* Chemicals accounting for more than 70% of total releases and transfers of metals from the facility.

Table 5-24		The 50 TRI Facilities with the Largest Total Releases and Transfers of Metals and Their Compounds, 1997								
M	1997			US SIC Code	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	ASARCO Inc.	East Helena, MT	33	9	40,338	2,280	0	17,100,454	17,143,072	
2	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	9	224,918	195	0	0	225,113	
3	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	10	133,922	3,644	0	12,048,532	12,186,098	
4	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	8	71,865	4,215	0	10,900,498	10,976,578	
5	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	11	18,596	0	0	8,503,492	8,522,088	
6	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1	2,018	113	0	6,575,964	6,578,095	
7	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	7	7,224	0	0	0	7,224	
8	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	11	140,596	7,755	0	6,450,341	6,598,692	
9	Northwestern Steel & Wire Co.	Sterling, IL	33	4	55,261	1,179	0	6,716,100	6,772,540	
10	Steel Dynamics Inc.	Butler, IN	33	6	6,612	0	0	0	6,612	
11	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33	7	33,356	2,111	0	0	35,467	
12	Nucor Steel, Nucor Corp.	Crawfordsville, IN	33	6	964	42	0	660	1,666	
13	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	6	33,575	2,175	0	5,564,083	5,599,833	
14	Elkem Metals Co.	Marietta, OH	33	5	174,615	205,442	0	4,752,382	5,132,439	
15	ASARCO Inc., Glover Plant	Annapolis, MO	33	7	28,690	10	0	4,892,495	4,921,195	
16	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	2,843	14	0	4,126,984	4,129,841	
17	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	8	118,721	183	0	3,839,901	3,958,805	
18	Nucor Steel	Plymouth, UT	33	5	4,348	0	0	2,334	6,682	
19	DuPont	Pass Christian, MS	28	6	0	0	3,809,524	0	3,809,524	
20	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	5	52,446	4,354	0	0	56,800	
21	DuPont	New Johnsonville, TN	28	5	0	0	3,516,553	0	3,516,553	
22	USS Mon Valley Works, USX Corp.	Braddock, PA	33	5	1,549	465	0	0	2,014	
23	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33	7	10,868	115	0	0	10,983	
24	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	11	2,046,411	0	0	842,723	2,889,134	
25	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3	120	4	0	0	124	
26	Granite City Steel, National Steel Corp.	Granite City, IL	33	6	22,216	5,704	0	2,667,815	2,695,735	
27	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33	5	34,992	398	0	210	35,600	
28	Timken Co., Faircrest Steel Plant	Canton, OH	33	6	5,378	1	0	0	5,379	
29	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33	5	12,563	0	0	0	12,563	
30	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	5	4,231	0	0	0	4,231	
31	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6	5,185	0	0	0	5,185	
32	FMC Corp.	Pocatello, ID	28	9	4,674	338	0	2,167,628	2,172,640	
33	USS Fairfield Works, USX Corp.	Fairfield, AL	33	8	6,353	794	0	2,133,209	2,140,356	
34	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.	3	4,354	6,145	0	2,066,666	2,077,165	
35	Southwire Co.	Carrollton, GA	Mult.	29	13,228	1,310	0	0	14,538	
36	Bar Techs. Inc.	Johnstown, PA	33	5	4,815	4	0	0	4,819	
37	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33	5	10,815	0	0	0	10,815	
38	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	5	27,463	4,549	0	0	32,012	
39	ASARCO Inc.	Omaha, NE	33	5	5,008	539	0	1,362	6,909	
40	Ameristeel Corp.	Charlotte, NC	33	6	20,292	0	0	0	20,292	
41	Oregon Steel Mills Inc.	Portland, OR	33	6	2,737	47	0	0	2,784	
42	Chemetals Inc., Comilog	New Johnsonville, TN	28	1	15,556	583	0	1,523,810	1,539,949	
43	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.	6	16,643	681	0	0	17,324	
44	Louisiana Pigment Co. L.P.	Westlake, LA	28	1	9	122	0	1,405,896	1,406,027	
45	Millennium Inorganic Chemicals, Plant 2, Millennium Chemical	Ashtabula, OH	28	1	0	63,492	0	0	63,492	
46	Austeel Lemont Co. Inc.	Lemont, IL	33	5	12,521	226	0	766,139	778,886	
47	Koppel Steel Corp., NS Group Inc.	Koppel, PA	33	5	3,957	22	0	0	3,979	
48	Timken Co., Harrison Steel Plant	Canton, OH	33	7	2,602	114	0	0	2,716	
49	Eveready Battery Co. Inc., Ralston Purina Co.	Marietta, OH	28	1	5,170	181	0	0	5,351	
50	Roanoke Electric Steel Corp.	Roanoke, VA	33	7	2,422	137	0	0	2,559	
Subtotal				311	3,453,040	319,683	7,326,077	105,049,678	116,148,478	
% of Total				1.5	35.1	11.5	96.4	81.4	77.8	
Total for All TRI Matched Metals				20,186	9,850,938	2,769,749	7,596,524	129,026,000	149,243,211	

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	547,191	547,191	17,690,263	Zinc and compounds (land)
2	0	0	0	13,855,648	13,855,648	14,080,761	Zinc and compounds (transfers of metals)
3	0	0	0	113	113	12,186,211	Zinc/Copper and compounds (land)
4	0	0	0	192,057	192,057	11,168,635	Copper/Zinc/Lead and compounds (land)
5	0	0	0	0	0	8,522,088	Copper and compounds (land)
6	0	0	0	1,434,288	1,434,288	8,012,383	Chromium and compounds (land)
7	0	0	0	7,543,045	7,543,045	7,550,269	Zinc and compounds (transfers of metals)
8	0	0	0	294,304	294,304	6,892,996	Zinc and compounds (land)
9	0	0	0	30,658	30,658	6,803,198	Zinc/Manganese and compounds (land)
10	0	0	0	6,529,560	6,529,560	6,536,172	Zinc and compounds (transfers of metals)
11	0	0	0	6,086,892	6,086,892	6,122,359	Zinc and compounds (transfers of metals)
12	0	0	0	5,609,771	5,609,771	5,611,437	Zinc and compounds (transfers of metals)
13	0	0	0	505	505	5,600,338	Zinc and compounds (land)
14	0	0	0	56,236	56,236	5,188,675	Manganese and compounds (land)
15	0	0	0	0	0	4,921,195	Zinc/Lead and compounds (land)
16	0	0	0	6,349	6,349	4,136,190	Chromium and compounds (land)
17	0	0	0	451	451	3,959,256	Zinc and compounds (land)
18	0	0	0	3,922,477	3,922,477	3,929,159	Zinc and compounds (transfers of metals)
19	0	0	0	0	0	3,809,524	Manganese and compounds (UIJ)
20	0	0	0	3,497,819	3,497,819	3,554,619	Zinc and compounds (transfers of metals)
21	0	0	0	0	0	3,516,553	Manganese and compounds (UIJ)
22	0	0	0	3,090,268	3,090,268	3,092,282	Zinc and compounds (transfers of metals)
23	0	0	0	2,957,542	2,957,542	2,968,525	Zinc and compounds (transfers of metals)
24	0	0	0	36	36	2,889,170	Copper and compounds (air)
25	0	0	0	2,863,172	2,863,172	2,863,296	Copper and compounds (transfers of metals)
26	0	0	0	24	24	2,695,759	Zinc and compounds (land)
27	0	0	0	2,498,413	2,498,413	2,534,013	Zinc and compounds (transfers of metals)
28	0	0	0	2,486,113	2,486,113	2,491,492	Zinc and compounds (transfers of metals)
29	0	0	0	2,388,657	2,388,657	2,401,220	Zinc and compounds (transfers of metals)
30	0	0	0	2,384,320	2,384,320	2,388,551	Zinc and compounds (transfers of metals)
31	0	0	0	2,175,039	2,175,039	2,180,224	Zinc and compounds (transfers of metals)
32	0	0	0	790	790	2,173,430	Zinc/Chromium and compounds (land)
33	0	0	0	0	0	2,140,356	Zinc and compounds (land)
34	0	0	0	0	0	2,077,165	Manganese and compounds (land)
35	0	0	0	1,917,884	1,917,884	1,932,422	Zinc/Lead and compounds (transfers of metals)
36	0	0	0	1,925,941	1,925,941	1,930,760	Zinc and compounds (transfers of metals)
37	0	0	0	1,758,623	1,758,623	1,769,438	Zinc and compounds (transfers of metals)
38	0	0	0	1,723,356	1,723,356	1,755,368	Lead and compounds (transfers of metals)
39	0	0	0	1,742,791	1,742,791	1,749,700	Lead/Zinc and compounds (transfers of metals)
40	0	0	0	1,680,432	1,680,432	1,700,724	Zinc and compounds (transfers of metals)
41	0	0	0	1,620,869	1,620,869	1,623,653	Zinc and compounds (transfers of metals)
42	0	0	0	0	0	1,539,949	Manganese and compounds (land)
43	0	0	0	1,487,000	1,487,000	1,504,324	Zinc and compounds (transfers of metals)
44	0	0	0	1	1	1,406,028	Manganese and compounds (land)
45	0	0	0	1,292,517	1,292,517	1,356,009	Manganese and compounds (transfers of metals)
46	0	0	0	562,110	562,110	1,340,996	Zinc and compounds (land, transfers of metals)
47	0	0	0	1,332,607	1,332,607	1,336,586	Zinc and compounds (transfers of metals)
48	0	0	0	1,310,549	1,310,549	1,313,265	Zinc and compounds (transfers of metals)
49	0	0	0	1,306,122	1,306,122	1,311,473	Manganese and compounds (transfers of metals)
50	0	0	0	1,233,769	1,233,769	1,236,328	Zinc and compounds (transfers of metals)
	0	0	0	91,346,309	91,346,309	207,494,787	
				50.6	50.6	62.9	
	0	0	0	180,542,191	180,542,191	329,785,402	

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

► UIJ=underground injection



Releases and Transfers by Industry

The top three industries contributed roughly three-quarters of total releases and transfers in both NPRI and TRI in 1997, but their distribution differed significantly in the two PRTRs. The primary metals industry reported the largest totals in NPRI, amounting to

36 percent of NPRI's total releases and transfers. The chemical manufacturing sector reported the largest TRI amounts, representing 33 percent of the TRI total (Figure 5-19).

In NPRI, the primary metals industry reported 46.9 million kg (36 percent of the total), the largest amount by a substantial margin. Chemical manufacturing ranked second, with 30.8 million

kg (24 percent). In TRI, the chemical manufacturing industry released and transferred 381.9 million kg (33 percent of the total), followed by primary metals with 318.7 million kg (27 percent). Paper products ranked third in both systems, reporting 19.1 million kg to NPRI and 120.1 million kg to TRI (Tables 5-25 and 5-26).

Transfers exceeded releases in several industries, including primary metals and industrial machinery, in NPRI. Two industries—food products and electronic/electrical equipment—reported transferring more than they released in both Canada and the United States.

Table 5-25

NPRI Total Releases and Transfers by Industry (US SIC Code), 1997

M 1997

Rank	US SIC Code	Industry	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	33	Primary Metals	637	19,025,036	27,919,767	46,944,803	36.1
2	28	Chemicals	1,429	18,334,510	12,459,163	30,793,673	23.7
3	26	Paper Products	329	17,068,622	2,048,447	19,117,069	14.7
4	37	Transportation Equipment	376	6,147,046	879,806	7,026,852	5.4
5	30	Rubber and Plastics Products	263	5,945,315	927,044	6,872,359	5.3
6	29	Petroleum and Coal Products	365	4,671,163	1,121,630	5,792,793	4.5
7	34	Fabricated Metals Products	420	2,039,537	1,750,866	3,790,403	2.9
8	24	Lumber and Wood Products	192	2,219,981	206,520	2,426,501	1.9
9	27	Printing and Publishing	37	1,609,267	152,956	1,762,223	1.4
10	20	Food Products	134	503,468	752,763	1,256,231	1.0
11	32	Stone/Clay/Glass Products	102	868,511	93,052	961,563	0.7
12	25	Furniture and Fixtures	41	788,675	137,990	926,665	0.7
13	39	Misc. Manufacturing Industries	99	571,518	299,448	870,966	0.7
14	35	Industrial Machinery	66	269,113	448,543	717,656	0.6
15	36	Electronic/Electrical Equipment	92	82,010	274,229	356,239	0.3
16	22	Textile Mill Products	12	281,192	28,760	309,952	0.2
17	31	Leather Products	3	23,680	7,027	30,707	0.0
18	23	Apparel and Other Textile Products	1	280	0	280	0.0
19	38	Measurement/Photographic Instruments	1	0	250	250	0.0
Total for All Matched Industries			4,599	80,448,924	49,508,261	129,957,185	100.0

Table 5-26		TRI Total Releases and Transfers by Industry (US SIC Code), 1997					
M	1997						
Rank	US SIC Code	Industry	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total
1	28	Chemicals	16,168	254,570,269	127,308,998	381,879,267	32.9
2	33	Primary Metals	6,086	171,007,781	147,718,667	318,726,448	27.4
3	26	Paper Products	2,094	95,270,022	24,799,677	120,069,699	10.3
4		Multiple Codes 20-39	3,840	42,133,850	21,755,280	63,889,130	5.5
5	30	Rubber and Plastics Products	3,001	39,109,825	6,303,337	45,413,162	3.9
6	37	Transportation Equipment	3,841	36,551,961	8,053,776	44,605,737	3.8
7	34	Fabricated Metals Products	6,665	20,721,712	17,503,446	38,225,158	3.3
8	29	Petroleum and Coal Products	2,701	23,348,244	4,391,613	27,739,857	2.4
9	20	Food Products	2,700	11,024,132	11,056,516	22,080,648	1.9
10	36	Electronic/Electrical Equipment	2,556	6,638,547	11,704,615	18,343,162	1.6
11	32	Stone/Clay/Glass Products	1,449	11,182,122	4,240,455	15,422,577	1.3
12	24	Lumber and Wood Products	1,536	10,867,571	249,478	11,117,049	1.0
13	25	Furniture and Fixtures	992	10,588,626	427,052	11,015,678	0.9
14	27	Printing and Publishing	368	10,582,679	285,188	10,867,867	0.9
15	35	Industrial Machinery	2,455	6,249,781	3,426,787	9,676,568	0.8
16	22	Textile Mill Products	488	7,536,066	1,400,523	8,936,589	0.8
17	38	Measurement/Photographic Instruments	522	4,676,856	1,606,489	6,283,345	0.5
18	39	Misc. Manufacturing Industries	612	3,863,478	816,796	4,680,274	0.4
19	31	Leather Products	110	464,848	921,985	1,386,833	0.1
20	21	Tobacco Products	28	662,668	929	663,597	0.1
21	23	Apparel and Other Textile Products	40	251,153	68,149	319,302	0.0
		Total	58,252	767,302,191	394,039,756	1,161,341,947	100.0

Table 5-27		Average Total Releases and Transfers per Form, by Industry, 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	35	Industrial Machinery	10,874	3,942	2.8
2	25	Furniture and Fixtures	22,602	11,105	2.0
3	24	Lumber and Wood Products	12,638	7,238	1.7
4	30	Rubber and Plastics Products	26,131	15,133	1.7
5	27	Printing and Publishing	47,628	29,532	1.6
6	37	Transportation Equipment	18,688	11,613	1.6
7	34	Fabricated Metals Products	9,025	5,735	1.6
8	29	Petroleum and Coal Products	15,871	10,270	1.5
9	22	Textile Mill Products	25,829	18,313	1.4
10	33	Primary Metals	73,697	52,370	1.4
11	39	Misc. Manufacturing Industries	8,798	7,648	1.2
12	20	Food Products	9,375	8,178	1.1
13	26	Paper Products	58,107	57,340	1.0
14	28	Chemicals	21,549	23,619	0.9
15	32	Stone/Clay/Glass Products	9,427	10,644	0.9
16	31	Leather Products	10,236	12,608	0.8
17	36	Electronic/Electrical Equipment	3,872	7,177	0.5
18	23	Apparel and Other Textile Products	280	7,983	0.0
19	38	Measurement/Photographic Instruments	250	12,037	0.0
21		Tobacco Products	—	23,700	—
		Multiple Codes 20-39*	—	16,638	—
Total for All Matched Industries			28,258	19,937	1.4

* Multiple SIC codes reported only in TRI data.

Average Releases and Transfers

In the 1997 matched data set, total releases and transfers per form in NPRI averaged almost one and one-half times as much as in TRI. (Each form constitutes one facility's report for one of the listed matched substances.) Forms submitted to NPRI averaged 28,258 kg per form, compared to 19,937 kg per form in TRI (**Table 5-27**). NPRI total releases and transfers per form exceeded TRI averages in 13 of the industry sectors in the matched data set (**Figure 5-20**).

The difference was greatest in the industrial machinery and furniture sectors. Industrial machinery submissions to NPRI averaged 2.8 times the amount of releases and transfers per form as their submissions to TRI. In the furniture and fixtures industry, the NPRI average was twice that in TRI. Although these producers did not report the largest amounts in either system, their substantially higher averages in NPRI contributed significantly to the overall disparity.

Of the three industries reporting the largest amounts in 1997, the primary metals industry showed the largest difference between NPRI and TRI. This sector's releases and transfers averaged 1.4 times higher per form in NPRI than in TRI. The paper products industry exhibited little difference in averages in the two PRTRs (a ratio of 1.0), while the chemical manufacturing industry's forms averaged somewhat higher in TRI than in NPRI (an NPRI-to-TRI ratio of 0.9).

Figure 5-20
M 1997
Average Total Releases and Transfers per Form by Industry, NPRI and TRI, 1997

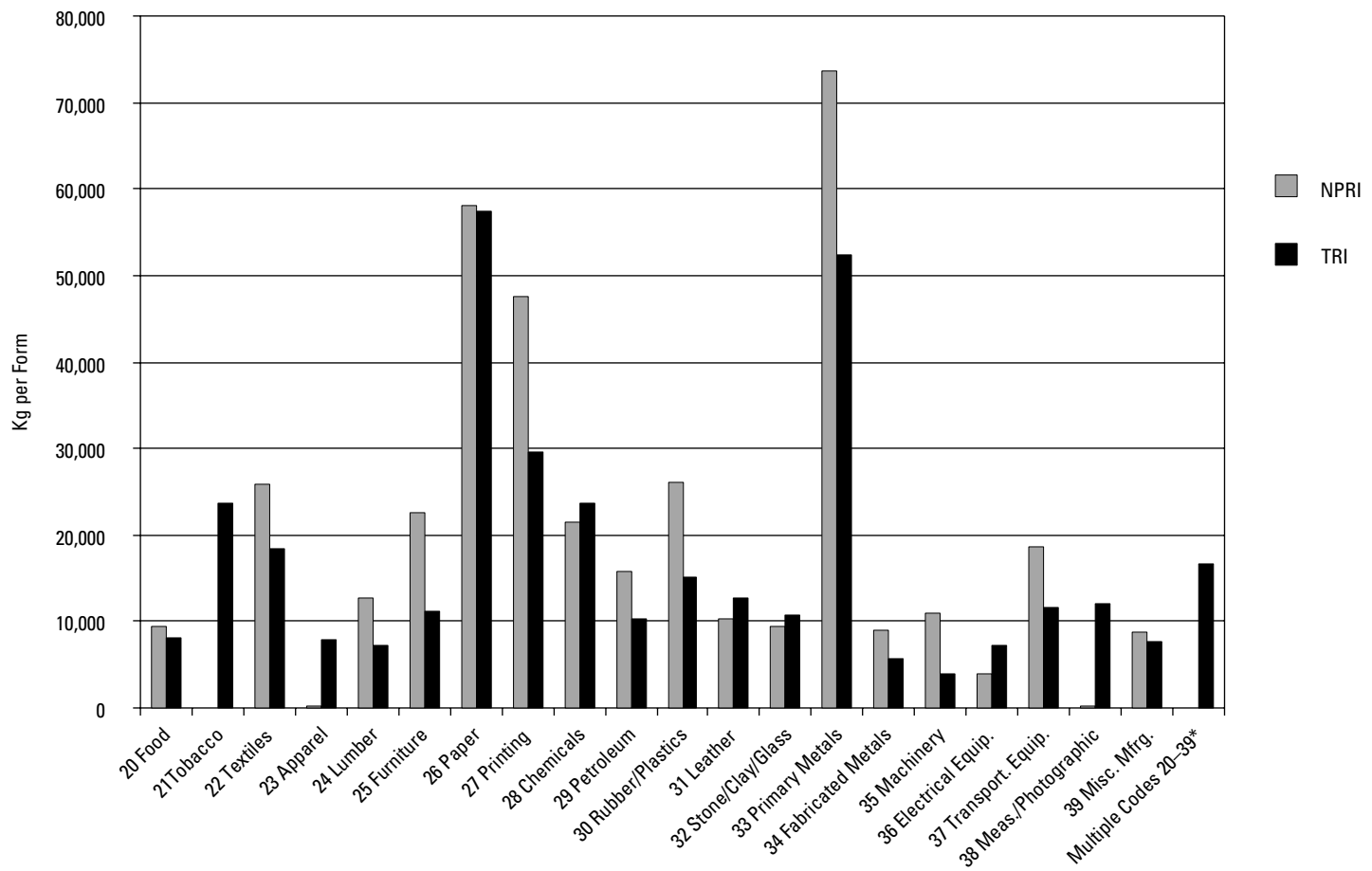


Table 5-28

M 1997

Average Releases and Transfers per Form and per Facility, NPRI and TRI, 1997

	NPRI			TRI			Ratio of Average per Form NPRI/TRI)	Ratio of Average per Facility (NPRI/TRI)
	Number	Forms/Facility		Number	Forms/Facility			
Total Facilities	1,430	3.2		19,125	3.0			
Total Forms	4,599			58,252				
On-site Releases	kg	kg/form	kg/facility	kg	kg/form	kg/facility		
Total Air Emissions	62,838,622	13,664	43,943	449,375,340	7,714	23,497	1.8	1.9
Surface Water Discharges	4,224,169	918	2,954	94,618,694	1,624	4,947	0.6	0.6
Underground Injection	4,197,660	913	2,935	74,649,654	1,281	3,903	0.7	0.8
On-site Land Releases	9,062,108	1,970	6,337	148,658,503	2,552	7,773	0.8	0.8
Total Releases	80,448,924	17,493	56,258	767,302,191	13,172	40,120	1.3	1.4
Off-site Transfers								
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
Total Transfers	49,508,261	10,765	34,621	394,039,756	6,764	20,603	1.6	1.7
Total Releases and Transfers	129,957,185	28,258	90,879	1,161,341,947	19,937	60,724	1.4	1.5

On a facility basis, NPRI averaged 90,879 kg of total releases and transfers per facility, compared to 60,724 kg per facility in TRI, again one and one-half times higher. The disparity in averages held for total releases and total transfers, as seen in earlier chapters, and for averages per facility as well as per form. The most substantial difference appeared in transfers of metals, where NPRI facilities averaged 2.2 times the amount per form and 2.4 times the amount per facility as their TRI counterparts. On-site surface water discharges were more than one and one-half times the average for TRI facilities as for

NPRI facilities (NPRI-to-TRI ratio of 0.6—see **Table 5-28**).

Taking Stock 1996 presented results of an investigation into the differences between NPRI and TRI average releases and transfers per form, taking methanol and methyl ethyl ketone as case studies (see box on p. 180, *Taking Stock 1996*, based on the report, "Analysis of Differences between the Canadian NPRI and the United States TRI Releases and Transfers per Form: Case Studies on Reported NPRI and TRI Releases and Transfers of Methanol and Methyl Ethyl Ketone," prepared by Cheminfo Services, Inc., for the Commission for

Environmental Cooperation, February 1999).

The investigation found two key factors contributing to the differences in averages:

- differences in industry structure, with associated differences in facility production capacity, and
- differences in pollution prevention and control practices, driven by the respective Canadian and US regulatory requirements.

The larger average per form in NPRI appeared only in some of the industry sectors that reported the two target chemicals, and within those

sectors, often a small number of facilities accounted for the majority of the NPRI releases and transfers. NPRI facilities that manufactured methanol, for example, had nearly double the production capacity, on average, of TRI's methanol manufacturers. Further, most Canadian methanol is exported, contributing to higher releases from storage and loading, whereas more US methanol is piped to recipient facilities. Some US states and counties also require vapor control systems at TRI facilities to limit VOC emissions. These factors were found to have similar influences on the NPRI/TRI differences

in other industry subsectors. Factors that were not found to explain many of the differences were reporting thresholds and estimation methods.

In kraft paper mills, NPRI averages per form were smaller than those reported to TRI. The difference appeared to arise from the larger production capacity of the US mills and from their use of revised estimation methods (emission factors, as developed by the US trade associations, were revised in 1994), which have resulted in higher reportable amounts.

5.3 Changes in Releases and Transfers, 1995–1997, and Projections for 1998–1999

This section of *Taking Stock 1997* shows changes in the amounts of releases and transfers reported from 1995 to 1997, using the 1997 matched data set. As noted in **Chapter 2**, the chemicals and industries covered by NPRI and TRI did not change from 1995 to 1997. In addition, on the 1997 form, both NPRI and TRI facilities project expected releases and transfers for the next two years, 1998 and 1999.

5.3.1 Overview

From 1995 to 1997, North American facilities and forms in the matched data set decreased by about three percent, the result of opposing trends in NPRI, in which facilities and forms were up 10 percent, and TRI, which was down four percent (**Table 5–29**). Total releases

Table 5–29		North American Total Releases and 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
On-site Releases		kg	kg	kg	kg	%
Total Air Emissions		606,027,858	563,409,745	512,213,962	-93,813,896	-15.5
Surface Water Discharges		86,945,023	81,681,095	98,842,863	11,897,840	13.7
Underground Injection		87,824,019	75,235,496	78,847,314	-8,976,705	-10.2
On-site Land Releases		146,726,294	153,435,348	157,720,611	10,994,317	7.5
Total Releases		927,660,074	873,890,403	847,751,115	-79,908,959	-8.6
Off-site Transfers						
Treatment (except metals)		88,579,464	85,286,158	101,983,917	13,404,453	15.1
Sewage/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
Total Releases and Transfers		1,276,157,768	1,232,020,348	1,291,299,132	15,141,364	1.2

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

and transfers increased slightly (1.2 percent) from 1995 to 1997, but were projected to decrease through 1999.

Changes in Releases and Transfers, 1995–1997

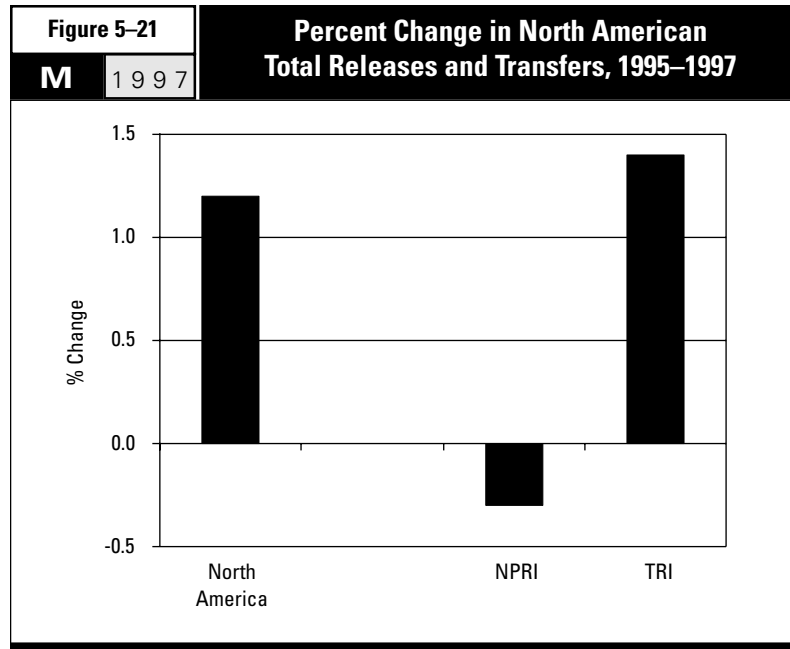
North American total releases and transfers increased 1.2 percent from 1995 to 1997. The NPRI total decreased slightly (0.3 percent reduction) while releases and transfers in TRI rose

(1.4 percent increase—see **Figure 5–21**). NPRI's reduction in releases and transfers occurred even while the number of facilities and forms increased. Conversely, TRI's releases and transfers increased, despite a reduction in numbers of facilities and forms.

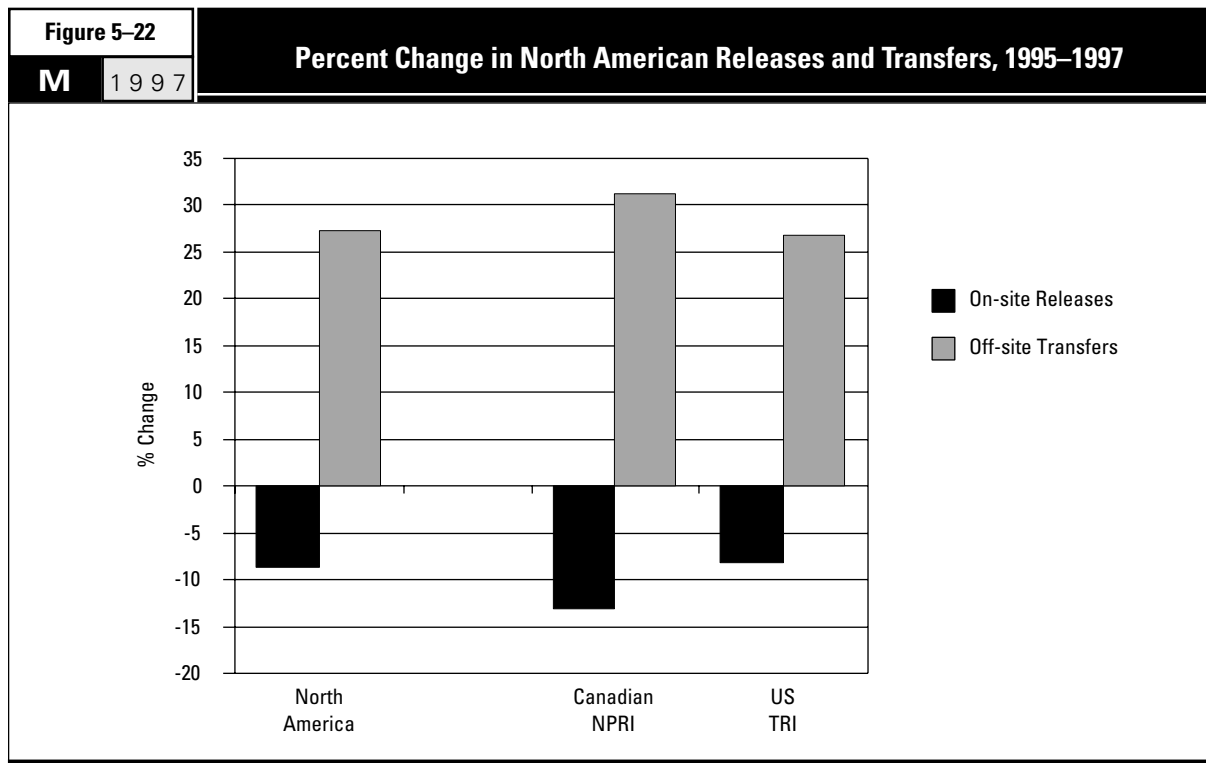
The overall North American increase, from 1.28 billion kg to 1.29 billion kg, principally reflected an increase in transfers of metals. North American facilities transferred 142.4 million kg

of metals in 1995 and 212.3 million kg in 1997, a 49 percent increase. Combined with increases in transfers of nonmetal substances, the large increase in metals transfers outweighed the overall reduction in North American on-site releases to air and underground injection over the 1995–1997 period (**Table 5–29** and **Figure 5–22**). **Chapter 7** examines in more detail the primary metals industry and the large increase in metals transfers.

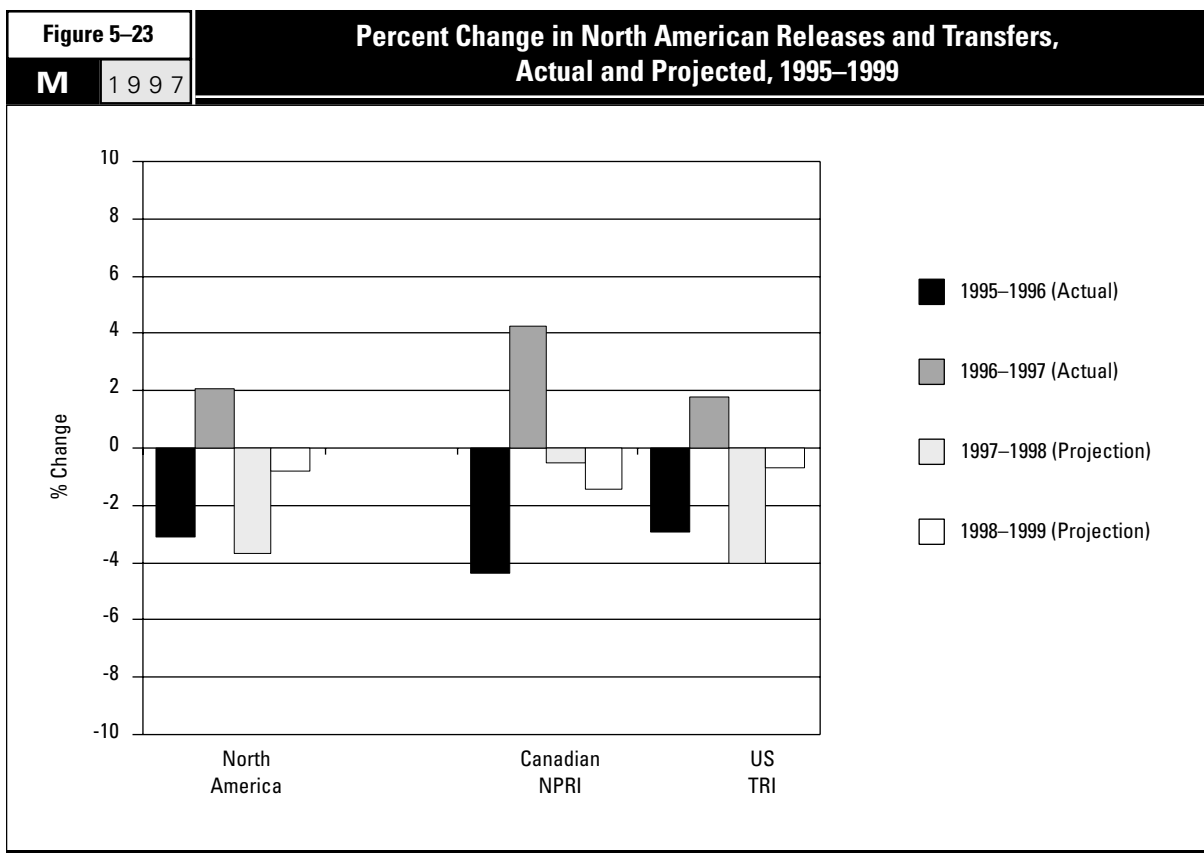
Canadian NPRI					US TRI				
1995	1996	1997	Change 1995–1997		1995	1996	1997	Change 1995–1997	
Number	Number	Number	Number	%	Number	Number	Number	Number	%
1,302	1,355	1,430	128	9.8	20,006	19,559	19,125	-881	-4.4
4,164	4,314	4,599	435	10.4	60,754	58,961	58,252	-2,502	-4.1
kg	kg	kg	kg	%					
66,987,712	64,152,247	62,838,622	-4,149,090	-6.2	539,040,146	499,257,498	449,375,340	-89,664,806	-16.6
12,330,846	5,128,041	4,224,169	-8,106,677	-65.7	74,614,177	76,553,054	94,618,694	20,004,517	26.8
3,556,927	4,812,379	4,197,660	640,733	18.0	84,267,092	70,423,117	74,649,654	-9,617,438	-11.4
9,607,743	8,950,491	9,062,108	-545,635	-5.7	137,118,551	144,484,857	148,658,503	11,539,952	8.4
92,620,108	83,171,877	80,448,924	-12,171,184	-13.1	835,039,966	790,718,526	767,302,191	-67,737,775	-8.1
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
130,368,812	124,688,830	129,957,185	-411,627	-0.3	1,145,788,956	1,107,331,518	1,161,341,947	15,552,991	1.4



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



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



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

Actual and Projected Changes, 1995-1999

While North American facilities projected reductions in total releases and transfers through 1999, the projected reductions did not reflect a continuing trend. Year-by-year data from 1995 showed total releases and transfers dropping in 1996 but increasing in 1997 for North America as a whole and for Canada and the United States (**Figure 5-23**).

TRI facilities enter their projections in a different section of their reporting form (Section 8 of TRI Form R) from where they report the specific releases and transfers (Sections 5 and 6) analyzed in *Taking Stock*. Therefore, total amounts for TRI releases and transfers in tables, figures and text that present both actual and projected data differ slightly from total releases and transfers analyzed throughout the rest of this report. NPRI facilities report their projections in a manner similar to their actual releases and transfers so the NPRI numbers do not differ.

Table 5-30

M 1997

North American Total Releases and Transfers, Actual and Projected, 1995–1999

	North America			Canadian NPRI			US TRI		
	Total Releases and Transfers (kg)	Change from Prior Year (kg)	% Change from Prior Year	Total Releases and Transfers (kg)	Change from Prior Year (kg)	% Change from Prior Year	Total Releases and Transfers (kg)	Change from Prior Year (kg)	% Change from Prior Year
1995 (Actual)	1,262,096,900			130,368,812			1,131,728,088		
1996 (Actual)	1,222,961,360	-39,135,540	-3.1	124,688,830	-5,679,982	-4.4	1,098,272,530	-33,455,558	-3.0
1997 (Actual)	1,248,067,173	25,105,813	2.1	129,957,185	5,268,355	4.2	1,118,109,988	19,837,458	1.8
1998 (Projection)	1,202,508,908	-45,558,265	-3.7	129,271,554	-685,631	-0.5	1,073,237,354	-44,872,634	-4.0
1999 (Projection)	1,193,012,810	-9,496,098	-0.8	127,399,099	-1,872,455	-1.4	1,065,613,711	-7,623,643	-0.7

- ▶ TRI data from Sections 8.1 plus 8.7 on TRI Form R.
- ▶ NPRI and TRI 1995 data from 1995 reporting forms; 1997 and 1999 data from 1997 reporting forms.
- ▶ Canada and US data only. Mexico data not collected for 1995–1997.

By this accounting, North American releases and transfers totaled 1.26 billion in 1995, dropped to 1.22 billion in 1996, and rose to 1.25 billion in 1997. North American facilities projected further decreases to 1.20 billion kg in 1998 and 1.19 billion kg in 1999. The projections also indicated a greater percentage reduction in NPRI in the second year out (1.4 percent reduction for 1998–1999), while TRI facilities expected to make a larger reduction in the first year (4.0 percent reduction for 1997–1998—see **Table 5-30**).

The North American total was expected to fall below its 1996 level as early as 1998. Canadian facilities, however, projected decreases at a slower pace. NPRI facilities projected a reduction to 127.4 million kg in 1999,

still above their 1996 total of 124.7 million kg. TRI facilities expected to reduce their releases and transfers to 1.07 billion kg in 1999, compared to 1.10 billion reported in 1996.

Projections can be expected to understate future totals to some extent. Facilities that expect to reduce their releases and transfers below reporting thresholds or to cease operations in 1998 or 1999 would project zero amounts on their 1997 reporting forms. However, current databases have no projected information on facilities that will come on line or whose releases and transfers will rise above the reporting thresholds in future years. As seen in the “top 50 facilities” tables in this chapter, such changes can be influential (for example, **Table 5-50**, later in this chapter).

Average Releases and Transfers

From 1995 to 1997, the averages of total releases and transfers per form and per facility decreased in NPRI and increased in TRI, narrowing the difference between them. In 1995, NPRI averages were 1.7 times those in TRI. By 1997, NPRI averages were approximately one and one-half times as high as in TRI (**Table 5-31**).

In 1995, NPRI’s total releases and transfers averaged 31,309 kg per form. By 1997, this average had declined to 28,258 kg per form. At the same time, TRI total releases and transfers increased from an average of 18,859 kg per form to 19,937 kg per form. A similar pattern prevailed in the averages per facility. NPRI’s releases and transfers decreased from an average of

100,130 kg per facility to 90,879 kg. In TRI, this average rose from 57,272 kg of total releases and transfers per facility to 60,724 kg.

The largest changes in the NPRI-to-TRI ratio came in releases to surface waters and transfers of nonmetals to disposal. For surface water discharges, NPRI releases in 1995 averaged about two and one-half times those in TRI (ratios of 2.4 for forms and 2.5 for facility averages). By 1997, NPRI facilities released to surface waters approximately half as much, on average, per form and per facility as TRI facilities (a ratio of 0.6). In 1995, the NPRI-to-TRI ratio for transfers of nonmetals to disposal was 3.5 for averages per form and 3.7 for averages per facility. By 1997, these ratios had declined to 1.6 and 1.7, respectively.

Table 5-31

Average Releases and Transfers per Form and per Facility, NPRI and TRI, 1995 and 1997

M

1997

	NPRI		TRI		Ratio of Average per Form (NPRI/TRI)		NPRI		TRI		Ratio of Average per Facility (NPRI/TRI)	
	1995	1997	1995	1997	1995	1997	1995	1997	1995	1997	1995	1997
	(kg/form)	(kg/form)	(kg/form)	(kg/form)	(kg/facility)	(kg/facility)	(kg/facility)	(kg/facility)	(kg/facility)	(kg/facility)	(kg/facility)	(kg/facility)
On-site Releases												
Total Air Emissions	16,087	13,664	8,873	7,714	1.8	1.8	51,450	43,943	26,944	23,497	1.9	1.9
Surface Water Discharges	2,961	918	1,228	1,624	2.4	0.6	9,471	2,954	3,730	4,947	2.5	0.6
Underground Injection	854	913	1,387	1,281	0.6	0.7	2,732	2,935	4,212	3,903	0.6	0.8
On-site Land Releases	2,307	1,970	2,257	2,552	1.0	0.8	7,379	6,337	6,854	7,773	1.1	0.8
Total Releases	22,243	17,493	13,745	13,172	1.6	1.3	71,137	56,258	41,739	40,120	1.7	1.4
Off-site Transfers												
Treatment (except metals)	1,791	2,158	1,335	1,580	1.3	1.4	5,727	6,941	4,055	4,814	1.4	1.4
Sewage/To POTWs (except metals)	1,003	1,144	1,504	1,733	0.7	0.7	3,209	3,679	4,568	5,279	0.7	0.7
Disposal (except metals)	1,019	551	292	352	3.5	1.6	3,258	1,771	885	1,071	3.7	1.7
Treatment/Sewage/Disposal of Metals	5,253	6,912	1,984	3,099	2.6	2.2	16,799	22,230	6,024	9,440	2.8	2.4
Total Transfers	9,065	10,765	5,115	6,764	1.8	1.6	28,993	34,621	15,533	20,603	1.9	1.7
Total Releases and Transfers	31,309	28,258	18,859	19,937	1.7	1.4	100,130	90,879	57,272	60,724	1.7	1.5

Table 5-32		NPRI Releases and Transfers, 1995 and 1997									
M	1997	1995					1997				
		Reported 1995 Only Number	Reported Both Years			Total Number	Reported 1997 Only Number	Reported Both Years			Total Number
		Decrease Number	Same Number	Increase Number		Decrease Number	Same Number	Increase Number			
Facilities		116	466	226	494	1,302	244	466	226	494	1,430
Forms		245	1,872	404	1,643	4,164	532	1,814	419	1,834	4,599
On-site Releases		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
Total Air Emissions		1,994,779	41,002,532	155,039	23,835,362	66,987,712	3,890,037	26,918,883	155,347	31,874,355	62,838,622
Surface Water Discharges		227,664	11,582,721	24,200	496,261	12,330,846	197,648	2,370,858	24,200	1,631,463	4,224,169
Underground Injection		0	59,226	0	3,497,701	3,556,927	900	70,527	0	4,126,233	4,197,660
On-site Land Releases		2,763	4,842,163	3,157	4,759,660	9,607,743	37,062	1,720,623	3,157	7,301,266	9,062,108
Total Releases		2,233,332	57,543,982	192,697	32,650,097	92,620,108	4,137,369	31,125,335	192,696	44,993,524	80,448,924
Off-site Transfers											
Treatment (except metals)		502,018	3,873,151	1,360	3,080,121	7,456,650	2,759,196	2,151,004	1,360	5,014,133	9,925,693
Sewage/To POTWs (except metals)		91,217	722,195	124	3,364,373	4,177,909	211,245	519,445	124	4,530,028	5,260,842
Disposal (except metals)		108,814	3,194,588	3,200	935,878	4,242,480	153,804	791,236	3,200	1,584,775	2,533,015
Treatment/Sewage/Disposal of Metals		105,271	11,404,801	40,061	10,321,532	21,871,665	236,371	8,429,290	40,062	23,082,988	31,788,711
Total Transfers		807,320	19,194,735	44,745	17,701,904	37,748,704	3,360,616	11,890,975	44,746	34,211,924	49,508,261
Total Releases and Transfers		3,040,652	76,738,717	237,442	50,352,001	130,368,812	7,497,985	43,016,310	237,442	79,205,448	129,957,185

Overall Change by Facilities with Increases and Facilities with Decreases

The population of all facilities that reported increases in total releases and transfers from 1995 to 1997 contributed the majority of all releases and transfers in 1997 in both NPRI and TRI. They reported 79.2 million kg of NPRI's 130.0 million kg total releases and transfers for 1997 and 643.5 million kg

of the 1997 TRI total of 1.16 billion kg. These are facilities that reported in both years and their total releases and transfers increased. They do not include facilities that reported in 1997 but not in 1995 (Tables 5-32 and 5-33).

Facilities with increases thus accounted for 61 percent of NPRI's total releases and transfers and 55 percent of TRI's total in 1997, although they represented only about one-third of the total facilities in both systems.

These "increaser" facilities reported half or more of all releases (56 percent of all releases in NPRI and 51 percent in TRI) and an even larger percentage of off-site transfers (69 percent of all transfers in NPRI and 64 percent in TRI—see Figure 5-24).

In NPRI, releases and transfers by the 466 facilities that reported decreases declined by a total of 33.7 million kg from 1995 to 1997, while amounts reported by the 494 facilities with

increases rose by 28.9 million kg. In TRI, the 7,874 facilities with decreases reported a reduction of 248.1 million kg, while the 6,291 facilities with increases reported an overall increase of 268.5 million kg. Again, these do not include facilities that reported in 1995, but did not report in 1997, thus contributing to the overall net decrease.

	Change 1995–1997							
	Reported One		Decrease		Increase		Total	
	Year Only		Number	%	Number	%	Number	%
Facilities	128	110.3	0	0.0	0	0.0	128	9.8
Forms	287	117.1	-58	-3.1	191	11.6	435	10.4
On-site Releases	kg	%	kg	%	kg	%	kg	%
Total Air Emissions	1,895,258	95.0	-14,083,649	-34.3	8,038,993	33.7	-4,149,090	-6.2
Surface Water Discharges	-30,016	-13.2	-9,211,863	-79.5	1,135,202	228.8	-8,106,677	-65.7
Underground Injection	900	—	11,301	19.1	628,532	18.0	640,733	18.0
On-site Land Releases	34,299	1241.4	-3,121,540	-64.5	2,541,606	53.4	-545,635	-5.7
Total Releases	1,904,037	85.3	-26,418,647	-45.9	12,343,427	37.8	-12,171,184	-13.1
Off-site Transfers								
Treatment (except Metals)	2,257,178	449.6	-1,722,147	-44.5	1,934,012	62.8	2,469,043	33.1
Sewage/To POTWs (except Metals)	120,028	131.6	-202,750	-28.1	1,165,655	34.6	1,082,933	25.9
Disposal (except Metals)	44,990	41.3	-2,403,352	-75.2	648,897	69.3	-1,709,465	-40.3
Treatment/Sewage/Disposal of Metals	131,100	124.5	-2,975,511	-26.1	12,761,456	123.6	9,917,046	45.3
Total Transfers	2,553,296	316.3	-7,303,760	-38.1	16,510,020	93.3	11,759,557	31.2
Total Releases and Transfers	4,457,333	146.6	-33,722,407	-43.9	28,853,447	57.3	-411,627	-0.3

Table 5-33		TRI Releases and Transfers, 1995 and 1997									
M	1997	1995					1997				
		Reported 1995 Only Number	Reported Both Years			Total Number	Reported 1997 Only Number	Reported Both Years			Total Number
		Decrease Number	Same Number	Increase Number		Decrease Number	Same Number	Increase Number			
Facilities		3,056	7,874	2,785	6,291	20,006	2,175	7,874	2,785	6,291	19,125
Forms		5,537	28,695	4,886	21,636	60,754	3,995	26,444	4,973	22,840	58,252
On-site Releases											
Total Air Emissions		23,568,206	349,400,853	380,996	165,690,091	539,040,146	12,972,574	225,239,375	380,659	210,782,732	449,375,340
Surface Water Discharges		58,940	36,895,940	1,918	37,657,379	74,614,177	408,617	27,302,454	1,921	66,905,702	94,618,694
Underground Injection		6,902	67,004,696	0	17,255,494	84,267,092	1,665,815	42,060,063	0	30,923,776	74,649,654
On-site Land Releases		3,952,608	85,238,555	3,903	47,923,485	137,118,551	913,100	65,997,270	4,018	81,744,115	148,658,503
Total Releases		27,586,656	538,540,044	386,817	268,526,449	835,039,966	15,960,106	360,599,162	386,598	390,356,325	767,302,191
Off-site Transfers											
Treatment (except metals)		2,231,849	50,299,691	23,697	28,567,577	81,122,814	3,597,215	23,915,478	23,697	64,521,834	92,058,224
Sewage/To POTWs (except metals)		2,056,375	54,686,824	76,596	34,569,474	91,389,269	2,246,607	44,842,333	76,707	53,789,091	100,954,738
Disposal (except metals)		1,482,270	11,847,979	3,399	4,381,323	17,714,971	2,088,623	4,376,694	3,288	14,015,998	20,484,603
Treatment/Sewage/Disposal of Metals		3,391,246	78,012,640	125,348	38,992,702	120,521,936	8,079,974	51,531,924	125,567	120,804,726	180,542,191
Total Transfers		9,161,740	194,847,134	229,040	106,511,076	310,748,990	16,012,419	124,666,429	229,259	253,131,649	394,039,756
Total Releases and Transfers		36,748,396	733,387,178	615,857	375,037,525	1,145,788,956	31,972,525	485,265,591	615,857	643,487,974	1,161,341,947

	Change 1995–1997							
	Reported One Year Only		Decrease		Increase		Total	
	Number	%	Number	%	Number	%	Number	%
Facilities	-881	-28.8	0	0.0	0	0.0	-881	-4.4
Forms	-1,542	-27.8	-2,251	-7.8	1,204	5.6	-2,502	-4.1
On-site Releases	kg	%	kg	%	kg	%	kg	%
Total Air Emissions	-10,595,632	-45.0	-124,161,478	-35.5	45,092,641	27.2	-89,664,806	-16.6
Surface Water Discharges	349,677	593.3	-9,593,486	-26.0	29,248,323	77.7	20,004,517	26.8
Underground Injection	1,658,913	24035.3	-24,944,633	-37.2	13,668,282	79.2	-9,617,438	-11.4
On-site Land Releases	-3,039,508	-76.9	-19,241,285	-22.6	33,820,630	70.6	11,539,952	8.4
Total Releases	-11,626,550	-42.1	-177,940,882	-33.0	121,829,876	45.4	-67,737,775	-8.1
Off-site Transfers								
Treatment (except Metals)	1,365,366	61.2	-26,384,213	-52.5	35,954,257	125.9	10,935,410	13.5
Sewage/To POTWs (except Metals)	190,232	9.3	-9,844,491	-18.0	19,219,617	55.6	9,565,469	10.5
Disposal (except Metals)	606,353	40.9	-7,471,285	-63.1	9,634,675	219.9	2,769,632	15.6
Treatment/Sewage/Disposal of Metals	4,688,728	138.3	-26,480,716	-33.9	81,812,024	209.8	60,020,255	49.8
Total Transfers	6,850,679	74.8	-70,180,705	-36.0	146,620,573	137.7	83,290,766	26.8
Total Releases and Transfers	-4,775,871	-13.0	-248,121,587	-33.8	268,450,449	71.6	15,552,991	1.4

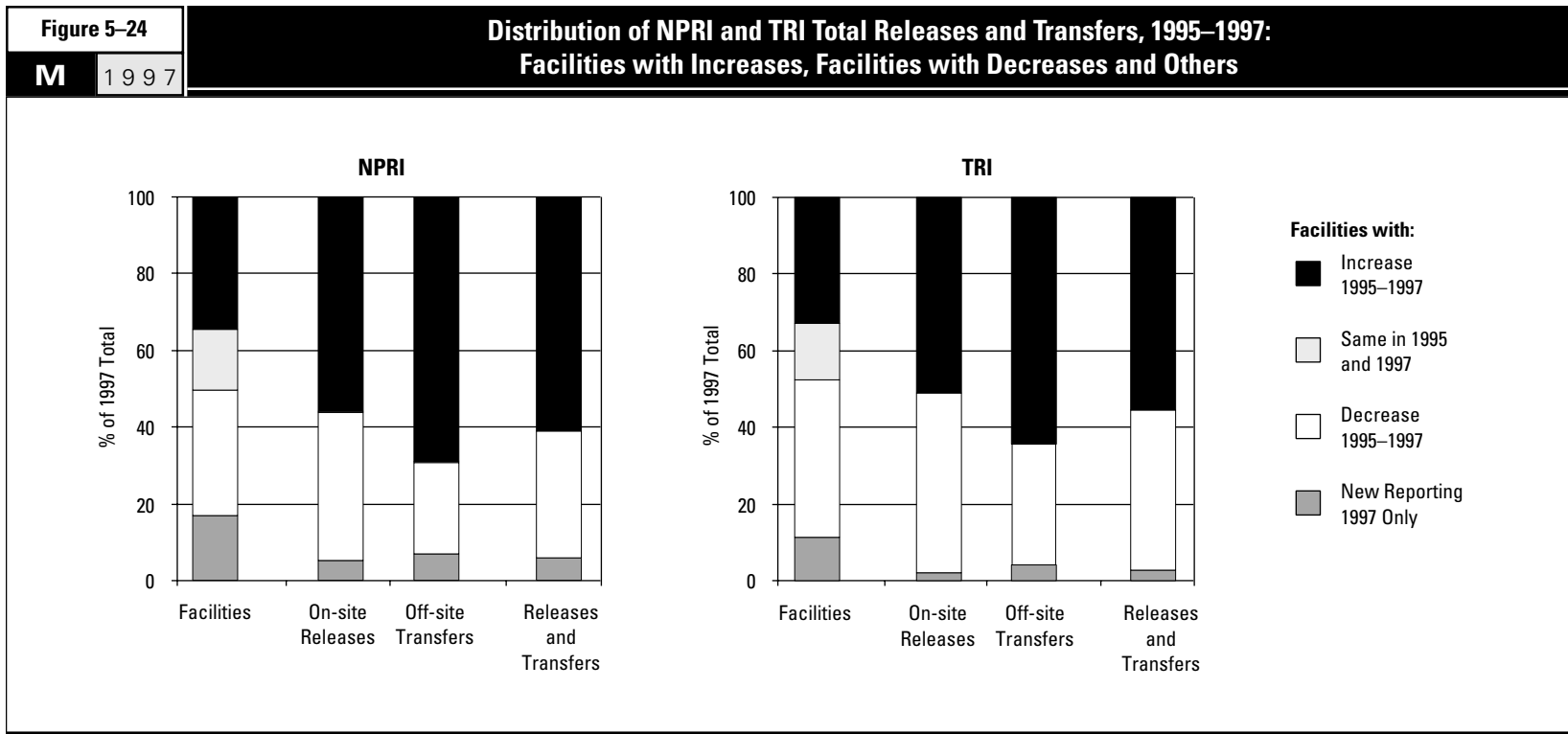


Table 5-34		North American States and Provinces with Largest Total Releases and Transfers, 1995 and 1997					
M	1997	1995		1997		Change 1995-1997	
State		Total Releases and Transfers (kg)	Rank	Total Releases and Transfers (kg)	Rank	kg	%
Texas		143,078,732	1	120,900,533	1	-22,178,199	-15.5
Pennsylvania		62,710,387	5	79,842,229	2	17,131,842	27.3
Ontario		71,149,129	2	75,351,065	3	4,201,936	5.9
Ohio		67,858,916	3	68,786,964	4	928,048	1.4
Louisiana		64,297,788	4	67,597,965	5	3,300,177	5.1
All Others		867,062,816		878,820,376		11,757,560	1.4
Total		1,276,157,768		1,291,299,132		15,141,364	1.2

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

5.3.2 Changes in Releases and Transfers by State and Province

Releases and Transfers, 1995-1997

Changes from 1995 to 1997 in releases and transfers led to changes in the rankings of the states and provinces. Texas remained first with the largest total releases and transfers in both years, despite a 22.2-million-kg reduction. The other four states and provinces with the largest total releases and transfers in 1997 all reported increases from 1995 to 1997. A large increase (17.1 million kg) brought the state of Pennsylvania from fifth for total releases and transfers in 1995 to second in 1997. Although the province of Ontario and the states of Ohio and Louisiana also reported increases, they stepped down in rank behind Pennsylvania (Table 5-34).

Comparing Canadian provinces, from 1995 to 1997, total releases and transfers increased in Ontario and Quebec, the provinces with the largest 1997 totals. Ontario facilities reported the largest increase among provinces, rising 4.2 million kg to a 1997 total of 75.4 million kg. Ontario's on-site releases decreased by 6.0 million kg in this period, but an increase of 10.2 million kg in off-site transfers outweighed that reduction. In contrast, the increase in Quebec amounted to 18,357 kg. Quebec facilities reported a total of 23.7 million kg in both 1995 and 1997, and the changes in releases (2.4 million kg reduction) and in transfers (2.4 million kg increase) offset each other (**Table 5-35**).

The second-largest increase among Canadian provinces appeared in Manitoba, where total releases and transfers more than doubled, climbing from 1.8 million in 1995 to 3.8 million kg in 1997. Nearly all of this increase occurred in releases. Prince Edward Island ranked third among provinces for increases, with total releases and transfers rising 241,044 kg. The bulk of this increase was reported in releases (a 206,750-kg increase).

In three provinces, releases and transfers decreased by more than

one million kg each from 1995 to 1997. Among them was Alberta, which ranked third for total releases and transfers in 1997, with 13.2 million kg. Alberta's decrease of 3.1 million kg, almost all in releases, was the largest Canadian reduction. The second largest occurred in New Brunswick, a reduction of 1.9 million kg. New Brunswick facilities cut their reported releases by 2.4 million kg but increased their transfers by 539,585 kg. In British Columbia, a 1.7-million-kg reduction occurred in transfers, with a slight increase (20,183 kg) in releases. British Columbia ranked third in Canada for 1995-1997 reductions.

All provinces had the same ranking for total releases and transfers in 1997 as in 1995. The number of facilities reporting increased from 1995 to 1997 in all Canadian provinces.

Comparing US states, Texas, which had the largest total releases and transfers in both 1995 and 1997, also had the largest US reduction. Texas facilities reported a decrease of 22.2 million kg (almost entirely in releases), to 120.9 million kg total releases and transfers in 1997 (**Table 5-36**).

States with the next largest reductions—Alabama and North Carolina—had decreases of approximately

8.0 million kg each, from 1995 to 1997. Alabama facilities reported a reduction of 11.0 million kg in releases, partly offset by a 3.1-million-kg increase in transfers. With total releases and transfers of 41.5 million kg in 1997, Alabama ranked 10th among states, down from sixth in 1995. In North Carolina, both releases and transfers decreased—releases by 5.4 million kg and transfers by 2.4 million kg. North Carolina's 1997 total was 34.0 million kg, ranking 12th (down from 10th in 1995).

Pennsylvania, Ohio and Louisiana—with the largest total releases and transfers in 1997 after Texas—saw increases over 1995 levels. Pennsylvania had the largest increase of any state, 17.1 million kg, with increases in both releases (by 5.5 million kg) and transfers (by 11.6 million kg), contributing to a total for 1997 of 79.8 million kg. In Ohio, releases decreased by 5.6 million kg, but transfers increased by 6.5 million kg, giving the state an overall increase of 928,048 kg. Ohio's releases and transfers totaled 68.8 million kg in 1997, just ahead of Louisiana's total of 67.6 million kg. Louisiana facilities also reported larger releases (by 2.2 million kg) and larger transfers (by 1.1 million kg) in 1997, compared to 1995 reporting.

With its large increase, Pennsylvania rose from fourth to second among states for total releases and transfers. This meant that Ohio and Louisiana moved down in rank, despite their increases.

States with the largest increases, after Pennsylvania, were Utah, increasing by 11.7 million kg to 46.4 million kg total releases and transfers in 1997, and Arkansas, increasing by 10.9 million kg to a total of 23.1 million kg. Utah facilities reported larger amounts for both releases (by 7.8 million kg) and transfers (by 4.0 million kg), while Arkansas's increase occurred in transfers (11.1 million kg), with a small reduction (224,932 kg) in releases. Both states rose in rankings for total releases and transfers, Utah from 11th to seventh and Arkansas from 29th to 19th.

The number of facilities decreased in 42 US states and territories, remained the same in four and increased in seven.

Large percentage increases in total releases and transfers (more than 20 percent) occurred in 10 provinces and states. Eleven provinces and states had reductions of more than 20 percent (**Map 5-2**).

Table 5-35

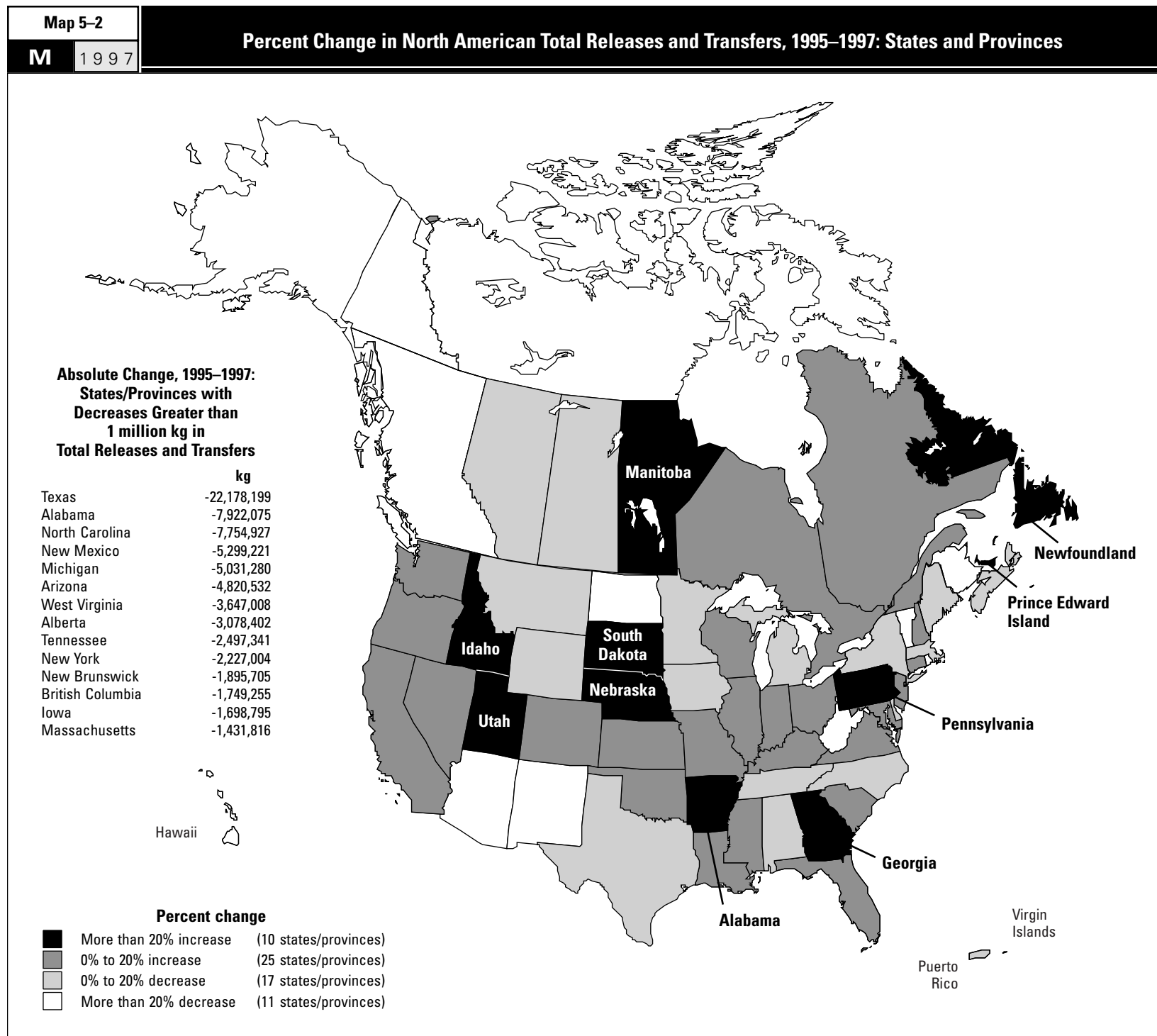
NPRI Total Releases and Transfers, by Province, 1995 and 1997
(Ordered by Total 1997 Releases and Transfers)

M 1997

Province	1995					1997				
	Number of Facilities	On-site Releases (kg)	Off-site Transfers (kg)	Total Releases and Transfers (kg)	Rank	Number of Facilities	On-site Releases (kg)	Off-site Transfers (kg)	Total Releases and Transfers (kg)	Rank
Ontario	726	45,919,331	25,229,798	71,149,129	1	767	39,955,770	35,395,295	75,351,065	1
Quebec	320	17,044,512	6,664,921	23,709,433	2	356	14,649,326	9,078,464	23,727,790	2
Alberta	87	15,000,884	1,231,830	16,232,714	3	107	11,987,370	1,166,942	13,154,312	3
British Columbia	72	5,438,945	2,659,847	8,098,792	4	77	5,459,128	890,409	6,349,537	4
New Brunswick	20	4,792,326	1,558,561	6,350,887	5	25	2,357,036	2,098,146	4,455,182	5
Manitoba	37	1,530,130	289,145	1,819,275	6	44	3,397,552	357,194	3,754,746	6
Nova Scotia	21	1,583,093	107,917	1,691,010	7	23	1,063,517	472,606	1,536,123	7
Saskatchewan	14	1,013,664	6,257	1,019,921	8	20	946,849	14,511	961,360	8
Newfoundland	3	284,203	28	284,231	9	8	412,606	0	412,606	9
Prince Edward Island	2	13,020	400	13,420	10	3	219,770	34,694	254,464	10
Total	1,302	92,620,108	37,748,704	130,368,812		1,430	80,448,924	49,508,261	129,957,185	
	Change 1995-1997					Percent Change 1995-1997				
	Number	kg	kg	kg	Rank	%	%	%	%	Rank
Ontario	41	-5,963,561	10,165,497	4,201,936	10	5.6	-13.0	40.3	5.9	7
Quebec	36	-2,395,186	2,413,543	18,357	6	11.3	-14.1	36.2	0.1	6
Alberta	20	-3,013,514	-64,888	-3,078,402	1	23.0	-20.1	-5.3	-19.0	3
British Columbia	5	20,183	-1,769,438	-1,749,255	3	6.9	0.4	-66.5	-21.6	2
New Brunswick	5	-2,435,290	539,585	-1,895,705	2	25.0	-50.8	34.6	-29.8	1
Manitoba	7	1,867,422	68,049	1,935,471	9	18.9	122.0	23.5	106.4	9
Nova Scotia	2	-519,576	364,689	-154,887	4	9.5	-32.8	337.9	-9.2	4
Saskatchewan	6	-66,815	8,254	-58,561	5	42.9	-6.6	131.9	-5.7	5
Newfoundland	5	128,403	-28	128,375	7	166.7	45.2	-100.0	45.2	8
Prince Edward Island	1	206,750	34,294	241,044	8	50.0	1587.9	8573.5	1796.2	10
Total	128	-12,171,184	11,759,557	-411,627		9.8	-13.1	31.2	-0.3	

Table 5-36		TRI Total Releases and Transfers, by State, 1995 and 1997 (Ordered by Total 1997 Releases and Transfers)									
M	1997	1995					1997				
State	Number of Facilities	On-site Releases (kg)	Off-site Transfers (kg)	Total Releases and Transfers (kg)	Rank	Number of Facilities	On-site Releases (kg)	Off-site Transfers (kg)	Total Releases and Transfers (kg)	Rank	
Texas	1,087	105,839,053	37,239,679	143,078,732	1	1,080	83,883,000	37,017,533	120,900,533	1	
Pennsylvania	1,179	28,224,217	34,486,170	62,710,387	4	1,120	33,713,706	46,128,523	79,842,229	2	
Ohio	1,527	42,573,363	25,285,553	67,858,916	2	1,464	36,992,382	31,794,582	68,786,964	3	
Louisiana	276	61,044,458	3,253,330	64,297,788	3	261	63,224,378	4,373,587	67,597,965	4	
Indiana	958	29,939,396	16,481,625	46,421,021	9	913	27,811,195	23,853,714	51,664,909	5	
Illinois	1,233	34,483,295	14,057,811	48,541,106	7	1,166	31,144,870	19,112,546	50,257,416	6	
Utah	135	34,082,808	626,564	34,709,372	11	125	41,835,001	4,582,453	46,417,454	7	
Michigan	831	26,697,119	24,369,024	51,066,143	5	786	20,000,568	26,034,295	46,034,863	8	
Tennessee	600	40,027,685	6,900,860	46,928,545	8	568	35,877,974	8,553,230	44,431,204	9	
Alabama	465	41,233,206	8,204,893	49,438,099	6	461	30,199,535	11,316,489	41,516,024	10	
Florida	458	28,517,751	5,009,425	33,527,176	12	457	32,013,775	8,217,166	40,230,941	11	
North Carolina	783	34,432,863	7,330,472	41,763,335	10	736	29,035,377	4,973,031	34,008,408	12	
Virginia	405	21,656,488	7,018,035	28,674,523	13	387	19,348,059	10,668,654	30,016,713	13	
Missouri	521	21,856,481	6,212,336	28,068,817	14	502	22,779,721	6,806,404	29,586,125	14	
Georgia	639	19,660,127	3,722,592	23,382,719	18	609	20,373,823	8,596,443	28,970,266	15	
South Carolina	462	20,721,736	5,132,118	25,853,854	15	439	19,349,981	8,850,818	28,200,799	16	
Wisconsin	804	13,100,770	10,492,770	23,593,540	17	798	11,955,575	14,882,171	26,837,746	17	
Mississippi	283	21,620,941	2,345,718	23,966,659	16	264	24,753,247	1,232,243	25,985,490	18	
Arkansas	340	10,452,876	1,713,939	12,166,815	29	326	10,227,944	12,860,185	23,088,129	19	
California	1,232	8,906,945	11,228,782	20,135,727	20	1,154	8,921,534	11,897,413	20,818,947	20	
New York	651	14,566,183	6,933,373	21,499,556	19	600	11,707,417	7,565,135	19,272,552	21	
Montana	21	19,379,820	24,646	19,404,466	22	23	18,699,623	553,382	19,253,005	22	
Kentucky	378	12,210,951	5,265,774	17,476,725	25	380	12,243,252	6,808,052	19,051,304	23	
New Jersey	550	5,336,171	13,519,904	18,856,075	23	498	6,022,954	12,863,215	18,886,169	24	
Oregon	232	9,354,325	6,709,624	16,063,949	26	227	9,677,021	7,336,782	17,013,803	25	
Arizona	163	16,963,419	3,059,071	20,022,490	21	175	13,436,541	1,765,417	15,201,958	26	
New Mexico	32	18,650,847	167,438	18,818,285	24	32	13,287,600	231,464	13,519,064	27	
Iowa	371	10,327,183	4,842,852	15,170,035	28	356	7,830,048	5,641,192	13,471,240	28	
Washington	261	10,271,201	1,604,528	11,875,729	30	254	8,735,877	4,246,444	12,982,321	29	
West Virginia	132	11,139,089	4,595,199	15,734,288	27	125	7,865,320	4,221,960	12,087,280	30	
Kansas	261	6,531,589	3,835,432	10,367,021	32	245	7,228,250	3,879,211	11,107,461	31	
Minnesota	462	7,230,561	4,196,965	11,427,526	31	429	5,371,218	5,314,124	10,685,342	32	
Oklahoma	253	6,449,451	1,815,935	8,265,386	34	261	6,067,878	2,510,321	8,578,199	33	
Connecticut	298	3,573,272	3,835,532	7,408,804	36	278	2,314,384	6,184,467	8,498,851	34	
Maryland	173	4,704,290	2,926,201	7,630,491	35	165	4,446,359	3,923,483	8,369,842	35	
Massachusetts	453	3,018,643	5,521,475	8,540,118	33	422	2,079,208	5,029,094	7,108,302	36	
Idaho	50	4,772,712	210,677	4,983,389	39	50	6,229,364	340,740	6,570,104	37	
Nebraska	149	3,255,960	1,902,096	5,158,056	38	141	2,140,998	4,410,219	6,551,217	38	
Puerto Rico	143	3,540,065	3,740,016	7,280,081	37	134	2,894,302	3,615,562	6,509,864	39	
Maine	78	3,698,236	958,961	4,657,197	40	75	2,947,091	849,997	3,797,088	40	
Wyoming	24	4,089,641	4,232	4,093,873	41	27	3,565,677	28,174	3,593,851	41	
South Dakota	72	1,675,907	265,990	1,941,897	44	64	1,343,396	1,189,050	2,532,446	42	
Delaware	62	1,472,223	1,472,524	2,944,747	42	60	1,011,075	1,502,816	2,513,891	43	
Colorado	159	1,447,568	753,819	2,201,387	43	151	1,331,351	970,229	2,301,580	44	
Nevada	40	1,494,614	36,883	1,531,497	46	43	1,821,377	13,540	1,834,917	45	
New Hampshire	93	1,048,074	290,379	1,338,453	47	97	970,539	417,204	1,387,743	46	
Rhode Island	138	1,119,455	570,220	1,689,675	45	116	705,748	500,366	1,206,114	47	
Virgin Islands	2	549,643	86,683	636,326	50	2	537,535	159,608	697,143	48	
North Dakota	31	659,870	270,237	930,107	49	29	509,847	85,306	595,153	49	
Alaska	8	1,005,984	2,747	1,008,731	48	6	540,492	1,133	541,625	50	
Vermont	36	284,806	140,501	425,307	51	33	174,940	127,329	302,269	51	
Hawaii	11	146,635	77,264	223,899	52	10	123,864	3,258	127,122	52	
District of Columbia	1	0	116	116	53	1	0	2	2	53	
Total	20,006	835,039,966	310,748,990	1,145,788,956		19,125	767,302,191	394,039,756	1,161,341,947		

State	Change 1995–1997					Percent Change 1995–1997				
	Number of Facilities	On-site Releases (kg)	Off-site Transfers (kg)	Total Releases and Transfers (kg)	Rank	Number of Facilities (%)	On-site Releases (%)	Off-site Transfers (%)	Total Releases and Transfers (%)	Rank
Texas	-7	-21,956,053	-222,146	-22,178,199	1	-0.6	-20.7	-0.6	-15.5	14
Pennsylvania	-59	5,489,489	11,642,353	17,131,842	53	-5.0	19.4	33.8	27.3	49
Ohio	-63	-5,580,981	6,509,029	928,048	34	-4.1	-13.1	25.7	1.4	25
Louisiana	-15	2,179,920	1,120,257	3,300,177	47	-5.4	3.6	34.4	5.1	32
Indiana	-45	-2,128,201	7,372,089	5,243,888	48	-4.7	-7.1	44.7	11.3	42
Illinois	-67	-3,338,425	5,054,735	1,716,310	43	-5.4	-9.7	36.0	3.5	27
Utah	-10	7,752,193	3,955,889	11,708,082	52	-7.4	22.7	631.4	33.7	52
Michigan	-45	-6,696,551	1,665,271	-5,031,280	5	-5.4	-25.1	6.8	-9.9	20
Tennessee	-32	-4,149,711	1,652,370	-2,497,341	8	-5.3	-10.4	23.9	-5.3	22
Alabama	-4	-11,033,671	3,111,596	-7,922,075	2	-0.9	-26.8	37.9	-16.0	13
Florida	-1	3,496,024	3,207,741	6,703,765	50	-0.2	12.3	64.0	20.0	46
North Carolina	-47	-5,397,486	-2,357,441	-7,754,927	3	-6.0	-15.7	-32.2	-18.6	10
Virginia	-18	-2,308,429	3,650,619	1,342,190	38	-4.4	-10.7	52.0	4.7	31
Missouri	-19	923,240	594,068	1,517,308	40	-3.6	4.2	9.6	5.4	33
Georgia	-30	713,696	4,873,851	5,587,547	49	-4.7	3.6	130.9	23.9	47
South Carolina	-23	-1,371,755	3,718,700	2,346,945	45	-5.0	-6.6	72.5	9.1	38
Wisconsin	-6	-1,145,195	4,389,401	3,244,206	46	-0.7	-8.7	41.8	13.8	43
Mississippi	-19	3,132,306	-1,113,475	2,018,831	44	-6.7	14.5	-47.5	8.4	36
Arkansas	-14	-224,932	11,146,246	10,921,314	51	-4.1	-2.2	650.3	89.8	53
California	-78	14,589	668,631	683,220	31	-6.3	0.2	6.0	3.4	26
New York	-51	-2,858,766	631,762	-2,227,004	9	-7.8	-19.6	9.1	-10.4	19
Montana	2	-680,197	528,736	-151,461	20	9.5	-3.5	2145.3	-0.8	23
Kentucky	2	32,301	1,542,278	1,574,579	41	0.5	0.3	29.3	9.0	37
New Jersey	-52	686,783	-656,689	30,094	24	-9.5	12.9	-4.9	0.2	24
Oregon	-5	322,696	627,158	949,854	35	-2.2	3.4	9.3	5.9	34
Arizona	12	-3,526,878	-1,293,654	-4,820,532	6	7.4	-20.8	-42.3	-24.1	8
New Mexico	0	-5,363,247	64,026	-5,299,221	4	0.0	-28.8	38.2	-28.2	7
Iowa	-15	-2,497,135	798,340	-1,698,795	10	-4.0	-24.2	16.5	-11.2	17
Washington	-7	-1,535,324	2,641,916	1,106,592	37	-2.7	-14.9	164.7	9.3	39
West Virginia	-7	-3,273,769	-373,239	-3,647,008	7	-5.3	-29.4	-8.1	-23.2	9
Kansas	-16	696,661	43,779	740,440	33	-6.1	10.7	1.1	7.1	35
Minnesota	-33	-1,859,343	1,117,159	-742,184	14	-7.1	-25.7	26.6	-6.5	21
Oklahoma	8	-381,573	694,386	312,813	29	3.2	-5.9	38.2	3.8	29
Connecticut	-20	-1,258,888	2,348,935	1,090,047	36	-6.7	-35.2	61.2	14.7	44
Maryland	-8	-257,931	997,282	739,351	32	-4.6	-5.5	34.1	9.7	41
Massachusetts	-31	-939,435	-492,381	-1,431,816	11	-6.8	-31.1	-8.9	-16.8	12
Idaho	0	1,456,652	130,063	1,586,715	42	0.0	30.5	61.7	31.8	51
Nebraska	-8	-1,114,962	2,508,123	1,393,161	39	-5.4	-34.2	131.9	27.0	48
Puerto Rico	-9	-645,763	-124,454	-770,217	13	-6.3	-18.2	-3.3	-10.6	18
Maine	-3	-751,145	-108,964	-860,109	12	-3.8	-20.3	-11.4	-18.5	11
Wyoming	3	-523,964	23,942	-500,022	15	12.5	-12.8	565.7	-12.2	16
South Dakota	-8	-332,511	923,060	590,549	30	-11.1	-19.8	347.0	30.4	50
Delaware	-2	-461,148	30,292	-430,856	18	-3.2	-31.3	2.1	-14.6	15
Colorado	-8	-116,217	216,410	100,193	27	-5.0	-8.0	28.7	4.6	30
Nevada	3	326,763	-23,343	303,420	28	7.5	21.9	-63.3	19.8	45
New Hampshire	4	-77,535	126,825	49,290	25	4.3	-7.4	43.7	3.7	28
Rhode Island	-22	-413,707	-69,854	-483,561	16	-15.9	-37.0	-12.3	-28.6	6
Virgin Islands	0	-12,108	72,925	60,817	26	0.0	-2.2	84.1	9.6	40
North Dakota	-2	-150,023	-184,931	-334,954	19	-6.5	-22.7	-68.4	-36.0	4
Alaska	-2	-465,492	-1,614	-467,106	17	-25.0	-46.3	-58.8	-46.3	2
Vermont	-3	-109,866	-13,172	-123,038	21	-8.3	-38.6	-9.4	-28.9	5
Hawaii	-1	-22,771	-74,006	-96,777	22	-9.1	-15.5	-95.8	-43.2	3
District of Columbia	0	0	-114	-114	23	0.0	—	-98.3	-98.3	1
Total	-881	-67,737,775	83,290,766	15,552,991		-4.4	-8.1	26.8	1.4	



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

Table 5-37		NPRI Actual and Projected Total Releases and Transfers, by Province, 1995–1999						
M 1997								
Province	Total Releases and Transfers			Actual Change 1995–1997 (kg)	Projected Change 1997–1999 (kg)	Actual % Change 1995–1997	Projected % Change 1997–1999	
	Actual 1995 (kg)	Actual 1997 (kg)	Projected 1999 (kg)					
Alberta	16,232,714	13,154,312	11,186,968	-3,078,402	-1,967,344	-19.0	-15.0	
British Columbia	8,098,792	6,349,537	7,113,298	-1,749,255	763,761	-21.6	12.0	
Manitoba	1,819,275	3,754,746	5,080,866	1,935,471	1,326,120	106.4	35.3	
New Brunswick	6,350,887	4,455,182	4,098,665	-1,895,705	-356,517	-29.8	-8.0	
Newfoundland	284,231	412,606	384,676	128,375	-27,930	45.2	-6.8	
Nova Scotia	1,691,010	1,536,123	1,656,879	-154,887	120,756	-9.2	7.9	
Ontario	71,149,129	75,351,065	73,043,606	4,201,936	-2,307,459	5.9	-3.1	
Prince Edward Island	13,420	254,464	340,627	241,044	86,163	1796.2	33.9	
Quebec	23,709,433	23,727,790	23,791,444	18,357	63,654	0.1	0.3	
Saskatchewan	1,019,921	961,360	702,070	-58,561	-259,290	-5.7	-27.0	
Total	130,368,812	129,957,185	127,399,099	-411,627	-2,558,086	-0.3	-2.0	

► 1995 data from 1995 reporting forms; 1997 and 1999 data from 1997 reporting forms.

Actual and Projected Changes in Releases and Transfers, 1995–1999

NPRI and TRI facilities projected future reductions in total releases and transfers at a somewhat more rapid pace than had been achieved in the most recent years. NPRI facilities projected a two percent reduction in releases and transfers for 1997 to 1999, compared to a 0.3 percent actual reduction reported for 1995 to 1997. TRI facilities expected to reduce total releases and transfers by five percent from 1997 to 1999, compared to a one percent actual reduction for 1995 to 1997 (Tables 5-37 and 5-38).

On a province-by-province basis, NPRI facilities' projections generally continued the directions recorded for 1995 to 1997. Notable exceptions included Ontario and Newfoundland. In Ontario, NPRI facilities reported an increase of 4.2 million kg from 1995 to 1997 and projected a decrease of 2.3 million kg for 1997 to 1999. Ontario's projected three percent decrease contrasted with the province's recent six percent increase. Newfoundland facilities similarly projected a seven percent reduction for 1997 to 1999, despite a 45 percent increase since 1995.

Two provinces with decreasing releases and transfers from 1995 to

1997 projected increases through 1999: British Columbia (22 percent actual reduction, versus 12 percent projected increase) and Nova Scotia (nine percent actual reduction, versus eight percent projected increase). Of the remaining provinces, three projected continued increases and three projected continued decreases.

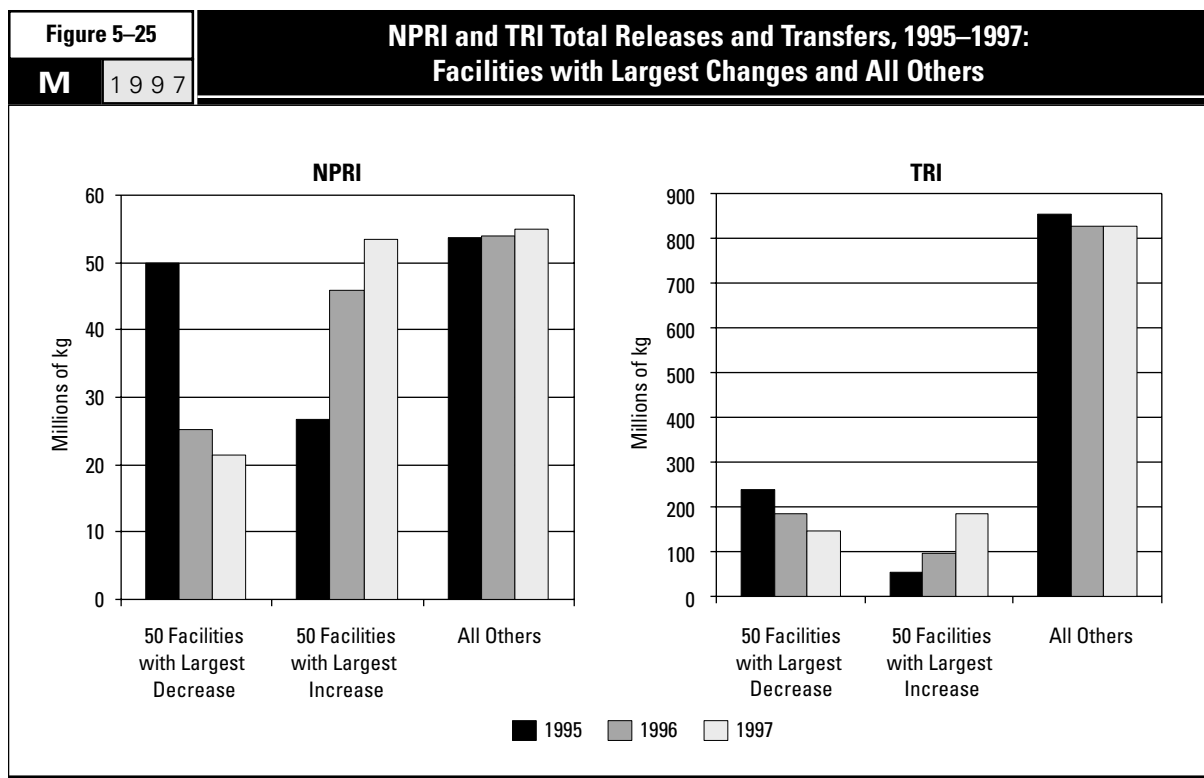
In most US states and territories (32 out of 53), facility projections for 1997–1999 were a continuation of their overall results for 1995–1997. Among these were 23 states and territories, including Texas, whose facilities expected to continue to reduce total releases and transfers. With a reduction of 24.6 million kg (a 17 percent decrease)

from 1995 to 1997, Texas facilities projected a further reduction of 7.1 million kg (six percent) through 1999.

Pennsylvania, Ohio and Louisiana were among the 16 states and territories whose facilities expected to reverse recent increases in varying degrees. Pennsylvania facilities reported a 20 percent increase for 1995 to 1997 and projected a one percent reduction through 1999. Ohio's releases and transfers increased four percent from 1995 to 1997 and were projected to decline 12 percent over the next two years. With a five percent increase from 1995 to 1997, Louisiana facilities projected a seven percent reduction through 1999.

Table 5-38		TRI Actual and Projected Total Releases and Transfers, by State, 1995-1999						
M	1997							
State	Total Releases and Transfers			Actual Change 1995-1997 (kg)	Projected Change 1997-1999 (kg)	Actual % Change 1995-1997	Projected % Change 1997-1999	
	Actual 1995 (kg)	Actual 1997 (kg)	Projected 1999 (kg)					
Alabama	45,637,086	39,091,378	38,829,839	-6,545,708	-261,539	-14.3	-0.7	
Alaska	1,009,362	538,862	168,416	-470,500	-370,446	-46.6	-68.7	
Arizona	19,832,634	15,168,902	10,951,269	-4,663,732	-4,217,633	-23.5	-27.8	
Arkansas	17,561,438	22,000,125	26,019,178	4,438,687	4,019,053	25.3	18.3	
California	19,428,804	19,379,409	22,124,727	-49,395	2,745,318	-0.3	14.2	
Colorado	2,241,877	2,336,773	1,879,459	94,896	-457,314	4.2	-19.6	
Connecticut	8,981,216	8,742,007	6,485,690	-239,209	-2,256,317	-2.7	-25.8	
Delaware	2,925,478	2,515,102	2,707,016	-410,376	191,914	-14.0	7.6	
District of Columbia	0	8	7	8	-1	—	-12.5	
Florida	31,574,649	34,998,462	31,375,488	3,423,813	-3,622,974	10.8	-10.4	
Georgia	22,586,370	27,303,407	25,405,146	4,717,037	-1,898,261	20.9	-7.0	
Hawaii	229,448	126,056	127,887	-103,392	1,831	-45.1	1.5	
Idaho	5,134,641	6,230,995	6,234,952	1,096,354	3,957	21.4	0.1	
Illinois	46,832,925	46,168,374	44,893,800	-664,551	-1,274,574	-1.4	-2.8	
Indiana	44,196,703	52,666,862	57,589,678	8,470,159	4,922,816	19.2	9.3	
Iowa	14,981,666	12,301,719	11,843,160	-2,679,947	-458,559	-17.9	-3.7	
Kansas	10,586,366	11,203,119	10,293,039	616,753	-910,080	5.8	-8.1	
Kentucky	17,864,491	17,756,815	16,320,874	-107,676	-1,435,941	-0.6	-8.1	
Louisiana	63,917,548	66,958,413	62,125,133	3,040,865	-4,833,280	4.8	-7.2	
Maine	4,676,617	3,813,689	3,695,683	-862,928	-118,006	-18.5	-3.1	
Maryland	7,414,123	8,566,174	8,352,421	1,152,051	-213,753	15.5	-2.5	
Massachusetts	8,637,166	7,052,172	6,812,521	-1,584,994	-239,651	-18.4	-3.4	
Michigan	50,961,634	44,587,534	37,737,867	-6,374,100	-6,849,667	-12.5	-15.4	
Minnesota	11,959,686	10,845,107	10,462,492	-1,114,579	-382,615	-9.3	-3.5	
Mississippi	22,323,239	25,176,615	28,029,656	2,853,376	2,853,041	12.8	11.3	
Missouri	26,546,968	28,583,787	27,126,681	2,036,819	-1,457,106	7.7	-5.1	
Montana	19,404,340	18,720,967	18,495,967	-683,373	-225,000	-3.5	-1.2	
Nebraska	5,008,254	4,608,899	2,543,290	-399,355	-2,065,609	-8.0	-44.8	
Nevada	1,536,403	1,840,452	1,533,431	304,049	-307,021	19.8	-16.7	
New Hampshire	1,381,892	1,382,446	1,293,706	554	-88,740	0.0	-6.4	
New Jersey	19,042,490	20,216,582	18,363,331	1,174,092	-1,853,251	6.2	-9.2	
New Mexico	18,803,908	13,530,871	13,596,163	-5,273,037	65,292	-28.0	0.5	
New York	21,927,409	19,040,881	14,347,760	-2,886,528	-4,693,121	-13.2	-24.6	
North Carolina	41,263,019	34,074,658	31,422,891	-7,188,361	-2,651,767	-17.4	-7.8	
North Dakota	912,661	618,417	430,800	-294,244	-187,617	-32.2	-30.3	
Ohio	66,899,060	69,465,065	61,442,029	2,566,005	-8,023,036	3.8	-11.5	
Oklahoma	8,266,991	8,429,711	8,605,518	162,720	175,807	2.0	2.1	
Oregon	15,820,935	16,917,552	17,510,112	1,096,617	592,560	6.9	3.5	
Pennsylvania	56,497,489	67,674,237	66,773,750	11,176,748	-900,487	19.8	-1.3	
Puerto Rico	7,439,852	6,649,021	6,683,411	-790,831	34,390	-10.6	0.5	
Rhode Island	1,670,899	1,083,059	867,487	-587,840	-215,572	-35.2	-19.9	
South Carolina	25,524,014	27,662,394	26,399,101	2,138,380	-1,263,293	8.4	-4.6	
South Dakota	1,908,830	2,504,018	2,506,812	595,188	2,794	31.2	0.1	
Tennessee	47,587,989	44,125,521	40,327,575	-3,462,468	-3,797,946	-7.3	-8.6	
Texas	144,116,732	119,536,246	112,472,936	-24,580,486	-7,063,310	-17.1	-5.9	
Utah	34,110,943	43,269,702	44,708,373	9,158,759	1,438,671	26.8	3.3	
Vermont	416,938	252,289	241,470	-164,649	-10,819	-39.5	-4.3	
Virgin Islands	636,329	697,145	724,025	60,816	26,880	9.6	3.9	
Virginia	29,063,786	30,967,283	29,362,111	1,903,497	-1,605,172	6.5	-5.2	
Washington	11,820,369	12,712,843	11,458,561	892,474	-1,254,282	7.6	-9.9	
West Virginia	15,588,885	11,965,822	11,077,496	-3,623,063	-888,326	-23.2	-7.4	
Wisconsin	22,941,221	22,457,974	21,498,047	-483,247	-959,927	-2.1	-4.3	
Wyoming	4,094,315	3,594,067	3,335,479	-500,248	-258,588	-12.2	-7.2	
Total	1,131,728,088	1,118,109,988	1,065,613,711	-13,618,100	-52,496,277	-1.2	-4.7	

► Data from Sections 8.1 plus 8.7 on TRI Form R; 1995 data from 1995 reporting forms; 1997 and 1999 data from 1997 reporting forms.



from 263 in 1995 to 326 in 1997. The 50 facilities included nine that did not report matched chemicals in 1995 but did in 1997 (Table 5-40).

TRI Facilities with Largest Decreases/Increases

The overall increase (1.4 percent) in TRI releases and transfers from 1995 to 1997 was primarily attributable to facilities reporting the largest such changes. Increases by the 50 facilities making the largest increases outweighed the effects of the largest reductions and an overall reduction by all other TRI facilities (Figure 5-25).

The facilities making the largest reductions in TRI releases and transfers reported 239.2 million kg in 1995 and 147.4 million kg in 1997, a reduction of 91.8 million kg. Releases reported by the 50 facilities declined from 175.5 million kg to 106.3 million kg. Little change occurred in the number of forms submitted (683 in 1995 and 676 in 1997). Four of the facilities did not report matched chemicals in 1997, having done so in 1995 (Table 5-41).

The 50 TRI facilities with large increases reported releasing and transferring a total of 54.5 million kg in 1995 and 185.8 million kg in 1997, an increase of 131.2 million kg. Their releases more than doubled, from 43.8 million kg to 101.9 million kg, but a larger increase—roughly sevenfold—occurred in transfers, which jumped from 10.7 to 83.9 million kg. The 50 facilities submitted 491 forms in 1995 and 595 forms in 1997, also a substantial increase. Among the facilities were five that did not report matched chemicals in 1995 but did so in 1997 (Table 5-42).

5.3.3 NPRI and TRI Facilities with Largest Changes, 1995–1997

A few facilities accounted for the net change seen in both NPRI and TRI. Total releases and transfers in NPRI decreased slightly and the reduction can be largely attributed to the 50 facilities with the largest decreases reported. Similarly, the increase reported by the 50 TRI facilities reporting the largest increases in TRI total releases and transfers outweighed the overall reductions of other TRI facilities.

NPRI Facilities with Largest Decreases/Increases

The reduction in NPRI releases and transfers, although small (0.3 percent), was largely attributable to the facilities reporting the largest such changes. Fifty NPRI facilities making the largest reductions slightly overcame the influence of the largest increases and a small increase posted by all other NPRI facilities in the matched data set (Figure 5-25).

The 50 NPRI facilities making the largest reductions reported 49.9 million kg in 1995 and 21.4 million kg in 1997. This reduction of 28.5 million kg occurred principally in releases, which

decreased from 36.9 million kg to 13.9 million kg. Most of the decrease appeared in 1996. A small reduction occurred in the number of forms the top facilities submitted, from 332 in 1995 to 317 in 1997. Six of the facilities did not report matched chemicals in 1997, although they had done so in 1995 (Table 5-39).

The 50 NPRI facilities with the largest increases reported 26.8 million kg in 1995 and 53.5 million kg in 1997, increasing 26.7 million kg over the comparison period. Most of this increase appeared in the reporting of transfers, which rose from 10.2 million kg to 26.1 million kg. The number of forms submitted by these facilities rose

Table 5-39		The 50 NPRI Facilities with Largest Decrease in Total Releases and Transfers, 1995-1997						
Rank	Facility	City, Province	SIC Codes		Number of Forms	1995		
			Canada	US		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John, NB	27	26	4	3,663,623	0	3,663,623
2	Methanex Corporation	Medicine Hat, AB	37	28	4	3,353,220	31,950	3,385,170
3	Sherritt International Corporation	Fort Saskatchewan, AB	37	28	13	2,275,064	16,370	2,291,434
4	Fort James Corporation, Fort James - Marathon, Ltd.	Marathon, ON	27	26	4	2,215,100	610	2,215,710
5	CXY Chemicals LP, Canadian Occidental Petroleum	Nanaimo, BC	37	28	2	244	1,988,000	1,988,244
6	Cartons St-Laurent Inc.	LaTuque, QC	27	26	4	2,407,638	944	2,408,582
7	Domtar Packaging, Red Rock Mill	Red Rock, ON	27	26	1	1,900,000	0	1,900,000
8	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33	17	1,598,360	0	1,598,360
9	Co-Steel Lasco	Whitby, ON	29	33	6	2,411,507	6,030,824	8,442,331
10	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	3	1,227	1,485,964	1,487,191
11	Les Papiers Perkins Ltée, Cascades	Candiac, QC	27	26	1	793,700	0	793,700
12	Bayer Inc., Bayer AG	Sarnia, ON	37	28	15	2,336,921	381,350	2,718,271
13	Standard Products (Canada) Limited, Rubber Plant #1	Stratford, ON	15	30	3	951,015	17,365	968,380
14	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28	4	149,778	588,390	738,168
15	General Motors of Canada Ltd., Oshawa Truck Assembly Centre	Oshawa, ON	32	37	12	850,907	23,306	874,213
16	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33	7	8,060	411,095	419,155
17	Oakside Chemicals Limited, Oakside Investments Limited	London, ON	37	28	5	700	322,740	323,440
18	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33	6	21,240	305,238	326,478
19	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37	13	465,482	29,388	494,870
20	Norkraft Quévillon Inc., Domtar Inc.	Lebel-sur-Quévillon, QC	27	26	5	399,568	0	399,568
21	Pétromont, Société en commandite	Montréal-est, QC	37	28	1	350,611	0	350,611
22	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	6	598,950	200	599,150
23	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	7	1,123,783	0	1,123,783
24	Ford Motor Company, Ontario Truck	Oakville, ON	32	37	8	264,407	271,194	535,601
25	Sydney Steel Corporation	Sydney, NS	29	33	10	533,500	0	533,500
26	Rexam Metallising, Rexam Canada Ltd.	Brantford, ON	27	26	2	240,000	0	240,000
27	Ford Motor Company, St. Thomas Assembly Plant	St. Thomas, ON	32	37	12	626,463	20,007	646,470
28	Cami Automotive Inc.	Ingersoll, ON	32	37	12	389,808	5,966	395,774
29	Velcro Canada Inc., Velcro Industries B.V.	Brampton, ON	19	22	3	204,985	0	204,985
30	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26	4	616,600	0	616,600
31	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28	5	653,459	0	653,459
32	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28	15	566,115	0	566,115
33	Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan, QC	27	26	4	189,126	0	189,126
34	Imperial Oil, IOL Dartmouth Refinery	Dartmouth, NS	36	29	13	284,268	2,840	287,108
35	BASF Canada Inc., Windsor Site	Windsor, ON	37	28	7	75,616	281,483	357,099
36	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26	4	612,600	0	612,600
37	Boler Group, Hendrickson Spring	Stratford, ON	32	34	2	94,600	81,000	175,600
38	Western Co-Operative Fertilizers Limited	Calgary, AB	37	28	1	0	154,000	154,000
39	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33	7	153,630	0	153,630
40	3M Canada Company (Perth)	Perth, ON	35	32	5	209,287	381	209,668
41	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	13	663,045	0	663,045
42	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29	15	308,871	0	308,871
43	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33	10	69,620	88,365	157,985
44	Versatech Industries, Apex Metals Inc.	Kitchener, ON	32	34	3	0	136,000	136,000
45	Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge, ON	16	30	7	959,979	4,459	964,438
46	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	4	672,732	0	672,732
47	Canac Kitchens Limited, Kohler Company	Thornhill, ON	25	24	16	205,317	0	205,317
48	Owens-Corning Canada Inc., Guelph Glass Plant	Guelph, ON	35	32	1	7,728	117,320	125,048
49	Formica Canada Inc, Formica Corp.	St-Jean-sur-Richelieu, QC	27	26	2	420,000	0	420,000
50	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34	4	0	209,781	209,781
Total					332	36,898,454	13,006,530	49,904,984

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

Rank	1996			1997			Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Decreases (Primary Media/Transfers with Decreases)*		
	Number of Forms	Total Releases (kg)	Total Transfers and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers and Transfers (kg)				
1	4	2,183,425	0	2,183,425	4	1,070,289	0	1,070,289	-2,593,334	Methanol (water)
2	3	1,454,080	3,920	1,458,000	3	790,700	5,150	795,850	-2,589,320	Methanol (air)
3	10	179,700	8,710	188,410	8	224,280	1,540	225,820	-2,065,614	Methanol (air)
4	4	149,600	480	150,080	4	153,600	1,600	155,200	-2,060,510	Methanol (water)
5	**	**	**	**	2	276	272	548	-1,987,696	Asbestos (transfers to disposal)
6	8	402,093	80,841	482,934	8	430,731	71,673	502,404	-1,906,178	Methanol (water)
7	2	235,117	0	235,117	2	273,348	0	273,348	-1,626,652	Methanol (water)
8	16	261,169	0	261,169	19	210,235	0	210,235	-1,388,125	Manganese and compounds (land)
9	6	1,254,893	3,578,510	4,833,403	6	1,259,869	5,799,885	7,059,754	-1,382,577	Copper and compounds (land)
10	4	6,591	906,005	912,596	4	1,776	571,557	573,333	-913,858	Chromium and compounds (transfers of metals)
11	**	**	**	**	**	**	**	**	-793,700	Xylene (air)
12	16	1,725,826	400,240	2,126,066	17	1,421,799	618,300	2,040,099	-678,172	Chloromethane (air)
13	3	582,700	17,100	599,800	3	427,400	14,900	442,300	-526,080	Xylene (air)
14	6	213,487	0	213,487	5	289,000	0	289,000	-449,168	Vinyl acetate (transfers to treatment)
15	11	610,855	29,042	639,897	14	391,461	42,825	434,286	-439,927	Xylene, Toluene (air)
16	7	8,070	51,862	59,932	7	8,060	22,452	30,512	-388,643	Zinc and compounds (transfers of metals)
17	5	900	0	900	**	**	**	**	-323,440	Xylene (transfers to treatment)
18	3	12,900	52,000	64,900	2	6,660	0	6,660	-319,818	Zinc and compounds (transfers of metals)
19	14	461,699	47,630	509,329	12	147,592	40,341	187,933	-306,937	Xylene (air)
20	7	351,160	0	351,160	11	99,375	0	99,375	-300,193	Methanol (air)
21	2	131,106	0	131,106	2	63,938	0	63,938	-286,673	Ethylene (air)
22	6	386,122	200	386,322	6	342,683	200	342,883	-256,267	Methanol (water)
23	8	767,070	0	767,070	8	874,802	0	874,802	-248,981	Methanol (air)
24	10	217,576	41,061	258,637	9	282,315	6,653	288,968	-246,633	Toluene (transfers to treatment, air)
25	9	331,280	0	331,280	9	290,290	0	290,290	-243,210	Zinc/Manganese/Lead and compounds (land)
26	2	290,100	0	290,100	**	**	**	**	-240,000	Methyl ethyl ketone (air)
27	11	543,878	16,236	560,114	11	386,554	24,566	411,120	-235,350	Xylene, Methyl isobutyl ketone, Ethylbenzene (air)
28	12	300,226	4,722	304,948	11	167,483	1,609	169,092	-226,682	Xylene, Methyl ethyl ketone (air)
29	3	201,517	1	201,518	**	**	**	**	-204,985	Methyl ethyl ketone (air)
30	4	616,600	0	616,600	4	412,600	0	412,600	-204,000	Methanol, Chlorine (air)
31	5	605,923	2,100	608,023	6	444,335	14,500	458,835	-194,624	Ethylene glycol (air)
32	16	579,650	0	579,650	16	375,364	0	375,364	-190,751	Nitric acid and nitrate compounds (water)
33	4	3,877	0	3,877	**	**	**	**	-189,126	Formaldehyde (water)
34	13	192,792	1,285	194,077	14	89,736	20,291	110,027	-177,081	Xylene, Toluene (air)
35	7	61,000	309,530	370,530	8	43,772	140,090	183,862	-173,237	Methyl ethyl ketone, Xylene (transfers to treatment)
36	4	884,500	0	884,500	4	442,050	0	442,050	-170,550	Methanol (air)
37	4	53,908	30,560	84,468	4	12,879	7,056	19,935	-155,665	Xylene (air), Zinc and compounds (transfers of metals)
38	1	0	26,800	26,800	1	0	0	0	-154,000	Asbestos (transfers to disposal)
39	**	**	**	**	**	**	**	**	-153,630	Nickel/Lead and compounds (air)
40	3	47,137	0	47,137	6	59,047	0	59,047	-150,621	Xylene, Toluene (air)
41	12	693,550	0	693,550	12	515,120	0	515,120	-147,925	Lead and compounds (air)
42	15	282,231	0	282,231	19	138,763	23,029	161,792	-147,079	Sulfuric acid, Xylene, Toluene (air)
43	9	16,166	47,187	63,353	9	5,717	7,163	12,880	-145,105	Aluminum (transfers of metals), Styrene (air)
44	3	0	0	0	3	0	0	0	-136,000	Zinc and compounds (transfers of metals)
45	10	998,783	200	998,983	8	817,865	15,392	833,257	-131,181	Methyl ethyl ketone, Toluene (air)
46	6	437,406	0	437,406	5	542,102	0	542,102	-130,630	Chlorine (air)
47	6	129,749	0	129,749	5	80,377	0	80,377	-124,940	Toluene, Xylene, Styrene (air)
48	2	2,760	4,720	7,480	1	1,430	0	1,430	-123,618	Zinc and compounds (transfers of metals)
49	2	339,192	5,645	344,837	2	290,800	5,700	296,500	-123,500	Methanol (air)
50	4	0	209,462	209,462	3	0	91,920	91,920	-117,861	Chromium/Zinc/Nickel and compounds (transfers of metals)
	322	19,208,364	5,876,049	25,084,413	317	13,886,473	7,548,664	21,435,137	-28,469,847	

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

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

Table 5-40		The 50 NPRI Facilities with Largest Increase in Total Releases and Transfers, 1995-1997							
Rank	Facility	City, Province	SIC Codes		Number of Forms	1995			
			Canada	US		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	
1	Dofasco Inc.	Hamilton, ON	29	33	18	591,844	1,931,285	2,523,129	
2	Aimco Solrec Ltd.	Milton, ON	37	28	*	*	*	*	
3	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	19	639,890	0	639,890	
4	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7	3,662,640	0	3,662,640	
5	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	4	762,000	0	762,000	
6	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28	*	*	*	*	
7	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28	*	*	*	*	
8	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1	0	0	0	
9	Ispat Sidbec Inc. Acierie, Ispat Mexicana	Contrecoeur, QC	29	33	5	1,510,387	0	1,510,387	
10	Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga, ON	28	27	1	36,000	5,000	41,000	
11	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	6	100	3,336,100	3,336,200	
12	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	6	181,387	0	181,387	
13	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	5	18,478	0	18,478	
14	Metalex Products Ltd.	Richmond, BC	29	33	4	10,250	0	10,250	
15	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	2	17,276	0	17,276	
16	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5	10,030	1,864,400	1,874,430	
17	Celanese Canada Inc.	Edmonton, AB	37	28	10	3,497,171	35,658	3,532,829	
18	Papiers Domtar - Centre d'affaires Windsor	Windsor, QC	27	26	5	143,400	0	143,400	
19	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28	11	651,881	0	651,881	
20	International Wallcoverings Ltd.	Brampton, ON	27	26	4	316,000	0	316,000	
21	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28	5	65,900	306,300	372,200	
22	Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton, AB	37	28	5	14	0	14	
23	Inland Technologies Inc., Debert Treatment Centre	Debert, NS	36	29	*	*	*	*	
24	Pétroles Coastal Canada Inc., Coastal Corporation	Montréal-est, QC	37	28	7	71,398	1,281	72,679	
25	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	7	12,197	347,570	359,767	
26	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24	*	*	*	*	
27	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29	6	5,000	0	5,000	
28	Kraft Canada Inc, Cheese Operations, Philip Morris Companies	Ingleside, ON	10	20	1	0	0	0	
29	Emballages Stone (Canada), Div. Chaleurs, Stone Container	New Richmond, QC	27	26	*	*	*	*	
30	Zalev Brothers Limited	Windsor, ON	29	33	7	453	849,840	850,293	
31	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	1	455,000	22,000	477,000	
32	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	23	441,713	126,328	568,041	
33	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	*	*	*	*	
34	Kronos Canada, Inc.	Varenes, QC	37	28	8	71,100	633,000	704,100	
35	Morbern Incorporated	Cornwall, ON	16	30	3	632,240	0	632,240	
36	Crown Cork & Seal Canada Inc., Plant 244	Concord, ON	30	34	5	29,956	0	29,956	
37	Atlas Steels Inc., Atlas Specialty Steels	Wellsand, ON	29	33	5	81,141	216,300	297,441	
38	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6	626,833	179,183	806,016	
39	Novopharm Limited	Markham, ON	37	28	1	72,981	0	72,981	
40	Stelco Inc., Hilton Works	Hamilton, ON	29	33	21	259,745	255,380	515,125	
41	Kitchencraft of Canada Ltd.	Winnipeg, MB	25	24	3	71,000	0	71,000	
42	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	6	815,500	0	815,500	
43	Les Aciers Canam, Le Groupe Canam Manac Inc.	St-Gédéon, QC	30	34	6	200,100	15,600	215,700	
44	Parmalat Canada	Winchester, ON	10	20	2	0	0	0	
45	Chrysler Canada, Ltd., Bramalea Assembly Plant	Bramalea, ON	32	37	11	153,985	30,111	184,096	
46	McCain Foods (Canada), Borden-Carleton Plants	Carleton, PE	10	20	*	*	*	*	
47	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	30	37	2	0	1,388	1,388	
48	Avenor Inc., Dryden Mill	Dryden, ON	27	26	6	474,560	0	474,560	
49	Secal, usine Vaudreuil	Jonquière, QC	37	28	3	99,670	0	99,670	
50	Parmalat Canada	Victoriaville, QC	10	20	*	*	*	*	
Total					263	16,689,220	10,156,724	26,845,944	

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

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

Rank	1996				1997				Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Increases (Primary Media/Transfers with Increases)**
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)		
1	18	586,441	2,546,892	3,133,333	18	431,063	8,169,478	8,600,541	6,077,412	Zinc and compounds (transfers of metals)
2	6	33,708	2,100,316	2,134,024	6	35,641	2,028,917	2,064,558	2,064,558	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
3	19	603,307	3,814,700	4,418,007	16	577,432	1,480,000	2,057,432	1,417,542	Zinc and compounds (transfers of metals)
4	7	4,773,818	0	4,773,818	7	4,908,786	0	4,908,786	1,246,146	Sulfuric acid (air), Chromium and compounds (land)
5	5	2,031,067	0	2,031,067	7	1,782,947	0	1,782,947	1,020,947	Zinc and compounds (land)
6	*	*	*	*	10	750,109	145,965	896,074	896,074	Methyl ethyl ketone, Toluene, Methanol (air)
7	10	2,121,980	22,314	2,144,294	4	762,000	81,600	843,600	843,600	Methanol (air)
8	1	0	0	0	1	0	840,570	840,570	840,570	Zinc and compounds (transfers of metals)
9	5	2,322,985	0	2,322,985	5	2,349,790	0	2,349,790	839,403	Zinc and compounds (land)
10	1	27,000	4,400	31,400	2	797,000	20,345	817,345	776,345	Methanol (air)
11	6	50	4,099,400	4,099,450	6	29	3,956,300	3,956,329	620,129	Nitric acid and nitrate compounds (transfers to sewage)
12	6	437,092	0	437,092	6	744,572	0	744,572	563,185	Zinc/Lead and compounds (air)
13	5	21,634	0	21,634	6	38,248	467,400	505,648	487,170	Lead/Cadmium and compounds (transfers of metals)
14	5	24,229	257,210	281,439	5	371	484,370	484,741	474,491	Lead and compounds (transfers of metals)
15	2	20,943	0	20,943	2	342,136	127,000	469,136	451,860	Methanol, Formaldehyde (air)
16	5	17,410	3,054,700	3,072,110	5	17,750	2,298,300	2,316,050	441,620	Zinc/Manganese and compounds (transfers of metals)
17	10	4,492,813	48,855	4,541,668	11	3,836,908	105,384	3,942,292	409,463	Methanol (UIJ)
18	4	116,200	0	116,200	6	527,484	0	527,484	384,084	Methanol (air)
19	15	956,800	55,010	1,011,810	15	935,330	93,313	1,028,643	376,762	Nitric acid and nitrate compounds (UIJ, water)
20	4	416,300	0	416,300	4	669,500	0	669,500	353,500	Methyl ethyl ketone, Toluene (air)
21	5	63,800	572,400	636,200	4	83,100	639,700	722,800	350,600	Toluene (transfers to treatment)
22	5	20	0	20	4	30	317,039	317,069	317,055	Methanol, Dichloromethane (transfers to treatment)
23	1	0	181,328	181,328	1	0	296,054	296,054	296,054	Ethylene glycol (transfers to treatment)
24	7	292,217	1,178	293,395	6	357,878	288	358,166	285,487	Xylene (air)
25	7	12,030	787,420	799,450	7	10,782	632,378	643,160	283,393	Zinc and compounds (transfers of metals)
26	*	*	*	*	1	279,000	0	279,000	279,000	Formaldehyde (air)
27	8	4,958	90,000	94,958	8	12,029	271,000	283,029	278,029	Asbestos (transfers to disposal)
28	2	280,000	0	280,000	2	72,000	201,000	273,000	273,000	Nitric acid and nitrate compounds (transfers to sewage)
29	4	415,000	0	415,000	3	267,000	0	267,000	267,000	Methanol (air)
30	7	456	877,606	878,062	8	429	1,104,869	1,105,298	255,005	Zinc/Copper and compounds (transfers of metals)
31	2	471,000	15,000	486,000	2	474,000	248,000	722,000	245,000	Methanol (transfers to sewage)
32	22	476,826	19,138	495,964	23	760,113	44,279	804,392	236,351	Nitric acid and nitrate compounds (water)
33	*	*	*	*	11	231,251	0	231,251	231,251	Lead and compounds, Sulfuric acid, Copper and compounds (air)
34	8	68,546	836,000	904,546	8	47,933	855,000	902,933	198,833	Manganese and compounds (transfers of metals)
35	3	746,600	0	746,600	3	757,500	60,000	817,500	185,260	Methyl ethyl ketone (air)
36	4	158,412	0	158,412	4	200,925	0	200,925	170,969	n-Butyl alcohol, Xylene (air)
37	5	123,600	362,101	485,701	7	162,714	305,118	467,832	170,391	Aluminum oxide (land)
38	6	609,901	68,720	678,621	6	729,605	241,888	971,493	165,477	Copper and compounds (transfers of metals)
39	1	61,955	0	61,955	2	238,198	0	238,198	165,217	Dichloromethane (air)
40	21	352,705	397,640	750,345	21	338,723	328,500	667,223	152,098	Asbestos (transfers to disposal), Phenol (transfers to sewage)
41	4	113,000	0	113,000	5	223,000	0	223,000	152,000	Toluene, Xylene, n-Butyl alcohol (air)
42	8	845,780	0	845,780	10	956,957	0	956,957	141,457	Zinc and compounds (land), Methanol (air)
43	6	200,100	15,600	215,700	7	346,800	7,200	354,000	138,300	Xylene (air)
44	2	0	0	0	3	137,177	0	137,177	137,177	Nitric acid and nitrate compounds (water)
45	12	407,240	44,457	451,697	13	284,621	35,156	319,777	135,681	Methyl ethyl ketone, Toluene (air)
46	*	*	*	*	1	127,540	0	127,540	127,540	Nitric acid and nitrate compounds (water)
47	2	0	121,540	121,540	2	0	128,300	128,300	126,912	Manganese and compounds (transfers of metals)
48	7	497,880	0	497,880	7	601,092	0	601,092	126,532	Methanol, Chlorine (air)
49	3	166,418	0	166,418	3	209,835	0	209,835	110,165	Hydrochloric acid (air)
50	*	*	*	*	2	0	108,856	108,856	108,856	Nitric acid and nitrate compounds (transfers to sewage)
	296	25,372,221	20,393,925	45,766,146	326	27,417,328	26,123,567	53,540,895	26,694,951	

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

► UIJ = underground injection

Table 5-41		The 50 TRI Facilities with Largest Decrease in Total Releases and Transfers, 1995-1997					
Rank	Facility	City, State	US SIC Code	Number of Forms	1995		
					Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	9	7,908,991	2,010,436	9,919,427
2	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28	5	15,427,756	0	15,427,756
3	DuPont	Beaumont, TX	28	27	8,523,823	289,770	8,813,593
4	DuPont Cape Fear	Leland, NC	28	21	1,641,748	3,588,734	5,230,482
5	Millennium Petrochemical Inc., Millennium Chemicals Inc.	La Porte, TX	28	22	1,006,283	4,142,623	5,148,906
6	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28	23	4,326,523	135,676	4,462,199
7	Chino Mines Co., Phelps Dodge Corp.	Hurley, NM	33	3	3,233,586	0	3,233,586
8	Lenzing Fibers Corp.	Lowland, TN	28	5	10,526,240	263,039	10,789,279
9	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	22	10,573,159	11,331	10,584,490
10	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	15	87,471	6,128,351	6,215,822
11	Sterling Chemicals Inc.	Texas City, TX	28	36	5,384,579	42,668	5,427,247
12	Bayer Corp.	New Martinsville, WV	28	30	3,811,028	28,903	3,839,931
13	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	11	14,607,892	2	14,607,894
14	IMC-Agrico Co., New Wales Plant	Mulberry, FL	Mult.	2	3,746,031	0	3,746,031
15	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	10	265,389	15,729,385	15,994,774
16	PD Glycol, Occidental Petroleum Corp.	Beaumont, TX	28	6	34,815	1,748,908	1,783,723
17	Cabot Corp.	Ville Platte, LA	28	3	1,614,127	0	1,614,127
18	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28	20	6,171,389	1,321,499	7,492,888
19	Monsanto Co., Chocolate Bayou	Alvin, TX	28	19	1,856,700	0	1,856,700
20	Witco Corp., Gretna Plant	Harvey, LA	28	2	1,763,311	0	1,763,311
21	BASF Corp.	Freeport, TX	28	25	7,853,878	92,237	7,946,115
22	Cabot Corp., Canal Plant	Franklin, LA	28	3	1,905,154	0	1,905,154
23	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33	7	43,650	1,228,394	1,272,044
24	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33	4	68,933	1,268,007	1,336,940
25	Merichem-Sasol USA LLC	Houston, TX	28	12	1,362,384	671,885	2,034,269
26	Osram Sylvania Prods. Inc., Osram GMBH	Versailles, KY	36	6	1,173,335	64,544	1,237,879
27	Reynolds Metals Co.	Sheffield, AL	34	12	1,285,786	8,156	1,293,942
28	Pharmacia & Upjohn Co.	Portage, MI	28	26	3,305,571	1,445,782	4,751,353
29	Cabot Corp., Cab-o-sil Div.	Tuscola, IL	28	6	1,121,425	0	1,121,425
30	Mobil Chemical Co., Mobil Corp.	Beaumont, TX	28	23	1,220,267	5,866	1,226,133
31	Degussa Corp., Ivanhoe	Louisa, LA	28	2	929,705	0	929,705
32	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT	33	6	29,168,743	0	29,168,743
33	DuPont	Louisville, KY	28	10	38,567	872,295	910,862
34	Flexel Indiana Inc.	Covington, IN	30	5	861,798	8,979	870,777
35	Exxon Chemical, Baton Rouge Chemical Plant, Exxon Corp.	Baton Rouge, LA	28	34	953,396	398,077	1,351,473
36	Craig Ind.	Teresita, MO	28	1	860,082	0	860,082
37	Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood, MS	33	5	1,198	840,229	841,427
38	Shell Oil Co.	Deer Park, TX	Mult.	51	1,904,354	604,964	2,509,318
39	Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena, TX	28	10	23,210	8,805,712	8,828,922
40	North American Rayon Corp., North American Corp.	Elizabethton, TN	28	3	1,276,176	113,492	1,389,668
41	Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle, IN	33	5	5,079	1,074,889	1,079,968
42	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26	8	576,481	3,783,492	4,359,973
43	Merck & Co. Inc.	Rahway, NJ	28	17	64,527	1,068,131	1,132,658
44	Finch Pruyn & Co. Inc.	Glens Falls, NY	26	5	1,983,407	25	1,983,432
45	BP Chemicals Inc., BP America Inc.	Lima, OH	28	27	5,045,344	5,381	5,050,725
46	Mallinckrodt Inc.	Saint Louis, MO	28	19	165,631	2,135,210	2,300,841
47	OSI Specialties Inc., Witco Corp.	Friendly, WV	28	17	362,672	1,042,030	1,404,702
48	Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta, PR	28	6	59,821	1,248,708	1,308,529
49	Olin Brass Indianapolis, Olin Corp.	Indianapolis, IN	33	8	10,373	717,081	727,454
50	DuPont	Victoria, TX	28	29	9,369,475	733,239	10,102,714
Total				683	175,511,263	63,678,130	239,189,393

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

Rank	1996			1997			Change 95-97		Major Chemicals Reported with Decreases (Primary Media/Transfers with Decreases)*	
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)		
1	9	4,676,363	3,033,529	7,709,892	9	375,009	560,926	935,935	-8,983,492	Copper/Zinc and compounds (land)
2	4	12,781,207	0	12,781,207	4	7,033,029	0	7,033,029	-8,394,727	Carbon disulfide (air)
3	19	3,900,458	284,024	4,184,482	22	2,792,231	263,174	3,055,405	-5,758,188	Nitric acid and nitrate compounds, Acetonitrile (UIJ)
4	19	1,258,878	559,548	1,818,426	19	1,136,325	101,290	1,237,615	-3,992,867	Ethylene glycol (transfers to treatment)
5	22	1,042,478	404,462	1,446,940	21	1,041,238	485,572	1,526,810	-3,622,096	Vinyl acetate (transfers to treatment)
6	19	4,256,990	32,098	4,289,088	19	882,623	54,209	936,832	-3,525,367	Propylene (air)
7	2	3,539,360	0	3,539,360	**	**	**	**	-3,233,586	Copper and compounds (land)
8	5	8,357,877	0	8,357,877	5	7,764,811	0	7,764,811	-3,024,468	Carbon disulfide (air)
9	23	9,372,030	10,021	9,382,051	24	7,669,796	21,715	7,691,511	-2,892,979	Acetonitrile, Acrylic acid (UIJ)
10	17	96,345	6,357,178	6,453,523	18	101,370	3,508,789	3,610,159	-2,605,663	Zinc and compounds (transfers of metals)
11	36	3,072,310	52,730	3,125,040	34	2,872,333	17,175	2,889,508	-2,537,739	Nitric acid and nitrate compounds (UIJ)
12	29	3,137,198	21,257	3,158,455	29	1,562,576	14,371	1,576,947	-2,262,984	Nitric acid and nitrate compounds (water)
13	11	12,764,989	2	12,764,991	13	12,345,745	113	12,345,858	-2,262,036	Zinc and compounds (land)
14	2	2,056,689	0	2,056,689	3	1,631,746	0	1,631,746	-2,114,285	Phosphoric acid (land)
15	9	220,257	10,473,482	10,693,739	9	225,113	13,855,648	14,080,761	-1,914,013	Lead and compounds (transfers of metals)
16	6	40,781	200,470	241,251	6	61,987	158,086	220,073	-1,563,650	Ethylene glycol (transfers to treatment)
17	3	1,518,164	0	1,518,164	3	78,028	0	78,028	-1,536,099	Carbon disulfide (air)
18	20	3,829,753	257,134	4,086,887	20	1,903,636	4,112,957	6,016,593	-1,476,295	Ethylene glycol (UIJ)
19	17	1,586,005	0	1,586,005	4	471,070	0	471,070	-1,385,630	Acrylonitrile, Acetonitrile, Phenol, Hydrogen cyanide (UIJ)
20	2	1,857,445	0	1,857,445	1	429,478	0	429,478	-1,333,833	Methanol (UIJ)
21	24	6,507,355	131,612	6,638,967	26	6,502,858	131,800	6,634,658	-1,311,457	Nitric acid and nitrate compounds (water)
22	5	1,979,977	0	1,979,977	3	622,199	0	622,199	-1,282,955	Carbon disulfide, Ethylene (air)
23	7	35,683	387,751	423,434	**	**	**	**	-1,272,044	Chromium and compounds (transfers of metals)
24	5	9,654	127,741	137,395	5	19,430	111,984	131,414	-1,205,526	Chromium and compounds (transfers of metals)
25	12	1,148,242	149,389	1,297,631	12	918,449	2,713	921,162	-1,113,107	Naphthalene, Xylene (transfers to treatment), o-cresol, m-Cresol, Aniline (UIJ)
26	6	992,874	4,727	997,601	6	130,704	897	131,601	-1,106,278	Xylene (air)
27	11	268,980	3,501	272,481	12	249,705	3,386	253,091	-1,040,851	Methyl ethyl ketone, Toluene (air)
28	23	1,774,718	2,349,414	4,124,132	25	1,408,997	2,325,557	3,734,554	-1,016,799	Methanol (UIJ)
29	6	946,558	0	946,558	6	123,465	0	123,465	-997,960	Chlorine (air)
30	21	1,151,794	2,732	1,154,526	16	286,665	2,723	289,388	-936,745	Ethylene, Propylene (air)
31	2	671,202	0	671,202	2	30,385	0	30,385	-899,320	Carbon disulfide (air)
32	6	29,619,666	0	29,619,666	6	28,270,233	0	28,270,233	-898,510	Hydrochloric acid (air)
33	8	18,036	28,040	46,076	6	23,005	8,783	31,788	-879,074	Toluene (transfers to treatment)
34	5	1,249,238	7,080	1,256,318	**	**	**	**	-870,777	Carbon disulfide (air)
35	34	335,426	73,981	409,407	35	388,830	93,265	482,095	-869,378	Nitric acid and nitrate compounds, Methanol (water)
36	**	**	**	**	**	**	**	**	-860,082	Methanol (air)
37	6	3,815	0	3,815	5	1,886	0	1,886	-839,541	Lead/Manganese and compounds (transfers of metals)
38	93	1,020,507	829,160	1,849,667	94	1,052,840	618,138	1,670,978	-838,340	Phenol (UIJ)
39	12	29,525	8,401,166	8,430,691	12	29,252	7,964,044	7,993,296	-835,626	Nitric acid and nitrate compounds, Dinitrotoluene (transfers to sewage)
40	3	1,172,262	39	1,172,301	2	571,610	0	571,610	-818,058	Carbon disulfide (air)
41	5	7,982	256,673	264,655	5	19,057	265,510	284,567	-795,401	Chromium and compounds (transfers of metals)
42	8	533,951	2,185,668	2,719,619	8	211,227	3,361,224	3,572,451	-787,522	Methanol (transfers to sewage), Chloroform (air)
43	17	55,385	387,280	442,665	15	56,034	305,380	361,414	-771,244	Methanol (transfers to sewage)
44	5	1,101,449	2	1,101,451	6	1,203,200	13,809	1,217,009	-766,423	Nitric acid and nitrate compounds (water)
45	27	4,875,406	9,790	4,885,196	27	4,289,188	8,091	4,297,279	-753,446	Acrylonitrile (UIJ)
46	19	137,933	1,607,981	1,745,914	20	118,730	1,428,703	1,547,433	-753,408	Methanol (transfers to sewage), 1,1,2-Trichloroethane (transfers to treatment)
47	17	339,968	437,295	777,263	18	335,024	342,599	677,623	-727,079	Methanol, Toluene (transfers to treatment)
48	6	72,292	754,468	826,760	5	43,902	540,726	584,628	-723,901	Methanol (transfers to treatment)
49	8	8,463	1,771	10,234	7	8,718	1,209	9,927	-717,527	Copper/Chromium and compounds (transfers of metals)
50	29	8,737,253	478,514	9,215,767	29	9,044,261	345,615	9,389,876	-712,838	Nitric acid and nitrate compounds (UIJ)
	704	144,171,171	40,301,710	184,472,881	676	106,337,998	41,030,181	147,368,179	-91,821,214	

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

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

► UIJ = underground injection

Table 5-42		The 50 TRI Facilities with Largest Increase in Total Releases and Transfers, 1995-1997						
M		1997						
Rank	Facility	City, State	US SIC Code	Number of Forms	1995			Total Releases and Transfers (kg)
					Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	
1	USS Clairton Works, USX Corp.	Clairton, PA	33	18	240,552	962,639	1,203,191	
2	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	14	2,715,080	170,044	2,885,124	
3	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	8	34,269	37,750	72,019	
4	Armco Inc. (Route 8 S.)	Butler, PA	33	14	4,728,754	15,652	4,744,406	
5	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28	11	6,939,334	16,365	6,955,699	
6	Steel Dynamics Inc.	Butler, IN	33	1	956	5,161	6,117	
7	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	29	3,462,571	50,085	3,512,656	
8	Solutia Inc.	Gonzalez, FL	28	21	5,936,347	2,994	5,939,341	
9	DuPont	Pass Christian, MS	28	5	232,766	9,070	241,836	
10	Nucor Steel	Plymouth, UT	33	8	16,283	164,581	180,864	
11	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	2	4,266,281	40,867	4,307,148	
12	Regal Ware Inc.	Kewaskum, WI	34	6	474	538,390	538,864	
13	DuPont	New Johnsonville, TN	28	6	160,851	0	160,851	
14	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL	28	4	13,514	0	13,514	
15	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33	9	11,998	8	12,006	
16	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	11	204,604	8,982	213,586	
17	Timken Co., Faircrest Steel Plant	Canton, OH	33	7	5,445	22,879	28,324	
18	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33	6	11,462	0	11,462	
19	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	5	2,252	0	2,252	
20	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6	8,663	0	8,663	
21	USS Mon Valley Works, USX Corp.	Braddock, PA	33	6	49,944	1,018,552	1,068,496	
22	FMC Corp.	Baltimore, MD	28	14	36,874	244,485	281,359	
23	ASARCO Inc., Glover Plant	Annapolis, MO	33	6	2,959,545	0	2,959,545	
24	Bar Techs. Inc.	Johnstown, PA	33	*	*	*	*	
25	Solutia Inc., Chocolate Bayou	Alvin, TX	28	*	*	*	*	
26	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33	5	1,806	0	1,806	
27	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	5	37,507	18,141	55,648	
28	Ameristeel Corp.	Charlotte, NC	33	6	20,076	0	20,076	
29	Southwire Co.	Carrollton, GA	Mult.	19	46,541	349,766	396,307	
30	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	13	7,066,233	0	7,066,233	
31	Monsanto Co.	Luling, LA	28	13	1,978,881	8,530	1,987,411	
32	GNI Chemicals Corp. Inc., GNI Group Inc.	Deer Park, TX	28	*	*	*	*	
33	Austeel Lemont Co. Inc.	Lemont, IL	33	4	24,748	0	24,748	
34	Koppers Ind. Inc.	Cicero, IL	28	9	47,931	45,870	93,801	
35	Timken Co., Harrison Steel Plant	Canton, OH	33	7	12,546	27,152	39,698	
36	Roanoke Electric Steel Corp.	Roanoke, VA	33	7	1,865	0	1,865	
37	DuPont	Belle, WV	28	25	116,311	179,917	296,228	
38	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28	8	9,665	407,719	417,384	
39	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33	*	*	*	*	
40	Koppel Steel Corp., NS Group Inc.	Koppel, PA	33	4	665	140,624	141,289	
41	Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa, AL	33	7	0	0	0	
42	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.	12	39,620	319,810	359,430	
43	Amoco Petroleum Prods., Amoco Corp.	Texas City, TX	29	32	630,312	40,272	670,584	
44	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22	*	*	*	*	
45	Millennium Inorganic Chemicals, Plant 1, Millennium Chemicals	Ashtabula, OH	28	4	10,605	0	10,605	
46	Auburn Steel Co. Inc.	Auburn, NY	33	4	4,189	20	4,209	
47	Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville, OR	33	5	1,969	0	1,969	
48	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33	8	26,224	5,071,785	5,098,009	
49	DuPont Chambers Works	Deepwater, NJ	28	47	418,280	813,621	1,231,901	
50	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA	29	30	1,253,307	7,342	1,260,649	
Total				491	43,788,100	10,739,073	54,527,173	

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

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

Rank	Number of Forms	1996			1997			Change 95-97		Major Chemicals Reported with Increases (Primary Media/Transfers with Increases)**
		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Total Releases and Transfers (kg)	
1	20	184,284	506,024	690,308	19	162,129	9,945,033	10,107,162	8,903,971	Ethylene (transfers to treatment)
2	14	4,239,677	347,302	4,586,979	14	11,022,591	192,057	11,214,648	8,329,524	Copper/Lead/Arsenic and compounds (land)
3	7	13,061	2,097,304	2,110,365	8	7,224	7,543,045	7,550,269	7,478,250	Zinc and compounds (transfers of metals)
4	14	5,711,005	0	5,711,005	14	11,891,923	154,645	12,046,568	7,302,162	Nitric acid and nitrate compounds (water)
5	11	9,740,677	524	9,741,201	12	13,827,714	0	13,827,714	6,872,015	Phosphoric acid (water)
6	3	2,327	1,982,278	1,984,605	7	6,642	6,529,560	6,536,202	6,530,085	Zinc and compounds (transfers of metals)
7	34	3,389,124	45,386	3,434,510	33	7,254,469	294,422	7,548,891	4,036,235	Zinc and compounds (land)
8	18	7,808,148	2,168	7,810,316	18	9,817,381	1,594	9,818,975	3,879,634	Nitric acid and nitrate compounds (UIJ)
9	5	292,680	7,710	300,390	11	4,091,982	8,163	4,100,145	3,858,309	Manganese and compounds (UIJ)
10	9	10,282	1,893,349	1,903,631	7	6,755	3,922,477	3,929,232	3,748,368	Zinc and compounds (transfers of metals)
11	2	5,127,596	27,279	5,154,875	2	6,578,798	1,434,288	8,013,086	3,705,938	Chromium and compounds (land, transfers of metals)
12	6	474	3,646,259	3,646,733	6	0	4,078,005	4,078,005	3,539,141	Aluminum oxide (transfers to disposal)
13	6	65,227	0	65,227	11	3,583,542	0	3,583,542	3,422,691	Manganese and compounds (UIJ)
14	4	11,156	0	11,156	4	3,183,329	0	3,183,329	3,169,815	Phosphoric acid (water)
15	9	10,147	10	10,157	10	10,983	2,957,542	2,968,525	2,956,519	Zinc and compounds (transfers of metals)
16	7	2,562,032	817	2,562,849	13	2,889,134	36	2,889,170	2,675,584	Copper and compounds (air)
17	7	5,722	703,221	708,943	6	5,379	2,486,113	2,491,492	2,463,168	Zinc and compounds (transfers of metals)
18	5	9,661	0	9,661	5	12,563	2,388,657	2,401,220	2,389,758	Zinc and compounds (transfers of metals)
19	4	3,498	0	3,498	6	4,231	2,384,320	2,388,551	2,386,299	Zinc and compounds (transfers of metals)
20	6	8,662	3,512,206	3,520,868	6	5,185	2,175,039	2,180,224	2,171,561	Zinc and compounds (transfers of metals)
21	7	15,975	3,260,882	3,276,857	7	2,204	3,090,268	3,092,472	2,023,976	Zinc and compounds (transfers of metals)
22	16	24,119	1,159,788	1,183,907	18	22,051	2,283,231	2,305,282	2,023,923	Methanol, Toluene (transfers to treatment)
23	6	4,030,227	0	4,030,227	7	4,921,195	0	4,921,195	1,961,650	Zinc/Lead and compounds (land)
24	5	1,146	376,327	377,473	6	4,824	1,926,825	1,931,649	1,931,649	Zinc and compounds (transfers of metals)
25	*	*	*	*	16	1,803,515	0	1,803,515	1,803,515	Acrylonitrile, Hydrogen cyanide, Phenol (UIJ)
26	5	16,395	0	16,395	5	10,815	1,758,623	1,769,438	1,767,632	Zinc and compounds (transfers of metals)
27	5	16,501	0	16,501	5	32,012	1,723,356	1,755,368	1,699,720	Lead and compounds (transfers of metals)
28	6	19,636	1,430,806	1,450,442	6	20,292	1,680,432	1,700,724	1,680,648	Zinc and compounds (transfers of metals)
29	30	22,601	1,180,378	1,202,979	37	26,884	1,917,891	1,944,775	1,548,468	Zinc and compounds (transfers of metals)
30	13	11,590,932	0	11,590,932	13	8,596,464	0	8,596,464	1,530,231	Copper and compounds (land)
31	13	2,673,597	10,399	2,683,996	14	3,406,590	16,830	3,423,420	1,436,009	Formaldehyde (UIJ)
32	1	2,207	244,666	246,873	9	3,545	1,350,989	1,354,534	1,354,534	Acetonitrile (transfers to disposal)
33	5	668,314	161,166	829,480	5	778,886	562,110	1,340,996	1,316,248	Zinc and compounds (land, transfers to metals)
34	10	35,275	49,925	85,200	9	65,945	1,304,542	1,370,487	1,276,686	Phthalic anhydride (transfers to disposal)
35	7	14,237	521,606	535,843	7	2,716	1,310,549	1,313,265	1,273,567	Zinc and compounds (transfers of metals)
36	7	1,833	203,898	205,731	7	2,559	1,233,769	1,236,328	1,234,463	Zinc and compounds (transfers of metals)
37	25	336,545	14,962	351,507	24	1,209,295	310,971	1,520,266	1,224,038	Nitric acid and nitrate compounds (water)
38	9	4,357	879,587	883,944	16	6,357	1,634,088	1,640,445	1,223,061	Methanol, Carbon tetrachloride, Xylene (transfers to treatment)
39	10	54,085	277,106	331,191	9	31,976	1,164,263	1,196,239	1,196,239	Manganese/Lead/Copper/Arsenic and compounds (transfers of metals)
40	6	4,530	1,047,587	1,052,117	6	4,077	1,332,607	1,336,684	1,195,395	Zinc and compounds (transfers of metals)
41	12	5	60,237	60,242	12	1,478	1,192,598	1,194,076	1,194,076	Zinc and compounds (transfers of metals)
42	12	36,602	401,860	438,462	8	22,730	1,488,998	1,511,728	1,152,298	Zinc and compounds (transfers of metals)
43	33	1,713,945	16,544	1,730,489	33	1,709,465	54,381	1,763,846	1,093,262	Methanol (air)
44	1	0	0	0	11	1,083,600	0	1,083,600	1,083,600	Zinc/Chromium and compounds (air)
45	5	83,381	816,327	899,708	5	92,619	997,732	1,090,351	1,079,746	Manganese and compounds (transfers of metals)
46	4	2,222	296,171	298,393	4	2,277	1,066,656	1,068,933	1,064,724	Zinc and compounds (transfers of metals)
47	5	1,202	400,290	401,492	5	3,056	1,060,770	1,063,826	1,061,857	Zinc and compounds (transfers of metals)
48	7	25,985	5,933,560	5,959,545	7	35,467	6,086,892	6,122,359	1,024,350	Zinc/Manganese and compounds (transfers of metals)
49	43	1,001,751	1,420,580	2,422,331	40	1,354,680	866,709	2,221,389	989,488	Nitric acid and nitrate compounds (water)
50	30	1,303,901	4,633	1,308,534	32	2,231,062	6,203	2,237,265	976,616	Nitric acid and nitrate compounds (water)
		529	62,896,946	34,941,122	595	101,850,590	83,917,279	185,767,869	131,240,696	

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

► UIJ = underground injection

5.3.4 Changes in Releases and Transfers by Chemical, 1995–1997

Two chemical groups of particular concern showed substantially greater change than the matched data set as a whole for 1995 to 1997. Total releases and transfers of designated carcinogens declined, especially in NPRI (a reduction of 10 percent compared to less than one percent in TRI). Both NPRI and TRI showed large increases in releases and transfers of metals—up 29 percent in NPRI and 34 percent in TRI (Figure 5–26).

NPRI Chemicals with Largest Decreases/Increases

Methanol showed the largest decrease in total releases and transfers in NPRI, from 32.1 million kg in 1995 to 21.9 million kg in 1997, a change of 10.2 million kg. This amounted to a 32 percent reduction. Two other chemicals had reductions of more than one million kg: asbestos, from 3.5 million kg to 1.2 million kg, and xylene, from 9.3 million kg to 8.1 million kg. For asbestos, the reduction amounted to 67 percent, while for xylene, total releases and transfers were reduced by 12 percent (Table 5–43).

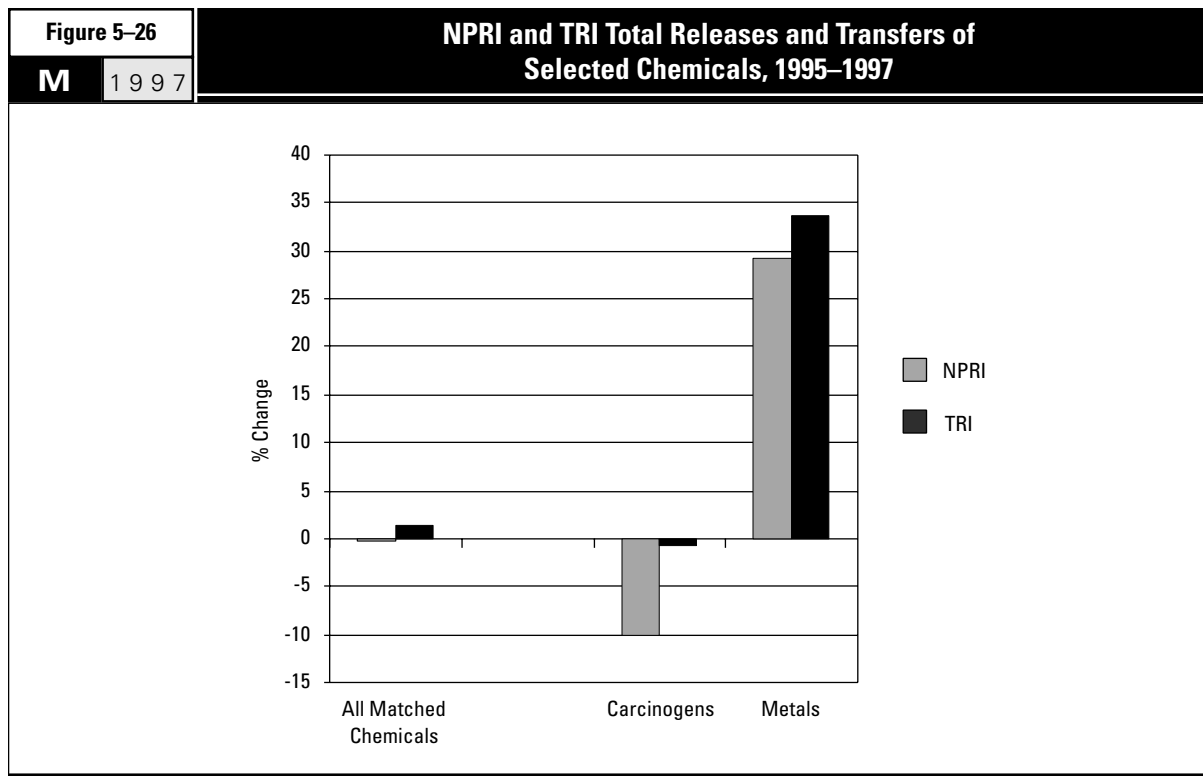


Table 5-43		The 10 Chemicals with the Largest Decrease in NPRI Total Releases and Transfers, 1995–1997				
M		1997				
CAS Number	Chemical	Total Releases and Transfers			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
67-56-1	Methanol	32,124,311	23,409,810	21,938,075	-10,186,236	-31.7
1332-21-4	Asbestos (friable)	3,475,355	1,072,209	1,156,168	-2,319,187	-66.7
1330-20-7	Xylene (mixed isomers)	9,259,359	8,216,714	8,112,404	-1,146,955	-12.4
—	Copper (and its compounds)	2,395,813	1,437,803	1,772,514	-623,299	-26.0
108-05-4	Vinyl acetate	837,914	329,313	287,212	-550,702	-65.7
74-87-3	Chloromethane	970,846	648,505	434,586	-536,260	-55.2
71-43-2	Benzene	1,938,524	1,871,519	1,507,090	-431,434	-22.3
74-85-1	Ethylene	2,328,642	2,246,209	1,992,423	-336,219	-14.4
7782-50-5	Chlorine	1,237,753	904,783	918,093	-319,660	-25.8
—	Chromium (and its compounds)	3,085,937	2,747,282	2,767,382	-318,555	-10.3

Table 5-44		The 10 Chemicals with the Largest Increase in NPRI Total Releases and Transfers, 1995–1997				
M		1997				
CAS Number	Chemical	Total Releases and Transfers			Change 1995–1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Zinc (and its compounds)	16,750,383	18,165,375	25,701,932	8,951,549	53.4
—	Nitric acid and nitrate compounds	6,059,390	7,615,562	8,152,389	2,092,999	34.5
7664-93-9	Sulfuric acid	3,660,258	4,944,817	4,463,666	803,408	21.9
—	Lead (and its compounds)	3,364,397	3,648,574	4,166,443	802,046	23.8
—	Manganese (and its compounds)	5,975,691	8,470,695	6,772,260	796,569	13.3
50-00-0	Formaldehyde	1,387,308	1,708,782	2,130,849	743,541	53.6
108-88-3	Toluene	7,730,588	7,401,177	8,412,760	682,172	8.8
78-93-3	Methyl ethyl ketone	5,379,472	6,557,372	5,929,227	549,755	10.2
75-09-2	Dichloromethane	2,246,081	2,288,724	2,563,331	317,250	14.1
1344-28-1	Aluminum oxide (fibrous forms)	58,404	118,825	346,444	288,040	493.2

Zinc and its compounds showed the largest increase in total releases and transfers in NPRI, from 16.8 million kg in 1995 to 25.7 million kg in 1997, which amounted to 53.4 percent. NPRI facilities also reported a 2.1-million-kg increase in releases and transfers of nitric acid and nitrate compounds, from 6.1 million kg to 8.2 million kg. This increase amounted to 35 percent. NPRI increases for sulfuric acid and for lead and its compounds were both just over 800,000 kg. For sulfuric acid, NPRI facilities released and transferred 3.7 million kg in 1995 and 4.5 million kg in 1997. For lead and its compounds, the increase was from 3.4 million kg to 4.2 million kg (Table 5-44).

Among the top 10 chemicals in NPRI for reduced releases and transfers were four carcinogens (asbestos, benzene, chromium and its compounds and vinyl acetate—for uses of vinyl acetate, see Section 4.3.4, above) and two metals (chromium and copper and their compounds). Three of the 10 NPRI chemicals with the largest increases were carcinogens (dichloromethane, formaldehyde and lead and its compounds), and two were metals (lead and manganese and their compounds).

TRI Chemicals with Largest Decreases/Increases

TRI facilities reported the largest decreases in releases and transfers for toluene, from 77.0 million kg in 1995 to 61.5 million kg in 1997, and carbon disulfide, from 38.4 million kg to 23.5 million kg. The reduction for toluene equaled 15.5 million kg, or 20 percent, while the reduction for carbon disulfide was 14.9 million kg, or 39 percent. Methanol had the third-largest reduction, dropping 11.4 million kg (seven percent), from 171.0 million kg to 159.6 million kg (**Table 5-45**).

TRI releases and transfers of zinc and its compounds increased from 110.3 million kg in 1995 to 154.4 million kg in 1997. At 44.1 million kg, this was the largest increase in TRI. In percentage terms, zinc and its compounds showed a 40 percent increase. Ranking second for increases, manganese and its compounds increased by 22.1 million kg (51.0 percent), from 43.4 million kg in 1995 to 65.5 million kg in 1997. Releases and transfers of nitric acid and nitrate compounds rose 11.4 million kg (8.7 percent), from 131.2 million kg in 1995 to 142.7 million kg in 1997 (**Table 5-46**).

The top 10 chemicals in TRI for decreased releases and transfers included two carcinogens (dichloromethane and vinyl acetate); none were metals. Three of the chemicals with the largest TRI increases were carcinogens (arsenic, chromium and lead and their compounds), and six were metals (arsenic, chromium, copper, lead, manganese and zinc and their compounds).

Table 5-45

The 10 Chemicals with Largest Decrease in TRI Total Releases and Transfers, 1995-1997

CAS Number	Chemical	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
108-88-3	Toluene	76,970,635	67,990,657	61,457,252	-15,513,383	-20.2
75-15-0	Carbon disulfide	38,379,845	33,192,330	23,509,184	-14,870,661	-38.7
67-56-1	Methanol	170,977,185	163,499,583	159,573,461	-11,403,724	-6.7
1330-20-7	Xylene (mixed isomers)	48,776,806	42,028,670	38,815,162	-9,961,644	-20.4
78-93-3	Methyl ethyl ketone	34,780,381	29,777,419	27,357,628	-7,422,753	-21.3
107-21-1	Ethylene glycol	26,045,663	17,838,071	19,888,474	-6,157,189	-23.6
115-07-1	Propylene	12,449,708	12,119,599	7,436,517	-5,013,191	-40.3
7647-01-0	Hydrochloric acid	30,967,552	28,838,728	26,161,189	-4,806,363	-15.5
108-05-4	Vinyl acetate	6,369,767	2,831,610	2,112,673	-4,257,094	-66.8
75-09-2	Dichloromethane	31,486,221	30,000,325	27,591,806	-3,894,415	-12.4

Table 5-46

The 10 Chemicals with Largest Increase in TRI Total Releases and Transfers, 1995-1997

CAS Number	Chemical	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Zinc (and its compounds)	110,254,783	125,622,492	154,350,644	44,095,861	40.0
—	Manganese (and its compounds)	43,372,348	47,202,906	65,474,105	22,101,757	51.0
—	Nitric acid and nitrate compounds	131,241,024	126,054,855	142,660,350	11,419,326	8.7
7664-38-2	Phosphoric acid	29,417,642	31,039,107	39,101,518	9,683,876	32.9
74-85-1	Ethylene	16,909,766	16,454,997	23,579,204	6,669,438	39.4
—	Lead (and its compounds)	19,960,972	21,961,939	26,418,897	6,457,925	32.4
1344-28-1	Aluminum oxide (fibrous forms)	1,635,456	4,407,035	4,918,131	3,282,675	200.7
—	Copper (and its compounds)	31,690,605	36,416,087	34,715,649	3,025,044	9.5
—	Chromium (and its compounds)	23,741,812	22,465,998	26,212,360	2,470,548	10.4
—	Arsenic (and its compounds)	2,120,447	2,396,332	4,077,455	1,957,008	92.3

Carcinogens

NPRI releases and transfers of known or suspected carcinogens totaled 20.7 million kg in 1995 and 18.7 million kg in 1997, a decrease of 2.1 million kg or 10 percent. Carcinogens declined from 16 percent of all NPRI releases and transfers in the matched data set for 1995 to 14 percent in 1997 (Table 5-47).

Submitting reports on 39 of the 48 carcinogens in the matched data set, NPRI facilities reported reductions in releases and transfers of 23 of them. The largest reduction was for asbestos, decreasing by 2.3 million kg (from 3.5 million kg in 1995 to 1.2 million kg in 1997). Amounts reported for vinyl acetate decreased by 550,702 kg (from 837,914 kg to 287,212 kg). For both asbestos and vinyl acetate, these were reductions of two-thirds.

The largest NPRI increase for carcinogens was for lead and its compounds, increasing by 802,046 kg (from 3.4 million kg to 4.2 million kg). Formaldehyde releases and transfers rose 743,541 kg (from 1.4 million kg to 2.1 million kg). The increase for lead and its compounds amounted to 24 percent and the increase for formaldehyde amounted to 54 percent.

Table 5-47		Change in NPRI Total Releases and Transfers of Known or Suspected Carcinogens [†] , 1995-1997				
CAS Number	Chemical	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
1332-21-4	Asbestos (friable)	3,475,355	1,072,209	1,156,168	-2,319,187	-66.7
108-05-4	Vinyl acetate	837,914	329,313	287,212	-550,702	-65.7
71-43-2	Benzene	1,938,524	1,871,519	1,507,090	-431,434	-22.3
—	Chromium (and its compounds)	3,085,937	2,747,282	2,767,382	-318,555	-10.3
—	Nickel (and its compounds)	1,121,479	894,862	879,686	-241,793	-21.6
106-99-0	1,3-Butadiene	283,028	129,531	118,440	-164,588	-58.2
127-18-4	Tetrachloroethylene	218,627	198,711	77,066	-141,561	-64.8
79-01-6	Trichloroethylene	811,328	862,867	732,552	-78,776	-9.7
107-13-1	Acrylonitrile	50,921	28,251	6,469	-44,452	-87.3
75-07-0	Acetaldehyde	309,188	434,034	275,269	-33,919	-11.0
117-81-7	Di(2-ethylhexyl) phthalate	96,564	71,519	65,289	-31,275	-32.4
67-66-3	Chloroform	242,001	212,417	227,714	-14,287	-5.9
75-21-8	Ethylene oxide	26,204	23,094	16,159	-10,045	-38.3
56-23-5	Carbon tetrachloride	20,859	7,873	12,765	-8,094	-38.8
—	Cobalt (and its compounds)	38,005	36,503	30,986	-7,019	-18.5
79-06-1	Acrylamide	6,362	1,223	3,211	-3,151	-49.5
123-91-1	1,4-Dioxane	7,059	6,054	3,998	-3,061	-43.4
106-46-7	1,4-Dichlorobenzene	10,264	9,600	8,500	-1,764	-17.2
140-88-5	Ethyl acrylate	1,090	440	241	-849	-77.9
584-84-9	Toluene-2,4-diisocyanate	400	502	10	-390	-97.5
106-89-8	Epichlorohydrin	133	127	7	-126	-94.7
79-46-9	2-Nitropropane	125	125	0	-125	-100.0
101-77-9	4,4'-Methylenedianiline	100	0	0	-100	-100.0
91-08-7	Toluene-2,6-diisocyanate	0	1	0	—	—
77-78-1	Dimethyl sulfate	8	11	10	2	25.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	4	5	6	2	50.0
121-14-2	2,4-Dinitrotoluene	700	2,350	816	116	16.6
96-09-3	Styrene oxide	100	537	297	197	197.0
26471-62-5	Toluenediisocyanate (mixed isomers)	8,203	8,962	9,089	886	10.8
75-56-9	Propylene oxide	10,469	11,448	13,005	2,536	24.2
139-13-9	Nitrotriacetic acid	2,660	2,205	5,770	3,110	116.9
107-06-2	1,2-Dichloroethane	6,219	17,476	20,192	13,973	224.7
75-01-4	Vinyl chloride	18,195	20,409	43,992	25,797	141.8
—	Cadmium (and its compounds)	54,950	21,735	164,980	110,030	200.2
—	Arsenic (and its compounds)	74,078	172,813	216,145	142,067	191.8
100-42-5	Styrene	976,254	1,141,638	1,139,870	163,616	16.8
75-09-2	Dichloromethane	2,246,081	2,288,724	2,563,331	317,250	14.1
50-00-0	Formaldehyde	1,387,308	1,708,782	2,130,849	743,541	53.6
—	Lead (and its compounds)	3,364,397	3,648,574	4,166,443	802,046	23.8
	Subtotal	20,731,093	17,983,726	18,651,009	-2,080,084	-10.0
	% of Total	15.9	14.4	14.4		
	Total for Matched NPRI Chemicals	130,368,812	124,688,830	129,957,185	-411,627	-0.3

[†] 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.

In TRI, carcinogen releases and transfers totaled 177.4 million kg in 1995 and 176.3 million kg in 1997, a decrease of 1.1 million kg (less than one percent). As a percentage of total releases and transfers, carcinogens declined only slightly (from 15.5 percent to 15.2 percent) over the comparison period (Table 5-48).

TRI facilities submitted reports for all 48 carcinogens in the matched data set, recording reductions in releases and transfers of 28 of them. Vinyl acetate ranked first among carcinogens for TRI decreases, with a reduction of 4.3 million kg. Vinyl acetate releases and transfers totaled 6.4 million kg in 1995 and 2.1 million kg in 1997, a two-thirds reduction. TRI facilities reported a 3.9-million-kg reduction in releases and transfers of dichloromethane, from 31.5 million kg to 27.6 million kg, and a 3.6-million-kg reduction for trichloroethylene, from 12.2 million kg to 8.6 million kg. These reductions amounted to 12 percent for dichloromethane and 30 percent for trichloroethylene.

The largest TRI increase was for lead and its compounds, increasing by 6.5 million kg. Releases and transfers of lead and its compounds rose 32 percent, from 20.0 million kg to 26.4 million kg. Amounts reported for chromium and its compounds increased by 2.5 million kg, from 23.7 million kg to 26.2 million kg. Arsenic and its compounds ranked third for TRI increases, with an increase of 2.0 million kg, from 2.1 million kg to 4.1 million kg. Percentage increases were 10 percent for chromium and its compounds and 92 percent for arsenic and its compounds.

Table 5-48		Change in TRI Total Releases and Transfers of Known or Suspected Carcinogens [†] , 1995-1997				
CAS Number	Chemical	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
108-05-4	Vinyl acetate	6,369,767	2,831,610	2,112,673	-4,257,094	-66.8
75-09-2	Dichloromethane	31,486,221	30,000,325	27,591,806	-3,894,415	-12.4
79-01-6	Trichloroethylene	12,235,153	10,492,294	8,589,073	-3,646,080	-29.8
127-18-4	Tetrachloroethylene	5,301,445	4,059,680	3,542,725	-1,758,720	-33.2
67-66-3	Chloroform	5,765,586	5,534,618	4,186,035	-1,579,551	-27.4
117-81-7	Di(2-ethylhexyl) phthalate	1,733,242	1,141,600	699,502	-1,033,740	-59.6
107-13-1	Acrylonitrile	3,543,584	2,719,780	2,916,258	-627,326	-17.7
75-07-0	Acetaldehyde	7,215,465	6,323,108	6,606,827	-608,638	-8.4
107-06-2	1,2-Dichloroethane	1,475,758	941,335	1,287,424	-188,334	-12.8
106-46-7	1,4-Dichlorobenzene	395,722	340,157	210,943	-184,779	-46.7
71-43-2	Benzene	5,321,836	4,719,206	5,194,127	-127,709	-2.4
123-91-1	1,4-Dioxane	507,194	506,045	422,055	-85,139	-16.8
1332-21-4	Asbestos (friable)	2,266,788	2,098,371	2,200,165	-66,623	-2.9
106-99-0	1,3-Butadiene	1,431,270	1,305,524	1,376,050	-55,220	-3.9
—	Cadmium (and its compounds)	1,144,575	845,823	1,099,954	-44,621	-3.9
75-56-9	Propylene oxide	587,983	453,419	561,921	-26,062	-4.4
95-80-7	2,4-Diaminotoluene	13,730	841	1,013	-12,717	-92.6
101-77-9	4,4'-Methylenedianiline	62,251	57,919	51,004	-11,247	-18.1
96-45-7	Ethylene thiourea	12,119	4,913	4,587	-7,532	-62.2
75-01-4	Vinyl chloride	507,997	498,143	500,671	-7,326	-1.4
79-46-9	2-Nitropropane	15,540	22,470	12,037	-3,503	-22.5
62-56-6	Thiourea	11,473	9,395	10,087	-1,386	-12.1
64-67-5	Diethyl sulfate	5,607	5,207	4,307	-1,300	-23.2
101-14-4	4,4'-Methylenebis(2-chloroaniline)	4,967	5,698	4,089	-878	-17.7
121-14-2	2,4-Dinitrotoluene	1,624	1,015	943	-681	-41.9
90-94-8	Michler's ketone	715	0	182	-533	-74.5
606-20-2	2,6-Dinitrotoluene	324	269	260	-64	-19.8
96-09-3	Styrene oxide	6	14	5	-1	-16.7
77-78-1	Dimethyl sulfate	2,919	2,629	3,098	179	6.1
94-59-7	Safrole	118	290	342	224	189.8
91-08-7	Toluene-2,6-diisocyanate	2,095	11,684	2,700	605	28.9
584-84-9	Toluene-2,4-diisocyanate	9,083	10,801	9,967	884	9.7
302-01-2	Hydrazine	19,041	15,627	25,803	6,762	35.5
139-13-9	Nitritotriacetic acid	2,179	8,883	9,984	7,805	358.2
140-88-5	Ethyl acrylate	141,970	259,850	157,330	15,360	10.8
75-21-8	Ethylene oxide	447,403	385,130	470,769	23,366	5.2
106-89-8	Epichlorohydrin	623,152	830,223	770,644	147,492	23.7
56-23-5	Carbon tetrachloride	542,421	908,079	700,486	158,065	29.1
26471-62-5	Toluenediisocyanate (mixed isomers)	130,820	285,432	445,335	314,515	240.4
—	Cobalt (and its compounds)	577,112	682,712	943,532	366,420	63.5
98-95-3	Nitrobenzene	446,878	378,756	908,311	461,433	103.3
79-06-1	Acrylamide	2,885,819	2,863,636	3,469,206	583,387	20.2
50-00-0	Formaldehyde	10,258,740	10,967,404	11,391,573	1,132,833	11.0
100-42-5	Styrene	21,961,202	21,452,523	23,392,846	1,431,644	6.5
—	Nickel (and its compounds)	6,140,156	6,476,739	7,751,290	1,611,134	26.2
—	Arsenic (and its compounds)	2,120,447	2,396,332	4,077,455	1,957,008	92.3
—	Chromium (and its compounds)	23,741,812	22,465,998	26,212,360	2,470,548	10.4
—	Lead (and its compounds)	19,960,972	21,961,939	26,418,897	6,457,925	32.4
	Subtotal	177,432,281	167,283,446	176,348,651	-1,083,630	-0.6
	% of Total	15.5	15.1	15.2		
	Total	1,145,788,956	1,107,331,518	1,161,341,947	15,552,991	1.4

[†] 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.

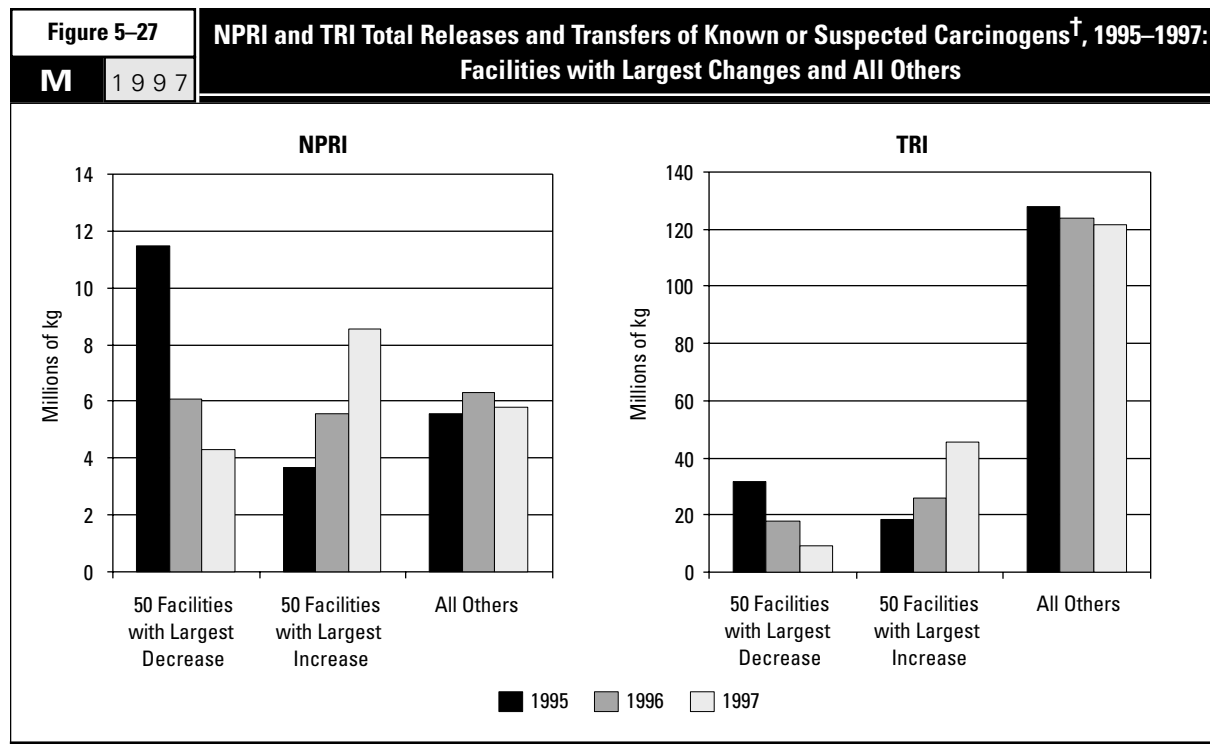
(As indicated in Chapter 3, arsenic is principally used as a wood preservative. It is also used in agricultural products, in glass, and in nonferrous alloys.)

NPRI Facilities with Largest Decreases/Increases

Among facilities reporting the largest changes in NPRI releases and transfers of carcinogens from 1995 to 1997, the 50 largest reductions substantially exceeded the 50 largest increases, with little overall change by all other facilities (Figure 5-27).

The 50 NPRI facilities with the largest reductions in releases and transfers of carcinogenic substances reported 11.5 million kg in 1995 and 4.3 million kg in 1997. The bulk of their reductions occurred in amounts transferred, which fell from 7.2 million kg to 2.1 million kg. They submitted 126 forms in 1995 and 114 in 1997, a small decrease. Nine of the 50 facilities submitted forms for carcinogens in the matched data set in 1995 but not in 1997 (Table 5-49).

The 50 NPRI facilities with the largest increases reported releases and transfers of 3.7 million kg in 1995 and 8.5 million kg in 1997. Taken together, these facilities made larger increases in transfers (from 1.2 million kg to 4.1 million kg) than in releases (from 2.5 million kg to 4.4 million kg). They also submitted one and one-half times as many forms in 1997 (92) as in 1995 (59). Twenty of these facilities did not report carcinogens in the matched data set in 1995 but did so in 1997 (Table 5-50).



[†] 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.

TRI Facilities with Largest Decreases/Increases

Decreases from 1995 to 1997 by the 50 TRI facilities with the largest reductions in carcinogen releases and transfers were slightly larger than the net increase of all other facilities. Indeed, they were larger than either the increase of the 50 TRI facilities with the largest increases, or the net increase of all other TRI facilities (Figure 5-27).

The 50 TRI facilities with the largest reductions in releases and trans-

fers of carcinogenic substances reported 31.6 million kg in 1995 and 9.2 million kg in 1997. These facilities' transfers dropped substantially over the period. In 1995, their transfers of designated carcinogens totaled 17.4 million kg, larger than the 14.3 million kg they released. In 1997, transfers had decreased to 3.3 million kg, less than the 5.9 million kg released. The facilities submitted 191 forms for carcinogens in 1995 and 164 forms in 1997. Five of these facilities submitted forms for carcinogens in the matched data set in 1995 but not in 1997 (Table 5-51).

For the 50 TRI facilities with the largest increases, releases and transfers of designated carcinogens rose from 18.2 million kg in 1995 to 45.4 million in 1997. The facilities' releases doubled, from 15.4 million kg to 30.3 million kg, while their transfers increased five-fold, from 2.7 million kg to 15.2 million kg. The number of forms they submitted expanded from 133 in 1995 to 172 in 1997. Nine of these facilities did not report carcinogens in the matched data set in 1995 but did in 1997 (Table 5-52).

Table 5-49		The 50 NPRI Facilities with Largest Decrease in Total Releases and Transfers of Known or Suspected Carcinogens [†] , 1995-1997								
M	1997	Rank	Facility	City, Province	SIC Codes		Number of Forms	1995		
					Canada	US		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
		1	CXY Chemicals LP, Canadian Occidental Petroleum	Nanaimo, BC	37	28	1	0	1,988,000	1,988,000
		2	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	1	1,127	1,400,778	1,401,905
		3	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28	1	36,083	588,390	624,473
		4	Co-Steel Lasco	Whitby, ON	29	33	3	334,898	663,911	998,809
		5	Bayer Inc., Bayer AG	Sarnia, ON	37	28	5	361,475	278,500	639,975
		6	Western Co-Operative Fertilizers Limited	Calgary, AB	37	28	1	0	154,000	154,000
		7	Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan, QC	27	26	1	147,397	0	147,397
		8	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33	5	126,800	0	126,800
		9	Dow Chemical Canada Inc.	Sarnia, ON	37	28	8	248,425	9,867	258,292
		10	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	6	398,980	0	398,980
		11	Advanced Monobloc Manufacturing, CCL Industries Inc.	Penetanguishene, ON	30	34	1	109,380	0	109,380
		12	Cooper Automotive Products., Wagner Div., Cooper Industries	Stratford, ON	32	37	1	447	105,840	106,287
		13	Novopharm Limited	Scarborough, ON	37	28	1	418,410	0	418,410
		14	BASF Canada Inc., Sarnia Site	Sarnia, ON	37	28	2	140	104,600	104,740
		15	Magotteaux Inc., Magotteaux Canada	Magog, QC	30	39	2	210	94,770	94,980
		16	Solutia Canada Inc, Produits chimiques	LaSalle, QC	16	30	4	5,450	122,902	128,352
		17	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33	1	100	88,005	88,105
		18	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36	2	21,149	61,634	82,783
		19	MAAX Inc., Division fibre de verre moderne - usine 4	Tring-Jonction, QC	37	28	1	91,820	13,600	105,420
		20	M.B. Paper, Alberni Specialties Division, MacMillan Bloedel	Port Alberni, BC	27	26	1	0	97,200	97,200
		21	Sydney Steel Corporation	Sydney, NS	29	33	3	105,200	0	105,200
		22	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	5	34,130	123,033	157,163
		23	Consumers Packaging Inc., Consumers Glass (Brampton)	Brampton, ON	35	32	1	0	72,300	72,300
		24	Wolverine Tube (Canada) Inc.	London, ON	29	33	1	133,212	0	133,212
		25	A.P. Green Refractories (Canada) Ltd., A.P. Green Industries	Smithville, ON	35	32	2	0	87,732	87,732
		26	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34	2	0	140,811	140,811
		27	Celanese Canada Inc.	Edmonton, AB	37	28	5	507,498	35,041	542,539
		28	A.G. Simpson Co Ltd.	Oshawa, ON	32	34	2	400	101,853	102,253
		29	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33	5	53,000	265	53,265
		30	PCI Chemicals Canada Inc, Pioneer Companies Inc.	Cornwall, ON	37	28	3	7,819	43,776	51,595
		31	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33	2	60,019	119,300	179,319
		32	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33	2	1,831	48,250	50,081
		33	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28	3	37,590	69,300	106,890
		34	Blount Canada Ltd., Blount Inc.	Guelph, ON	30	34	3	40,943	3,060	44,003
		35	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	5	76,822	39,366	116,188
		36	CXY Chemicals Canada LP, Canadian Occidental Petroleum Ltd	North Vancouver, BC	37	28	1	0	48,000	48,000
		37	E.B. Eddy Forest Products Ltd., George Weston Ltd.	Espanola, ON	27	26	2	63,345	0	63,345
		38	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	3	1,849	356,188	358,037
		39	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	3	102,969	0	102,969
		40	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28	5	49,240	0	49,240
		41	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	3	54,270	0	54,270
		42	Vitafoam Products Canada Ltd., Vita-Toronto	Downsview, ON	16	30	2	212,755	25,600	238,355
		43	Camoplast Inc, Division Roski I	Roxton Falls, QC	32	37	1	80,000	0	80,000
		44	Petro-Canada, Mississauga Lubricant Center	Mississauga, ON	36	29	3	8,440	45,000	53,440
		45	Malette Québec Inc., Panneaux Malette OSB	St-Georges de Champlain, QC	25	24	1	96,380	0	96,380
		46	Inco Limited, Manitoba Division	Thompson, MB	29	33	3	114,525	0	114,525
		47	Aries Flexographics Ltd.	Mississauga, ON	28	27	1	3,930	28,830	32,760
		48	Suzorite Mica Products Inc., Mica Plant, Zemex Corp.	Boucherville, QC	35	32	1	60,000	0	60,000
		49	Wyeth - Ayerst, Canada Inc., American Home Products	St-Laurent, QC	37	28	1	43,419	1,095	44,514
		50	Imperial Oil, IOL Strathcona Refinery	Edmonton, AB	36	29	4	12,840	32,100	44,940
			Total				126	4,264,717	7,192,897	11,457,614

► 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	1996			1997			Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Decreases (Primary Media/Transfers with Decreases)*		
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)			Total Transfers (kg)	Total Releases and Transfers (kg)
1	**	**	**	**	1	0	272	272	-1,987,728	Asbestos (transfers to disposal)
2	2	6,491	888,042	894,533	2	1,676	545,510	547,186	-854,719	Chromium and compounds (transfers of metals)
3	1	85,914	0	85,914	1	84,600	0	84,600	-539,873	Vinyl acetate (transfers to treatment)
4	3	233,261	397,208	630,469	3	92,573	496,278	588,851	-409,958	Cadmium and compounds (land, transfers of metals), Chromium/Lead and compounds (land)
5	5	162,400	104,500	266,900	5	82,673	200,300	282,973	-357,002	Benzene (air, transfers to treatment)
6	1	0	26,800	26,800	1	0	0	0	-154,000	Asbestos (transfers to disposal)
7	1	3,135	0	3,135	**	**	**	**	-147,397	Formaldehyde (water)
8	**	**	**	**	**	**	**	**	-126,800	Arsenic/Chromium/Cobalt/Lead and compounds (air), Nickel and compounds (air)
9	8	214,262	72,416	286,678	17	100,758	30,931	131,689	-126,603	Benzene, Ethylene oxide (air), Asbestos (land)
10	5	393,700	0	393,700	5	281,030	0	281,030	-117,950	Cadmium/Lead and compounds (air)
11	1	87,240	0	87,240	**	**	**	**	-109,380	Tetrachloroethylene (air)
12	1	186	44,286	44,472	**	**	**	**	-106,287	Asbestos (transfers to disposal)
13	1	366,565	0	366,565	1	313,250	0	313,250	-105,160	Dichloromethane (air)
14	**	**	**	**	**	**	**	**	-104,740	Styrene, 1,3-Butadiene (transfers to treatment)
15	2	210	0	210	2	210	0	210	-94,770	Chromium and compounds (transfers of metals)
16	4	4,209	77,847	82,056	2	55	36,721	36,776	-91,576	Formaldehyde (transfers to sewage), Styrene, Acrylonitrile (transfers to treatment)
17	1	100	7,710	7,810	1	100	1,410	1,510	-86,595	Lead and compounds (transfers of metals)
18	2	12,423	106,657	119,080	**	**	**	**	-82,783	Trichloroethylene (air), Lead and compounds (transfers of metals)
19	1	19,373	2,250	21,623	1	22,200	2,250	24,450	-80,970	Styrene (air)
20	1	0	11,540	11,540	1	0	16,330	16,330	-80,870	Asbestos (transfers to disposal)
21	3	33,180	0	33,180	3	29,120	0	29,120	-76,080	Cadmium/Chromium/Lead and compounds (land)
22	5	43,715	17,073	60,788	5	39,412	43,641	83,053	-74,110	Benzene, 1,3-Butadiene (air), Asbestos (transfers to disposal)
23	1	0	4,000	4,000	1	0	0	0	-72,300	Chromium and compounds (transfers of metals)
24	1	133,212	0	133,212	1	62,500	590	63,090	-70,122	Trichloroethylene (air)
25	1	0	30,601	30,601	1	0	20,141	20,141	-67,591	Asbestos (transfers to disposal), Chromium and compounds (transfers of metals)
26	2	0	140,811	140,811	2	0	74,750	74,750	-66,061	Chromium/Nickel and compounds (transfers of metals)
27	5	570,772	48,061	618,833	6	378,422	105,033	483,455	-59,084	Acetaldehyde (UIJ)
28	3	400	127,520	127,920	3	200	46,807	47,007	-55,246	Nickel and compounds (transfers of metals)
29	4	0	200	200	4	0	337	337	-52,928	Styrene (air)
30	1	28	84	112	**	**	**	**	-51,595	Carbon tetrachloride (air, transfers to treatment), Asbestos (transfers to disposal)
31	2	114,557	192,501	307,058	2	699	128,180	128,879	-50,440	Chromium and compounds (land)
32	**	**	**	**	**	**	**	**	-50,081	Chromium/Lead and compounds (transfers of metals)
33	3	43,300	29,000	72,300	3	56,400	5,100	61,500	-45,390	Benzene (transfers to treatment), Asbestos (transfers to disposal)
34	3	74,616	3,882	78,498	**	**	**	**	-44,003	Trichloroethylene (air)
35	5	66,737	61,330	128,067	4	69,991	2,560	72,551	-43,637	Benzene, 1,3-Butadiene (air), Asbestos (transfers to disposal)
36	2	0	48,400	48,400	2	0	4,900	4,900	-43,100	Asbestos (transfers to disposal)
37	2	44,149	0	44,149	2	22,421	0	22,421	-40,924	Chloroform, Acetaldehyde (air)
38	5	2,459	268,691	271,150	5	2,455	316,350	318,805	-39,232	Lead and compounds (transfers of metals)
39	4	59,558	0	59,558	4	63,977	0	63,977	-38,992	Benzene (air)
40	5	10,600	0	10,600	5	10,837	0	10,837	-38,403	Asbestos (land)
41	1	14,000	0	14,000	1	18,000	0	18,000	-36,270	Formaldehyde, Chloroform (air)
42	3	209,711	0	209,711	3	202,260	0	202,260	-36,095	Dichloromethane (transfers to treatment, air)
43	1	69,000	0	69,000	1	44,600	0	44,600	-35,400	Styrene (air)
44	2	8,140	19,000	27,140	2	4,043	15,740	19,783	-33,657	Benzene, 1,3-Butadiene (air), Asbestos (transfers to disposal)
45	1	55,108	0	55,108	1	66,857	0	66,857	-29,523	Formaldehyde (air)
46	3	92,844	0	92,844	3	85,303	0	85,303	-29,222	Arsenic/Cobalt/Nickel and compounds (air)
47	1	3,930	28,830	32,760	1	3,930	0	3,930	-28,830	Tetrachloroethylene (transfers to treatment)
48	1	60,000	0	60,000	1	33,000	0	33,000	-27,000	Dichloromethane (air)
49	1	23,017	200	23,217	1	18,579	0	18,579	-25,935	Dichloromethane (air)
50	3	12,408	2,764	15,172	4	9,234	10,122	19,356	-25,584	Benzene (air), Asbestos (transfers to disposal)
114	3,334,910	2,762,204	6,097,114	114	2,201,365	2,104,253	4,305,618	-7,151,996		

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

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

► UIJ = underground injection

Table 5-50		The 50 NPRI Facilities with Largest Increase in Total Releases and Transfers of Known or Suspected Carcinogens†, 1995-1997						
Rank	Facility	City, Province	SIC Codes		Number of Forms	1995		
			Canada	US		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	3	18,200	0	18,200
2	Metalex Products Ltd.	Richmond, BC	29	33	2	6,310	0	6,310
3	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4	498,950	0	498,950
4	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24	*	*	*	*
5	Petro-Canada, Burrard Products Terminal	Port Moody, BC	36	29	1	1,200	0	1,200
6	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	3	41,177	0	41,177
7	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	1	3,323	0	3,323
8	Novopharm Limited	Markham, ON	37	28	1	72,981	0	72,981
9	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6	174,590	145,380	319,970
10	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	3	46,270	233,090	279,360
11	Carpenter Canada Ltd.	Woodbridge, ON	16	30	2	196,585	0	196,585
12	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	*	*	*	*
13	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	1	100	1,400	1,500
14	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	1	80,000	0	80,000
15	Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton, AB	37	28	1	0	0	0
16	Tonolli Canada Limited	Mississauga, ON	29	33	1	2,357	226,980	229,337
17	Dow Chemical Canada Inc.	Varenes, QC	16	30	2	755	56,295	57,050
18	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	1	129,500	0	129,500
19	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24	*	*	*	*
20	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24	*	*	*	*
21	MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction, QC	16	30	*	*	*	*
22	René Matériaux composites Ltée	St-Ephrem-de-Beauce, QC	32	37	*	*	*	*
23	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33	1	0	405	405
24	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	*	*	*	*
25	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	29	33	1	100	0	100
26	Les Produits chimiques Delmar Inc.	LaSalle, QC	37	28	1	28,100	5,000	33,100
27	Domfoam International Inc.	St-Léonard, QC	16	30	2	195,472	0	195,472
28	Marswell Metal Industries Limited	Burlington, ON	30	34	1	0	1	1
29	Dofasco Inc.	Hamilton, ON	29	33	5	460,142	110,468	570,610
30	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	2	650	122,700	123,350
31	Beauce Composites Inc., ADS Groupe Composites Inc.	Ste-Clotilde-de-Beauce, QC	32	37	*	*	*	*
32	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37	*	*	*	*
33	Louisiana-Pacific Canada Ltd., Dawson Creek OSB	Dawson Creek, BC	25	24	*	*	*	*
34	Chemrec Inc.	Cowansville, QC	37	28	3	5,090	62,900	67,990
35	Ranger Board Ltd., West Fraser Mills Ltd.	Blue Ridge, AB	25	24	1	24,455	0	24,455
36	Bonar Inc, Plastics Division, Low & Bonar PLC	Burlington/Halton, ON	16	26	*	*	*	*
37	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	2	0	185,000	185,000
38	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	2	1,951	56,130	58,081
39	North American Lumber, Roblin Forest Products	Roblin, MB	25	24	*	*	*	*
40	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	2	290,100	170	290,270
41	Ispat Sidbec Inc. Acierie, Ispat Mexicana	Contrecoeur, QC	29	33	2	202,179	0	202,179
42	West Fraser Mills Ltd., Westpine, MDF	Quesnel, BC	25	24	*	*	*	*
43	Phytogen Pharmaceuticals Inc., Phytogen Life Sciences Inc.	Delta, BC	37	28	*	*	*	*
44	Cartons St-Laurent Inc.	LaTuque, QC	27	26	*	*	*	*
45	MacMillan Bloedel, North Superior Forest Products	Wawa, ON	25	24	*	*	*	*
46	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	37	28	1	6,000	0	6,000
47	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	*	*	*	*
48	Fleet Industries Ltd., Magellan Aerospace Corp.	Fort Erie, ON	32	37	*	*	*	*
49	Grant Forest Products Corp., OSB Plant	Englehart, ON	25	24	*	*	*	*
50	Garlock of Canada Ltd., Garlock Sealing Technology	Sherbrooke, QC	18	22	*	*	*	*
Total					59	2,486,537	1,205,919	3,692,456

† 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.

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

Rank	1996				1997				Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Increases (Primary Media/Transfers with Increases)**
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)		
1	3	21,194	0	21,194	3	17,987	465,000	482,987	464,787	Lead and compounds (transfers of metals)
2	2	10,488	213,670	224,158	2	342	421,667	422,009	415,699	Lead and compounds (transfers of metals)
3	4	215,858	0	215,858	4	897,650	0	897,650	398,700	Chromium and compounds (land)
4	*	*	*	*	1	279,000	0	279,000	279,000	Formaldehyde (air)
5	2	1,166	90,000	91,166	2	1,319	271,000	272,319	271,119	Asbestos (transfers to disposal)
6	3	166,644	0	166,644	3	234,454	0	234,454	193,277	Lead and compounds (air)
7	1	3,582	0	3,582	1	62,136	127,000	189,136	185,813	Formaldehyde (air, land)
8	1	61,955	0	61,955	1	226,993	0	226,993	154,012	Dichloromethane (air)
9	6	234,615	238,340	472,955	6	242,390	230,400	472,790	152,820	Asbestos (transfers to disposal), Benzene (air)
10	3	23,190	355,270	378,460	3	23,870	401,290	425,160	145,800	Chromium and compounds (transfers of metals)
11	2	238,953	0	238,953	2	296,925	0	296,925	100,340	Dichloromethane (air)
12	1	104,411	0	104,411	1	100,003	0	100,003	100,003	Benzene (air)
13	1	100	1,400	1,500	1	100	100,000	100,100	98,600	Nickel and compounds (transfers of metals)
14	1	217,440	0	217,440	2	169,273	0	169,273	89,273	Lead and compounds (land)
15	1	0	0	0	1	0	89,214	89,214	89,214	Dichloromethane (transfers to treatment)
16	1	2,357	376,450	378,807	1	2,355	311,202	313,557	84,220	Lead and compounds (transfers of metals)
17	2	709	57,794	58,503	2	953	139,063	140,016	82,966	Styrene (transfers to treatment)
18	1	229,000	0	229,000	2	212,430	0	212,430	82,930	Formaldehyde (water)
19	1	64,800	0	64,800	1	77,100	5,240	82,340	82,340	Formaldehyde (air)
20	1	40,688	0	40,688	1	82,298	0	82,298	82,298	Formaldehyde (air)
21	1	58,119	6,750	64,869	1	66,510	6,750	73,260	73,260	Styrene (air)
22	2	144,000	0	144,000	2	71,000	0	71,000	71,000	Styrene, Dichloromethane (air)
23	1	0	110,000	110,000	1	0	71,000	71,000	70,595	Lead and compounds (transfers of metals)
24	*	*	*	*	4	69,999	0	69,999	69,999	Lead and compounds (air)
25	1	100	0	100	1	700	65,600	66,300	66,200	Lead and compounds (transfers of metals)
26	1	20,700	27,800	48,500	1	37,300	51,700	89,000	55,900	Dichloromethane (transfers to treatment)
27	2	230,802	0	230,802	2	245,996	0	245,996	50,524	Dichloromethane (air)
28	1	0	1	1	1	0	50,000	50,000	49,999	Lead and compounds (transfers of metals)
29	5	457,530	109,259	566,789	5	316,496	302,763	619,259	48,649	Lead and compounds (transfers of metals)
30	2	970	194,500	195,470	2	990	166,500	167,490	44,140	Lead and compounds (transfers of metals)
31	2	43,536	0	43,536	2	43,536	0	43,536	43,536	Styrene (air)
32	*	*	*	*	2	31,920	11,218	43,138	43,138	Chromium and compounds (air, transfers of metals)
33	1	36,598	0	36,598	1	41,712	0	41,712	41,712	Formaldehyde (air)
34	3	1,420	55,900	57,320	3	2,700	105,500	108,200	40,210	Dichloromethane (transfers to treatment)
35	1	16,508	0	16,508	1	64,585	0	64,585	40,130	Formaldehyde (air)
36	1	29,300	0	29,300	1	36,000	2,000	38,000	38,000	Trichloroethylene (air)
37	2	0	228,000	228,000	2	0	223,000	223,000	38,000	Lead and compounds (transfers of metals)
38	2	1,929	125,670	127,599	2	1,569	91,952	93,521	35,440	Lead and compounds (transfers of metals)
39	*	*	*	*	2	0	34,090	34,090	34,090	Chromium/Arsenic and compounds (transfers of metals)
40	2	251,600	400	252,000	2	0	324,258	324,258	33,988	Chromium and compounds (transfers of metals)
41	2	230,540	0	230,540	2	234,792	0	234,792	32,613	Lead and compounds (land)
42	*	*	*	*	1	31,134	0	31,134	31,134	Formaldehyde (air)
43	1	0	16,500	16,500	1	0	30,340	30,340	30,340	Dichloromethane (transfers to treatment)
44	2	30,034	7	30,041	2	29,283	7	29,290	29,290	Chloroform, Acetaldehyde (air)
45	1	35,400	0	35,400	1	29,230	0	29,230	29,230	Formaldehyde (air)
46	1	6,000	0	6,000	2	34,960	0	34,960	28,960	Lead and compounds (land)
47	2	28,140	0	28,140	2	28,584	0	28,584	28,584	Acetaldehyde, Chloroform (air)
48	1	30,970	0	30,970	1	26,250	2,300	28,550	28,550	Trichloroethylene (air)
49	1	81,800	0	81,800	1	28,370	3	28,373	28,373	Formaldehyde (air)
50	*	*	*	*	1	0	28,000	28,000	28,000	Asbestos (transfers to disposal)
78	3,373,146	2,207,711	5,580,857	92	4,401,194	4,128,057	8,529,251	4,836,795		

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

Table 5-51		The 50 TRI Facilities with Largest Decrease in Total Releases and Transfers of Known or Suspected Carcinogens†, 1995-1997					
M 1997							
Rank	Facility	City, State	US SIC Code	Number of Forms	1995		
					Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	Millennium Petrochemical Inc., Millennium Chemicals Inc.	La Porte, TX	28	6	242,269	3,474,222	3,716,491
2	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	4	1,237,100	1,397,915	2,635,015
3	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	4	5,711	2,519,653	2,525,364
4	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33	2	66,435	1,249,518	1,315,953
5	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33	3	37,270	1,124,603	1,161,873
6	BP Chemicals Inc., BP America Inc.	Lima, OH	28	10	1,821,315	2,454	1,823,769
7	Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle, IN	33	2	0	849,182	849,182
8	Monsanto Co., Chocolate Bayou	Alvin, TX	28	4	801,396	0	801,396
9	Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood, MS	33	3	302	604,370	604,672
10	Armstrong World Indl. Inc.	Lancaster, PA	39	2	29,664	550,022	579,686
11	Slater Steels, Ft. Wayne Spec. Alloys Div.	Fort Wayne, IN	33	2	3,945	569,071	573,016
12	Heatcraft Inc., Lennox Intl. Inc.	Grenada, MS	Mult.	1	447,951	31	447,982
13	Piper Impact Inc.	New Albany, MS	34	2	358,617	8,254	366,871
14	Celanese Eng. Resins Inc., Hoechst Corp.	Bishop, TX	28	4	447,212	11,753	458,965
15	PD Glycol, Occidental Petroleum Corp.	Beaumont, TX	28	2	114	359,906	360,020
16	Eastman Kodak Co., Kodak Park	Rochester, NY	38	10	1,352,547	15,632	1,368,179
17	GE Plastics Co., GE Co.	Mount Vernon, IN	28	4	698,118	18,441	716,559
18	DuPont	Beaumont, TX	28	9	341,818	264,477	606,295
19	Chemical Solvents Inc., Denison Facility	Cleveland, OH	28	4	2,300	279,176	281,476
20	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26	2	287,075	54,422	341,497
21	Quin-T Corp.	Erie, PA	26	1	340	261,111	261,451
22	DuPont	Towanda, PA	38	1	244,898	10,567	255,465
23	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Brackenridge, PA	33	3	21,247	303,991	325,238
24	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Vernon, CA	33	2	1,384	383,721	385,105
25	Solutia Inc.	Springfield, MA	Mult.	5	16,109	522,696	538,805
26	Gaska Tape Inc.	Elkhart, IN	30	2	252,550	7,087	259,637
27	Celanese Ltd.	Bay City, TX	28	5	191,243	50,823	242,066
28	Trinity American Corp.	High Point, NC	30	2	276,214	8,131	284,345
29	Gates Rubber Co.	Iola, KS	30	2	111	237,766	237,877
30	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	7	891,992	0	891,992
31	Philips Display Components Co., North American Philips Corp.	Ottawa, OH	36	3	40,413	196,666	237,079
32	Vitafoam Inc., British Vita PLC	Tupelo, MS	30	2	205,427	0	205,427
33	Olin Brass Indianapolis, Olin Corp.	Indianapolis, IN	33	3	101	204,857	204,958
34	Foamex L.P., Foamex Intl. Inc.	La Porte, IN	30	2	196,516	1,927	198,443
35	Weyerhaeuser Co.	Longview, WA	Mult.	6	537,293	4,777	542,070
36	Bristol-Myers Barceloneta Inc., Bristol-Myers Squibb Co.	Barceloneta, PR	28	1	46,366	280,725	327,091
37	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	6	785,764	370	786,134
38	Fortron Ind., Hoechst Celanese - Agent	Wilmington, NC	28	1	3,532	226,035	229,567
39	Chevron Chemical Co., Polyethylene Plant, Chevron Corp.	Orange, TX	28	1	19,410	219,774	239,184
40	Corhart Refractories Corp.	Buckhannon, WV	32	1	14,829	249,327	264,156
41	Dow Chemical Co.	Freeport, TX	28	21	462,411	27,594	490,005
42	IBM	Endicott, NY	36	2	14,145	253,699	267,844
43	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28	5	295,193	10,726	305,919
44	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28	6	404,831	41,677	446,508
45	Lubrizol Corp., Bayport Facility	Pasadena, TX	28	4	9,425	186,458	195,883
46	Vitafoam Inc.	High Point, NC	30	3	338,776	0	338,776
47	Hoechst-Celanese Corp., Hoechst Corp.	Spartanburg, SC	Mult.	5	177,338	2	177,340
48	Great Lakes Chemical Corp.	El Dorado, AR	28	2	391,977	0	391,977
49	Arco Chemical Co., Atlantic Richfield Co.	South Charleston, WV	28	5	4,729	297,641	302,370
50	Schering-Plough Prods. Inc., Schering-Plough Corp.	Las Piedras, PR	28	2	253,660	23,870	277,530
Total				191	14,279,383	17,365,120	31,644,503

† 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	Number of Forms	1996			1997			Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Decreases (Primary Media/Transfers with Decreases)*	
		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)			Total Releases and Transfers (kg)
1	5	248,445	0	248,445	5	260,736	0	260,736	-3,455,755	Vinyl acetate (transfers to treatment)
2	4	945,577	2,593,811	3,539,388	4	56,321	478,160	534,481	-2,100,534	Lead and compounds (land, transfers of metals)
3	4	5,895	1,265,686	1,271,581	4	5,163	1,061,318	1,066,481	-1,458,883	Lead and compounds (transfers of metals)
4	2	2,670	104,379	107,049	2	5,230	62,029	67,259	-1,248,694	Chromium and compounds (transfers of metals)
5	4	2,250	382,397	384,647	**	**	**	**	-1,161,873	Chromium and compounds (transfers of metals)
6	10	1,195,459	3,538	1,198,997	10	992,438	2,780	995,218	-828,551	Acrylonitrile (UIJ)
7	2	0	45,887	45,887	2	0	49,344	49,344	-799,838	Chromium and compounds (transfers of metals)
8	3	657,431	0	657,431	1	43,284	0	43,284	-758,112	Acrylonitrile (UIJ)
9	2	291	0	291	3	131	0	131	-604,541	Lead and compounds (transfers of metals)
10	1	9,827	149,416	159,243	1	13,742	0	13,742	-565,944	Di(2-ethylhexyl) phthalate (transfers to disposal)
11	2	3,628	19,547	23,175	2	7,864	27,209	35,073	-537,943	Chromium and compounds (transfers of metals)
12	1	164,902	160	165,062	1	48,202	113	48,315	-399,667	Trichloroethylene (air)
13	2	127,778	1,361	129,139	2	227	2,041	2,268	-364,603	Tetrachloroethylene (air)
14	5	385,525	1,172	386,697	5	106,392	1,905	108,297	-350,668	Formaldehyde (UIJ)
15	2	6,876	8,844	15,720	2	8,825	9,879	18,704	-341,316	Acetaldehyde (transfers to treatment)
16	9	1,142,344	4,595	1,146,939	9	1,013,355	17,996	1,031,351	-336,828	Dichloromethane, Acetaldehyde (air)
17	7	569,534	33,736	603,270	4	392,448	19,049	411,497	-305,062	Dichloromethane (air)
18	4	107,635	255,988	363,623	5	98,399	221,724	320,123	-286,172	Carbon tetrachloride (transfers to treatment, air), Acrylonitrile (UIJ)
19	4	19,627	0	19,627	3	589	0	589	-280,887	Dichloromethane, Styrene (transfers to treatment)
20	2	286,168	34,013	320,181	2	39,455	33,560	73,015	-268,482	Chloroform (air)
21	1	340	258,843	259,183	**	**	**	**	-261,451	Asbestos (transfers to disposal)
22	1	222,222	1,452	223,674	**	**	**	**	-255,465	Dichloromethane (air)
23	3	4,625	141,157	145,782	4	7,165	65,850	73,015	-252,223	Chromium and compounds (transfers of metals)
24	2	1,384	400,628	402,012	2	1,551	134,000	135,551	-249,554	Lead and compounds (transfers of metals)
25	4	14,398	374,314	388,712	4	19,024	271,398	290,422	-248,383	Formaldehyde (transfers to sewage)
26	2	33,149	7,362	40,511	2	18,301	5,390	23,691	-235,946	Dichloromethane, Tetrachloroethylene (air)
27	3	35,597	8	35,605	3	11,550	0	11,550	-230,516	Vinyl acetate (UIJ, air), Acetaldehyde (UIJ, transfers to treatment)
28	1	160,100	5,687	165,787	2	53,574	4,082	57,656	-226,689	Dichloromethane (air)
29	2	40	15,025	15,065	2	21	12,079	12,100	-225,777	Di(2-ethylhexyl) phthalate (transfers to disposal)
30	7	1,321,135	0	1,321,135	7	680,183	0	680,183	-211,809	Lead and compounds (land)
31	3	47,307	28,299	75,606	2	5	26,644	26,649	-210,430	Lead and compounds (transfers of metals)
32	3	352,260	0	352,260	**	**	**	**	-205,427	Dichloromethane (air)
33	3	115	288	403	2	115	126	241	-204,717	Chromium and compounds (transfers of metals)
34	2	45,972	23,839	69,811	**	**	**	**	-198,443	Dichloromethane (air)
35	6	402,497	8,841	411,338	5	339,823	9,096	348,919	-193,151	Chloroform (air, water), Acetaldehyde (air)
36	1	23,645	332,541	356,186	1	16,920	118,486	135,406	-191,685	Dichloromethane (transfers to treatment)
37	6	689,212	368	689,580	5	594,782	368	595,150	-190,984	Lead and compounds (land)
38	1	3,525	174,403	177,928	1	3,579	35,150	38,729	-190,838	1,4-Dichlorobenzene (transfers to treatment)
39	1	22,336	0	22,336	1	10,408	38,367	48,775	-190,409	Vinyl acetate (transfers to treatment)
40	1	13,349	61,061	74,410	1	7,314	66,516	73,830	-190,326	Chromium and compounds (transfers of metals)
41	21	406,386	7,435	413,821	21	297,191	3,665	300,856	-189,149	Propylene oxide, Dichloromethane, Benzene, Tetrachloroethylene (air)
42	2	11,701	125,399	137,100	2	10,825	72,737	83,562	-184,282	Tetrachloroethylene (transfers to treatment)
43	4	214,753	1,853	216,606	4	106,712	25,620	132,332	-173,587	Benzene (air)
44	6	128,816	19,321	148,137	6	61,319	220,163	281,482	-165,026	Vinyl acetate (UIJ)
45	4	15,869	166,301	182,170	4	18,230	13,648	31,878	-164,005	Acrylonitrile (transfers to treatment)
46	3	201,395	15,497	216,892	2	174,720	476	175,196	-163,580	Dichloromethane (air)
47	5	38,575	0	38,575	5	13,822	0	13,822	-163,518	Acetaldehyde (air)
48	2	299,060	0	299,060	2	228,899	0	228,899	-163,078	Dichloromethane (UIJ)
49	5	7,161	49,084	56,245	5	7,714	139,842	147,556	-154,814	Styrene (transfers to treatment)
50	2	205,587	7,215	212,802	2	128,277	115	128,392	-149,138	Dichloromethane (air)
182		10,804,373	7,130,751	17,935,124	164	5,904,825	3,250,925	9,155,750	-22,488,753	

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

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

► UIJ=underground injection

Table 5-52		The 50 TRI Facilities with Largest Increase in Total Releases and Transfers of Known or Suspected Carcinogens†, 1995-1997						
M 1997								
Rank	Facility	City, State	US SIC Code	Number of Forms	1995			Total Releases and Transfers (kg)
					Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1	4,265,578	40,867	4,306,445	
2	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	5	759,954	70,725	830,679	
3	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	2	18,146	18,141	36,287	
4	Monsanto Co.	Luling, LA	28	2	1,823,991	6,349	1,830,340	
5	Solutia Inc., Chocolate Bayou	Alvin, TX	28	*	*	*	*	
6	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	3,313,374	1,723	3,315,097	
7	C & D Techs. Inc.	Conyers, GA	36	1	458	116	574	
8	Borden Chemicals & Plastics LP	Geismar, LA	28	7	38,378	21,103	59,481	
9	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	4	16,119	3,335	19,454	
10	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33	*	*	*	*	
11	ASARCO Inc., Glover Plant	Annapolis, MO	33	4	960,950	0	960,950	
12	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	547,715	0	547,715	
13	Foamex L.P., Div. of Kihl	Corry, PA	30	2	448,333	5,245	453,578	
14	Reichhold Chemicals Inc.	Jacksonville, FL	28	2	3,629	5,370	8,999	
15	Doe Run Co., Recycling Facility, Renco Group Inc.	Boss, MO	33	2	18,302	21,216	39,518	
16	ASARCO Inc.	Omaha, NE	33	2	16,688	436,597	453,285	
17	Wagner Brake, Cooper Ind. Inc.	Scottsville, KY	37	1	113	136,893	137,006	
18	Boeing Co.	Wichita, KS	Mult.	9	230,411	79,114	309,525	
19	Aquaglass Corp., Masco Corp.	Adamsville, TN	30	1	665,652	0	665,652	
20	Squibb Mfg. Inc., Bristol-Myers Squibb Co.	Humacao, PR	28	3	9,533	260	9,793	
21	DuPont	Pass Christian, MS	28	*	*	*	*	
22	Quality Chemicals Inc., Chemfirst Corp.	Tyrone, PA	28	*	*	*	*	
23	Nucor Steel	Plymouth, UT	33	3	7,003	14,040	21,043	
24	Vitafoam Inc., British Vita PLC	Tupelo, MS	30	2	98,199	0	98,199	
25	Lacks Ind. Inc., Airplane Plant, Lacks Ent's. Inc.	Kentwood, MI	Mult.	3	459	63,601	64,060	
26	Scot Forge Co.	Spring Grove, IL	34	2	0	0	0	
27	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	5	1,398,049	289	1,398,338	
28	DuPont	New Johnsonville, TN	28	*	*	*	*	
29	Arco Chemical Co.	Westlake, LA	28	*	*	*	*	
30	Able Electro Polishing	Chicago, IL	34	2	7,424	18,701	26,125	
31	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	3	569	0	569	
32	Rubicon Inc.	Geismar, LA	28	9	106,728	118,097	224,825	
33	Quemetco Inc., RSR Corp.	Indianapolis, IN	33	3	3,618	615,461	619,079	
34	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	5	22,155	8,982	31,137	
35	Wayne Pigment Corp.	Milwaukee, WI	28	2	121	453	574	
36	American Video Glass Co.	Mt Pleasant, PA	32	*	*	*	*	
37	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	3	738	0	738	
38	Quemetco Inc., RSR Corp.	City of Industry, CA	33	3	746	701,642	702,388	
39	Carpenter Co.	Russellville, KY	Mult.	3	353,610	0	353,610	
40	Shell Chemical Co., Shell Oil Co.	Geismar, LA	28	4	34,607	9,524	44,131	
41	ZTT Minerals Inc., Babcock Intl.	Caldwell, TX	33	1	118	17,345	17,463	
42	Arco Chemical Co., Bayport Div., Atlantic Richfield Co.	Pasadena, TX	28	1	34,785	65,515	100,300	
43	Hydrite Chemical Co.	Cottage Grove, WI	28	4	2,167	1,267	3,434	
44	Tennessee Mat Co.	Nashville, TN	30	*	*	*	*	
45	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN	30	1	206,396	0	206,396	
46	BASF Corp.	Geismar, LA	28	11	15,926	24,120	40,046	
47	Steel Dynamics Inc.	Butler, IN	33	*	*	*	*	
48	Southwire Co.	Carrollton, GA	Mult.	8	14,901	198,793	213,694	
49	Burkart Foam Inc., Ohio Decorative Prods. Inc.	Cairo, IL	30	2	684	0	684	
50	Timken Co., Faircrest Steel Plant	Canton, OH	33	3	520	6,898	7,418	
Total				133	15,446,847	2,711,782	18,158,629	

† 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.

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

Rank	1996				1997				Change 95-97		Major Chemicals Reported with Increases (Primary Media/Transfers with Increases)**
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Total Releases and Transfers (kg)		
1	1	5,126,893	27,279	5,154,172	1	6,578,095	1,434,288	8,012,383	3,705,938	Chromium and compounds (land, transfers of metals)	
2	5	741,870	119,252	861,122	5	4,101,067	69,666	4,170,733	3,340,054	Lead/Arsenic and compounds (land)	
3	2	63	0	63	2	57	1,723,356	1,723,413	1,687,126	Lead and compounds (transfers of metals)	
4	2	2,549,116	5,442	2,554,558	2	3,236,644	6,803	3,243,447	1,413,107	Formaldehyde (UIJ)	
5	*	*	*	*	3	1,039,050	0	1,039,050	1,039,050	Acrylonitrile (UIJ)	
6	1	4,084,751	4,535	4,089,286	1	4,129,841	6,349	4,136,190	821,093	Chromium and compounds (land)	
7	1	535	431,778	432,313	1	793	810,519	811,312	810,738	Lead and compounds (transfers of metals)	
8	6	77,681	53,659	131,340	7	815,745	18,809	834,554	775,073	Benzene (air)	
9	3	15	248,621	248,636	4	663	735,580	736,243	716,789	Lead and compounds (transfers of metals)	
10	6	42,111	83,002	125,113	5	19,140	666,122	685,262	685,262	Lead/Arsenic/Cobalt and compounds (transfers of metals)	
11	4	1,445,774	0	1,445,774	4	1,603,364	0	1,603,364	642,414	Lead and compounds (land)	
12	1	922,590	0	922,590	1	1,097,645	0	1,097,645	549,930	Nickel and compounds (land)	
13	2	756,420	1,813	758,233	2	903,448	7,126	910,574	456,996	Dichloromethane (air)	
14	2	3,853	0	3,853	2	3,456	462,390	465,846	456,847	Styrene (transfers to treatment)	
15	2	14,575	120,624	135,199	3	17,360	475,008	492,368	452,850	Lead and compounds (transfers of metals)	
16	2	10,528	397,779	408,307	2	2,836	893,671	896,507	443,222	Lead and compounds (transfers of metals)	
17	1	113	133,630	133,743	1	113	557,771	557,884	420,878	Asbestos (transfers to disposal)	
18	6	350,371	172,801	523,172	6	596,395	132,328	728,723	419,198	Tetrachloroethylene (air)	
19	1	1,046,797	0	1,046,797	1	1,057,867	0	1,057,867	392,215	Styrene (air)	
20	4	10,712	60,333	71,045	3	6,163	363,885	370,048	360,255	Dichloromethane (transfers to treatment)	
21	*	*	*	*	4	358,277	0	358,277	358,277	Chromium and compounds (UIJ)	
22	1	1,503	497,742	499,245	4	1,510	346,159	347,669	347,669	Carbon tetrachloride (transfers to treatment)	
23	4	5,161	166,505	171,666	2	2,062	363,053	365,115	344,072	Lead and compounds (transfers of metals)	
24	2	35,755	4,132	39,887	3	425,644	0	425,644	327,445	Dichloromethane (air)	
25	3	459	50,338	50,797	3	459	386,248	386,707	322,647	Nickel/Chromium and compounds (transfers of metals)	
26	2	0	0	0	2	0	320,425	320,425	320,425	Chromium and compounds (transfers of metals)	
27	5	1,243,881	329	1,244,210	5	1,711,337	711	1,712,048	313,710	Acrylamide (UIJ)	
28	*	*	*	*	2	296,145	0	296,145	296,145	Chromium and compounds (UIJ)	
29	*	*	*	*	3	29	290,092	290,121	290,121	Toluenediisocyanate (transfers to treatment)	
30	2	10,073	293,991	304,064	2	14,608	299,433	314,041	287,916	Chromium and compounds (transfers of metals)	
31	2	330	0	330	3	495	283,347	283,842	283,273	Lead and compounds (transfers of metals)	
32	9	110,086	12,914	123,000	9	308,696	197,998	506,694	281,869	Nitrobenzene (UIJ)	
33	3	1,879	743,366	745,245	3	1,416	879,880	881,296	262,217	Lead/Chromium and compounds (transfers of metals)	
34	4	60,361	817	61,178	7	291,902	31	291,933	260,796	Arsenic and compounds (land)	
35	2	121	458	579	2	121	256,702	256,823	256,249	Lead and compounds (transfers of metals)	
36	*	*	*	*	2	120	245,511	245,631	245,631	Lead and compounds (transfers of metals)	
37	3	792	168,028	168,820	3	1,012	240,636	241,648	240,910	Lead and compounds (transfers of metals)	
38	3	847	847,238	848,085	3	723	934,969	935,692	233,304	Lead and compounds (transfers of metals)	
39	3	374,128	513	374,641	5	571,776	4,402	576,178	222,568	Dichloromethane (air)	
40	5	75,637	28,571	104,208	5	222,355	32,325	254,680	210,549	Ethylene oxide (air)	
41	1	224	5,140	5,364	1	225	224,203	224,428	206,965	Lead and compounds (transfers of metals)	
42	1	20,730	75,938	96,668	1	23,300	281,266	304,566	204,266	Propylene oxide (transfers to sewage)	
43	4	2,363	476,259	478,622	5	1,447	201,930	203,377	199,943	Trichloroethylene, Dichloromethane (transfers to treatment)	
44	1	4	0	4	1	198,200	0	198,200	198,200	Dichloromethane (air)	
45	1	269,465	0	269,465	1	404,393	0	404,393	197,997	Styrene (air)	
46	12	11,349	20,620	31,969	12	15,425	222,324	237,749	197,703	Nitrobenzene (transfers to treatment)	
47	2	165	141,059	141,224	3	196	194,014	194,210	194,210	Lead and compounds (transfers of metals)	
48	14	4,576	496,891	501,467	16	3,258	403,098	406,356	192,662	Lead and compounds (transfers of metals)	
49	2	278,642	0	278,642	2	189,911	0	189,911	189,227	Dichloromethane (air)	
50	3	494	65,819	66,313	2	422	194,367	194,789	187,371	Lead and compounds (transfers of metals)	
	146	19,693,793	5,957,216	25,651,009	172	30,255,206	15,166,795	45,422,001	27,263,372		

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

► UIJ = underground injection

Metals

NPRI releases and transfers of metals and their compounds increased 9.8 million kg, from 33.7 million kg in 1995 to 43.5 million kg in 1997, a 29 percent increase. This meant that metals rose from one-quarter of all NPRI reporting in the matched data set in 1995 to one-third in 1997. NPRI facilities reported increases for 10 of the 15 metallic substances in the matched data set (Table 5-53).

The largest NPRI increase, of 9.0 million kg (53 percent), occurred in releases and transfers of zinc and its compounds. Releases and transfers of two other metals rose approximately 800,000 kg each: lead and its compounds (an increase of 24 percent) and manganese and its compounds (a 13 percent increase). On the other hand, NPRI facilities reported their largest reduction for copper and its compounds. Releases and transfers of this substance decreased 623,299 kg (a 26 percent reduction).

Table 5-53		Change in NPRI Total Releases and Transfers of Metals and Their Compounds, 1995-1997				
CAS Number	Chemical	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
—	Copper (and its compounds)	2,395,813	1,437,803	1,772,514	-623,299	-26.0
—	Chromium (and its compounds)	3,085,937	2,747,282	2,767,382	-318,555	-10.3
—	Nickel (and its compounds)	1,121,479	894,862	879,686	-241,793	-21.6
—	Mercury (and its compounds)	19,305	9,647	3,730	-15,575	-80.7
—	Cobalt (and its compounds)	38,005	36,503	30,986	-7,019	-18.5
—	Silver (and its compounds)	1,029	1,432	1,748	719	69.9
—	Selenium (and its compounds)	33,611	40,023	39,649	6,038	18.0
—	Antimony (and its compounds)	13,103	17,750	20,234	7,131	54.4
7440-62-2	Vanadium (fume or dust)	173,414	189,527	217,001	43,587	25.1
—	Cadmium (and its compounds)	54,950	21,735	164,980	110,030	200.2
—	Arsenic (and its compounds)	74,078	172,813	216,145	142,067	191.8
7429-90-5	Aluminum (fume or dust)	613,535	717,376	790,035	176,500	28.8
—	Manganese (and its compounds)	5,975,691	8,470,695	6,772,260	796,569	13.3
—	Lead (and its compounds)	3,364,397	3,648,574	4,166,443	802,046	23.8
—	Zinc (and its compounds)	16,750,383	18,165,375	25,701,932	8,951,549	53.4
	Subtotal	33,714,730	36,571,397	43,544,725	9,829,995	29.2
	% of Total	25.9	29.3	33.5		
	Total for Matched NPRI Chemicals	130,368,812	124,688,830	129,957,185	-411,627	-0.3

Table 5-54		Change in TRI Total Releases and Transfers of Metals and Their Compounds, 1995-1997				
CAS Number	Chemical	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
7440-62-2	— Mercury (and its compounds)	110,365	27,702	33,375	-76,990	-69.8
	— Cadmium (and its compounds)	1,144,575	845,823	1,099,954	-44,621	-3.9
	— Vanadium (fume or dust)	85,043	68,013	78,978	-6,065	-7.1
	— Selenium (and its compounds)	192,107	168,707	203,086	10,979	5.7
	— Silver (and its compounds)	49,494	70,277	72,370	22,876	46.2
7429-90-5	— Antimony (and its compounds)	2,741,814	3,476,086	2,796,482	54,668	2.0
	— Cobalt (and its compounds)	577,112	682,712	943,532	366,420	63.5
	— Aluminum (fume or dust)	4,677,483	4,916,455	5,557,225	879,742	18.8
	— Nickel (and its compounds)	6,140,156	6,476,739	7,751,290	1,611,134	26.2
	— Arsenic (and its compounds)	2,120,447	2,396,332	4,077,455	1,957,008	92.3
— Chromium (and its compounds)	23,741,812	22,465,998	26,212,360	2,470,548	10.4	
— Copper (and its compounds)	31,690,605	36,416,087	34,715,649	3,025,044	9.5	
— Lead (and its compounds)	19,960,972	21,961,939	26,418,897	6,457,925	32.4	
— Manganese (and its compounds)	43,372,348	47,202,906	65,474,105	22,101,757	51.0	
— Zinc (and its compounds)	110,254,783	125,622,492	154,350,644	44,095,861	40.0	
	Subtotal	246,859,116	272,798,268	329,785,402	82,926,286	33.6
	% of Total	21.5	24.6	28.4		
	Total for Matched TRI Chemicals	1,145,788,956	1,107,331,518	1,161,341,947	15,552,991	1.4

In TRI, releases and transfers of metals and their compounds increased by 82.9 million kg, from 246.9 million kg in 1995 to 329.8 million kg in 1997. This amounted to an increase of 34 percent. Metals accounted for one-fifth of the 1995 TRI releases and transfers of all substances and more than one-quarter in 1997 (Table 5-54).

Zinc and its compounds showed the largest increase—44.1 million kg—and this was twice the increase for second-ranked manganese and its compounds. Zinc releases and transfers increased from 110.3 million kg to 154.4 million kg, or 40 percent. Manganese and its compounds increased from 43.4 million kg to 65.5 million kg, or 51 percent. TRI facilities reported increases in releases and transfers of 12 of the 15 metals. The largest of the few reductions was in mercury and its compounds, decreasing from 110,365 kg to 33,375 kg, a reduction of 76,990 kg, or 70 percent.

NPRI Facilities with Largest Decreases/Increases

While NPRI facilities making the largest reductions in releases and transfers of metals cut their totals by about one-third from 1995 levels, the facilities with the largest increases doubled their totals over the 1995–1997 period (**Figure 5–28**).

The 50 NPRI facilities with the largest decreases in releases and transfers of metals and their compounds reported 16.4 million kg in 1995 and 9.6 million kg in 1997. This was a 6.8-million-kg reduction, achieved about equally in releases and in transfers. The 50 facilities submitted 170 forms in 1995 and 141 in 1997. Eight facilities

that submitted forms for metals in 1995 did not do so in 1997 (**Table 5–55**).

For the 50 NPRI facilities reporting the largest increases, releases and transfers of metals totaled 15.1 million kg in 1995 and 31.0 million kg in 1997. Most of this 15.9-million-kg increase occurred in transfers, which rose from 9.9 million kg to 22.7 million kg. The number of forms increased from 140 submitted in 1995 to 178 in 1997. Nine of the facilities had not reported metals in 1995 (**Table 5–56**).

TRI Facilities with Largest Decreases/Increases

The TRI facilities with the largest decreases and increases in releases and

transfers of metals between 1995 and 1997 were responsible for the majority of such releases and transfers reported to the PRTR. This represented an unusual concentration of releases and transfers among facilities with large changes—either up or down—in the amounts they reported. For metals, the largest increases far outweighed the largest reductions, while releases and transfers by all other facilities also rose (**Figure 5–28**).

The 50 TRI facilities with the largest decreases in releases and transfers of metals and their compounds reported 119.9 million kg in 1995 and 83.7 million kg in 1997. About half of this 36.2-million-kg reduction occurred in releases and half in transfers. There

was only a small reduction in the number of forms submitted, from 235 in 1995 to 218 in 1997. Four facilities that submitted forms for metals in 1995 did not in 1997 (**Table 5–57**).

For the 50 facilities reporting the largest increases, total releases and transfers of metals and their compounds quadrupled from 31.9 million kg in 1995 to 127.0 million kg in 1997. Two-thirds of this 95.1-million-kg increase occurred in transfers, which rose from 7.6 million kg to 70.8 million kg. The number of forms these facilities submitted increased from 213 in 1995 to 287 in 1997. Ten facilities that did not submit forms for metals in 1995 did so in 1997 (**Table 5–58**).

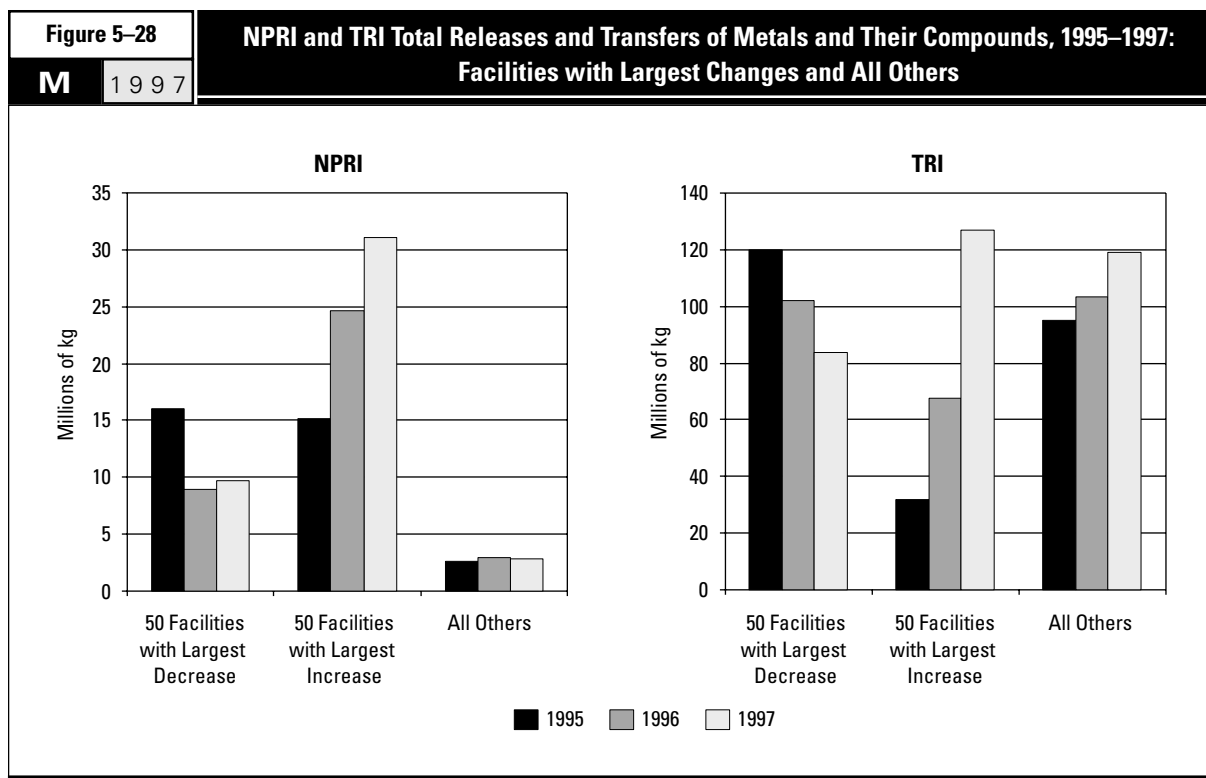


Table 5-55		The 50 NPRI Facilities with Largest Decrease in Total Releases and Transfers of Metals and Their Compounds, 1995-1997						
Rank	Facility	City, Province	SIC Codes		Number of Forms	1995		
			Canada	US		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33	6	1,401,740	0	1,401,740
2	Co-Steel Lasco	Whitby, ON	29	33	6	2,411,507	6,030,824	8,442,331
3	Dominion Castings Ltd., NACO Inc.	Hamilton, ON	29	33	2	1,227	1,485,964	1,487,191
4	Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey, BC	30	33	2	200	398,035	398,235
5	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33	6	21,240	305,238	326,478
6	Sydney Steel Corporation	Sydney, NS	29	33	8	530,500	0	530,500
7	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33	7	153,630	0	153,630
8	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	11	648,045	0	648,045
9	Versatech Industries, Apex Metals Inc.	Kitchener, ON	32	34	3	0	136,000	136,000
10	Owens-Corning Canada Inc., Guelph Glass Plant	Guelph, ON	35	32	1	7,728	117,320	125,048
11	Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton, ON	32	34	4	0	209,781	209,781
12	Magotteaux Inc., Magotteaux Canada	Magog, QC	30	39	4	320	98,650	98,970
13	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33	5	66,670	386,200	452,870
14	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33	7	605	88,365	88,970
15	Boler Group, Hendrickson Spring	Stratford, ON	32	34	1	0	81,000	81,000
16	Consumers Packaging Inc., Consumers Glass (Brampton)	Brampton, ON	35	32	1	0	72,300	72,300
17	Duracell Canada Inc., Duracell Inc.	Mississauga, ON	33	36	2	200	87,094	87,294
18	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36	2	1,489	67,364	68,853
19	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	1	0	99,700	99,700
20	Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel, QC	30	34	3	703	119,800	120,503
21	A.P. Green Refractories (Canada) Ltd., A.P. Green Industries	Smithville, ON	35	32	1	0	77,632	77,632
22	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-de-Valleyfield, QC	29	33	8	115,361	70,200	185,561
23	Griffin Canada Inc., Amsted Industries	Winnipeg, MB	29	33	1	0	69,480	69,480
24	Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock, ON	29	33	1	1,582	69,500	71,082
25	A.G. Simpson Co Ltd.	Oshawa, ON	32	34	4	400	112,523	112,923
26	Stelco Inc., Hilton Works	Hamilton, ON	29	33	8	19,700	54,580	74,280
27	Riverside Brass, Riverside Brass & Aluminum Foundry	New Hamburg, ON	29	33	4	52,000	0	52,000
28	Inco Limited, Manitoba Division	Thompson, MB	29	33	4	130,315	0	130,315
29	Michelin North America (Canada) Inc., Waterville Plant	Cambridge Station, NS	15	30	6	2	40,069	40,071
30	Eveready Division, Ralston Purina Canada	Walkerton, ON	33	36	2	0	39,548	39,548
31	Inco Limited, Copper Refinery	Copper Cliff, ON	29	33	7	30,090	0	30,090
32	GE Lighting, Canada, Oakville Lamp Plant	Oakville, ON	33	36	3	300	39,533	39,833
33	Sherritt International Corporation	Fort Saskatchewan, AB	37	28	4	7,336	16,370	23,706
34	Johnson Matthey Limited, Precious Metals Division	Brampton, ON	39	33	3	300	18,618	18,918
35	Standard Products (Canada) Limited, Rubber Plant #2	Stratford, ON	15	30	1	0	58,149	58,149
36	Inco Limited, Central Mills	Copper Cliff, ON	29	33	2	17,310	0	17,310
37	Valeo Engine Cooling Limited, Automotive Division	Stratford, ON	32	35	3	438	36,740	37,178
38	Esco Limited	Port Coquitlam, BC	29	33	2	79,213	0	79,213
39	Stelpipe Ltd, Steel Tube Manufacturing	Welland, ON	29	33	2	535	15,130	15,665
40	Goodyear Tire & Rubber Company, Goodyear Canada Inc.	Napanee, ON	15	30	1	120	14,000	14,120
41	Owens-Corning Canada Inc.	Edmonton, AB	35	32	1	100	13,398	13,498
42	Prototype Circuits Inc, Plant 1	Scarborough, ON	33	36	1	250	25,000	25,250
43	Norcast Division de Tritech Precision Inc., fonderie Norcast	Mont-Joli, QC	30	34	4	2,534	16,657	19,191
44	Consumers Packaging Inc., Consumers Glass (Scoudouc)	Scoudouc, NB	35	32	1	0	10,500	10,500
45	General Motors of Canada Limited, London Diesel Division	London, ON	32	37	4	1,951	14,524	16,475
46	Aluminerie de Bécancour Inc., Reynolds Metal Company	Ville de Bécancour, QC	29	33	1	0	9,300	9,300
47	ICI Canada Inc, ICI Forest Products, Cornwall Works	Cornwall, ON	37	28	3	34	9,259	9,293
48	Standard Products (Canada) Limited, Rubber Plant #4	Mitchell, ON	15	30	1	0	10,937	10,937
49	Tamis CAE Inc., CAE Inc.	Lennoxville, QC	30	34	3	100	11,682	11,782
50	Belden Canada Inc., Cobourg Facility	Cobourg, ON	29	33	2	1	15,444	15,445
Total					170	5,705,776	10,652,408	16,358,184

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

Rank	1996			1997			Change 95-97 and Transfers (kg)	Major Chemicals Reported with Decreases (Primary Media/Transfers with Decreases)*		
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)			Total Transfers (kg)	Total Releases and Transfers (kg)
1	5	5,499	0	5,499	7	7,628	0	7,628	-1,394,112	Manganese and compounds (land)
2	6	1,254,893	3,578,510	4,833,403	6	1,259,869	5,799,885	7,059,754	-1,382,577	Copper and compounds (land)
3	3	6,591	906,005	912,596	3	1,776	571,557	573,333	-913,858	Chromium and compounds (transfers of metals)
4	2	200	36,760	36,960	2	200	6,450	6,650	-391,585	Zinc and compounds (transfers of metals)
5	3	12,900	52,000	64,900	2	6,660	0	6,660	-319,818	Zinc and compounds (transfers of metals)
6	8	331,280	0	331,280	8	290,290	0	290,290	-240,210	Zinc/Manganese/Lead and compounds (land)
7	**	**	**	**	**	**	**	**	-153,630	Nickel/Lead and compounds (air)
8	10	676,550	0	676,550	11	498,120	0	498,120	-149,925	Lead and compounds (air)
9	3	0	0	0	3	0	0	0	-136,000	Zinc and compounds (transfers of metals)
10	1	1,250	4,720	5,970	**	**	**	**	-125,048	Zinc and compounds (transfers of metals)
11	4	0	209,462	209,462	3	0	91,920	91,920	-117,861	Chromium/Zinc/Nickel and compounds (transfers of metals)
12	4	320	0	320	4	320	0	320	-98,650	Chromium and compounds (transfers of metals)
13	5	53,530	383,900	437,430	5	5,942	362,000	367,942	-84,928	Zinc and compounds (water)
14	7	145	47,187	47,332	7	13	7,163	7,176	-81,794	Aluminum (transfers of metals)
15	1	0	30,560	30,560	1	0	7,056	7,056	-73,944	Zinc and compounds (transfers of metals)
16	1	0	4,000	4,000	1	0	0	0	-72,300	Chromium and compounds (transfers of metals)
17	2	200	52,700	52,900	2	200	15,273	15,473	-71,821	Manganese and compounds (transfers of metals)
18	2	287	110,477	110,764	**	**	**	**	-68,853	Lead and compounds (transfers of metals)
19	1	0	38,000	38,000	1	0	34,000	34,000	-65,700	Manganese and compounds (transfers of metals)
20	3	323	191,540	191,863	3	347	55,258	55,605	-64,898	Manganese and compounds (transfers of metals)
21	1	0	30,601	30,601	1	0	20,141	20,141	-57,491	Chromium and compounds (transfers of metals)
22	8	118,880	29,885	148,765	8	107,762	20,633	128,395	-57,166	Zinc/Selenium and compounds (transfers of metals)
23	1	140	13,600	13,740	1	140	13,600	13,740	-55,740	Manganese and compounds (transfers of metals)
24	1	1,433	60,877	62,310	1	688	21,036	21,724	-49,358	Manganese and compounds (transfers of metals)
25	5	400	154,560	154,960	5	300	64,802	65,102	-47,821	Nickel and compounds (transfers of metals)
26	8	37,720	29,740	67,460	8	19,660	9,900	29,560	-44,720	Zinc and compounds (transfers of metals)
27	1	500	0	500	4	6,818	2,861	9,679	-42,321	Copper/Zinc and compounds (air)
28	4	104,466	0	104,466	4	93,777	0	93,777	-36,538	Nickel/Copper and compounds (air)
29	2	0	7,362	7,362	2	0	6,778	6,778	-33,293	Zinc and compounds (transfers of metals)
30	2	0	36,812	36,812	2	0	8,794	8,794	-30,754	Zinc and compounds (transfers of metals)
31	**	**	**	**	**	**	**	**	-30,090	Copper and compounds (air)
32	3	300	22,265	22,565	3	300	14,461	14,761	-25,072	Lead and compounds (transfers of metals)
33	4	1,990	8,710	10,700	4	1,190	1,540	2,730	-20,976	Nickel and compounds (transfers of metals)
34	3	300	0	300	3	0	0	0	-18,918	Copper and compounds (transfers of metals)
35	1	0	45,300	45,300	1	0	39,900	39,900	-18,249	Zinc and compounds (transfers of metals)
36	2	36,430	0	36,430	**	**	**	**	-17,310	Nickel and compounds (water)
37	3	542	54,850	55,392	3	448	21,511	21,959	-15,219	Lead and compounds (transfers of metals)
38	2	65,720	0	65,720	2	64,495	0	64,495	-14,718	Manganese and compounds (land)
39	2	595	2,741	3,336	2	260	718	978	-14,687	Zinc and compounds (transfers of metals)
40	1	142	17,150	17,292	**	**	**	**	-14,120	Zinc and compounds (transfers of metals)
41	**	**	**	**	**	**	**	**	-13,498	Chromium and compounds (transfers of metals)
42	1	133	6,773	6,906	1	144	12,375	12,519	-12,731	Copper and compounds (transfers of metals)
43	4	4,062	5,674	9,736	4	491	6,007	6,498	-12,693	Chromium and compounds (transfers of metals)
44	1	0	0	0	1	0	0	0	-10,500	Chromium and compounds (transfers of metals)
45	4	3,486	5,837	9,323	4	5,836	1,301	7,137	-9,338	Manganese and compounds (transfers of metals)
46	1	0	12,000	12,000	1	0	0	0	-9,300	Manganese and compounds (transfers of metals)
47	1	32	4,626	4,658	**	**	**	**	-9,293	Mercury and compounds (transfers of metals)
48	1	0	1,400	1,400	1	0	2,100	2,100	-8,837	Zinc and compounds (transfers of metals)
49	3	100	15,300	15,400	3	100	3,200	3,300	-8,482	Chromium and compounds (transfers of metals)
50	2	1	4,474	4,475	3	32	7,530	7,562	-7,883	Copper and compounds (transfers of metals)
	143	2,721,340	6,216,358	8,937,698	141	2,373,806	7,229,750	9,603,556	-6,754,628	

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

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

Table 5-56		The 50 NPRI Facilities with Largest Increase in Total Releases and Transfers of Metals and Their Compounds, 1995-1997						
Rank	Facility	City, Province	SIC Codes		Number of Forms	1995		
			Canada	US		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	Dofasco Inc.	Hamilton, ON	29	33	6	16,617	1,931,258	1,947,875
2	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6	446,525	0	446,525
3	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	3	762,000	0	762,000
4	Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac, QC	29	33	1	0	0	0
5	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5	1,510,387	0	1,510,387
6	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	5	161,217	0	161,217
7	Metalex Products Ltd.	Richmond, BC	29	33	4	10,250	0	10,250
8	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	5	18,478	0	18,478
9	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5	10,030	1,864,400	1,874,430
10	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6	621,640	0	621,640
11	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33	5	11,928	342,150	354,078
12	Zalev Brothers Limited	Windsor, ON	29	33	7	453	849,840	850,293
13	Kronos Canada, Inc.	Varenes, QC	37	28	2	40,700	633,000	673,700
14	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	4	27,640	362,590	390,230
15	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	5	624,322	173,130	797,452
16	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	*	*	*	*
17	Dana Canada Inc., Spicer Driveshaft Division	Thorold, ON	30	37	2	0	1,388	1,388
18	Cartons St-Laurent Inc.	LaTuque, QC	27	26	*	*	*	*
19	Ivaco Rolling Mills	L'Orignal, ON	29	33	5	16,256	1,532,610	1,548,866
20	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	*	*	*	*
21	Philip Services Corp., Philip Enterprises Inc.	Guelph, ON	29	33	4	800	44,300	45,100
22	Tonolli Canada Limited	Mississauga, ON	29	33	1	2,357	226,980	229,337
23	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26	*	*	*	*
24	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37	*	*	*	*
25	Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour, QC	29	33	2	0	0	0
26	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26	2	14,300	33,000	47,300
27	National-Standard Company of Canada, Ltd.	Guelph, ON	30	33	2	0	2,813	2,813
28	Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto, ON	29	33	2	200	0	200
29	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	4	42,330	0	42,330
30	Spectra Anodizing Ltd.	Woodbridge, ON	39	39	1	0	0	0
31	Marswell Metal Industries Limited	Burlington, ON	30	34	1	0	1	1
32	Protec Finishing Ltd.	Mississauga, ON	30	34	1	0	32,920	32,920
33	Metal Koting, Continuous Colour Coat Ltd.	Rexdale, ON	30	34	2	337	35,970	36,307
34	Stelwire Ltd., Parkdale Works	Hamilton, ON	30	33	3	668	73,717	74,385
35	North American Lumber, Roblin Forest Products	Roblin, MB	25	24	*	*	*	*
36	Michelin North America (Canada) Inc.	Kitchener, ON	15	30	2	50	2,286	2,336
37	Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax, ON	37	28	3	0	186,100	186,100
38	A.G. Simpson Co. Ltd.	Cambridge, ON	30	34	4	200	395	595
39	Coatings 85 Ltd.	Mississauga, ON	30	34	1	0	76,500	76,500
40	Acadian Platers Co. Ltd.	Rexdale, ON	30	34	1	0	19,640	19,640
41	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	5	10,004	1,445,515	1,455,519
42	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37	*	*	*	*
43	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35	3	295,200	210	295,410
44	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5	371,800	0	371,800
45	Produits Shell Canada Ltée., Raffinerie de Montréal-est	Montréal-est, QC	36	29	2	20	0	20
46	Columbia/MBF, Glynwed Steels & Engineering	Mississauga, ON	30	34	2	0	15,722	15,722
47	Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan, AB	29	33	*	*	*	*
48	Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est, QC	29	33	9	4,320	40,835	45,155
49	NRI Industries Inc., Cawthra Plant	Toronto, ON	15	30	*	*	*	*
50	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26	2	177,200	0	177,200
Total					140	5,198,229	9,927,270	15,125,499

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

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

Rank	1996				1997				Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Increases (Primary Media/Transfers with Increases)**
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)		
1	6	15,909	2,540,853	2,556,762	6	22,931	8,168,440	8,191,371	6,243,496	Zinc and compounds (transfers of metals)
2	7	481,240	3,814,700	4,295,940	6	462,724	1,480,000	1,942,724	1,496,199	Zinc and compounds (transfers of metals)
3	4	2,031,067	0	2,031,067	5	1,752,614	0	1,752,614	990,614	Zinc and compounds (land)
4	1	0	0	0	1	0	840,570	840,570	840,570	Zinc and compounds (transfers of metals)
5	5	2,322,985	0	2,322,985	5	2,349,790	0	2,349,790	839,403	Zinc and compounds (land)
6	5	416,922	0	416,922	5	710,354	0	710,354	549,137	Zinc/Lead and compounds (air)
7	5	24,229	257,210	281,439	5	371	484,370	484,741	474,491	Lead and compounds (transfers of metals)
8	5	21,634	0	21,634	5	18,248	467,400	485,648	467,170	Lead and compounds (transfers of metals)
9	5	17,410	3,054,700	3,072,110	5	17,750	2,298,300	2,316,050	441,620	Zinc/Manganese and compounds (transfers of metals)
10	6	427,818	0	427,818	6	1,014,986	0	1,014,986	393,346	Chromium and compounds (land)
11	5	11,754	764,570	776,324	5	10,608	621,538	632,146	278,068	Zinc and compounds (transfers of metals)
12	7	456	877,606	878,062	8	429	1,104,869	1,105,298	255,005	Zinc/Copper and compounds (transfers of metals)
13	2	45,350	836,000	881,350	2	32,500	855,000	887,500	213,800	Manganese and compounds (transfers of metals)
14	4	1,820	474,430	476,250	4	1,420	584,310	585,730	195,500	Chromium/Nickel and compounds (transfers of metals)
15	5	608,341	65,858	674,199	6	729,605	241,888	971,493	174,041	Copper and compounds (transfers of metals)
16	*	*	*	*	9	169,168	0	169,168	169,168	Lead/Copper and compounds (air)
17	2	0	121,540	121,540	2	0	128,300	128,300	126,912	Manganese and compounds (transfers of metals)
18	2	33,811	80,834	114,645	2	38,366	71,666	110,032	110,032	Manganese and compounds (transfers of metals, water)
19	7	11,020	1,559,360	1,570,380	7	9,447	1,647,700	1,657,147	108,281	Manganese/Lead and compounds, Aluminum (transfers of metals)
20	*	*	*	*	2	103,137	0	103,137	103,137	Zinc and compounds (land)
21	4	800	44,300	45,100	4	800	142,900	143,700	98,600	Nickel and compounds (transfers of metals)
22	1	2,357	376,450	378,807	1	2,355	311,202	313,557	84,220	Lead and compounds (transfers of metals)
23	1	31,300	38,600	69,900	1	28,500	52,900	81,400	81,400	Manganese and compounds (transfers of metals, water)
24	*	*	*	*	3	44,898	36,400	81,298	81,298	Aluminum, Copper and compounds (transfers of metals)
25	2	0	37,000	37,000	2	40,000	32,000	72,000	72,000	Manganese and compounds (land, transfers of metals)
26	2	10,600	76,000	86,600	2	9,500	107,600	117,100	69,800	Aluminum (transfers of metals)
27	2	0	111,156	111,156	2	0	72,062	72,062	69,249	Lead and compounds (transfers of metals)
28	2	200	0	200	2	800	65,600	66,400	66,200	Lead and compounds (transfers of metals)
29	4	79,116	43	79,159	4	92,846	4	92,850	50,520	Vanadium (air)
30	1	0	0	0	1	0	50,000	50,000	50,000	Aluminum (transfers of metals)
31	1	0	1	1	1	0	50,000	50,000	49,999	Lead and compounds (transfers of metals)
32	1	0	58,501	58,501	1	0	78,503	78,503	45,583	Zinc and compounds (transfers of metals)
33	2	301	41,700	42,001	2	301	80,087	80,388	44,081	Zinc and compounds (transfers of metals)
34	3	1,178	113,981	115,159	3	927	115,551	116,478	42,093	Zinc and compounds (transfers of metals)
35	*	*	*	*	3	0	41,000	41,000	41,000	Chromium/Arsenic and compounds (transfers of metals)
36	2	120	20,800	20,920	1	110	41,910	42,020	39,684	Zinc and compounds (transfers of metals)
37	3	0	229,400	229,400	3	0	224,300	224,300	38,200	Lead and compounds (transfers of metals)
38	5	200	1,402	1,602	5	300	37,618	37,918	37,323	Zinc and compounds (transfers of metals)
39	1	0	74,800	74,800	1	0	112,972	112,972	36,472	Zinc and compounds (transfers of metals)
40	1	0	29,001	29,001	1	0	55,673	55,673	36,033	Zinc and compounds (transfers of metals)
41	8	10,328	1,257,736	1,268,064	8	10,321	1,481,088	1,491,409	35,890	Zinc and compounds (transfers of metals)
42	*	*	*	*	1	21,505	11,218	32,723	32,723	Chromium and compounds (air, transfers of metals)
43	3	256,000	550	256,550	3	0	327,898	327,898	32,488	Chromium and compounds (transfers of metals)
44	5	457,180	0	457,180	5	402,950	0	402,950	31,150	Zinc/Lead and compounds (land)
45	2	0	0	0	4	7,950	23,100	31,050	31,030	Nickel and compounds (transfers of metals)
46	2	0	27,305	27,305	2	0	46,706	46,706	30,984	Zinc and compounds (transfers of metals)
47	4	11,260	31,830	43,090	4	2,094	26,865	28,959	28,959	Nickel and compounds (transfers of metals)
48	9	5,440	75,261	80,701	9	4,357	68,234	72,591	27,436	Arsenic/Selenium and compounds (transfers of metals)
49	1	200	9,500	9,700	1	13,000	12,800	25,800	25,800	Zinc and compounds (land, transfers of metals)
50	2	214,600	0	214,600	2	202,200	0	202,200	25,000	Manganese and compounds (water)
157		7,552,946	17,102,978	24,655,924	178	8,330,162	22,700,542	31,030,704	15,905,205	

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

Table 5-57		The 50 TRI Facilities with Largest Decrease in Total Releases and Transfers of Metals and Their Compounds, 1995-1997					
M 1997							
Rank	Facility	City, State	US SIC Code	Number of Forms	1995		
					Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)
1	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	8	7,854,444	2,010,436	9,864,880
2	Chino Mines Co., Phelps Dodge Corp.	Hurley, NM	33	2	3,169,958	0	3,169,958
3	National Steel Corp., Great Lakes Div.	Ecorse, MI	33	3	51,633	6,103,309	6,154,942
4	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	10	14,457,959	2	14,457,961
5	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33	10	265,389	15,729,385	15,994,774
6	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33	4	68,933	1,268,007	1,336,940
7	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33	4	37,386	1,167,570	1,204,956
8	Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood, MS	33	5	1,198	840,229	841,427
9	Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle, IN	33	3	0	851,385	851,385
10	Olin Brass Indianapolis, Olin Corp.	Indianapolis, IN	33	7	10,373	717,081	727,454
11	Northwestern Steel & Wire Co.	Sterling, IL	33	4	7,126,231	311,564	7,437,795
12	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	6	6,229,325	243	6,229,568
13	Chemetals Inc., Comilog	New Johnsonville, TN	28	2	2,108,027	0	2,108,027
14	Cerro Wire & Cable Co. Inc.	Hartselle, AL	33	3	21	3,415,766	3,415,787
15	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI	33	6	1,125,076	437	1,125,513
16	Slater Steels, Ft. Wayne Spec. Alloys Div.	Fort Wayne, IN	33	4	5,283	571,570	576,853
17	LTV Steel Co. Inc.	Cleveland, OH	33	5	1,151,427	79,943	1,231,370
18	Honda of America Mfg. Inc., American Honda Motor Co. Inc.	Anna, OH	37	5	176	495,806	495,982
19	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33	3	85,614	2,927,800	3,013,414
20	Nucor Steel - Texas, Nucor Corp.	Jewett, TX	33	7	10,171	501,185	511,356
21	Essex Group Inc.	Lithonia, GA	33	3	3	403,260	403,263
22	Newport Steel Corp., NS Group Inc.	Wilder, KY	33	8	4,266	1,384,942	1,389,208
23	Imco Recycling of Ohio Inc., Imco Recycling Inc.	Uhrichsville, OH	33	6	15,309	762,612	777,921
24	North American Royalties Inc., Wheland Fndy. Div.	Chattanooga, TN	33	6	9,049	757,761	766,810
25	Franklin Bronze & Alloy Co.	Franklin, PA	33	3	226	636,735	636,961
26	Rhone-Poulenc Basic Chemicals, Rhone-Poulenc Inc.	Martinez, CA	28	1	54	296,912	296,966
27	Wheeling-Pittsburgh Steel Corp., Wheeling-Pittsburgh Corp.	Mingo Junction, OH	33	3	31,111	304,971	336,082
28	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Brackenridge, PA	33	7	37,167	354,331	391,498
29	U.S. Pipe & Fndy. Co., Walter Ind. Inc.	Union City, CA	33	3	85,732	411,972	497,704
30	ABC Rail Prods. Corp.	Calera, AL	33	2	7,367	855,588	862,955
31	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Vernon, CA	33	3	1,411	383,871	385,282
32	S.D. Warren Co.	Westbrook, ME	26	2	9,801	245,250	255,051
33	Cox Creek Refining Co.	Baltimore, MD	33	3	230	240,363	240,593
34	ASARCO Inc.	El Paso, TX	33	6	84,925	176,733	261,658
35	ASARCO Inc.	East Helena, MT	33	9	17,914,439	179	17,914,618
36	Neenah Fndy. Co., Neenah Corp.	Neenah, WI	33	3	566	632,316	632,882
37	Elkem Metals Co.	Marietta, OH	33	5	5,379,659	23,129	5,402,788
38	Wheeling-Pittsburgh Steel Corp., Wheeling-Pittsburgh Corp.	Martins Ferry, OH	33	2	10,681	235,705	246,386
39	Gulf States Steel Inc., GSS Holding Corp.	Gadsden, AL	33	6	488,078	3,286	491,364
40	Johnstown Wire Techs. Inc.	Johnstown, PA	33	4	2,067	247,732	249,799
41	FMC Corp.	Pocatello, ID	28	9	2,371,621	725	2,372,346
42	Intermet Corp., Archer Creek Plant	Lynchburg, VA	33	5	219,214	2	219,216
43	Corhart Refractories Corp.	Buckhannon, WV	32	1	14,829	249,327	264,156
44	General Battery Corp., Reading Smelter Div., Exide Corp.	Reading, PA	33	6	2,320	889,729	892,049
45	Magotteaux Corp., Magotteaux Intl.	Pulaski, TN	33	7	41,177	224,450	265,627
46	Lukens Steel Co., Lukens Inc.	Coatesville, PA	33	6	203,887	62,926	266,813
47	Georgia-Pacific Paper Ops., Georgia-Pacific Corp.	Crossett, AR	26	1	276,746	0	276,746
48	Anzon Inc., Cookson America Inc.	Philadelphia, PA	28	4	226	168,461	168,687
49	Philips Display Components Co., North American Philips Corp.	Ottawa, OH	36	3	1,504	202,517	204,021
50	Oregon Steel Mills Inc.	Portland, OR	Mult.	7	7,778	1,776,756	1,784,534
Total				235	70,980,067	48,924,259	119,904,326

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

Rank	1996				1997				Change 95-97 Total Releases and Transfers (kg)	Major Chemicals Reported with Decreases (Primary Media/Transfers with Decreases)*
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)		
1	8	4,618,520	3,033,529	7,652,049	8	318,428	560,926	879,354	-8,985,526	Copper/Zinc and compounds (land)
2	1	3,476,043	0	3,476,043	**	**	**	**	-3,169,958	Copper and compounds (land)
3	4	54,671	6,346,480	6,401,151	5	56,800	3,497,819	3,554,619	-2,600,323	Zinc and compounds (transfers of metals)
4	10	12,606,649	2	12,606,651	10	12,186,098	113	12,186,211	-2,271,750	Zinc and compounds (land)
5	9	220,257	10,473,482	10,693,739	9	225,113	13,855,648	14,080,761	-1,914,013	Lead and compounds (transfers of metals)
6	4	4,551	127,741	132,292	4	7,500	111,984	119,484	-1,217,456	Chromium and compounds (transfers of metals)
7	5	3,027	387,736	390,763	**	**	**	**	-1,204,956	Chromium and compounds (transfers of metals)
8	6	3,815	0	3,815	5	1,886	0	1,886	-839,541	Lead/Manganese and compounds (transfers of metals)
9	3	0	48,092	48,092	3	0	51,575	51,575	-799,810	Chromium and compounds (transfers of metals)
10	7	8,463	1,771	10,234	6	8,718	1,209	9,927	-717,527	Copper/Chromium and compounds (transfers of metals)
11	4	6,545,333	65,170	6,610,503	4	6,772,540	30,658	6,803,198	-634,597	Zinc and compounds (land)
12	6	6,042,825	410	6,043,235	6	5,599,833	505	5,600,338	-629,230	Zinc and compounds (land)
13	1	1,685,692	0	1,685,692	1	1,539,949	0	1,539,949	-568,078	Manganese and compounds (land)
14	3	126	3,439,996	3,440,122	3	124	2,863,172	2,863,296	-552,491	Copper and compounds (transfers of metals)
15	6	1,019,211	426	1,019,637	6	576,725	1,115	577,840	-547,673	Zinc and compounds (land)
16	4	4,875	21,252	26,127	4	10,776	30,670	41,446	-535,407	Chromium and compounds (transfers of metals)
17	5	360,980	558,890	919,870	5	294,568	421,815	716,383	-514,987	Manganese and compounds (land)
18	4	335	141,328	141,663	5	444	4,085	4,529	-491,453	Zinc and compounds (transfers of metals)
19	3	763,440	2,351,083	3,114,523	5	35,600	2,498,413	2,534,013	-479,401	Zinc and compounds (transfers of metals)
20	7	16,336	196,306	212,642	7	16,466	84,801	101,267	-410,089	Zinc and compounds (transfers of metals)
21	3	10	96	106	3	10	99	109	-403,154	Copper and compounds (transfers of metals)
22	7	4,987	852,880	857,867	7	5,648	1,022,314	1,027,962	-361,246	Zinc and compounds (transfers of metals)
23	6	8,245	414,318	422,563	7	8,244	431,969	440,213	-337,708	Aluminum (transfers of metals)
24	6	6,317	514,648	520,965	6	5,901	446,282	452,183	-314,627	Zinc/Manganese and compounds (transfers of metals)
25	2	226	389,116	389,342	2	226	331,972	332,198	-304,763	Zinc/Copper and compounds (transfers of metals)
26	1	14	3,073	3,087	1	21	1,669	1,690	-295,276	Zinc and compounds (transfers of metals)
27	3	2,889	212,893	215,782	3	4,659	46,440	51,099	-284,983	Manganese and compounds (transfers of metals)
28	7	26,735	178,482	205,217	8	28,231	86,260	114,491	-277,007	Chromium/Nickel and compounds (transfers of metals)
29	3	88,241	199,681	287,922	3	54,965	171,409	226,374	-271,330	Zinc and compounds (transfers of metals)
30	2	5,144	576,478	581,622	2	5,336	600,011	605,347	-257,608	Manganese and compounds (transfers of metals)
31	3	1,411	411,262	412,673	3	1,582	138,272	139,854	-245,428	Lead and compounds (transfers of metals)
32	2	3,950	12,289	16,239	2	3,478	7,058	10,536	-244,515	Zinc and compounds (transfers of metals)
33	**	**	**	**	**	**	**	**	-240,593	Copper/Nickel and compounds (transfers of metals)
34	6	93,033	85,050	178,083	6	22,241	11,881	34,122	-227,536	Copper and compounds (air, transfers of metals), Zinc and compounds (transfers of metals)
35	9	20,160,568	15	20,160,583	9	17,143,072	547,191	17,690,263	-224,355	Zinc and compounds (land)
36	3	566	645,467	646,033	3	566	410,780	411,346	-221,536	Manganese and compounds (transfers of metals)
37	5	5,308,851	43,538	5,352,389	5	5,132,439	56,236	5,188,675	-214,113	Manganese and compounds (land, air, water)
38	2	7,875	231,238	239,113	1	113	34,590	34,703	-211,683	Zinc and compounds (transfers of metals)
39	6	337,532	6,167	343,699	6	277,605	5,384	282,989	-208,375	Zinc/Lead and compounds (land)
40	4	1,620	67,007	68,627	4	1,300	49,559	50,859	-198,940	Zinc and compounds (transfers of metals)
41	9	2,588,613	795	2,589,408	9	2,172,640	790	2,173,430	-198,916	Zinc and compounds (land)
42	3	27,005	2,022	29,027	3	20,420	572	20,992	-198,224	Zinc/Manganese and compounds (land)
43	1	13,349	61,061	74,410	1	7,314	66,516	73,830	-190,326	Chromium and compounds (transfers of metals)
44	6	2,261	1,220,971	1,223,232	6	1,347	703,568	704,915	-187,134	Lead/Zinc and compounds (transfers of metals)
45	5	5,394	85,232	90,626	5	6,193	80,866	87,059	-178,568	Aluminum (transfers of metals)
46	6	150,202	28,394	178,596	6	81,153	15,907	97,060	-169,753	Chromium/Nickel and compounds (land)
47	1	236,125	0	236,125	2	108,033	0	108,033	-168,713	Zinc and compounds (air, land)
48	2	175	84,173	84,348	**	**	**	**	-168,687	Zinc and compounds (transfers of metals)
49	3	642	30,660	31,302	3	121	35,374	35,495	-168,526	Lead and compounds (transfers of metals)
50	6	3,570	1,932,099	1,935,669	6	2,784	1,620,869	1,623,653	-160,881	Zinc and compounds, Aluminum (transfers of metals)
222		66,520,699	35,482,799	102,003,498	218	52,747,210	30,938,346	83,685,556	-36,218,770	

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

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

Table 5-58		The 50 TRI Facilities with Largest Increase in Total Releases and Transfers of Metals and Their Compounds, 1995-1997					
M	1997						
Rank	Facility	City, State	US SIC Code	Number of Forms	1995		Total Releases and Transfers (kg)
					Total Releases (kg)	Total Transfers (kg)	
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	8	2,674,512	170,044	2,844,556
2	Nucor-Yamato Steel Co., Nucor Corp.	Blytheville, AR	33	6	19,837	37,750	57,587
3	Steel Dynamics Inc.	Butler, IN	33	1	956	5,161	6,117
4	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	9	2,954,636	50,085	3,004,721
5	DuPont	Pass Christian, MS	28	*	*	*	*
6	Nucor Steel	Plymouth, UT	33	6	16,235	164,581	180,816
7	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1	4,265,578	40,867	4,306,445
8	DuPont	New Johnsonville, TN	28	*	*	*	*
9	Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville, AR	33	7	11,998	8	12,006
10	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	9	204,604	8,982	213,586
11	Timken Co., Faircrest Steel Plant	Canton, OH	33	7	5,445	22,879	28,324
12	Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville, GA	33	5	11,462	0	11,462
13	Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais, IL	33	5	2,252	0	2,252
14	Ameristeel Corp., Jacksonville Mill Div.	Baldwin, FL	33	6	8,663	0	8,663
15	USS Mon Valley Works, USX Corp.	Braddock, PA	33	4	6,860	1,018,552	1,025,412
16	ASARCO Inc., Glover Plant	Annapolis, MO	33	6	2,959,545	0	2,959,545
17	Bar Techs. Inc.	Johnstown, PA	33	*	*	*	*
18	Birmingham Steel Corp., Washington Steel Div.	Seattle, WA	33	5	1,806	0	1,806
19	American Microtrace Corp., Tetra Techs. Inc.	Fairbury, NE	28	5	37,507	18,141	55,648
20	Ameristeel Corp.	Charlotte, NC	33	6	20,076	0	20,076
21	Southwire Co.	Carrollton, GA	Mult.	17	41,430	349,765	391,195
22	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	11	7,015,825	0	7,015,825
23	Austeel Lemont Co. Inc.	Lemont, IL	33	4	24,748	0	24,748
24	Timken Co., Harrison Steel Plant	Canton, OH	33	7	12,546	27,152	39,698
25	Roanoke Electric Steel Corp.	Roanoke, VA	33	7	1,865	0	1,865
26	Koppel Steel Corp., NS Group Inc.	Koppel, PA	33	3	665	140,624	141,289
27	Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa, AL	33	7	0	0	0
28	New Haven Fndy., Wesley Ind. Inc.	New Haven, MI	33	*	*	*	*
29	Acme Steel Co., Acme Metals Inc.	Riverdale, IL	Mult.	7	13,060	308,132	321,192
30	Millennium Inorganic Chemicals, Plant 1, Millennium Chemicals	Ashtabula, OH	28	*	*	*	*
31	Auburn Steel Co. Inc.	Auburn, NY	33	4	4,189	20	4,209
32	Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville, OR	33	5	1,969	0	1,969
33	Rouge Steel Co., Rouge Ind. Inc.	Dearborn, MI	33	7	26,224	5,071,785	5,098,009
34	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22	*	*	*	*
35	P4 Production L.L.C.	Soda Springs, ID	Mult.	*	*	*	*
36	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1	3,313,374	1,723	3,315,097
37	C & D Techs. Inc.	Conyers, GA	36	1	458	116	574
38	Ameristeel Corp., WTN Steel Mill	Jackson, TN	33	7	24,159	0	24,159
39	Nucor Steel, Nucor Corp.	Huger, SC	33	*	*	*	*
40	Nucor Steel, Nucor Corp.	Darlington, SC	33	9	37,934	18,948	56,882
41	Ipsco Steel Inc., Ipsco Ents. Inc.	Muscatine, IA	33	*	*	*	*
42	Prestolite Wire Corp.	Paragould, AR	Mult.	4	2	3,514	3,516
43	Mueller Co., Plant #4, Tyco Intl. (US) Inc.	Decatur, IL	33	2	19,091	684	19,775
44	Green River Steel Corp., All Acquisition Corp.	Owensboro, KY	33	4	10,859	702	11,561
45	Algonquin Ind. Inc., Rea Magnet Wire Co.	Guilford, CT	33	1	0	5	5
46	ZTT Minerals Inc., Babcock Intl.	Caldwell, TX	33	3	462	87,646	88,108
47	Armco Inc.	Dover, OH	33	*	*	*	*
48	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1	547,715	0	547,715
49	Frog Switch & Mfg. Co.	Carlisle, PA	33	2	122	44,872	44,994
50	Lacks Ind. Inc., Airlane Plant, Lacks Ents. Inc.	Kentwood, MI	Mult.	3	237	43,751	43,988
Total				213	24,298,906	7,636,489	31,935,395

► 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 metals that year.

Rank	1996			1997			Change 95-97		Major Chemicals Reported with Increases (Primary Media/Transfers with Increases)**	
	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Number of Forms	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)		
1	8	4,188,084	347,302	4,535,386	8	10,976,578	192,057	11,168,635	8,324,079	Copper/Lead/Arsenic and compounds (land)
2	6	13,061	2,097,304	2,110,365	7	7,224	7,543,045	7,550,269	7,492,682	Zinc and compounds (transfers of metals)
3	3	2,327	1,982,278	1,984,605	6	6,612	6,529,560	6,536,172	6,530,055	Zinc and compounds (transfers of metals)
4	11	2,730,167	45,386	2,775,553	11	6,598,692	294,304	6,892,996	3,888,275	Zinc and compounds (land)
5	*	*	*	*	6	3,809,524	0	3,809,524	3,809,524	Manganese and compounds (UIJ)
6	7	10,225	1,893,349	1,903,574	5	6,682	3,922,477	3,929,159	3,748,343	Zinc and compounds (transfers of metals)
7	1	5,126,893	27,279	5,154,172	1	6,578,095	1,434,288	8,012,383	3,705,938	Chromium and compounds (land, transfers of metals)
8	*	*	*	*	5	3,516,553	0	3,516,553	3,516,553	Manganese and compounds (UIJ)
9	7	10,147	10	10,157	7	10,983	2,957,542	2,968,525	2,956,519	Zinc and compounds (transfers of metals)
10	5	2,562,032	817	2,562,849	11	2,889,134	36	2,889,170	2,675,584	Copper and compounds (air)
11	7	5,722	703,221	708,943	6	5,379	2,486,113	2,491,492	2,463,168	Zinc and compounds (transfers of metals)
12	5	9,661	0	9,661	5	12,563	2,388,657	2,401,220	2,389,758	Zinc and compounds (transfers of metals)
13	4	3,498	0	3,498	5	4,231	2,384,320	2,388,551	2,386,299	Zinc and compounds (transfers of metals)
14	6	8,662	3,512,206	3,520,868	6	5,185	2,175,039	2,180,224	2,171,561	Zinc and compounds (transfers of metals)
15	5	5,703	3,260,882	3,266,585	5	2,014	3,090,268	3,092,282	2,066,870	Zinc and compounds (transfers of metals)
16	6	4,030,227	0	4,030,227	7	4,921,195	0	4,921,195	1,961,650	Zinc/Lead and compounds (land)
17	4	1,141	376,191	377,332	5	4,819	1,925,941	1,930,760	1,930,760	Zinc and compounds (transfers of metals)
18	5	16,395	0	16,395	5	10,815	1,758,623	1,769,438	1,767,632	Zinc and compounds (transfers of metals)
19	5	16,501	0	16,501	5	32,012	1,723,356	1,755,368	1,699,720	Lead and compounds (transfers of metals)
20	6	19,636	1,430,806	1,450,442	6	20,292	1,680,432	1,700,724	1,680,648	Zinc and compounds (transfers of metals)
21	27	16,537	1,180,378	1,196,915	29	14,538	1,917,884	1,932,422	1,541,227	Zinc and compounds (transfers of metals)
22	11	11,478,460	0	11,478,460	11	8,522,088	0	8,522,088	1,506,263	Copper and compounds (land)
23	5	668,314	161,166	829,480	5	778,886	562,110	1,340,996	1,316,248	Zinc and compounds (land, transfers of metals)
24	7	14,237	521,606	535,843	7	2,716	1,310,549	1,313,265	1,273,567	Zinc and compounds (transfers of metals)
25	7	1,833	203,898	205,731	7	2,559	1,233,769	1,236,328	1,234,463	Zinc and compounds (transfers of metals)
26	5	4,530	1,047,587	1,052,117	5	3,979	1,332,607	1,336,586	1,195,297	Zinc and compounds (transfers of metals)
27	12	5	60,237	60,242	12	1,478	1,192,598	1,194,076	1,194,076	Zinc and compounds (transfers of metals)
28	6	36,671	12,254	48,925	6	28,983	1,158,730	1,187,713	1,187,713	Manganese/Copper/Lead/Arsenic and compounds (transfers of metals)
29	7	10,547	390,943	401,490	6	17,324	1,487,000	1,504,324	1,183,132	Zinc and compounds (transfers of metals)
30	1	81,633	816,327	897,960	1	90,703	997,732	1,088,435	1,088,435	Manganese and compounds (transfers of metals)
31	4	2,222	296,171	298,393	4	2,277	1,066,656	1,068,933	1,064,724	Zinc and compounds (transfers of metals)
32	5	1,202	400,290	401,492	5	3,056	1,060,770	1,063,826	1,061,857	Zinc and compounds (transfers of metals)
33	7	25,985	5,933,560	5,959,545	7	35,467	6,086,892	6,122,359	1,024,350	Zinc/Manganese and compounds (transfers of metals)
34	*	*	*	*	7	969,901	0	969,901	969,901	Zinc and compounds (air)
35	*	*	*	*	4	941,741	0	941,741	941,741	Zinc and compounds (land)
36	1	4,084,751	4,535	4,089,286	1	4,129,841	6,349	4,136,190	821,093	Chromium and compounds (land)
37	1	535	431,778	432,313	1	793	810,519	811,312	810,738	Lead and compounds (transfers of metals)
38	7	12,638	1,601,937	1,614,575	7	22,906	780,190	803,096	778,937	Zinc and compounds (transfers of metals)
39	3	133	103,514	103,647	4	1,204	757,234	758,438	758,438	Zinc and compounds (transfers of metals)
40	7	51,913	1,645,527	1,697,440	6	49,265	753,082	802,347	745,465	Zinc and compounds (transfers of metals)
41	*	*	*	*	6	1,452	710,884	712,336	712,336	Zinc and compounds (transfers of metals)
42	4	115	226	341	4	117	680,693	680,810	677,294	Copper and compounds (transfers of metals)
43	2	20,965	4	20,969	4	33,579	640,804	674,383	654,608	Zinc/Copper and compounds (transfers of metals)
44	4	6,438	570	7,008	4	5,219	651,538	656,757	645,196	Manganese and compounds (transfers of metals)
45	1	0	2	2	1	0	642,234	642,234	642,229	Copper and compounds (transfers of metals)
46	3	1,915	68,950	70,865	3	1,916	722,948	724,864	636,756	Zinc/Lead and compounds (transfers of metals)
47	*	*	*	*	2	588	600,888	601,476	601,476	Zinc and compounds (transfers of metals)
48	1	922,590	0	922,590	1	1,097,645	0	1,097,645	549,930	Nickel and compounds (land)
49	2	124	760,620	760,744	2	96	583,890	583,986	538,992	Manganese and compounds (transfers of metals)
50	3	237	38,707	38,944	3	237	574,226	574,463	530,475	Copper/Nickel and compounds (transfers of metals)
244		36,204,612	31,357,818	67,562,430	287	56,179,136	70,808,834	126,987,970	95,052,575	

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

► UIJ = underground injection

5.3.5 Changes in Releases and Transfers by Industry

Releases and Transfers, 1995–1997

Among the three industries reporting the largest amounts, the primary metals industry reported substantial increases in releases and transfers from 1995 to 1997—up more than 25 percent—in both NPRI and TRI. (Chapter 7 more closely reviews this sector, its activities, and its releases and transfers.) In contrast, both the chemical manufacturing and paper products sectors reported decreases. Canadian paper products facilities reported the largest percentage reduction in this group, with releases and transfers down one-third from 1995 to 1997. (*Taking Stock 1995* more closely examined the pulp and paper industry and its reporting and identified factors expected to contribute to such reductions.) All other industries in the matched data set, taken together, reported increases in NPRI and decreases in TRI from 1995 to 1997 (Figure 5–29).

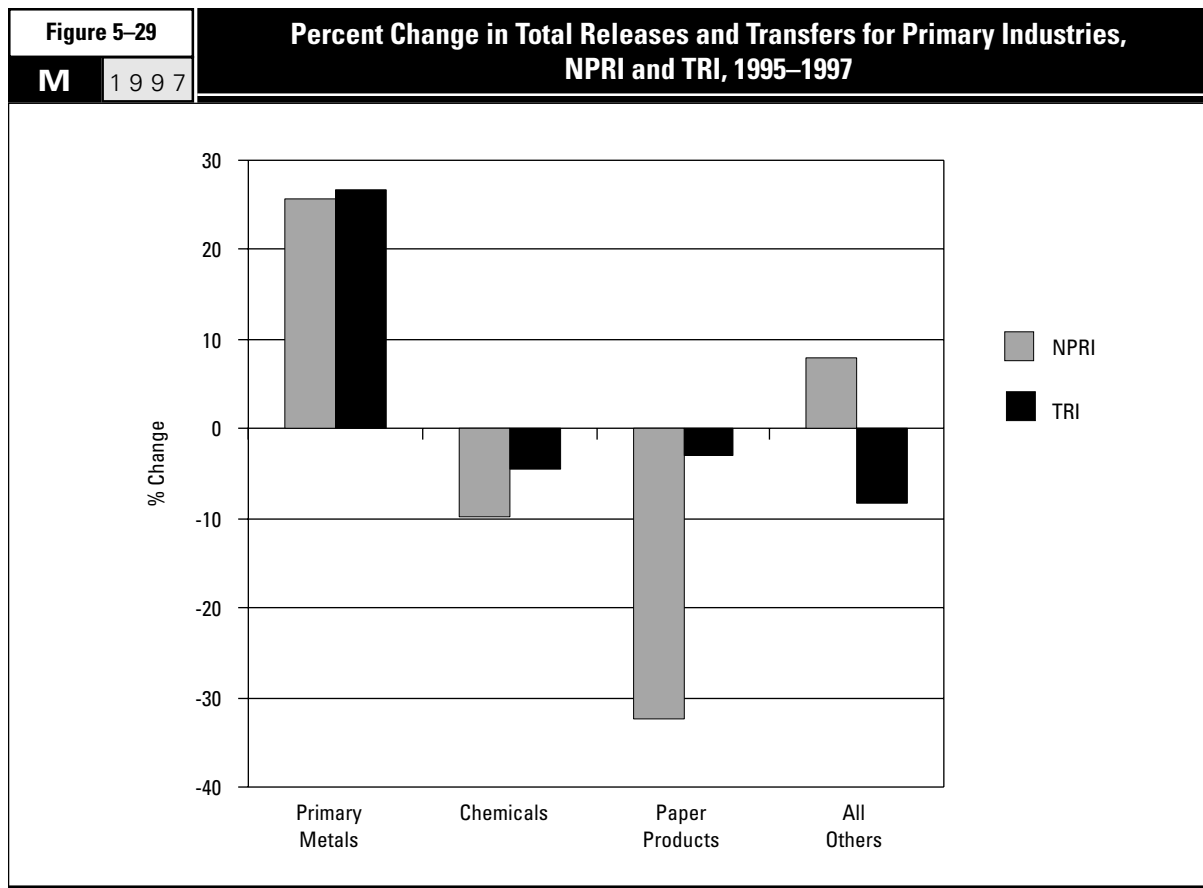


Table 5-59

Change in NPRI Total Releases and Transfers by Industry (US SIC Code), 1995-1997

M 1997

US SIC Code	Industry	Total Releases and Transfers			Change 1995-1997	
		1995 (kg)	1996 (kg)	1997 (kg)	kg	%
20	Food Products	439,137	739,665	1,256,231	817,094	186.1
22	Textile Mill Products	926,200	539,126	309,952	-616,248	-66.5
23	Apparel and Other Textile Products	860	740	280	-580	-67.4
24	Lumber and Wood Products	1,276,303	1,791,209	2,426,501	1,150,198	90.1
25	Furniture and Fixtures	494,600	484,581	926,665	432,065	87.4
26	Paper Products	28,238,014	19,867,741	19,117,069	-9,120,945	-32.3
27	Printing and Publishing	867,577	836,970	1,762,223	894,646	103.1
28	Chemicals	34,105,213	33,003,955	30,793,673	-3,311,540	-9.7
29	Petroleum and Coal Products	5,302,865	5,224,649	5,792,793	489,928	9.2
30	Rubber and Plastics Products	7,448,810	7,075,329	6,872,359	-576,451	-7.7
31	Leather Products	23,888	13,500	30,707	6,819	28.5
32	Stone/Clay/Glass Products	1,447,512	1,161,140	961,563	-485,949	-33.6
33	Primary Metals	37,337,705	40,930,129	46,944,803	9,607,098	25.7
34	Fabricated Metals Products	3,346,060	3,800,040	3,790,403	444,343	13.3
35	Industrial Machinery	589,699	593,504	717,656	127,957	21.7
36	Electronic/Electrical Equipment	634,095	456,474	356,239	-277,856	-43.8
37	Transportation Equipment	7,553,220	7,429,389	7,026,852	-526,368	-7.0
38	Measurement/Photographic Instruments	1,501	55	250	-1,251	-83.3
39	Misc. Manufacturing Industries	335,553	740,634	870,966	535,413	159.6
	Total	130,368,812	124,688,830	129,957,185	-411,627	-0.3

NPRI's primary metals industry (US SIC code 33) increased releases and transfers from 37.3 million kg in 1995 to 46.9 million kg in 1997. This increase of 9.6 million kg was more than eight times the second-largest increase, 1.2 million kg, reported by the lumber and wood products industry (US SIC code 24). The lumber and wood products industry's releases and

transfers increased from 1.3 million kg to 2.4 million kg. Releases and transfers more than doubled in three NPRI industries: food products (US SIC code 20, 186 percent increase), miscellaneous manufacturing (US SIC code 39, 160 percent) and printing and publishing (US SIC code 27, 103 percent—see Table 5-59).

In NPRI, the paper products industry (US SIC code 26) reported 28.2 million kg in 1995 and 19.1 million kg in 1997, a reduction of 9.1 million kg. The chemical manufacturing industry (US SIC code 28) reported NPRI's second-largest reduction, from 34.1 million kg to 30.8 million kg, or 3.3 million kg. Three industries reported reducing

releases and transfers by half or more: measurement/photographic instruments (US SIC code 38, 83 percent reduction), apparel (US SIC code 23, 67 percent) and textiles (US SIC code 22, 67 percent). These were among industries with the smallest NPRI totals in 1997.

Table 5-60		Change in TRI Total Releases and Transfers by Industry (US SIC Code), 1995-1997				
M	1997	Total Releases and Transfers			Change 1995-1997	
US SIC Code	Industry	1995 (kg)	1996 (kg)	1997 (kg)	kg	%
20	Food Products	20,626,121	19,430,614	22,080,648	1,454,527	7.1
21	Tobacco Products	469,578	635,028	663,597	194,019	41.3
22	Textile Mill Products	8,117,852	7,795,008	8,936,589	818,737	10.1
23	Apparel and Other Textile Products	483,148	429,648	319,302	-163,846	-33.9
24	Lumber and Wood Products	14,140,894	12,586,057	11,117,049	-3,023,845	-21.4
25	Furniture and Fixtures	18,340,376	15,855,608	11,015,678	-7,324,698	-39.9
26	Paper Products	123,669,957	118,757,016	120,069,699	-3,600,258	-2.9
27	Printing and Publishing	13,687,483	11,944,646	10,867,867	-2,819,616	-20.6
28	Chemicals	399,414,120	372,115,239	381,879,267	-17,534,853	-4.4
29	Petroleum and Coal Products	24,762,762	27,293,027	27,739,857	2,977,095	12.0
30	Rubber and Plastics Products	50,111,101	48,389,574	45,413,162	-4,697,939	-9.4
31	Leather Products	1,564,638	1,394,534	1,386,833	-177,805	-11.4
32	Stone/Clay/Glass Products	12,531,918	15,343,203	15,422,577	2,890,659	23.1
33	Primary Metals	251,596,049	276,762,519	318,726,448	67,130,399	26.7
34	Fabricated Metals Products	37,984,043	36,933,612	38,225,158	241,115	0.6
35	Industrial Machinery	11,007,654	9,912,474	9,676,568	-1,331,086	-12.1
36	Electronic/Electrical Equipment	19,462,835	17,987,020	18,343,162	-1,119,673	-5.8
37	Transportation Equipment	49,701,036	44,476,925	44,605,737	-5,095,299	-10.3
38	Measurement/Photographic Instruments	8,282,055	7,229,158	6,283,345	-1,998,710	-24.1
39	Misc. Manufacturing Industries	6,292,434	4,742,902	4,680,274	-1,612,160	-25.6
	Multiple Codes 20-39*	73,542,902	57,317,706	63,889,130	-9,653,772	-13.1
	Total	1,145,788,956	1,107,331,518	1,161,341,947	15,552,991	1.4

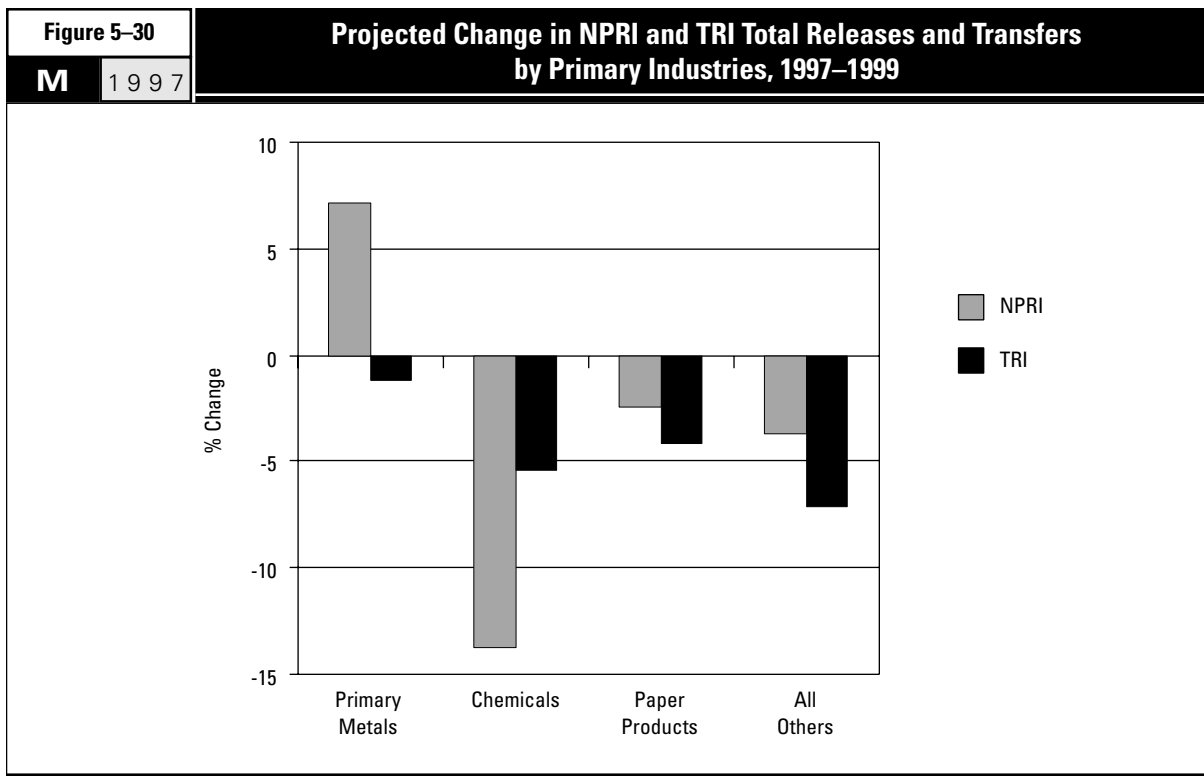
In TRI, the primary metals industry (US SIC code 33) released and transferred 251.6 million kg in 1995 and 318.7 million kg in 1997, an increase of 67.1 million kg. In comparison, the second-largest increase was 3.0 million kg, reported by the petroleum refining industry (US SIC code 29, up from 24.8 million kg to 27.7 million kg). The stone/clay/glass products industry also increased by 2.9 million kg (US SIC code 32, up from 12.5 million kg to

15.4 million kg). The largest percentage increase (41 percent) was reported by the tobacco products industry (US SIC code 21), although this industry reported small totals in comparison to other industries. The increase of 27 percent by the primary metals industry was the second highest in percentage terms (Table 5-60).

The chemical manufacturing industry (US SIC code 28) reported TRI's largest reduction, a 17.5-million-kg

decrease from 399.4 million kg in 1995 to 381.9 million kg in 1997. The "multiple codes" group, which consists of forms from facilities reporting more than one SIC code to describe their operations, ranked second among TRI industries for reductions. This group reported 73.5 million kg in 1995 and 63.9 million kg in 1997, a decrease of 9.7 million kg. (Canadian facilities report only one SIC code, so NPRI does not contain a similar group.) As in

NPRI, industries making the largest percentage reductions (furniture, US SIC code 25, a 40 percent decrease; apparel, US SIC code 23, 34 percent; and miscellaneous manufacturing, US SIC code 39, 26 percent) were not among the largest sources of releases and transfers.



Actual and Projected Changes, 1995-1999

The three industries with the largest releases and transfers projected improved performance through 1999, compared to their 1995-1997 record. The primary metals industry projected an increase in NPRI and a reduction (quite small in percentage terms) in TRI. The chemical manufacturing industry and the paper products industry expected to make continued reductions in both NPRI and TRI—of these, only the Canadian paper industry projected a smaller reduction (two percent) for 1995-1997 than the large reduction (32 percent) achieved in recent years. Taken together, all other industries also projected a decrease (**Figure 5-30**).

Table 5-61		NPRI Actual and Projected Total Releases and Transfers, by Industry, 1995-1999						
M	1997							
US SIC Code	Industry	Total Releases and Transfers			Actual Change 1995-1997 (kg)	Projected Change 1997-1999 (kg)	Actual % Change 1995-1997	Projected % Change 1997-1999
		Actual 1995 (kg)	Actual 1997 (kg)	Projected 1999 (kg)				
20	Food Products	439,137	1,256,231	1,021,704	817,094	-234,527	186.1	-18.7
22	Textile Mill Products	926,200	309,952	333,597	-616,248	23,645	-66.5	7.6
23	Apparel and Other Textile Products	860	280	1,400	-580	1,120	-67.4	400.0
24	Lumber and Wood Products	1,276,303	2,426,501	2,500,380	1,150,198	73,879	90.1	3.0
25	Furniture and Fixtures	494,600	926,665	1,021,069	432,065	94,404	87.4	10.2
26	Paper Products	28,238,014	19,117,069	18,661,413	-9,120,945	-455,656	-32.3	-2.4
27	Printing and Publishing	867,577	1,762,223	1,734,213	894,646	-28,010	103.1	-1.6
28	Chemicals	34,105,213	30,793,673	26,582,968	-3,311,540	-4,210,705	-9.7	-13.7
29	Petroleum and Coal Products	5,302,865	5,792,793	5,140,597	489,928	-652,196	9.2	-11.3
30	Rubber and Plastics Products	7,448,810	6,872,359	6,370,121	-576,451	-502,238	-7.7	-7.3
31	Leather Products	23,888	30,707	29,500	6,819	-1,207	28.5	-3.9
32	Stone/Clay/Glass Products	1,447,512	961,563	913,385	-485,949	-48,178	-33.6	-5.0
33	Primary Metals	37,337,705	46,944,803	50,267,007	9,607,098	3,322,204	25.7	7.1
34	Fabricated Metals Products	3,346,060	3,790,403	4,088,191	444,343	297,788	13.3	7.9
35	Industrial Machinery	589,699	717,656	647,655	127,957	-70,001	21.7	-9.8
36	Electronic/Electrical Equipment	634,095	356,239	478,533	-277,856	122,294	-43.8	34.3
37	Transportation Equipment	7,553,220	7,026,852	6,904,337	-526,368	-122,515	-7.0	-1.7
38	Measurement/Photographic Instruments	1,501	250	250	-1,251	0	-83.3	0.0
39	Misc. Manufacturing Industries	335,553	870,966	702,779	535,413	-168,187	159.6	-19.3
	Total	130,368,812	129,957,185	127,399,099	-411,627	-2,558,086	-0.3	-2.0

► 1995 data from 1995 reporting forms; 1997 and 1999 data from 1997 reporting forms.

Seven industries projected increasing the releases and transfers they report to NPRI through 1999. The primary metals industry (US SIC code 33), with the largest actual increase from 1995 to 1997, also projected the largest increase from 1997 to 1999. Primary metals producers projected an increase of 3.3 million kg for 1997-1999, in comparison to a 9.6-million-kg increase from 1995 to 1997. This would mean a seven percent projected increase compared to a 26 percent actual increase since 1995 (Table 5-61).

In chemical manufacturing (US SIC code 28), NPRI releases and transfers were expected to decline another 4.2 million kg through 1999, a 14 percent projected reduction. From 1995 to 1997, the chemical manufacturing industry's total amounts decreased by 3.3 million kg, or 10 percent. No other industry projected an increase or decrease of more than one million kg from 1997 to 1999. After a 9.1-million kg reduction in releases and transfers from 1995 to 1997, the paper products industry (US SIC code 26) expected a

further reduction of 455,656 kg from 1997 to 1999. Paper products facilities reported a 32 percent actual reduction for 1995-1997 and a two percent projected reduction for 1997-1999.

Industries projecting the largest percentage reductions in NPRI were miscellaneous manufacturing (US SIC code 39) and food products (US SIC code 20). Both expected a reduction of 19 percent through 1999, despite increases of more than 150 percent since 1995. The apparel industry (US SIC code 23) expected its releases and

transfers to increase 400 percent from 1997 to 1999, the largest percentage increase. However, releases and transfers by this industry are among the smallest in NPRI. The electronics and electrical equipment industry (US SIC code 36) projected an increase of 34 percent, the second largest relative increase in the projections and a reversal of the industry's record for 1995 to 1997 (a 44 percent reduction).

All but one industry in TRI projected reductions in releases and transfers. The exception was a 0.4 percent

Table 5-62

TRI Actual and Projected Total Releases and Transfers, by Industry, 1995-1999

M 1997

US SIC Code	Industry	Total Releases and Transfers			Actual Change 1995-1997 (kg)	Projected Change 1997-1999 (kg)	Actual % Change 1995-1997	Projected % Change 1997-1999
		Actual 1995 (kg)	Actual 1997 (kg)	Projected 1999 (kg)				
20	Food Products	20,669,945	21,811,878	21,067,678	1,141,933	-744,200	5.5	-3.4
21	Tobacco Products	469,577	663,521	654,521	193,944	-9,000	41.3	-1.4
22	Textile Mill Products	8,060,206	8,806,334	6,455,930	746,128	-2,350,404	9.3	-26.7
23	Apparel and Other Textile Products	480,542	296,438	195,896	-184,104	-100,542	-38.3	-33.9
24	Lumber and Wood Products	13,526,724	11,165,594	10,430,942	-2,361,130	-734,652	-17.5	-6.6
25	Furniture and Fixtures	17,878,641	10,782,760	10,135,764	-7,095,881	-646,996	-39.7	-6.0
26	Paper Products	123,430,649	119,577,001	114,614,408	-3,853,648	-4,962,593	-3.1	-4.2
27	Printing and Publishing	12,649,809	9,996,368	8,974,139	-2,653,441	-1,022,229	-21.0	-10.2
28	Chemicals	399,588,309	378,830,391	358,183,719	-20,757,918	-20,646,672	-5.2	-5.5
29	Petroleum and Coal Products	24,952,332	27,314,363	23,216,170	2,362,031	-4,098,193	9.5	-15.0
30	Rubber and Plastics Products	49,465,989	44,818,250	43,179,491	-4,647,739	-1,638,759	-9.4	-3.7
31	Leather Products	1,534,227	1,430,113	1,370,070	-104,114	-60,043	-6.8	-4.2
32	Stone/Clay/Glass Products	12,575,334	14,272,266	12,665,275	1,696,932	-1,606,991	13.5	-11.3
33	Primary Metals	241,332,963	290,929,593	287,356,314	49,596,630	-3,573,279	20.6	-1.2
34	Fabricated Metals Products	38,613,088	33,259,163	29,654,256	-5,353,925	-3,604,907	-13.9	-10.8
35	Industrial Machinery	10,497,197	9,229,872	9,270,587	-1,267,325	40,715	-12.1	0.4
36	Electronic/Electrical Equipment	19,343,480	17,190,837	16,513,065	-2,152,643	-677,772	-11.1	-3.9
37	Transportation Equipment	49,000,295	44,529,471	41,216,035	-4,470,824	-3,313,436	-9.1	-7.4
38	Measurement/Photographic Instruments	8,330,260	6,251,374	5,528,591	-2,078,886	-722,783	-25.0	-11.6
39	Misc. Manufacturing Industries	6,539,453	4,710,827	4,594,857	-1,828,626	-115,970	-28.0	-2.5
	Multiple Codes 20-39	72,789,068	62,243,574	60,336,003	-10,545,494	-1,907,571	-14.5	-3.1
	Total	1,131,728,088	1,118,109,988	1,065,613,711	-13,618,100	-52,496,277	-1.2	-4.7

► Data from Sections 8.1 plus 8.7 on TRI Form R; 1995 data from 1995 reporting forms; 1997 and 1999 data from 1997 reporting forms.

increase (40,715 kg) projected by the industrial machinery sector (US SIC code 35), after a 12 percent reduction (1.3 million kg) since 1995. The chemical manufacturing industry (US SIC code 28) expected to make about the same reduction (projected decrease of 20.6 million kg, or 5.5 percent) as reported over the previous two years (actual decrease of 20.8 million kg, or 5.2 percent). The paper products industry (US SIC code 26) reported a reduction of 3.9 million kg (three percent)

from 1995 to 1997 and projected a reduction of 5.0 million kg (four percent) by 1999. The third-largest reduction expected was 4.1 million kg by the petroleum and coal products industry (US SIC code 29). This industry reported a 2.4 million kg increase from 1995 to 1997. The petroleum industry's projected 15 percent reduction compares to an actual 10 percent increase for 1995 to 1997 (Table 5-62).

Two industries with relatively small reported releases and transfers pro-

jected the largest percentage reductions. The apparel industry (US SIC code 23) expected reductions of 34 percent for 1997 to 1999, continuing the reductions of 38 percent achieved from 1995 to 1997. The textile mill products industry (US SIC code 22) expected reductions of 27 percent to more than reverse the increase of nine percent reported from 1995 to 1997.

Chapter 6: Special Analyses

M

All tables and figures in Chapter 6 are from the 1997 Matched Data Set

	Key Findings	381				
6.1	Introduction	381		6.3	Facilities Reporting Releases and Transfers less than 100,000 kg in 1995	388
				6.3.1	Releases and Transfers, 1995–1997	388
6.2	Parent Company Reporting	382		6.3.2	Industry Reporting, 1995–1997	395
6.2.1	On-site Releases	383		6.3.3	Actual and Projected Total Releases and Transfers, 1995–1999	400
6.2.2	Off-site Transfers	384				
6.2.3	Total Releases and Transfers	386		6.4	Pollution Prevention Reporting	401
				6.4.1	1997 Pollution Prevention/Source Reduction Reporting	403
				6.4.2	Pollution Prevention Reporting and Actual and Projected Changes in Total Releases and Transfers, 1995–1999	405

M

All tables and figures in Chapter 6 are from the 1997 Matched Data Set

Figures			
6-1	Percent Change in Total Releases and Transfers by NPRI and TRI Facilities Reporting less than 100,000 kg in 1995 Compared to that of Facilities Reporting 100,000 kg or more, 1995-1997	391	
6-2	Distribution of Releases and Transfers in 1997 by NPRI and TRI Facilities Reporting less than 100,000 kg in 1995 Compared to that of Facilities Reporting 100,000 kg or more	393	
6-3	Distribution by Industry of Total Releases and Transfers in 1997 by NPRI and TRI Facilities Reporting less than 100,000 kg in 1995 Compared to that of Facilities Reporting 100,000 kg or more	395	
6-4	Percent Change in NPRI and TRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to that of Facilities Reporting 100,000 kg or more in 1995, Actual and Projected, 1995-1999	400	
6-5	Comparison of Change in NPRI Total Releases and Transfers for Forms with and without Pollution Prevention Activity Reporting, 1995-1999 (Projected)	406	
6-6	Comparison of Change in TRI Total Releases and Transfers for Forms with and without Pollution Prevention Activity Reporting, 1995-1999 (Projected)	407	
Tables			
6-1	The 10 Parent Companies with the Largest NPRI Total On-site Releases, 1997	382	
6-2	The 10 Parent Companies with the Largest TRI Total On-site Releases, 1997	382	
6-3	The 10 Parent Companies with the Largest NPRI Total Off-site Transfers, 1997	384	
6-4	The 10 Parent Companies with the Largest TRI Total Off-site Transfers, 1997	384	
6-5	The 10 Parent Companies with the Largest NPRI Total Releases and Transfers, 1997	386	
6-6	The 10 Parent Companies with the Largest TRI Total Releases and Transfers, 1997	386	
6-7	NPRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997		389
6-8	TRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997		390
6-9	NPRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997		392
6-10	TRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997		394
6-11	NPRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, by Industry, 1995-1997		396
6-12	TRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, by Industry, 1995-1997		398
6-13	NPRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1999 (Projected)		400
6-14	TRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1999 (Projected)		401
6-15	NPRI Pollution Prevention Activities and TRI Source Reduction Activities		402
6-16	NPRI Facilities and Forms Reporting Pollution Prevention Activity, by Category, 1997		403
6-17	TRI Facilities and Forms Reporting Pollution Prevention Activity, by Category, 1997		404
6-18	Comparisons of NPRI Total Releases and Transfers for Forms with and without Pollution Prevention Activity Reporting, 1995-1999 (Projected)		406
6-19	Comparisons of TRI Total Releases and Transfers for Forms with and without Pollution Prevention Activity Reporting, 1995-1999 (Projected)		407

■ Key Findings

- The 10 parent companies (companies that owned reporting facilities) with the largest total releases and transfers accounted for one-third of NPRI releases and transfers in 1997. In TRI, the 10 parent companies with the largest amounts accounted for one-fifth of the total. For most of these companies, a single release or transfer type dominated the company's reporting.
- While overall PRTR releases and transfers are dominated by a few facilities reporting the largest amounts, most facilities in both NPRI and TRI report total releases and transfers of less than 100,000 kg. In 1995, 84 percent of NPRI facilities and 92 percent in TRI reported total releases and transfers of less than 100,000 kg. Excluding facilities that did not report in 1997, total releases and transfers from facilities reporting less than 100,000 kg in 1995 increased by 38 percent in NPRI and four percent in TRI from 1995 to 1997.
- Almost 75 percent of NPRI facilities indicated that they engaged in pollution prevention/source reduction activities in 1997. The overall reduction in NPRI total releases and transfers from 1995 to 1997 reflects decreases associated with reporting of source reduction activities. In TRI, almost 40 percent of facilities indicated pollution prevention/source reduction activities were undertaken in 1997. These facilities also had the largest percentage reduction in releases and transfers. Whether the difference in reporting pollution prevention/source reduction activities between NPRI and TRI is significant depends in part on whether NPRI facilities—for which 1997 was the first year that reporting on pollution prevention activities was mandatory—are reporting ongoing activities initiated in previous years in addition to newly implemented measures.

6.1 Introduction

This chapter examines some of the data common to both Canadian and US PRTRs that can be refined for further analysis. In **6.2**, releases and transfers are aggregated by the parent companies owning the facilities in the individual PRTRs. In **6.3**, reporting by facilities with releases and transfers of less than 100,000 kg is investigated (this provides a point of comparison with previous chapters, where the facilities reporting the largest releases and transfers were seen to dominate the totals in each country's PRTR.) The final section (**6.4**) examines the reporting on pollution prevention activities at the facilities. This type of reporting is mandatory for the first time in NPRI for the 1997 reporting year. Only US and Canadian facilities in the matched data set are included in the analyses in this chapter. Mexican data for 1997 are not available.

6.2 Parent Company Reporting

Both NPRI and TRI require facilities to identify their parent company. NPRI defines a parent company as the highest-level company or group of companies that directly controls the facility. NPRI collects the parent company name and address (which may be outside Canada). More than one parent company can be listed, if necessary, along with the percentage of ownership. TRI defines a parent company as the highest-level US company that directly owns at least 50 percent of the voting stock. TRI collects the parent company name and its Dun and Bradstreet number (an identification number supplied by this corporate information service).

A parent company may have other NPRI or TRI facilities that are not in the matched data set (based on common industries and chemicals in the two PRTRs). A parent company may also have facilities that do not report to NPRI or TRI because they do not meet reporting requirements. Compiling facility reports for a parent company

Table 6-1		The 10 Parent Companies with the Largest NPRI Total On-site Releases, 1997						
M	1997							
Rank	Facility	Number of Facilities	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	Inco Limited	3	21	4,360,123	19,572	0	702,900	5,082,595
2	Celanese Canada Inc.	2	17	331,175	4,780	3,542,000	913	3,878,868
3	Nova Corporation	7	41	2,868,703	480	2,883	0	2,872,116
4	ISPAT Mexicana	4	14	49,245	718	0	2,703,355	2,753,318
5	Avenor Inc.	4	22	1,872,659	2,334	0	2,001	1,876,994
6	General Motors of Canada	9	55	1,835,323	1,034	0	0	1,836,824
7	Grupo Gerdau	1	7	22,992	165	0	1,759,790	1,782,947
8	Agrium	3	22	967,110	160,160	571,060	0	1,698,330
9	Stelco Inc.	11	66	447,542	55,566	0	1,160,035	1,666,341
10	Bayer AG	1	17	1,397,853	22,937	0	0	1,421,799
Subtotal		45	282	14,152,725	267,746	4,115,943	6,328,994	24,870,132
% of Total		3.1	6.1	22.5	6.3	98.1	69.8	30.9
Total		1,430	4,599	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924

Table 6-2		The 10 Parent Companies with the Largest TRI Total On-site Releases, 1997						
M	1997							
Rank	Facility	Number of Facilities	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	Renco Group Inc.	11	40	28,561,139	532	0	3,839,903	32,401,574
2	DuPont	59	592	6,088,873	3,373,703	20,049,900	268,262	29,780,738
3	ASARCO Inc.	9	68	317,430	2,829	81,949	22,263,538	22,665,746
4	Potash Corp. of Saskatchewan Inc.	15	66	722,849	13,899,625	0	6,749,975	21,372,449
5	International Paper Co.	47	312	15,856,464	780,805	13,197	1,239,711	17,890,177
6	Armco Inc.	8	52	222,323	14,456,160	0	0	14,678,483
7	Phelps Dodge Corp.	17	74	1,557,338	4,439	0	12,055,746	13,617,523
8	General Motors Corp.	86	675	7,067,306	115,418	0	6,185,126	13,367,850
9	Solutia Inc.	16	117	735,584	23,775	11,360,300	82,287	12,201,946
10	Georgia-Pacific Corp.	82	359	9,528,040	1,051,040	0	1,067,422	11,646,502
Subtotal		350	2,355	70,657,346	33,708,326	31,505,346	53,751,970	189,622,988
% of Total		1.8	4.0	15.7	35.6	42.2	36.2	24.7
Total		19,125	58,252	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191

Rank	Major Chemicals Reported (Primary Media)*
1	Sulfuric acid (air)
2	Methanol, Methyl ethyl ketone (UIJ)
3	Cyclohexane, Ethylene (air)
4	Zinc and compounds (land)
5	Methanol (air)
6	Xylene, Toluene (air)
7	Zinc and compounds (land)
8	Methanol, Nitric acid and nitrate compounds (air)
9	Manganese/Zinc and compounds (land), Benzene (air)
10	Cyclohexane, Chloromethane (air)

* Chemicals accounting for more than 70% of total releases from the facilities belonging to the parent company.

► UIJ = underground injection

Rank	Major Chemicals Reported (Primary Media)*
1	Chlorine (air)
2	Nitric acid and nitrate compounds, Manganese and compounds, Hydrochloric acid (air)
3	Zinc and compounds (land)
4	Phosphoric acid (water, land)
5	Methanol, Hydrochloric acid (air)
6	Nitric acid and nitrate compounds (water)
7	Zinc/Copper and compounds (land)
8	Zinc/Manganese and compounds (land), Xylene, n-Butyl alcohol (air)
9	Nitric acid and nitrate compounds, Acrylonitrile (UIJ)
10	Methanol, Manganese and compounds, Formaldehyde, Sulfuric acid (air)

* Chemicals accounting for more than 70% of total releases from the facilities belonging to the parent company.

► UIJ = underground injection

requires the direct inspection of names, addresses and identification numbers. Complicating this effort is that company names are not standardized in the databases. For example, facilities belonging to the “Company of North America, Inc.” may identify their parent company by half a dozen or more variations, such as CNA, Inc., Co. of NA, Inc., First Division of CNA, City Branch of CNA, Inc., etc. While facilities may be owned by parent companies headquartered in other countries, only facilities that are located in the particular country report to the country’s PRTR. Thus, this analysis looks at facilities in the US and their ownership separately from facilities in Canada and their ownership.

6.2.1 On-site Releases

In 1997, the 10 parent companies with the largest total releases in NPRI owned 45 reporting facilities. These facilities accounted for 31 percent of all NPRI releases in the matched data set, or 24.9 million kg. Their releases included a substantial majority (70 percent) of

NPRI’s on-site land releases and nearly all (98 percent) of the underground injection (a 6 1, see previous page).

The 10 parent companies with the largest TRI releases owned 350 reporting facilities and their releases represented 25 percent of the TRI total, or 189.6 million kg. They reported more than one-third of TRI’s on-site releases to surface water, underground injection and land (a 6 2, see previous page).

For most of these companies, the great majority of the facilities’ releases were to a single environmental medium. For five companies in NPRI and three in TRI, for example, nearly all of the on-site releases were emitted to air. On-site land releases similarly predominated for three NPRI companies and two in TRI.

A number of parent companies have facilities in both Canada and the United States. Of these, General Motors, with nine Canadian facilities and 86 in the United States, was the only company ranking in the top 10 in both NPRI and TRI for total releases.

6.2.2 Off-site Transfers

In Canada, the 10 parent companies with the largest total off-site transfers reported nearly two-thirds (31.8 million kg) of the NPRI transfers in 1997. Their 31 facilities reported 76 percent of NPRI's transfers of metals to treatment/sewage/disposal and 73 percent of the transfers of nonmetals to sewage/POTWs (a 6 3).

In the United States, the 10 parent companies with the largest total transfers owned 145 reporting facilities, whose transfers amounted to one-quarter (93.3 million kg) of TRI transfers in 1997. They reported 36 percent of the transfers of metals (a 6 4).

For seven companies in NPRI and six companies in TRI, all or nearly all of the off-site transfers consisted of metals sent to treatment/sewage/disposal.

Table 6-3		The 10 Parent Companies with the Largest NPRI Total Off-site Transfers, 1997						
M	1997							
Rank	Facility	Number of Facilities	Number of Forms	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Disposal of Metals (kg)	Total Transfers (kg)
1	Dofasco Inc.	1	18	865	123	50	8,168,440	8,169,478
2	Co-Steel Inc.	1	6	0	0	0	5,799,885	5,799,885
3	Stelco Inc.	11	66	10,300	73,050	239,137	4,233,390	4,555,877
4	Kikuchi Color & Chemicals Corp.	1	6	0	3,732,000	0	224,300	3,956,300
5	Noranda	10	58	1,453,630	0	139,450	556,267	2,149,347
6	Aimco Solrec Ltd.	1	6	2,028,917	0	0	0	2,028,917
7	Ivaco	2	14	0	0	1	1,647,732	1,647,733
8	Slater Steels	2	14	0	15,075	14,391	1,536,346	1,565,812
9	Zalev Brothers Limited	1	8	0	0	0	1,104,869	1,104,869
10	Kronos Canada, Inc.	1	8	0	0	0	855,000	855,000
Subtotal		31	204	3,493,712	3,820,248	393,029	24,126,229	31,833,218
% of Total		2.2	4.4	35.2	72.6	15.5	75.9	64.3
Total		1,430	4,599	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261

Table 6-4		The 10 Parent Companies with the Largest TRI Total Off-site Transfers, 1997						
M	1997							
Rank	Facility	Number of Facilities	Number of Forms	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/Disposal of Metals (kg)	Total Transfers (kg)
1	Nucor Corp.	20	81	14,957	0	1,191	21,940,294	21,956,442
2	Horsehead Industries Inc.	7	41	0	0	0	14,587,115	14,587,115
3	USX Corp.	8	114	9,945,802	0	568	3,445,287	13,391,657
4	Air Products and Chemicals Inc.	25	121	839,201	7,843,235	1,561	44,762	8,728,759
5	Birmingham Steel Corp. Inc.	8	39	0	0	0	6,568,438	6,568,438
6	Steel Dynamics Inc.	1	7	0	0	0	6,529,560	6,529,560
7	Rouge Industries Inc.	1	7	0	0	0	6,086,892	6,086,892
8	DuPont	59	592	4,060,960	349,685	260,307	645,653	5,316,605
9	Ameristeel Corp.	6	30	0	0	0	5,053,114	5,053,114
10	Stone Container Corp.	10	86	0	4,841,260	228	195,054	5,036,542
Subtotal		145	1,118	14,860,920	13,034,180	263,855	65,096,169	93,255,124
% of Total		0.8	1.9	16.1	12.9	1.3	36.1	23.7
Total		19,125	58,252	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756

Rank	Major Chemicals Reported (Primary Transfers)*
1	Zinc/Manganese and compounds (transfers of metals)
2	Zinc and compounds (transfers of metals)
3	Zinc and compounds (transfers of metals)
4	Nitric acid and nitrate compounds (transfers to sewage)
5	Methanol (transfers to treatment)
6	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
7	Zinc and compounds (transfers of metals)
8	Zinc/Lead and compounds (transfers of metals)
9	Zinc/Copper and compounds (transfers of metals)
10	Manganese and compounds (transfers of metals)

* Chemicals accounting for more than 70% of total transfers from the facilities belonging to the parent company.

Rank	Major Chemicals Reported (Primary Transfers)*
1	Zinc and compounds (transfers of metals)
2	Zinc and compounds (transfers of metals)
3	Ethylene (transfers to treatment)
4	Nitric acid and nitrate compounds (transfers to sewage)
5	Zinc and compounds (transfers of metals)
6	Zinc and compounds (transfers of metals)
7	Zinc and compounds (transfers of metals)
8	Methanol, 1,2-Dichlorobenzene, Nitric acid and nitrate compounds, Ethylene glycol, Toluene, Cyclohexane, Xylene (transfers to treatment), Nickel and compounds (transfers of metals)
9	Zinc and compounds (transfers of metals)
10	Methanol (transfers to sewage)

* Chemicals accounting for more than 70% of total transfers from the facilities belonging to the parent company.

6.2.3 Total Releases and Transfers

Facilities of 10 parent companies reported more than one-third (45.8 million kg) of NPRI's total releases and transfers in 1997. These companies owned 41 reporting facilities. Large amounts of metals transferred off-site to treatment/sewage/disposal accounted for the majority of reporting for the three companies with the largest totals (a 6 5).

In the United States, the 10 parent companies accounted for 20 percent (228.1 million kg) of TRI's total releases and transfers. These companies owned 270 reporting facilities. For the top three companies, releases outweighed transfers, with a different release medium dominating in each case (underground injection, air emissions, and on-site land releases) (a 6 6).

Table 6-5		The 10 Parent Companies with the Largest NPRI Total Releases and Transfers, 1997						
M	1997							
Rank	Facility	Number of Facilities	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	Dofasco Inc.	1	18	424,762	6,176	0	125	431,063
2	Co-Steel Inc.	1	6	14,253	362	0	1,245,254	1,259,869
3	Stelco Inc.	11	66	447,542	55,566	0	1,160,035	1,666,341
4	Inco Limited	3	21	4,360,123	19,572	0	702,900	5,082,595
5	Celanese Canada Inc.	2	17	331,175	4,780	3,542,000	913	3,878,868
6	Kikychi Color & Chemicals Corp.	1	6	0	0	0	0	29
7	Noranda	10	58	933,673	30,136	0	0	966,701
8	Nova Corporation	7	41	2,868,703	480	2,883	0	2,872,116
9	ISPAT Mexicana	4	14	49,245	718	0	2,703,355	2,753,318
10	Aimco Solrec Ltd.	1	6	35,641	0	0	0	35,641
Subtotal		41	253	9,465,117	117,790	3,544,883	5,812,582	18,946,541
% of Total		2.9	5.5	15.1	2.8	84.4	64.1	23.6
Total		1,430	4,599	62,838,622	4,224,169	4,197,660	9,062,108	80,448,924

Table 6-6		The 10 Parent Companies with the Largest TRI Total Releases and Transfers, 1997						
M	1997							
Rank	Facility	Number of Facilities	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	DuPont	59	592	6,088,873	3,373,703	20,049,900	268,262	29,780,738
2	Renco Group Inc.	11	40	28,561,139	532	0	3,839,903	32,401,574
3	ASARCO Inc.	9	68	317,430	2,829	81,949	22,263,538	22,665,746
4	USX Corp.	8	114	1,154,994	67,407	0	8,605,123	9,827,524
5	Nucor Corp.	20	81	159,057	1,176	0	6,342	166,575
6	Potash Corp. of Saskatchewan Inc.	15	66	722,849	13,899,625	0	6,749,975	21,372,449
7	International Paper Co.	47	312	15,856,464	780,805	13,197	1,239,711	17,890,177
8	Armco Inc.	8	52	222,323	14,456,160	0	0	14,678,483
9	General Motors Corp.	86	675	7,067,306	115,418	0	6,185,126	13,367,850
10	Horsehead Industries Inc.	7	41	235,439	744	807	433	237,423
Subtotal		270	2,041	60,385,874	32,698,399	20,145,853	49,158,413	162,388,539
% of Total		1.4	3.5	13.4	34.6	27.0	33.1	21.2
Total		19,125	58,252	449,375,340	94,618,694	74,649,654	148,658,503	767,302,191

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	865	123	50	8,168,440	8,169,478	8,600,541	Zinc/Manganese and compounds (transfers of metals)
2	0	0	0	5,799,885	5,799,885	7,059,754	Zinc and compounds (transfers of metals)
3	10,300	73,050	239,137	4,233,390	4,555,877	6,222,218	Zinc/Manganese and compounds (transfers of metals)
4	0	0	0	0	0	5,082,595	Sulfuric acid (air)
5	0	0	64,484	41,000	105,484	3,984,352	Methanol, Methyl ethyl ketone (UIJ)
6	0	3,732,000	0	224,300	3,956,300	3,956,329	Nitric acid and nitrate compounds (transfers to sewage)
7	1,453,630	0	139,450	556,267	2,149,347	3,116,048	Methanol, Lead and compounds (transfers to treatment)
8	64,226	0	30,415	0	94,641	2,966,757	Cyclohexane, Ethylene (air)
9	0	0	0	9,100	9,100	2,762,418	Zinc and compounds (land)
10	2,028,917	0	0	0	2,028,917	2,064,558	Xylene, Toluene, Methyl ethyl ketone (transfers to treatment)
	3,557,938	3,805,173	473,536	19,032,382	26,869,029	45,815,570	
	35.8	72.3	18.7	59.9	54.3	35.3	
	9,925,693	5,260,842	2,533,015	31,788,711	49,508,261	129,957,185	

* Chemicals accounting for more than 70% of total releases and transfers from the facilities belonging to the parent company.

► UIJ = underground injection

Rank	Treatment (except metals) (kg)	Sewage/POTWs (except metals) (kg)	Disposal (except metals) (kg)	Treatment/ Sewage/Disposal of Metals (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	4,060,960	349,685	260,307	645,653	5,316,605	35,097,343	Nitric acid and nitrate compounds, Manganese and compounds, Methanol (UIJ), Hydrochloric acid (air)
2	0	0	0	599,360	599,360	33,000,934	Chlorine (air)
3	0	0	0	3,199,393	3,199,393	25,865,139	Zinc/Lead and compounds (land)
4	9,945,802	0	568	3,445,287	13,391,657	23,219,181	Ethylene (transfers to treatment), Zinc and compounds (land)
5	14,957	0	1,191	21,940,294	21,956,442	22,123,017	Zinc and compounds (transfers of metals)
6	0	38,079	0	10	38,089	21,410,538	Phosphoric acid (water, land)
7	244,009	1,638,199	4,385	160,434	2,047,027	19,937,204	Methanol, Hydrochloric acid (air)
8	1,600,820	0	3,944	1,335,899	2,940,663	17,619,146	Nitric acid and nitrate compounds (water)
9	171,504	499,828	218,822	762,041	1,652,195	15,020,045	Zinc/Manganese and compounds (land), Xylene, n-Butyl alcohol, Methanol (air)
10	0	0	0	14,587,115	14,587,115	14,824,538	Zinc and compounds (transfers of metals)
	16,038,052	2,525,791	489,217	46,675,486	65,728,546	228,117,085	
	17.4	2.5	2.4	25.9	16.7	19.6	
	92,058,224	100,954,738	20,484,603	180,542,191	394,039,756	1,161,341,947	

* Chemicals accounting for more than 70% of total releases and transfers from the facilities belonging to the parent company.

► UIJ = underground injection

6.3 Facilities Reporting Releases and Transfers less than 100,000 kg in 1995

Reporting to the PRTs is dominated by the facilities reporting the largest releases and transfers. **a 3, 4** and **5** include analyses of their influence on total amounts reported in 1997 and the changes from 1995 to 1997. In contrast, this section examines reporting by facilities that reported total releases and transfers of less than 100,000 kg in 1995. It investigates what changes this group reported from 1995 to 1997, including whether or not they were still reporting less than 100,000 kg in 1997. By tracking this group of facilities, the analysis enables us to compare the trends of this group with the trends of those facilities reporting 100,000 kg or more in 1995. The analysis covers only the facilities and forms in the matched data set (common industries and chemicals) addressed throughout most of *Taking Stock*.

6.3.1 Releases and Transfers, 1995–1997

Nearly 84 percent of NPRI facilities (nearly 1,100 facilities) reporting in 1995 reported less than 100,000 kg of total releases and transfers. In TRI, 92 percent (more than 18,400 facilities) did. By 1997, this group numbered fewer than 1,000 in NPRI and about 15,400 in TRI. In that time, their total releases and transfers rose from 13.9 million kg to 19.2 million kg in NPRI and from 193.9 million kg to 201.7 million kg in TRI (**a 6 7** and **6 8**).

This analysis excludes 19 TRI facilities whose reporting differed substantially from other facilities that had relatively small totals in 1995. These 19 facilities reported increases of more than one million kg in total releases and transfers from 1995 to 1997. This placed them among the 50 TRI facilities with the largest increases (see **a 5**, **a 5 42**). No NPRI facilities reporting less than 100,000 kg in 1995 reported such large increases.

Ten percent of the NPRI facilities reporting the smallest releases and transfers in 1995 did not report in 1997 (in the matched data set), but for the remaining facilities in this group, total releases and transfers increased 38 percent. The increase occurred in both on-site releases (25 percent) and off-site transfers (65 percent). The only type of release or transfer that decreased was on-site releases to land, with a reduction of 34 percent (**a 6 7** and **6 1**).

Trends differ between those facilities reporting the larger totals and those reporting less than 100,000 kg in 1995. NPRI facilities that reported larger totals (100,000 kg or more) in 1995 decreased in number by four percent, and their total releases and transfers decreased by 11 percent. This group did, however, also report increases in off-site transfers, but to a lesser extent than the increase of the group of facilities with smaller 1995 totals (16 percent, versus 65 percent). Also, the facilities with larger totals in 1995 reported a decrease in on-site releases

of 22 percent, in contrast to the facilities with smaller reported totals, whose releases rose 25 percent.

While there was a decrease of 16 percent by 1997 in the number of TRI facilities that had reported the smallest releases and transfers in 1995, their total releases and transfers rose four percent. The increase occurred in off-site transfers, up 48 percent. The only type of release or transfer that did decrease was on-site air emissions, which declined 19 percent (**a 6 8** and **6 1**).

This was in contrast to the TRI facilities that reported larger totals (100,000 kg or more) in 1995. The group with larger releases and transfers in 1995 had four percent fewer facilities reporting and a seven percent decrease in total releases and transfers. This group had reductions in on-site air emissions and underground injection and in off-site disposal of nonmetals.

Table 6-7

**NPRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995
Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997**

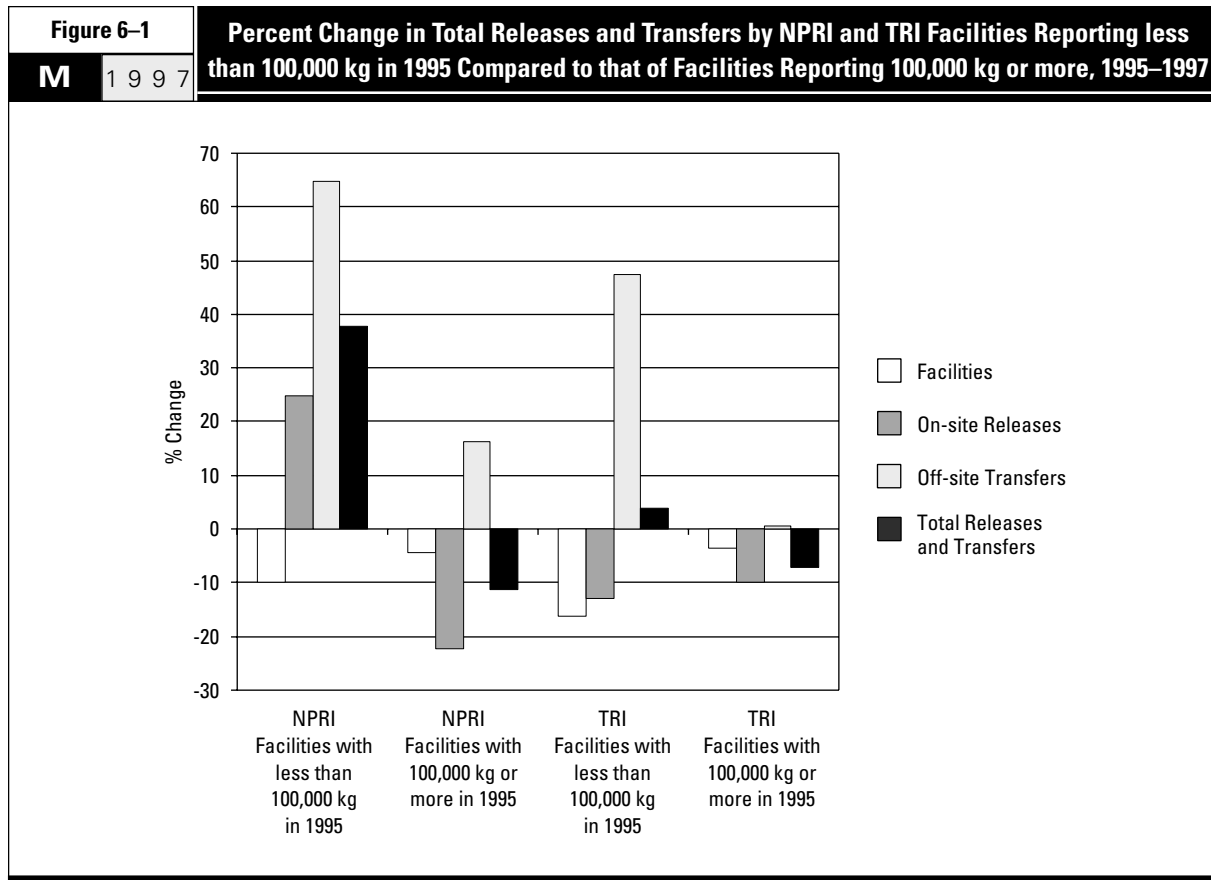
M 1997

	Facilities Reporting less than 100,000 kg in 1995		Facilities Reporting 100,000 kg or more in 1995		Total	
	1995 Number	1997 Number	1995 Number	1997 Number	1995 Number	1997 Number
Total Facilities	1,091	984	211	202	1,302	1,186
Total Forms	2,777	2,649	1,387	1,418	4,164	4,067
On-site Releases	kg	kg	kg	kg	kg	kg
Total Air Emissions	8,307,797	10,419,648	58,679,915	48,528,937	66,987,712	58,948,585
Surface Water Discharges	509,022	846,409	11,821,824	3,180,112	12,330,846	4,026,521
Underground Injection	1,336	14,233	3,555,591	4,182,527	3,556,927	4,196,760
On-site Land Releases	409,629	270,934	9,198,114	8,754,112	9,607,743	9,025,046
Total Releases	9,339,681	11,644,015	83,280,427	64,667,540	92,620,108	76,311,555
Off-site Transfers						
Treatment (except metals)	1,356,752	1,671,709	6,099,898	5,494,788	7,456,650	7,166,497
Sewage/POTWs (except metals)	476,345	568,371	3,701,564	4,481,226	4,177,909	5,049,597
Disposal (except metals)	515,737	811,144	3,726,743	1,568,067	4,242,480	2,379,211
Treatment/Sewage/Disposal of Metals	2,234,829	4,502,035	19,636,836	27,050,305	21,871,665	31,552,340
Total Transfers	4,583,663	7,553,259	33,165,041	38,594,386	37,748,704	46,147,645
Total Releases and Transfers	13,923,344	19,197,274	116,445,468	103,261,926	130,368,812	122,459,200
	Change 1995-1997		Change 1995-1997		Change 1995-1997	
	Number	%	Number	%	Number	%
Total Facilities	-107	-9.8	-9	-4.3	-116	-8.9
Total Forms	-128	-4.6	31	2.2	-97	-2.3
On-site Releases	kg	%	kg	%	kg	%
Total Air Emissions	2,111,851	25.4	-10,150,978	-17.3	-8,039,127	-12.0
Surface Water Discharges	337,387	66.3	-8,641,712	-73.1	-8,304,325	-67.3
Underground Injection	12,897	965.3	626,936	17.6	639,833	18.0
On-site Land Releases	-138,695	-33.9	-444,002	-4.8	-582,697	-6.1
Total Releases	2,304,334	24.7	-18,612,887	-22.3	-16,308,553	-17.6
Off-site Transfers						
Treatment (except metals)	314,957	23.2	-605,110	-9.9	-290,153	-3.9
Sewage/POTWs (except metals)	92,026	19.3	779,662	21.1	871,688	20.9
Disposal (except metals)	295,407	57.3	-2,158,676	-57.9	-1,863,269	-43.9
Treatment/Sewage/Disposal of Metals	2,267,206	101.4	7,413,469	37.8	9,680,675	44.3
Total Transfers	2,969,596	64.8	5,429,345	16.4	8,398,941	22.2
Total Releases and Transfers	5,273,930	37.9	-13,183,542	-11.3	-7,909,612	-6.1

► Does not include facilities not reporting in 1995.

Table 6-8		TRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997							
M	1997	Facilities Reporting less than 100,000 kg in 1995		Facilities Reporting less than 100,000 kg in 1995 but with increase 95-97 of more than 1,000,000 kg		Facilities Reporting 100,000 kg or more in 1995		Total	
		1995 Number	1997 Number	1995 Number	1997 Number	1995 Number	1997 Number	1995 Number	1997 Number
		18,421	15,420	19	19	1,566	1,511	20,006	16,950
		47,253	41,232	109	122	13,392	12,903	60,754	54,257
On-site Releases		kg	kg	kg	kg	kg	kg	kg	kg
Total Air Emissions		133,959,412	108,823,503	220,382	215,757	404,860,352	327,363,506	539,040,146	436,402,766
Surface Water Discharges		2,677,088	5,952,496	13,278	3,266,295	71,923,811	84,991,286	74,614,177	94,210,077
Underground Injection		177,250	379,456	0	0	84,089,842	72,604,383	84,267,092	72,983,839
On-site Land Releases		2,844,378	6,581,398	18,141	766,139	134,256,032	140,397,866	137,118,551	147,745,403
Total Releases		139,658,128	121,736,853	251,801	4,248,191	695,130,037	625,357,041	835,039,966	751,342,085
Off-site Transfers									
Treatment (except metals)		13,349,873	19,198,704	0	0	67,772,941	69,262,305	81,122,814	88,461,009
Sewage/POTWs (except metals)		12,520,656	16,555,711	13,204	9,884	78,855,409	82,142,536	91,389,269	98,708,131
Disposal (except metals)		5,365,051	7,153,012	32,666	1,294,658	12,317,254	9,948,310	17,714,971	18,395,980
Treatment/Sewage/Disposal of Metals		23,004,583	37,091,258	111,111	39,050,871	97,406,242	96,320,088	120,521,936	172,462,217
Total Transfers		54,240,163	79,998,685	156,981	40,355,413	256,351,846	257,673,239	310,748,990	378,027,337
Total Releases and Transfers		193,898,291	201,735,538	408,782	44,603,604	951,481,883	883,030,280	1,145,788,956	1,129,369,422
		Change from 1995 to 1997		Change from 1995 to 1997		Change from 1995 to 1997		Change from 1995 to 1997	
		Number	%	Number	%	Number	%	Number	%
Total Facilities		-3,001	-16.3	0	0.0	-55	-3.5	-3,056	-15.3
Total Forms		-6,021	-12.7	13	11.9	-489	-3.7	-6,497	-10.7
On-site Releases		kg	%	kg	%	kg	%	kg	%
Total Air Emissions		-25,135,909	-18.8	-4,625	-2.1	-77,496,846	-19.1	-102,637,380	-19.0
Surface Water Discharges		3,275,408	122.3	3,253,017	24,499.3	13,067,475	18.2	19,595,900	26.3
Underground Injection		202,206	114.1	0	—	-11,485,459	-13.7	-11,283,253	-13.4
On-site Land Releases		3,737,020	131.4	747,998	4,123.2	6,141,834	4.6	10,626,852	7.8
Total Releases		-17,921,275	-12.8	3,996,390	1,587.1	-69,772,996	-10.0	-83,697,881	-10.0
Off-site Transfers									
Treatment (except metals)		5,848,831	43.8	0	—	1,489,364	2.2	7,338,195	9.0
Sewage/POTWs (except metals)		4,035,055	32.2	-3,320	-25.1	3,287,127	4.2	7,318,862	8.0
Disposal (except metals)		1,787,961	33.3	1,261,992	3,863.3	-2,368,944	-19.2	681,009	3.8
Treatment/Sewage/Disposal of Metals		14,086,675	61.2	38,939,760	35,045.8	-1,086,154	-1.1	51,940,281	43.1
Total Transfers		25,758,522	47.5	40,198,432	25,607.2	1,321,393	0.5	67,278,347	21.7
Total Releases and Transfers		7,837,247	4.0	44,194,822	10,811.3	-68,451,603	-7.2	-16,419,534	-1.4

> Does not include facilities not reporting in 1995.



► Does not include facilities not reporting in 1995 or TRI facilities reporting an increase greater than 1,000,000 kg from 1995 to 1997.

Table 6-9		NPRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997							
M	1997	Facilities Reporting less than 100,000 kg in 1995				Facilities Reporting 100,000 kg or more in 1995			
		1995		1997		1995		1997	
		kg	%	kg	%	kg	%	kg	%
On-site Releases									
Total Air Emissions		8,307,797	59.7	10,419,648	54.3	58,679,915	50.4	48,528,937	47.0
Surface Water Discharges		509,022	3.7	846,409	4.4	11,821,824	10.2	3,180,112	3.1
Underground Injection		1,336	0.0	14,233	0.1	3,555,591	3.1	4,182,527	4.1
On-site Land Releases		409,629	2.9	270,934	1.4	9,198,114	7.9	8,754,112	8.5
Total Releases		9,339,681	67.1	11,644,015	60.7	83,280,427	71.5	64,667,540	62.6
Off-site Transfers									
Treatment (except metals)		1,356,752	9.7	1,671,709	8.7	6,099,898	5.2	5,494,788	5.3
Sewage/POTWs (except metals)		476,345	3.4	568,371	3.0	3,701,564	3.2	4,481,226	4.3
Disposal (except metals)		515,737	3.7	811,144	4.2	3,726,743	3.2	1,568,067	1.5
Treatment/Sewage/Disposal of Metals		2,234,829	16.1	4,502,035	23.5	19,636,836	16.9	27,050,305	26.2
Total Transfers		4,583,663	32.9	7,553,259	39.3	33,165,041	28.5	38,594,386	37.4
Total Releases and Transfers		13,923,344	100.0	19,197,274	100.0	116,445,468	100.0	103,261,926	100.0

► Does not include facilities not reporting in 1995.

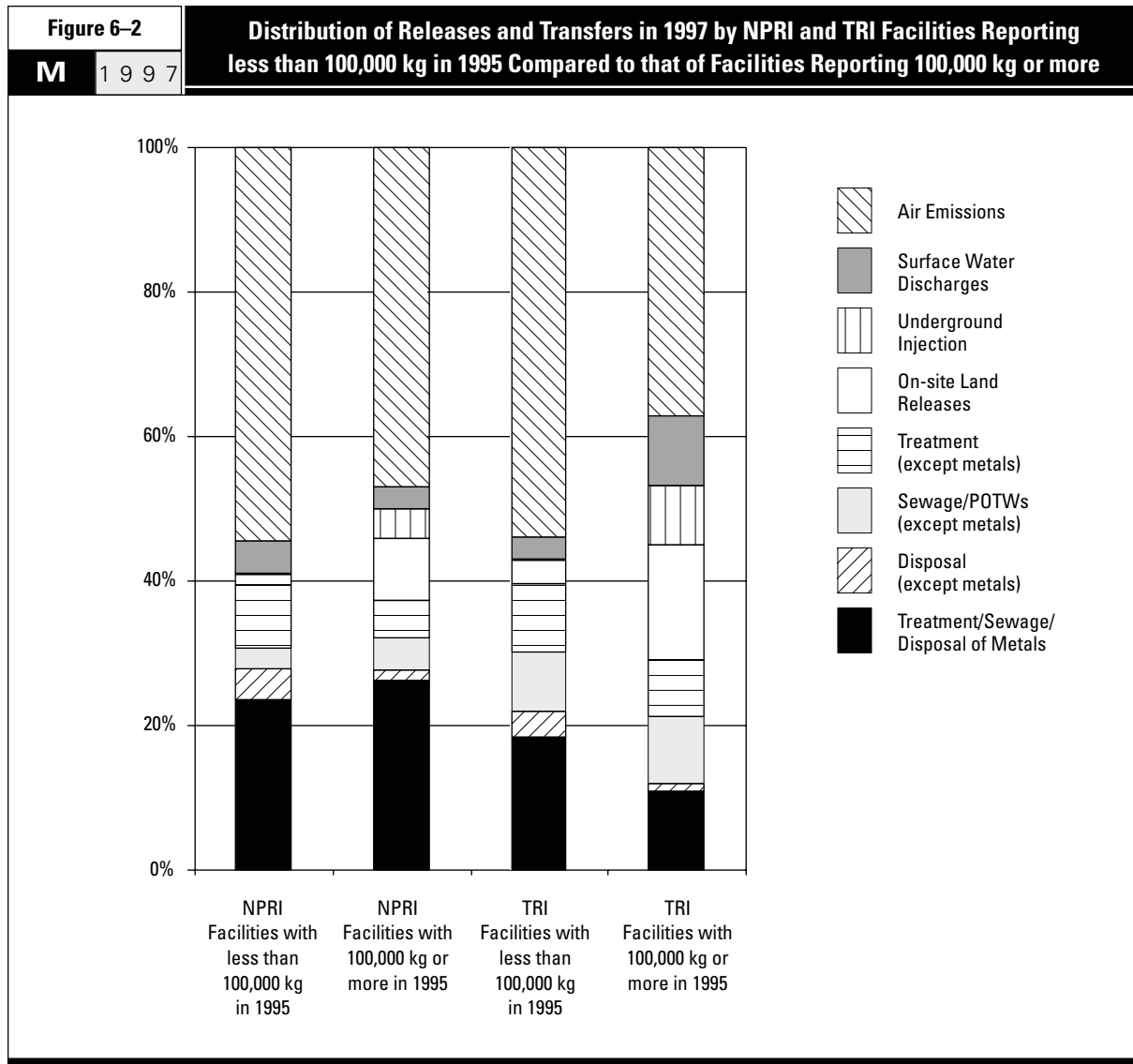
Changes in the proportion of various types of releases and transfers also were different for the two groups of facilities in both countries. For 1997, NPRI on-site releases to air constituted more than half (54 percent) of all releases and transfers by the facilities with smaller totals in 1995. The other

NPRI facilities, taken together, had relatively larger on-site releases to land in 1997 (nine percent for facilities reporting less than 100,000 kg in 1995, versus one percent for all others) (a 6 9 and 6 2).

For 1997, TRI on-site releases to air constituted more than half (54 per-

cent) of all releases and transfers for the group of facilities with smaller releases and transfers. The group of TRI facilities with larger total releases and transfers in 1995 reported just over one-third of their totals as on-site air releases. This group with larger total releases and transfers had relatively

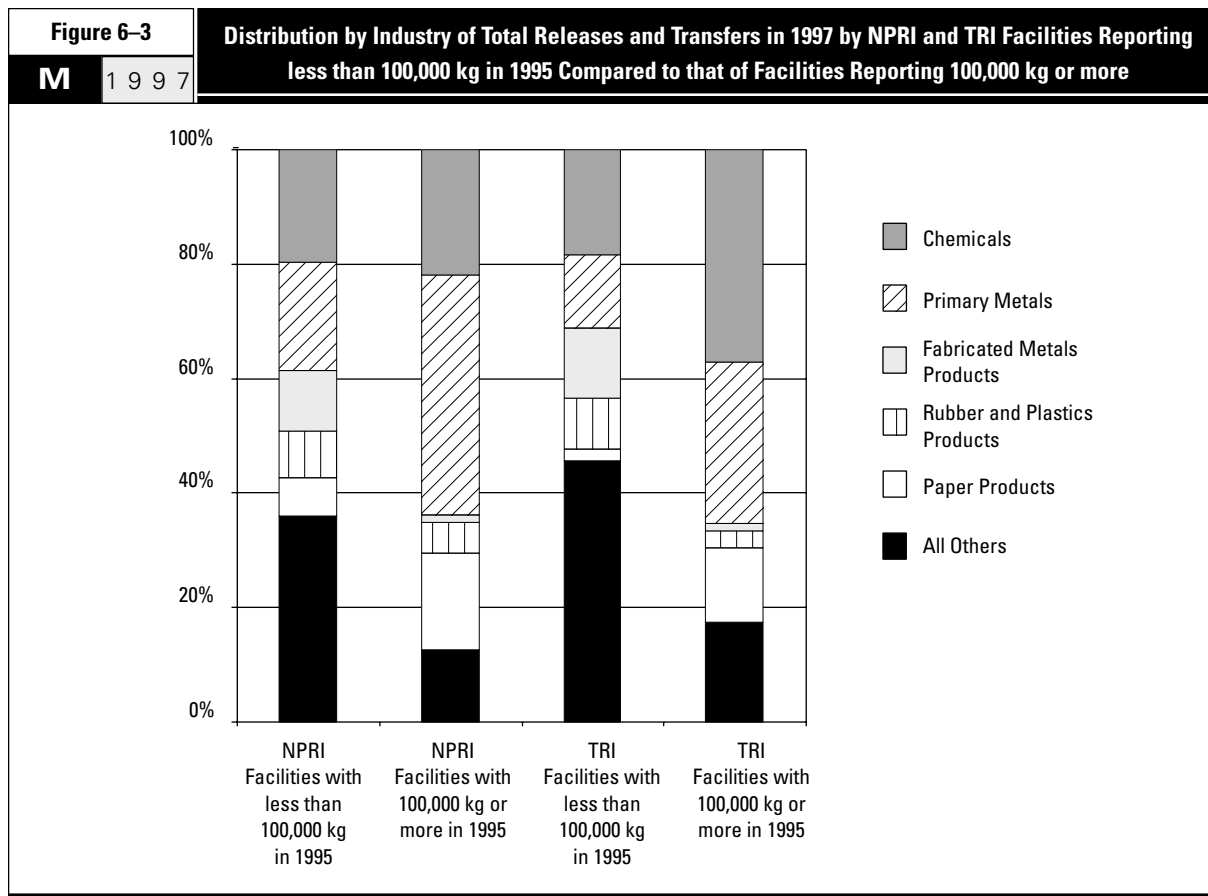
larger on-site releases to land, surface water and underground injection in 1997. Transfers of metals were larger (18 percent) for the facilities with smaller 1995 totals than for the other facilities (11 percent—see a 6 10 and 6 2).



► Does not include facilities not reporting in 1995 or TRI facilities reporting an increase greater than 1,000,000 kg from 1995 to 1997.

Table 6-10		TRI Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995-1997							
M	1997	Facilities Reporting less than 100,000 kg in 1995				Facilities Reporting 100,000 kg or more in 1995			
		1995		1997		1995		1997	
		kg	%	kg	%	kg	%	kg	%
On-site Releases									
Total Air Emissions		133,959,412	69.1	108,823,503	53.9	404,860,352	42.6	327,363,506	37.1
Surface Water Discharges		2,677,088	1.4	5,952,496	3.0	71,923,811	7.6	84,991,286	9.6
Underground Injection		177,250	0.1	379,456	0.2	84,089,842	8.8	72,604,383	8.2
On-site Land Releases		2,844,378	1.5	6,581,398	3.3	134,256,032	14.1	140,397,866	15.9
Total Releases		139,658,128	72.0	121,736,853	60.3	695,130,037	73.1	625,357,041	70.8
Off-site Transfers									
Treatment (except metals)		13,349,873	6.9	19,198,704	9.5	67,772,941	7.1	69,262,305	7.8
Sewage/POTWs (except metals)		12,520,656	6.5	16,555,711	8.2	78,855,409	8.3	82,142,536	9.3
Disposal (except metals)		5,365,051	2.8	7,153,012	3.5	12,317,254	1.3	9,948,310	1.1
Treatment/Sewage/Disposal of Metals		23,004,583	11.9	37,091,258	18.4	97,406,242	10.2	96,320,088	10.9
Total Transfers		54,240,163	28.0	79,998,685	39.7	256,351,846	26.9	257,673,239	29.2
Total Releases and Transfers		193,898,291	100.0	201,735,538	100.0	951,481,883	100.0	883,030,280	100.0

► Does not include facilities not reporting in 1995. Does not include 19 facilities reporting increases greater than 1,000,000 kg from 1995 to 1997.



► Does not include facilities not reporting in 1995 or TRI facilities reporting an increase greater than 1,000,000 kg from 1995 to 1997.

6.3.2 Industry Reporting, 1995–1997

The industries represented by NPRI facilities reporting less than 100,000 kg in 1995 were somewhat different from those for facilities with larger releases and transfers. The chemical manufacturing industry was the industry with the largest percentage of the total releases and transfers for the smaller release/transfer group. Chemical manufacturing facilities reported 23 percent of the total for this group in 1995, followed by the primary metals industry, with 13 percent. The primary

metals industry had the greatest increase, but still ranked second in 1997. Third-ranked in 1995 was the rubber and plastics products industry, and the fabricated metal products industry was fourth. By 1997, the two industries had switched places (**6 3** and **a 6 11**).

For the NPRI facilities reporting 100,000 kg or more in 1995, primary metals facilities reported the largest amount of total releases and transfers, with 31 percent of the total for this group. This industry also reported the largest increase from 1995 to 1997, rising to 42 percent of the total in 1997.

On the other hand, the chemical industry, ranking second in both years, decreased overall, from 27 percent of the total in 1995 to 22 percent in 1997. The paper industry ranked third in both years and had the largest decrease from 1995 to 1997 for facilities with larger total releases and transfers in 1995. On the other hand, for the facilities with smaller releases and transfers, this industry ranked fifth in 1995, but reported an increase of 21 percent.

For TRI facilities, the chemical industry reported the largest total releases and transfers for both the facilities reporting less than 100,000

kg and those reporting 100,000 kg or more in 1995. However, the primary metals industry facilities with smaller total releases and transfers reported the largest increase in this group (10.5 million kg, or 67 percent) and, therefore, rose from fifth-ranked in 1995 to second in 1997. The fabricated metal products industry ranked second for facilities with smaller releases and transfers in 1995 and third in 1997 (**6 3** and **a 6 12**).

Table 6-11		NPRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, by Industry, 1995-1997							
US SIC Code	Industry	NPRI Facilities Reporting less than 100,000 kg in 1995 Total Releases and Transfers						Change 1995-1997	
		1995			1997			kg	%
		kg	% of Total	Rank	kg	% of Total	Rank		
20	Food Products	175,137	1.3	15	663,435	3.5	10	488,298	278.8
22	Textile Mill Products	98,862	0.7	16	43,292	0.2	16	-55,570	-56.2
23	Apparel and Other Textile Products	860	0.0	19	280	0.0	18	-580	-67.4
24	Lumber and Wood Products	634,941	4.6	8	1,407,506	7.3	5	772,565	121.7
25	Furniture and Fixtures	196,504	1.4	14	288,911	1.5	13	92,407	47.0
26	Paper Products	1,069,957	7.7	5	1,288,998	6.7	6	219,041	20.5
27	Printing and Publishing	394,030	2.8	11	1,267,510	6.6	7	873,480	221.7
28	Chemicals	3,179,246	22.8	1	3,768,099	19.6	1	588,853	18.5
29	Petroleum and Coal Products	420,676	3.0	10	707,532	3.7	9	286,856	68.2
30	Rubber and Plastics Products	1,718,053	12.3	3	1,567,472	8.2	4	-150,581	-8.8
31	Leather Products	23,888	0.2	17	15,927	0.1	17	-7,961	-33.3
32	Stone/Clay/Glass Products	733,702	5.3	7	563,850	2.9	11	-169,852	-23.1
33	Primary Metals	1,749,257	12.6	2	3,634,456	18.9	2	1,885,199	107.8
34	Fabricated Metals Products	1,458,361	10.5	4	2,035,542	10.6	3	577,181	39.6
35	Industrial Machinery	294,289	2.1	12	264,966	1.4	14	-29,323	-10.0
36	Electronic/Electrical Equipment	634,095	4.6	9	335,626	1.7	12	-298,469	-47.1
37	Transportation Equipment	932,667	6.7	6	1,183,103	6.2	8	250,436	26.9
38	Measurement/Photographic Instruments	1,501	0.0	18	250	0.0	19	-1,251	-83.3
39	Misc. Manufacturing Industries	207,318	1.5	13	160,519	0.8	15	-46,799	-22.6
	Total	13,923,344	100.0		19,197,274	100.0		5,273,930	37.9

► Does not include facilities not reporting in 1995.

NPRI Facilities Reporting 100,000 kg or more in 1995									
Total Releases and Transfers									
US SIC Code	Industry	1995			1997			Change 1995-1997	
		kg	% of Total	Rank	kg	% of Total	Rank	kg	%
20	Food Products	264,000	0.2	14	201,600	0.2	14	-62,400	-23.6
22	Textile Mill Products	827,338	0.7	8	489,305	0.5	9	-338,033	-40.9
23	Apparel and Other Textile Products	0	0.0	18	0	0.0	18	0	—
24	Lumber and Wood Products	641,362	0.6	10	430,627	0.4	11	-210,735	-32.9
25	Furniture and Fixtures	298,096	0.3	12	493,357	0.5	8	195,261	65.5
26	Paper Products	27,168,057	23.3	3	17,418,164	16.9	3	-9,749,893	-35.9
27	Printing and Publishing	473,547	0.4	11	403,276	0.4	12	-70,271	-14.8
28	Chemicals	30,925,967	26.6	2	22,656,178	21.9	2	-8,269,789	-26.7
29	Petroleum and Coal Products	4,882,189	4.2	6	4,789,123	4.6	6	-93,066	-1.9
30	Rubber and Plastics Products	5,730,757	4.9	5	5,573,176	5.4	4	-157,581	-2.7
31	Leather Products	0	0.0	17	0	0.0	17	0	—
32	Stone/Clay/Glass Products	713,810	0.6	9	441,139	0.4	10	-272,671	-38.2
33	Primary Metals	35,588,448	30.6	1	43,161,824	41.8	1	7,573,376	21.3
34	Fabricated Metals Products	1,887,699	1.6	7	1,432,383	1.4	7	-455,316	-24.1
35	Industrial Machinery	295,410	0.3	13	327,898	0.3	13	32,488	11.0
36	Electronic/Electrical Equipment	0	0.0	16	0	0.0	16	0	—
37	Transportation Equipment	6,620,553	5.7	4	5,320,572	5.2	5	-1,299,981	-19.6
38	Measurement/Photographic Instruments	0	0.0	19	0	0.0	19	0	—
39	Misc. Manufacturing Industries	128,235	0.1	15	123,304	0.1	15	-4,931	-3.8
	Total	116,445,468	100.0		103,261,926	100.0		-13,183,542	-11.3

Table 6-12		TRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, by Industry, 1995-1997								
US SIC Code	Industry	TRI Facilities Reporting less than 100,000 kg in 1995 Total Releases and Transfers							Change 1995-1997	
		1995			1997			kg	%	
		kg	% of Total	Rank	kg	% of Total	Rank			
20	Food Products	5,368,993	2.8	12	6,919,178	3.4	9	1,550,185	28.9	
21	Tobacco Products	118,746	0.1	21	212,585	0.1	21	93,839	79.0	
22	Textile Mill Products	3,228,476	1.7	16	2,914,147	1.4	16	-314,329	-9.7	
23	Apparel and Other Textile Products	354,585	0.2	20	221,403	0.1	20	-133,182	-37.6	
24	Lumber and Wood Products	8,369,570	4.3	10	6,231,480	3.1	11	-2,138,090	-25.5	
25	Furniture and Fixtures	10,995,219	5.7	7	6,210,329	3.1	12	-4,784,890	-43.5	
26	Paper Products	4,846,923	2.5	13	4,410,618	2.2	14	-436,305	-9.0	
27	Printing and Publishing	2,129,942	1.1	17	1,549,434	0.8	17	-580,508	-27.3	
28	Chemicals	29,561,289	15.2	1	36,887,538	18.3	1	7,326,249	24.8	
29	Petroleum and Coal Products	4,188,524	2.2	14	5,826,497	2.9	13	1,637,973	39.1	
30	Rubber and Plastics Products	19,559,281	10.1	3	17,936,322	8.9	4	-1,622,959	-8.3	
31	Leather Products	1,459,451	0.8	19	1,286,170	0.6	19	-173,281	-11.9	
32	Stone/Clay/Glass Products	5,775,328	3.0	11	7,869,817	3.9	8	2,094,489	36.3	
33	Primary Metals	15,649,253	8.1	5	26,110,871	12.9	2	10,461,618	66.9	
34	Fabricated Metals Products	26,748,427	13.8	2	24,441,212	12.1	3	-2,307,215	-8.6	
35	Industrial Machinery	8,715,667	4.5	8	6,824,238	3.4	10	-1,891,429	-21.7	
36	Electronic/Electrical Equipment	8,514,494	4.4	9	9,535,383	4.7	7	1,020,889	12.0	
37	Transportation Equipment	17,544,371	9.0	4	16,099,597	8.0	5	-1,444,774	-8.2	
38	Measurement/Photographic Instruments	1,916,761	1.0	18	1,370,587	0.7	18	-546,174	-28.5	
39	Misc. Manufacturing Industries	3,685,940	1.9	15	2,995,773	1.5	15	-690,167	-18.7	
	Multiple Codes 20-39	15,167,051	7.8	6	15,882,359	7.9	6	715,308	4.7	
	Total	193,898,291	100.0		201,735,538	100.0		7,837,247	4.0	

► Does not include facilities not reporting in 1995. Does not include 19 facilities reporting more than 1,000,000 kg increase from 1995 to 1997.

		TRI Facilities Reporting 100,000 kg or more in 1995 Total Releases and Transfers							
US SIC Code	Industry	1995			1997			Change 1995-1997	
		kg	% of Total	Rank	kg	% of Total	Rank	kg	%
20	Food Products	15,257,128	1.6	8	14,167,146	1.6	8	-1,089,982	-7.1
21	Tobacco Products	350,832	0.0	19	404,088	0.0	19	53,256	15.2
22	Textile Mill Products	4,889,376	0.5	16	4,614,192	0.5	14	-275,184	-5.6
23	Apparel and Other Textile Products	128,563	0.0	20	62,187	0.0	20	-66,376	-51.6
24	Lumber and Wood Products	5,771,324	0.6	15	4,349,292	0.5	15	-1,422,032	-24.6
25	Furniture and Fixtures	7,345,157	0.8	12	4,112,777	0.5	16	-3,232,380	-44.0
26	Paper Products	118,823,034	12.5	3	115,032,612	13.0	3	-3,790,422	-3.2
27	Printing and Publishing	11,557,541	1.2	9	9,196,824	1.0	10	-2,360,717	-20.4
28	Chemicals	369,679,263	38.9	1	327,548,860	37.1	1	-42,130,403	-11.4
29	Petroleum and Coal Products	20,574,238	2.2	7	21,818,220	2.5	7	1,243,982	6.0
30	Rubber and Plastics Products	30,551,820	3.2	6	26,007,707	2.9	6	-4,544,113	-14.9
31	Leather Products	105,187	0.0	21	28,457	0.0	21	-76,730	-72.9
32	Stone/Clay/Glass Products	6,756,590	0.7	13	5,842,903	0.7	12	-913,687	-13.5
33	Primary Metals	235,711,582	24.8	2	248,369,175	28.1	2	12,657,593	5.4
34	Fabricated Metals Products	11,235,616	1.2	10	11,702,138	1.3	9	466,522	4.2
35	Industrial Machinery	2,291,987	0.2	18	2,221,773	0.3	17	-70,214	-3.1
36	Electronic/Electrical Equipment	10,948,341	1.2	11	7,804,382	0.9	11	-3,143,959	-28.7
37	Transportation Equipment	32,156,665	3.4	5	26,556,833	3.0	5	-5,599,832	-17.4
38	Measurement/Photographic Instruments	6,365,294	0.7	14	4,772,094	0.5	13	-1,593,200	-25.0
39	Misc. Manufacturing Industries	2,606,494	0.3	17	1,392,665	0.2	18	-1,213,829	-46.6
	Multiple Codes 20-39	58,375,851	6.1	4	47,025,955	5.3	4	-11,349,896	-19.4
	Total	951,481,883	100.0		883,030,280	100.0		-68,451,603	-7.2

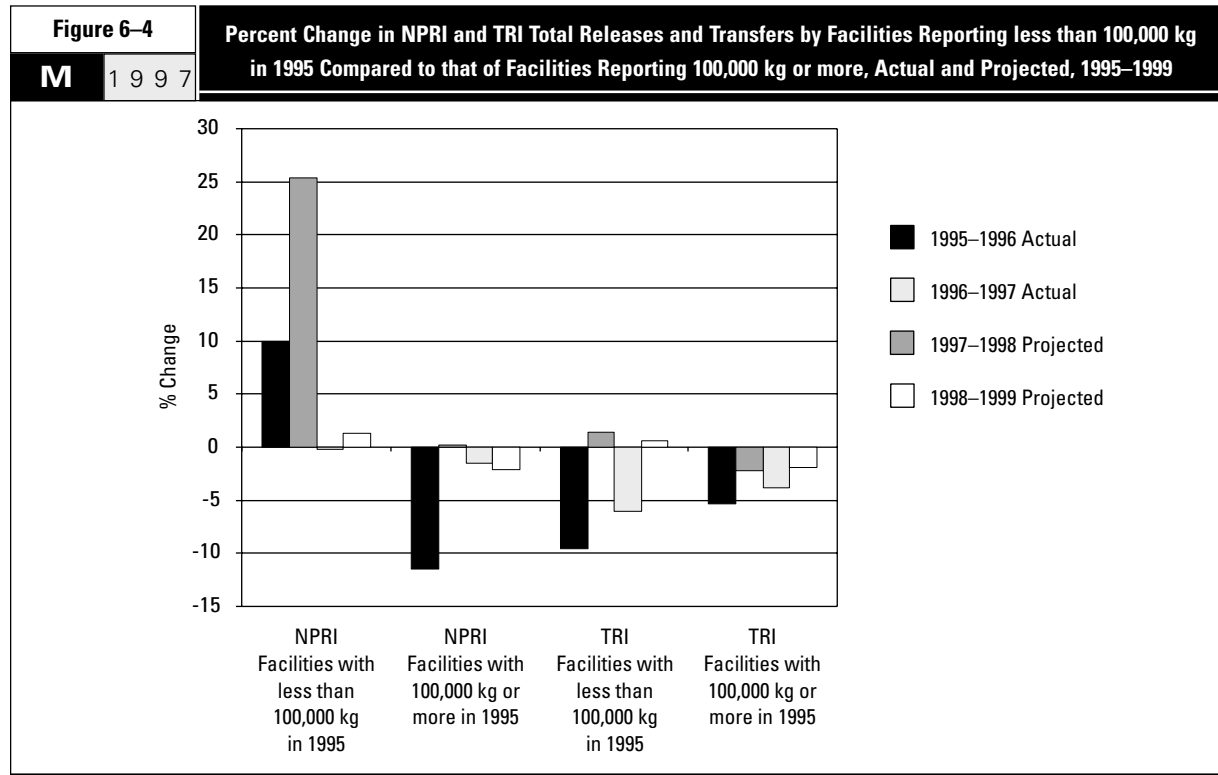
6.3.3 Actual and Projected Total Releases and Transfers, 1995–1999

NPRI facilities reporting less than 100,000 kg in 1995 reported substantial increases in total releases and transfers for both 1995 to 1996 and 1996 to 1997. This group projected a slight decrease of 0.2 percent for 1998 and an increase of 1.4 percent from 1998 to 1999. On the other hand, NPRI facilities reporting 100,000 kg or more in 1995 showed a decrease of 12 percent from 1995 to 1996 and a slight increase (0.2 percent) from 1996 to 1997, with continuing expected decreases for 1998 and 1999 (a 6 13 and 6 4).

TRI facilities in both groups reported decreases from 1995 to 1996, with the facilities with larger releases and transfers reporting continued decreases from 1996 to 1997 and projected decreases through 1999. The TRI facilities that reported under 100,000 kg in 1995 projected decreasing releases and transfers from 1997 to 1998 and then a slight increase for 1999. These data come from a different section of the TRI reporting form (Section 8), so the total releases and transfers for 1995 and 1997 do not match exactly those in other tables (a 6 14 and 6 4).

Table 6–13			
NPRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995–1999 (Projected)			
M	1997		
		Facilities Reporting less than 100,000 kg in 1995 (kg)	Facilities Reporting 100,000 kg or more in 1995 (kg)
			Total (kg)
		1995 Actual	13,923,344
		1996 Actual	15,312,747
		1997 Actual	19,197,274
		1998 Projected	19,166,088
		1999 Projected	19,424,990
			116,445,468
			103,102,143
			103,261,926
			101,660,794
			99,535,297
			130,368,812
			118,414,890
			122,459,200
			120,826,882
			118,960,287
		% Change	% Change
		1995–1996 Actual	10.0
		1996–1997 Actual	25.4
		1997–1998 Projected	-0.2
		1998–1999 Projected	1.4
			-11.5
			0.2
			-1.6
			-2.1
			-9.2
			3.4
			-1.3
			-1.5

► Does not include facilities not reporting in 1995.



► Does not include facilities not reporting in 1995 or TRI facilities reporting an increase greater than 1 million kg from 1995 to 1997.

6.4 Pollution Prevention Reporting

Reporting on pollution prevention activities that a facility undertakes to reduce the amount of a given substance in the waste generated began with the 1997 reporting year for NPRI and 1991 for TRI; however, the two systems of reporting differ in several respects.

While both systems list certain activities that are considered pollution prevention for the purposes of reporting to the PRTRs, the TRI list is much more specific as to what qualifies as pollution prevention. It itemizes 43 separate activities in eight categories, while NPRI lists seven general categories. The 43 TRI activities can be grouped into six of the NPRI categories (**a 6 15**).

In addition, NPRI includes on-site reuse, recycling or recovery as a pollution prevention category. TRI does not list this activity. However, a TRI facility must report the amount of the substance recycled or used for energy recovery on-site each year, so it is possible to know if on-site reuse, recycling or recovery of the substance went on at the facility.

TRI's 43 activities are called "source reduction" activities. The NPRI categories—six that correspond to TRI source reduction activities, plus one for on-site reuse, recycling or recovery—are designated "pollution prevention." Therefore, in this section, "source reduction" applies to the activities without on-site reuse, recycling and recovery, and "pollution prevention" indicates all the activities reported to both NPRI and TRI.

Table 6-14		TRI Total Releases and Transfers by Facilities Reporting less than 100,000 kg in 1995 Compared to those of Facilities Reporting 100,000 kg or more, 1995–1999 (Projected)		
M	1997			
		Facilities Reporting less than 100,000 kg in 1995 (kg)	Facilities Reporting 100,000 kg or more in 1995 (kg)	Total (kg)
1995 Actual		212,890,000	928,623,329	1,141,513,329
1996 Actual		192,609,818	878,833,935	1,071,443,753
1997 Actual		195,404,788	859,778,685	1,055,183,473
1998 Projected		183,576,064	826,886,576	1,010,462,640
1999 Projected		184,719,696	811,465,420	996,185,116
		% Change	% Change	% Change
1995–1996 Actual		-9.5	-5.4	-6.1
1996–1997 Actual		1.5	-2.2	-1.5
1997–1998 Projected		-6.1	-3.8	-4.2
1998–1999 Projected		0.6	-1.9	-1.4

► Does not include facilities not reporting in 1995.

► Data from Sections 8.1 plus 8.7 on TRI Form R; 1995 data from 1995 reporting forms; 1996 data from 1996 reporting forms; 1997, 1998 and 1999 data from 1997 reporting forms.

Table 6-15

NPRI Pollution Prevention Activities and TRI Source Reduction Activities

1 9 9 7

NPRI Categories

- A** Materials or feedstock substitution
- B** Product design or reformulation
- C** Equipment or process modifications
- D** Spill and leak prevention
- E** On-site reuse, recycling or recovery
- F** Improved inventory management or purchasing techniques
- G** Good operating practices or training

Corresponding NPRI
Category TRI Categories
Good Operating Practices

- G W13 Improved maintenance scheduling, recordkeeping, or procedures
- G W14 Changed production schedule to minimize equipment and feedstock changeovers
- G W19 Other changes in operating practices

Inventory Control

- F W21 Instituted procedures to ensure that materials do not stay in inventory beyond shelf-life
- F W22 Began to test outdated material—continue to use if still effective
- F W23 Eliminated shelf-life requirements for stable materials
- F W24 Instituted better labeling procedures
- F W25 Instituted clearinghouse to exchange materials that would otherwise be discarded
- F W29 Other changes in inventory control

Spill and Leak Prevention

- D W31 Improved storage or stacking procedures
- D W32 Improved procedures for loading, unloading, and transfer operations
- D W33 Installed overflow alarms or automatic shut-off valves
- D W35 Installed vapor recovery systems
- D W36 Implemented inspection or monitoring program of potential spill or leak sources
- D W39 Other spill and leak prevention

Raw Material Modifications

- A W41 Increased purity of raw materials
- A W42 Substituted raw materials
- A W49 Other raw material modifications

Corresponding NPRI
Category TRI Categories
Process Modifications

- C W51 Instituted recirculation within a process
- C W52 Modified equipment, layout, or piping
- C W53 Use of a different process catalyst
- C W54 Instituted better controls on operating bulk containers to minimize discarding of empty containers
- C W55 Changed from small volume containers to bulk containers to minimize discarding of empty containers
- C W58 Other process modifications

Cleaning and Degreasing

- C W59 Modified stripping/cleaning equipment
- C W60 Changed to mechanical stripping/cleaning devices (from solvents or other materials)
- A W61 Changed to aqueous cleaners (from solvents or other materials)
- D W63 Modified containment procedures for cleaning units
- D W64 Improved draining procedures
- C W65 Redesigned parts racks to reduce drag out
- C W66 Modified or installed rinse systems
- C W67 Improved rinse equipment design
- C W68 Improved rinse equipment operation
- C W71 Other cleaning and degreasing modifications

Surface Preparation and Finishing

- C W72 Modified spray systems or equipment
- A W73 Substituted coating materials used
- C W74 Improved application techniques
- C W75 Changed from spray to other system
- C W78 Other surface preparation and finishing modifications

Product Modifications

- B W81 Changed product specifications
- B W82 Modified design or composition
- B W83 Modified packaging
- B W89 Other product modifications

► On-site reuse, recycling or recovery not a source reduction activity in TRI.

In both systems, facilities are to report activities undertaken during the reporting year. Some facilities, however, may be reporting ongoing activities that began in earlier years. The TRI form specifies that facilities are to report activities engaged in during the reporting year, while the NPRI form does not (A, D, and). In both cases, separate instructions indicate that the reporting should cover those activities engaged in during the calendar year. Because this is the first reporting year for this information in NPRI, investigation as to whether these are newly implemented activities or ongoing activities that are being reported has not yet been done.

Except for on-site recycling and energy recovery under TRI, neither country asks a facility to report on the quantity of the substance in waste that was reduced due to the pollution prevention activities.

Table 6-16		NPRI Facilities and Forms Reporting Pollution Prevention Activity, by Category, 1997			
Source Reduction Activity Categories	Number	Facilities Reporting Source Reduction Activity		Forms Reporting Source Reduction Activity	
		Number	As % of All NPRI Facilities	Number	As % of All NPRI Forms
Materials or feedstock substitutions	154		10.8	283	6.2
Product redesign or reformulation	175		12.2	352	7.7
Equipment or process modifications	386		27.0	841	18.3
Spill and leak prevention	396		27.7	1,140	24.8
Improved inventory management or purchasing techniques	221		15.5	566	12.3
Good operating practices or training	743		52.0	2,195	47.7
Any Source Reduction Activity*	1,000		69.9	2,971	64.6
On-site reuse, recycling, recovery	389		27.2	905	19.7
Total Pollution Prevention Activity Reporting	1,068		74.7	3,198	69.5

* The numerical totals do not equal the sum of the above categories because facilities and forms may report more than one type of source reduction activity category.

6.4.1 1997 Pollution Prevention/Source Reduction Reporting

In 1997, 70 percent of NPRI facilities in the matched data set reported undertaking at least one source reduction

activity and 27 percent reported undertaking on-site reuse, recycling or recovery. A total of 75 percent of NPRI facilities reported some pollution prevention activity, source reduction and/or on-site reuse, recycling or recovery. These facilities reported such activity

for 70 percent of their forms. The most frequently reported source reduction activity was “good operating practices or training.” This activity was reported by 52 percent of the facilities and appeared on 48 percent of the forms (a 6 16).

On the other hand, 28 percent of TRI facilities in the matched data set reported engaging in at least one source reduction activity during 1997 and 19 percent reported on-site recycling or energy recovery. A total of 39 percent of TRI facilities reported undertaking some pollution prevention activity during 1997. These facilities reported such activities on 33 percent of their forms. The most frequently reported types of activity were “good operating practices or training” and “equipment or process modification.” Both of these categories were reported by 13 percent of TRI facilities and appeared on about 10 percent of the forms (a 6 17).

Substantially fewer TRI facilities reported on pollution prevention activities during 1997 than did NPRI facilities. Whether this difference is significant depends in part on whether NPRI facilities are reporting activities from previous years. As indicated in US EPA’s annual reports of TRI data, fewer TRI facilities indicate source reduction activities over time, suggesting that they are (correctly) reporting new source reduction efforts only in the year in which those activities are first undertaken.

Table 6-17		TRI Facilities and Forms Reporting Pollution Prevention Activity, by Category, 1997			
Source Reduction Activity Categories	Number	Facilities Reporting Source Reduction Activity		Forms Reporting Source Reduction Activity	
		As % of All TRI Facilities	As % of All TRI Forms	Number	As % of All TRI Forms
Materials or feedstock substitutions	1,468	8.7	2,592	5.2	
Product redesign or reformulation	422	2.5	821	1.6	
Equipment or process modifications	2,124	12.6	5,014	10.0	
Spill and leak prevention	932	5.5	2,803	5.6	
Improved inventory management or purchasing techniques	514	3.0	1,340	2.7	
Good operating practices or training	2,156	12.8	5,381	10.7	
Any Source Reduction Activity*	4,739	28.0	10,699	21.3	
On-site reuse, recycling, recovery**	3,205	19.0	8,285	16.5	
Total Pollution Prevention Activity Reporting	6,643	39.3	16,347	32.5	

* The numerical totals do not equal the sum of the above categories because facilities and forms may report more than one type of source reduction activity category.

** On-site recycling or energy amount reported in Section 8 of TRI Form for 1997.

➤ Only TRI Form R was used in this analysis because TRI Form A does not include the section on source reduction activity. There were 16,906 facilities submitting at least one TRI Form R for 1997 for matched chemicals and industries, with a total of 50,296 TRI Form Rs .

6.4.2 Pollution Prevention Reporting and Actual and Projected Changes in Total Releases and Transfers, 1995–1999

Pollution prevention activities are intended to reduce the amount of releases and transfers of the substances. The amounts of these reductions are not reported, just the activities under-

taken. However, the releases and transfers of facilities that report pollution prevention activities can be compared with those that do not to see if the amounts differ. This analysis covers only consistent reporting for all three years from 1995 to 1997, that is, submissions by the same facility for the same substance.

Overall, NPRI total releases and transfers decreased three percent from 1995 to 1997 for forms submitted in all three years and this decrease can be attributed to substances for which

source reduction activity was reported. These forms reported an 18 percent reduction from 1995 to 1997 and projected a six percent reduction from 1997 to 1999. All other forms, those with no source reduction as well as those with on-site reuse, recycling or recovery, reported an increase from 1995 to 1997 and projected an increase for 1997 to 1999 (a 6 18 and 6 5).

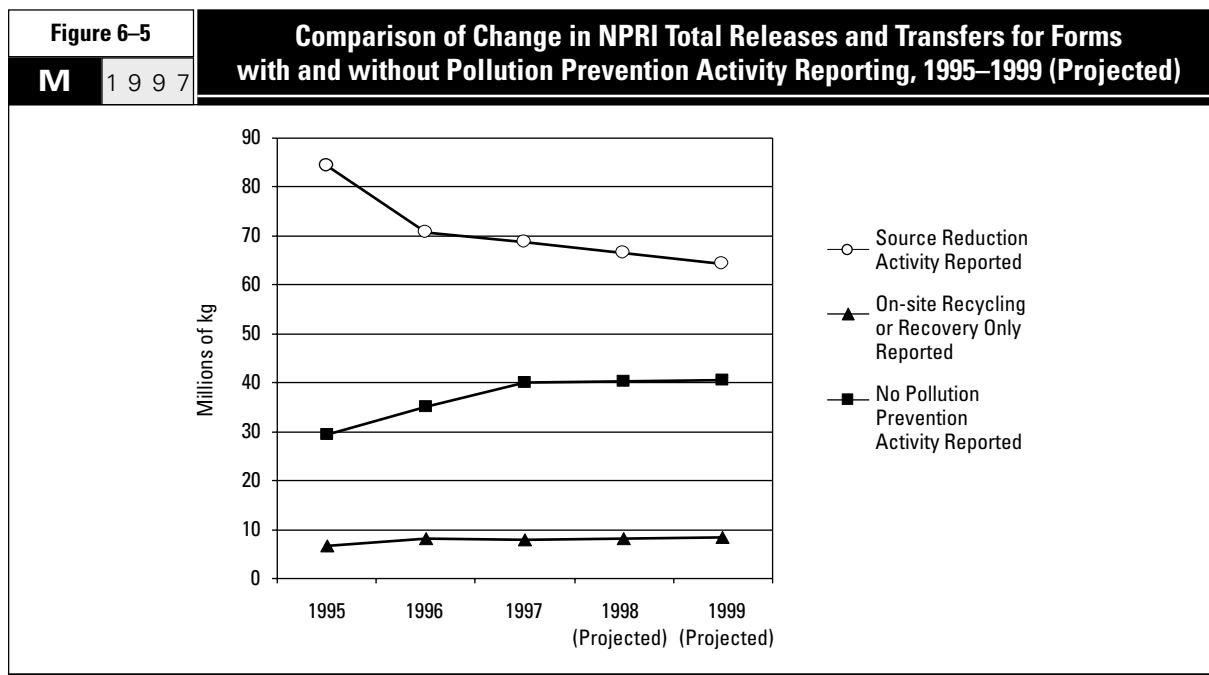
For TRI, all groups of forms with some type of pollution prevention reported decreases in total releases and

transfers from 1995 to 1997 and projected further decreases for 1997 to 1999. Forms indicating source reduction had the largest percentage decrease in total releases and transfers (eight percent from 1995 to 1997 and projected 10 percent from 1997 to 1999). TRI forms with on-site recycling or energy recovery also reported a reduction from 1995 to 1997 of seven percent with further projected reductions of two percent (a 6 19 and 6 6).

Table 6-18		Comparisons of NPRI Total Releases and Transfers for Forms with and without Pollution Prevention Activity Reporting, 1995-1999 (Projected)					
M 1997		Chemicals Reported All Three Years, 1995-1997*					
	All Forms Number	Forms Reporting Source Reduction Activities (SRA) Number	Forms Reporting On-site Reuse, Recycling or Recovery Only Number	Forms Reporting No SRA Number	Forms Reporting No SRA and No On-site Reuse, Recycling or Recovery Number	Forms Reporting Pollution Prevention Activity** as Reason for Change Number	
Forms	3,456	2,244	178	1,212	1,034	244	
Total Releases and Transfers	kg	kg	kg	kg	kg	kg	
1995 Actual	120,556,528	84,342,901	6,776,802	36,213,627	29,436,825	15,372,877	
1996 Actual	113,997,085	70,768,406	8,145,540	43,228,679	35,083,139	14,447,954	
1997 Actual	116,604,793	68,788,085	7,842,818	47,816,708	39,973,890	11,354,979	
1998 Projected	115,053,296	66,586,675	8,280,299	48,466,621	40,186,322	10,928,429	
1999 Projected	113,366,094	64,355,281	8,437,812	49,010,813	40,573,001	10,354,863	
	%	%	%	%	%	%	
	Change	Change	Change	Change	Change	Change	
1995-1997 Actual	-3.3	-18.4	15.7	32.0	35.8	-26.1	
1997-1999 Projected	-2.8	-6.4	7.6	2.5	1.5	-8.8	

* Data for forms submitted by the same facility for the same substance in all three years, 1995-1997.

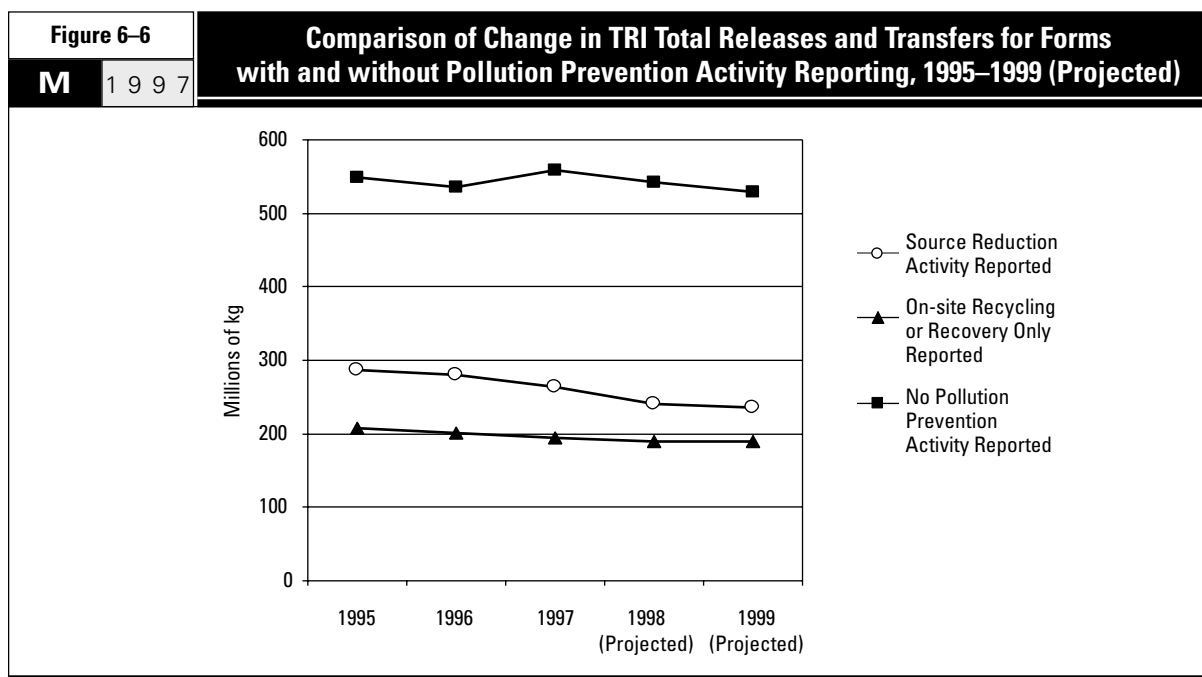
** Pollution prevention activity reporting includes source reduction activities (SRA) and/or on-site reuse, recycling or recovery.



► For chemicals reported in all three years (1995-1997) only.

Table 6-19		Comparisons of TRI Total Releases and Transfers for Forms with and without Pollution Prevention Activity Reporting, 1995-1999 (Projected)				
M 1997		Chemicals Reported All Three Years, 1995-1997*				
	All Forms Number	Forms Reporting Source Reduction Activities (SRA) Number	Forms Reporting On-site Reuse, Recycling or Recovery Only Number	Forms Reporting No SRA Number	Forms Reporting No SRA and No On-site Reuse, Recycling or Recovery Number	
Forms	40,343	9,036	4,774	31,307	26,533	
Total Releases and Transfers	kg	kg	kg	kg	kg	
1995 Actual	1,044,991,806	287,472,320	207,845,491	757,519,486	549,673,995	
1996 Actual	1,018,559,232	280,710,530	201,610,621	737,848,702	536,238,081	
1997 Actual	1,015,524,800	263,351,165	193,766,689	752,173,635	558,406,946	
1998 Projected	973,159,103	240,692,550	189,734,739	732,466,553	542,731,814	
1999 Projected	955,318,307	236,067,093	189,770,895	719,251,214	529,480,319	
	%	%	%	%	%	
	Change	Change	Change	Change	Change	
1995-1997 Actual	-2.8	-8.4	-6.8	-0.7	1.6	
1997-1999 Projected	-5.9	-10.4	-2.1	-4.4	-5.2	

* Data for forms submitted by the same facility for the same substance in all three years, 1995-1997.



► For chemicals reported in all three years (1995-1997) only.

Chapter 7: Primary Metals Industry

M

All tables and figures in Chapter 7 are from the 1997 Matched Data Set

	Key Findings	413			
7.1	Introduction	413		7.4	The North American Aluminum and Other Nonferrous Metals Industries (cont.)
7.1.1	The Primary Metals Industry and PRTR Reporting	414			Pollutants and Pollution Reduction and Prevention Opportunities
7.1.2	Guide to the Chapter	414		7.4.2	Production of Other Nonferrous Metals
					Economic Statistics
					Pollutants and Pollution Reduction and Prevention Opportunities
7.2	Primary Metals Industry in Canada, Mexico and the United States	416		7.5	Legislative and Regulatory Framework for the Primary Metals Industry
7.3	The North American Steel Industry	416		7.5.1	Overview of Canadian Legislation and Regulations
7.3.1	Steelmaking Process	416			General Framework
7.3.2	Industry Structure	418			Sector-specific Regulations and Standards
7.3.3	Major Economic Trends	418			Voluntary Measures
7.3.4	Changing Technology and Pollution Prevention Opportunities	419		7.5.2	Overview of US Legislation and Regulations
					General Framework
7.4	The North American Aluminum and Other Nonferrous Metals Industries	420			Sector-Specific Regulations and Standards
7.4.1	Aluminum Production	420			Voluntary Measures
	Industry Structure	420			
	Economic and Technological Trends	420			

M All tables and figures in Chapter 7 are from the 1997 Matched Data Set

7.6	Overview of Primary Metals Industry PRTR Reporting	426	7.9	Industrial Subsectors—Detailed PRTR Data (cont.)	
7.7	Change in Total Releases and Transfers, 1995–1997	427	7.9.2	Primary Nonferrous Metals (US SIC Code 333)	448
7.7.1	NPRI Facilities with Significant Changes, 1995–1997	427		Releases and Transfers from the Primary Nonferrous Metals Subsector	450
	NPRI Facilities with Large Decreases	428		Chemicals from the Primary Nonferrous Metals Subsector	450
	NPRI Facilities with Large Increases	430		Changes in Releases and Transfers for the Primary Nonferrous Metals Subsector, 1995–1997, and Projected Changes, 1997–1999	459
7.7.2	TRI Facilities with Significant Changes, 1995–1997	432			
	TRI Facilities with Large Decreases	432			
	TRI Facilities with Large Increases	433			
7.8	Industry Mix within the North American Primary Metals Sector	434	Figures		
7.8.1	Industrial Subsectors	434	7-1	NPRI and TRI Releases and Transfers, Blast Furnace and Basic Steel Products (US SIC Code 331), 1997	439
7.8.2	Multiple SIC Codes	435	7-2	NPRI and TRI Average Releases and Transfers per Form for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical Group, 1997	446
7.9	Industrial Subsectors—Detailed PRTR Data	435	7-3	Distribution of NPRI and TRI Total Releases and Transfers, Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical Group, 1997	446
7.9.1	Blast Furnace and Basic Steel Products (US SIC Code 331)	435	7-4	Percent Change in Total Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), NPRI and TRI, 1995–1997 and Projected 1997–1999	448
	Releases and Transfers from the Blast Furnace and Basic Steel Products Subsector	439	7-5	NPRI and TRI Releases and Transfers, Primary Nonferrous Metals (US SIC Code 333), 1997	450
	Chemicals from the Blast Furnace and Basic Steel Products Subsector	439	7-6	NPRI and TRI Total Releases and Transfers, Primary Nonferrous Metals (US SIC Code 333), by Chemical Group, 1997	451
	Changes in Releases and Transfers for the Blast Furnace and Basic Steel Products Subsector, 1995–1997, and Projected Changes, 1997–1999	447	7-7	NPRI and TRI Average Releases and Transfers per Form for Primary Nonferrous Metals (US SIC Code 333), by Chemical Group, 1997	458
			7-8	Percent Change in Total Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), NPRI and TRI, 1995–1997 and Projected 1997–1999	460

M All tables and figures in Chapter 7 are from the 1997 Matched Data Set

Tables	
7-1	Summary of Releases and Transfers for the Primary Metals Industry (US SIC Code 33) by Subsector, 1997 415
7-2	Facilities and Value of Shipments for the Primary Metals Industry in Canada, Mexico and the United States 417
7-3	Releases and Transfers for the Primary Metals Industry (US SIC Code 33), 1997 426
7-4	NPRI and TRI Releases and Transfers for the Primary Metals Industry (US SIC Code 33), 1995–1997 427
7-5	Releases and Transfers for the Primary Metals Industry (US SIC Code 33), by Subsector, 1997 436
7-6	NPRI and TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), 1997 438
7-7	NPRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical, 1997 440
7-8	TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical, 1997 (Single SIC Codes Only) 442
7-9	TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical, 1997 (Single and Multiple SIC Codes) 444
7-10	NPRI and TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), 1995–1997 447
7-11	Change in Total Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), NPRI and TRI, 1995–1997 and Projected 1997–1999 448
7-12	NPRI and TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997 449
7-13	NPRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997 452
7-14	TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997 (Single SIC Codes Only) 454
7-15	TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997 (Single and Multiple SIC Codes) 456
7-16	NPRI and TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1995–1997 459
7-17	Change in Total Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), NPRI and TRI, 1995–1997 and Projected 1997–1999 460

■ Key Findings

- The primary metals industry was the largest contributor of releases and transfers in Canada and the second largest in the United States in 1997, as identified in **Chapter 5**. This industry accounted for 36 percent of NPRI releases and transfers (see **Table 5–25**) and 27 percent of TRI releases and transfers (see **Table 5–26**).
- As noted in **Chapter 4**, this industry accounted for 78 percent of the increase in transfers from 1995 to 1997 reported to NPRI (see **Table 4–52**) and 67 percent of that reported to TRI (see **Table 4–53**).
- More than 72 percent of the total releases and transfers reported by the primary metals industry in both Canada and the United States were on-site releases to land or off-site transfers of metals, both of which result largely in land disposal of the wastes. In Canada, the percentage is even higher. Metal-containing wastes cannot be treated to destroy the metal. The alternative to disposal is recycling.
- Primary metals industry reporting is dominated by steel mills in both Canada and the United States. Manufacturers of basic steel products comprised one-quarter of NPRI primary metals facilities and generated almost two-thirds of NPRI total releases and transfers. In TRI, basic steel producers accounted for one-fifth of the primary metals facilities and almost one-half of the total releases and transfers.
- The primary metals industry reported increases of more than 25 percent in total releases and transfers from 1995 to 1997 in both NPRI and TRI. The industry's off-site transfers of metals rose substantially.
- For both Canada and the United States, the primary nonferrous metal facilities (aluminum, copper, zinc, nickel and lead refiners) accounted for the second-largest amounts of total releases and transfers—21 percent of the NPRI total and 27 percent of that in TRI.
- After a period of slow growth and restructuring, the North American steel industry is expanding, even in the face of domestic and world competition. Economic and regulatory challenges to the industry have, in many cases, led to new or refurbished equipment with cleaner, more efficient technologies and greater efforts to recycle or reuse materials on-site. However, increased production may also increase releases and transfers of pollutants. In addition, waste disposal has increased in years when the economics of disposal compared to recycling are more favorable or when on-site storage limits are reached.
- Several primary metals facilities also upgraded pollution control equipment during the 1995–1997 period. In Canada, several industry initiatives have set specific reduction targets for facilities to try to achieve through changes in production processes and pollution control technologies. US facilities generally attributed changes in pollution control equipment to regular maintenance.

7.1 Introduction

This chapter investigates in more detail primary metals industry reporting to NPRI and TRI. This sector was chosen for special analysis because of the following:

- Primary metals manufacturing is one of the most significant economic sectors in North America, serving as the foundation for virtually all other industrial and commercial sectors, including vehicle manufacturing, construction, packaging, energy transmission, durable appliances, and transportation.
- The primary metals industry is the largest contributor of releases and transfers in Canada and the second largest in the United States (see **Chapter 5, Tables 5–25 and 5–26**). This industrial sector also reported increases of more than 25 percent from 1995 to 1997 in both Canada and the United States, especially in off-site transfers (see **Table 7–4**, later in this chapter).
- Almost half of the 50 facilities in North America with the largest total releases and transfers in 1997 were primary metals facilities, and those facilities accounted for one-sixth of the total North American releases and transfers (see **Table 5–3 in Chapter 5**).

This chapter examines the context for PRTR reporting by the primary metals industry—the different types of facilities that make up the industry, their industrial processes and products, sources of the pollutants reported and opportunities for pollution reduction.

7.1.1 The Primary Metals Industry and PRTR Reporting

The primary metals industry (US SIC code 33) is composed of facilities that smelt or refine ferrous and nonferrous metal from ore or scrap. Ferrous metals are iron, steel and other iron-containing alloys. Nonferrous metals include aluminum, copper, lead, nickel and zinc. Primary smelting produces metals directly from ore, while secondary refining produces metals from scrap and process waste. Scrap consists of metal pieces (parts, bars, sheets, or wire) that did not meet product specifications in their manufacture, as well as used metallic material that can be recycled. This industry also produces alloys, castings, and formed or drawn metal products.

Economically, steel and aluminum are the most significant subsectors of the primary metals industry. Also, the blast furnace and basic steel products sector (US SIC code 331) facilities report the largest releases and transfers, while the primary refiners of nonferrous metals (US SIC code 333) report the

second largest in both Canada and the United States (**Table 7-1**). Therefore, this chapter focuses on steelmaking as well as primary refining of nonferrous metals, particularly aluminum.

The facilities included in the primary metals industry cover a wide range of facility sizes, processes, raw materials and products. While data about the amount of pollutants released and transferred are available, other important information, such as the specific processes and raw materials employed, and the products and size of production, is not available from the PRTR database. Thus, the overall combination of facilities making up the sectors and subsectors of the primary metals industry in North America and in each country will differ, depending on the specific facilities reporting. This needs to be kept in mind when reviewing the pollutant data.

In addition, data analyzed in this chapter are contained in the matched data set for chemicals that must be reported in both countries, as explained in **Chapter 2**. The analysis covers only those substances of concern reported to both NPRI and TRI. Many other

voluntary industry initiatives and governmental regulations affect the primary metals industry, but any detailed treatment of them is beyond the scope of this report.

When reporting to national PRTRs, facilities report the amount of metals and metal compounds in waste. A metal cannot be treated because it cannot be destroyed, regardless of whether the wastestream containing the metal is sent for treatment. Therefore, metals can be recycled, released to air or water, or be disposed of, most often in landfills on- or off-site. These landfills are permitted and regulated by government authorities. Reporting of metals recycled either on- or off-site is not required by NPRI and, therefore, is not included in the matched data set or in this analysis. In this report, since more than 72 percent of the amounts reported by the primary metals industry is disposed of in landfills (either on- or off-site—see **Table 7-4**), the analysis is based on the aggregate of releases (which includes on-site landfills) and transfers (which includes off-site landfills).

7.1.2 Guide to the Chapter

This chapter presents information about the economics and structure of the primary metals industry in the three North American countries. Given the relative importance of steelmaking and nonferrous refining, more detailed information is provided for these subsectors, including information on the processes used as well as economic and technological data. The chapter also addresses how those processes and technologies may be sources of pollutants and where opportunities for pollution prevention and reduction may occur. The second part of the chapter (from **Section 7.6**) presents the PRTR data as reported on the pollutants by US and Canadian facilities for 1997 and any changes noted from 1995 to 1997. Particular attention is paid to the two subsectors with the largest reported releases and transfers—manufacturers of basic steel products and primary refineries of nonferrous metals. The latter part of the chapter also discusses the reasons for change that were provided by the NPRI and TRI primary metals facilities reporting the largest decreases or increases of total releases and transfers from 1995 to 1997.

Table 7-1

M 1997

Summary of Releases and Transfers for the Primary Metals Industry (US SIC Code 33) by Subsector, 1997

US SIC Code	Industry	Number of Facilities	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	% of Total Releases and Transfers
NPRI Facilities						
331	Blast Furnace and Basic Steel Products	43	6,891,149	24,107,050	30,998,199	23.9
332	Iron and Steel Foundries	25	2,751,438	1,019,279	3,770,717	2.9
333	Primary Nonferrous Metals	30	8,722,657	1,125,165	9,847,822	7.6
334	Secondary Nonferrous Metals	8	16,028	480,895	496,923	0.4
335	Nonferrous Rolling and Drawing	36	171,920	65,248	237,168	0.2
336	Nonferrous Foundries	17	48,150	16,158	64,308	0.0
339	Miscellaneous Primary Metal Products	10	423,694	1,105,972	1,529,666	1.2
Total for NPRI Facilities within US SIC 33		169	19,025,036	27,919,767	46,944,803	36.1
Total for All NPRI Facilities in Matched Data Set		1,430	80,448,924	49,508,261	129,957,185	100.0
TRI Facilities						
331	Blast Furnace and Basic Steel Products	365	52,386,709	96,605,229	148,991,938	12.8
332	Iron and Steel Foundries	342	11,516,130	10,303,077	21,819,207	1.9
333	Primary Nonferrous Metals	54	82,111,466	3,955,533	86,066,999	7.4
334	Secondary Nonferrous Metals	159	1,644,545	8,410,648	10,055,193	0.9
335	Nonferrous Rolling and Drawing	347	3,553,917	5,409,999	8,963,916	0.8
336	Nonferrous Foundries	320	729,819	2,026,874	2,756,693	0.2
339	Miscellaneous Primary Metal Products	146	682,695	1,788,171	2,470,866	0.2
	SIC code not valid within SIC 33	1	243	117	360	0.0
Subtotal for Single SIC Codes within SIC 33		1,734	152,625,524	128,499,648	281,125,172	24.2
Subtotal for Multiple SIC Codes within SIC 33*		104	18,382,257	19,219,019	37,601,276	3.2
Total for TRI Facilities within US SIC 33		1,838	171,007,781	147,718,667	318,726,448	27.4
Total for All TRI Facilities in Matched Data Set		19,125	767,302,191	394,039,756	1,161,341,947	100.0

* TRI facilities may report more than one SIC code to define their operations.

7.2 Primary Metals Industry in Canada, Mexico and the United States

The primary metals industry in Canada is about equally divided between basic iron and steel manufacturers and non-ferrous metal manufacturers. For Mexico, there are twice as many iron and steel manufacturers as nonferrous metal foundries. For the United States, on the other hand, there are over 3.5 times as many nonferrous metal foundries as there are iron and steel manufacturers. For all three countries, the iron and steel manufacturers employ the majority of the primary metals industry workforce and the value of shipments is larger than that for the nonferrous metal industry, despite its greater number of facilities in Canada and the United States (**Table 7-2**). Because the three countries have different SIC code classification systems, this analysis can distinguish only three subsectors of the primary metals industry: iron and steel manufacturing, aluminum foundries and other nonferrous foundries. Each of the three sectors includes refining as well as casting and drawing of shaped products, such as steel tubes, aluminum pipes and copper wire.

About one-third of primary metals facilities in both Canada and the US report to the respective PRTRs (for NPRI, 169 out of 452, or 37 percent, and for TRI, 1,838 out of 5,330, or 34 percent). Not all facilities must report to the PRTR databases. Only those with more than 10 employee equivalents or who use or manufacture the chemical

substance in amounts greater than the thresholds must report. Also, for the purposes of this analysis, only the data for matched substances are included.

While PRTR data for Mexico are not available, there are about one-third as many primary metals industry facilities in Mexico as in Canada, and about three percent of the number in the United States.

7.3 The North American Steel Industry

Steel, an alloy of iron usually containing less than one percent carbon, is the backbone of many other industries, including motor vehicle manufacturing, construction, energy transmission, and the production of household appliances. Steelmaking is an energy-intensive operation, involving a series of manufacturing processes that transform raw materials into iron and steel products.

This section describes the steel-making process, the companies that make steel in North America, and major economic and technological trends in the industry, and provides a brief explanation of how these trends affect the generation of pollutants and the opportunities for pollution prevention and reduction.

Section 7.9.1, below, will present the PRTR data reported by the manufacturers of basic steel products. The remainder of **Section 7.3** will serve as a short introduction to the many different types of facilities making up the basic steel products subsector of the primary metals industry and will high-

light the different sources of the pollutant releases and transfers that will be presented in **Section 7.9.1**. This diversity of facility types and sources of releases and transfers should be kept in mind when reviewing the PRTR data.

7.3.1 Steelmaking Process

Steel manufacturing operations are broadly categorized as integrated or non-integrated. There are two steel-making processes, using basic oxygen furnaces and electric arc furnaces. The basic oxygen furnaces are used in integrated mills, while electric arc furnaces are usually used in non-integrated mills (mini-mills and specialty steel mills). A third technique, the Midland-Ross (Midrex) Process that produces direct-reduced iron (DRI), is a proprietary process used in one steel mill in Canada, Sidbec-Dosco (owned by Ispat International in Contrecoeur, Quebec) and several in Mexico (Ispat Mexicana and Hylsamex).

An integrated mill begins with raw materials (coal and iron ore), as well as scrap metals and, through a series of steps, extracts carbon and iron, processing them into high tonnage carbon steels. The integrated process begins with cokemaking, where coal is reduced in coke ovens to make a fuel to melt iron ore with limestone in a blast furnace, producing iron. Molten iron from the blast furnace is then combined with flux (an additive such as lime and/or fluorspar) and scrap steel, and high-purity oxygen is injected in a basic oxygen furnace, producing steel. The integrated mills produce a diversity of products, including bars, rods, rails,

structural shapes, sheets, tubes and wire rods. These mills are typically large establishments, and their need for coal and iron ore requires their location near rail or water transportation.

The non-integrated facilities, or mini-mills, use a simplified process that begins with scrap metals, thus avoiding the extracting and processing of raw materials. They can also use direct-reduced iron from the proprietary Midrex Process as the raw material. Mini-mills melt and refine scrap metal by passing an electric current through the scrap in electric arc furnaces. They generally produce carbon steels, low-tonnage alloys, and specialty steels—that is, more specialized types and grades of steel than the larger, integrated steel mills. Steel scrap often has a metallic coating of zinc, tin, nickel, lead and/or chromium. Mini-mills must treat the scrap to remove this coating before the scrap enters the furnace. These substances, then, may end up in waste. Mini-mills are generally smaller than integrated steel mills and are sited near sources of electricity and scrap steel and require a local market for their product.

The distinction between the two processes is an important one. Integrated mills are more capital and resource intensive, and their operations typically result in more releases to the environment. In comparison, mini-mill operations are less resource and capital intensive and result in fewer releases to the environment, as the coke and ironmaking steps are bypassed. However, because mini-mills rely exclusively on scrap metals from a variety of sources, they cannot completely

Table 7-2

Facilities and Value of Shipments for the Primary Metals Industry in Canada, Mexico and the United States

M 1997

	Primary Metals Industry					Both Iron/Steel and Nonferrous
	Total	Basic Iron and Steel Industry	Total Nonferrous Metals Industry	Aluminum Foundries	Other Nonferrous Foundries	
Canada						
Number of Facilities	452	201	251	91	160	
Value of Shipments (US\$ millions)	17,429	9,217	8,213	4,707	3,506	
Number of Employees	76,723	44,008	32,715	16,425	16,290	
NPRI Number of Facilities	169	75	94	45	49	
NPRI Total Releases and Transfers (kg)	46,944,803	36,298,580	10,646,223	2,460,950	8,185,273	
Mexico						
Number of Facilities	155	100	55	24	31	
Value of Shipments (US\$ millions)	10,501	7,403	3,098	481	2,617	
Number of Employees	54,634	35,669	18,965	6,665	12,300	
RETC Number of Facilities	data not available					
RETC Total Releases and Transfers (kg)	data not available					
United States						
Number of Facilities	5,330	1,143	4,187	1,273	2,914	
Value of Shipments (US\$ millions)	178,298	90,490	87,808	32,406	55,403	
Number of Employees	687,300	349,200	338,100	137,600	200,500	
TRI Number of Facilities	1,838	707	947	212	735	184
TRI Total Releases and Transfers (kg)	318,726,448	170,811,145	108,918,572	4,167,224	104,751,348	38,996,731
Including Multiple SIC Code Facilities*						
TRI Number of Facilities	1,838	757	1,128	322	899	
TRI Total Releases and Transfers (kg)	318,726,448	177,645,608	146,819,208	7,688,358	141,562,635	

► NPRI and TRI data for industry subsectors based on Canadian SIC code as reported by NPRI facilities and US SIC code as reported by TRI facilities.

Sources: **Canada** from *Manufacturing Industries of Canada: National and Provincial Areas, 1996*. Statistics Canada, Catalogue n. 31-203-XPB. **Mexico** from *Monthly Industrial Survey*, Mexican National Institute of Statistics, Geography and Computing, 1997 Annual Survey; **United States** Employees and Value of Shipments from "Table 2. Statistics for Industry Groups and Industries: 1996," *1996 Annual Survey of Manufacturers, Bureau of Census, M96(AS)-1*, February 1998, and Number of Facilities from *1996 County Business Patterns*, Bureau of Census.

* See Section 7.8.2.

control the quality of the materials fed into their process. This can result in significant variations in their environmental releases.

Both types of mills produce molten steel that is formed into ingots or slabs that are then rolled into finished products. Such rolling operations may require reheating, cleaning, and coating the steel. Finishing operations may also include acid pickling (cleaning the steel by the chemical removal of oil, grease and iron compounds) and coating.

7.3.2 Industry Structure

The United States produced 97.5 million tonnes of crude steel in 1997, the third largest production in the world (behind China and Japan). Canada produced 15.6 million tonnes, ranking 14th in the world, and Mexico produced 14.3 million tonnes, ranking 15th in the world.

The steel sectors of North America are highly interlinked. Steel producers in the three countries engage in cross-border shipments of steel and purchase materials from the same suppliers. Their largest customers are also the same—the automotive and auto parts manufacturers that span the border. With the elimination in 1998, under the North American Free Trade Agreement, of the tariff on steel products shipped over the border, these close linkages will only increase. The United States was the 14th largest exporter of steel in 1997, exporting 5.6 million tonnes. Mexico was the 16th, exporting 5.5 million tonnes and Canada was the 18th, exporting 4.8 million. The United States imported 28.5 million tonnes, the largest amount of any country in the

world. Canada and Mexico imported 6.7 million and 1.4 million, respectively, according to the International Iron and Steel Institute.

The Canadian steelmaking sector comprises twelve companies: Algoma Steel, Atlas Steels, Co-Steel Lasco, Dofasco, Gerdau Canada, IPSCO, Ispat Sidbec, Ivaco, QIT-Fer et Titane, Slater Steels, Stelco, and Sydney Steel Corp. These companies operate 17 plants that melt and pour steel in Alberta, Manitoba, Nova Scotia, Ontario, Quebec, and Saskatchewan. Operations in Ontario account for 70 percent of Canadian capacity, including four integrated mills. In 1997, the industry employed 33,400 employees, with sales in excess of C\$11 billion (US\$7 billion), of which C\$3.6 billion (US\$2.4 billion) were exports. The IPSCO facility in Regina, Saskatchewan, is not included in this report, since there are no reports from this facility in the public NPRI database.

The US steel industry is considerably larger. In 1997, the US iron and steel industry consisted of an estimated 197 companies operating 279 iron and steel mills, employing 147,000 employees, with shipments valued at US\$57 billion. The largest companies include the USX Corporation, Bethlehem Steel Corp., LTV Corp., National Steel Corp., Inland Steel Industries, Armco, Weirton Steel Corp., and Wheeling-Pittsburgh Steel. Approximately 80 percent of US integrated steelmaking capacity is located in the Great Lakes states because, historically, mill sites were selected for their proximity to water (for cooling and processing as well as transportation) and the sources of their raw materials. The remainder are found

in the southern and western regions; these are primarily mini-mills, built where abundant electricity and scrap are available. Some of the largest non-integrated steel companies are Nucor Steel, Northwestern Steel and Wire, Trico Steel and the Timken Company.

Mexico has several large steel companies. Altos Hornos de México has two facilities and is the largest steelwork in Mexico. The TAMSA facility is part of a global alliance of steel companies in Mexico, Argentina and Italy (The DSL Group) and is the sole Mexican producer of seamless steel pipe used in oil and gas production and transportation. Hyslamex, a subsidiary of Alfa Steel, is allied with AK Steel—both companies operating in Canada and the United States. Ispat Mexicana is Mexico's largest steel exporter and is part of Ispat International, which owns steel companies in the US and Canada as well as other countries.

7.3.3 Major Economic Trends

After a long period of slow growth and restructuring, the North American steel industry is enjoying a resurgence due to expanding markets and technical innovation. Throughout the 1980s, the North American steel industry saw slow growth in demand for its products, mainly due to market loss to other materials like plastics, increased imports, lower demand due to weakness elsewhere in the North American manufacturing sector, and inefficiency of older manufacturing plants. This has led to plant closures and massive layoffs, but also to increased auto-

mation and investment in new technologies.

During the same period, however, non-integrated mini-mills more than doubled their capacity, benefiting from low-cost scrap metal and lower start-up costs. While the mini-mills could initially manufacture only low-quality steel products, technological improvements have allowed them to expand into new markets such as flat-rolled products. Rising prices for scrap metal and the scarcity of high-quality scrap may now constrain their growth. This is prompting mini-mills to seek alternate iron sources, such as iron carbide. Because mini-mills tend to be smaller and have fewer employees, overall employment in the steel industry has decreased in the last 20 years.

Since 1993, demand for steel has once again picked up, due in large part to growth in the automotive and construction sectors. Recent and rapid changes in automotive design and manufacturing, the largest end use of North American steel, have had a direct impact on steel producers, bringing about much of the steel industry's technological improvements. Government pressure to create more fuel-efficient vehicles, particularly through the Corporate Average Fuel Economy (CAFE) standards in the United States, has driven innovation to develop and produce strong, light autobody steel.

At the same time that the North American steel industry has shown its ability to respond to changing and growing domestic demand, it is being challenged by Russian and European steelmakers, which are vying for an increased share of the North American market. Both the US and Canadian steel

industries have also accused some foreign steel suppliers, such as those from Japan and Brazil, of illegally dumping their steel (selling products at less than the cost of production) in the North American market. The steel industries in these countries have countered that the United States is also guilty of dumping its steel in foreign markets. The steel-dumping war is an indication of the fierce competition that has been characteristic of the global steel industry in the 1990s.

7.3.4 Changing Technology and Pollution Prevention Opportunities

Domestic and world competition has led to cleaner, more efficient technologies and environmental management systems. The North American iron and steel industries began major investments in air, water and solid waste control technology and management in the first half of the 1990s, which are continuing today. Recent innovations include the move toward continuous process production, making the whole steelmaking process a continuous flow. This reduces waste, production time, energy consumption and costs. Continuous casting, for example, is now the normal industrial process because of its energy efficiency compared to traditional batch-casting operations.

Overall, production in both countries is cleaner and more efficient than it was 10 or 15 years ago. According to a 1995 EPA review, the US iron and steel industry has generally become more efficient over the past 15 years through improvements in manufactur-

ing techniques, increasing water recycling rates and water conservation, eliminating obsolete processes, introducing pollution prevention, and improving wastewater treatment practices.

Similarly, according to the Canadian Steel Producers' Association, the production of one ton of steel in Canada now results in 80 percent fewer releases to air, water and waste disposal than at the beginning of the decade, and energy consumption has decreased by 19 percent from 1990 to 1997.

Steelmaking is a complex process whose many steps can produce pollutants. Pollution control techniques are necessary but these varied sources of pollutants also provide many opportunities for pollution reduction and prevention. Sources of pollutants and the techniques used to reduce them are described in this section. Efforts in the iron and steel industry have concentrated on reducing cokemaking emissions, dust from electric arc furnaces, and spent acids in finishing.

The production of coke yields many undesirable byproducts, including benzene, phenol, hydrogen cyanide and other cyanide compounds, naphthalene, toluene, and xylene, which are generated from the volatile components in the coal. Captured byproducts are sold commercially. To reduce emissions from cokemaking, some steelmakers are replacing coal with less polluting carbon sources such as pulverized coal injection, natural gas, oil and tar/pitch. Pollutants that escape from doors and lids of coke ovens become fugitive emissions that are released to air as gases and particulates, or they may be found in wastewater from quenching

operations or as "scrubber" wastes from air pollution control equipment. Fugitive emissions can be reduced through better door and lid design, seals and cleaning and maintenance.

Improved coke oven design can reduce pollution. Nonrecovery coke ovens use volatile compounds driven from the coal as fuel to heat the oven, eliminating recovery piping systems that may leak or break. EPA considers nonrecovery cokemaking technology to be the "best achievable technology" under the federal Clean Air Act Amendments (CAAA). This option is applicable, however, only in the construction of new coke ovens. Otherwise, the necessity for cokemaking can be reduced or eliminated by making iron directly from iron ore, fuel (coal or natural gas) and lime.

Producing molten iron from iron ore, coke and limestone in a blast furnace generates slag and air particulates. Slag captures impurities in the ore, such as silicon or phosphorus; metals such as cadmium, chromium, lead, manganese, nickel and zinc; or sulfur from the fuel. The amount of slag largely depends on the amount of iron ore processed. For decades, slag has been used by the construction industry as a raw material for aggregate, cement, or light masonry, and new markets are continually being explored. Iron oxide waste in dust and wastewater sludge can be recycled into the ironmaking process itself.

During steelmaking, pollution control devices remove dust and gas that exit the furnace. These devices use either a wet or dry system, producing dust (from the dry system) or sludge (from the wet system). Metals in the

emissions come from scrap metals used as raw materials and other metals mixed with the steel to produce steel alloys. Typical of these are zinc, chromium and nickel. Air emissions are proportional to the amount of time the metals spend at high temperatures but techniques are available for reducing this period.

Wastes produced by an electric arc furnace are similar to those from iron and steelmaking. Electric arc furnace processes avoid cokemaking wastes because they do not require coke. However, mini-mill wastes may have increased concentrations of metals in dust, slag and sludge because of the scrap metal used as input. Steel scrap usually has a metal coating of zinc, tin, nickel, lead and/or chromium; stainless steel scrap is high in nickel and chromium; and galvanized steel's coating is zinc.

The use of electric arc furnaces to produce steel from scrap metal generates electric arc furnace dust, a waste iron oxide contaminated with non-ferrous metals, primarily zinc and lead. Individual companies weigh the cost of having off-site facilities recover the metals from the waste against those of disposing of it in off-site landfills. Meanwhile, studies of more economical ways to recycle the metals in the waste continue. Dust from electric arc furnaces can be pelletized and then reused in the furnace. If the concentration of zinc is high enough, it can be recovered. However, not all mills find on-site recovery to be technically or economically competitive. Improvements in technologies have made off-site recycling a cost-effective alternative to land disposal in some cases.

Waste iron oxides are produced during integrated iron and steel manufacturing processes and pose a major pollution prevention challenge for North American producers. Steelmakers and industrial service providers are studying ways to recover iron and nonferrous metals from the waste. On-site recovery processes have yet to be proven, technically or commercially.

Other sources of pollutants and opportunities for pollution reduction occur after the initial steelmaking. Steel that is cast is generally reheated for forming, and then oxides on the surfaces of the cast steel are removed. The oxides become airborne particulates. Cooling water is collected in settling basins along with oil, grease and mill scale generated in the casting process. The scale can be recycled. When the wastewater is treated, sludge is generated. To finish steel, it must be cleaned or "pickled" before a protective coating is applied. Carbon steel is pickled with hydrochloric or sulfuric acid, and stainless steel is pickled with hydrochloric, nitric or hydrofluoric acids. Rinse water from coating processes or grindings from rolling may contain zinc, lead, cadmium or chromium. In forming and finishing, process waters can be recycled and reused or regenerated many times. There are alternatives to the strong acids used in the cleaning process, such as pressurized air or water, abrasives and alkaline agents. Large-scale steel manufacturers commonly recover hydrochloric acid in their finishing operations, but cost-effective recovery techniques for smaller-sized plants are still under development.

7.4 The North American Aluminum and Other Nonferrous Metals Industries

Nonferrous metals include aluminum as well as such metals as copper, nickel, lead and zinc. Primary aluminum is commonly produced by extracting aluminum oxide from bauxite ore, reducing the aluminum oxide to pure molten aluminum. This is then either mixed with other metals to form alloys of specific characteristics or cast into ingots for transportation to fabricating shops. In secondary aluminum production, scrap is usually melted in gas- or oil-fired furnaces, producing ingots of pure aluminum that serve as feedstock for other processes and for producers of other materials. Other nonferrous metals are refined by concentrating the metal from the ore and then leaching or smelting it at high temperatures. Refining wastes may contain impurities such as gold, silver, antimony and other metals that are recovered for their value.

7.4.1 Aluminum Production Industry Structure

In 1997, almost two-thirds of aluminum production fed three markets: transportation, containers and packaging, and building and construction. The automotive sector is the largest end-user, followed by makers of beverage containers. Electrical applications, consumer durables, and machinery and equipment are the next-largest group. Mexico has only one aluminum smelter, so this section focuses on production of aluminum in the US and Canada.

The Canadian aluminum sector consists of five companies: Alcan Aluminum Limited, Canadian Reynolds Metals Limited, Aluminerie de Bécancour Inc., Alcoa-Aluminerie Lauralco Inc., and Aluminerie Alouette Inc. All but one of the production facilities are located in Quebec, with the exception being in British Columbia. In 1997, the Canadian primary aluminum industry had a total production capacity of about 2.3 million tonnes and an estimated value of C\$5.2 billion (US\$3.5 billion). Canada is the world's third-largest producer, following the United States and Russia. Almost 81 percent of Canadian aluminum production is exported, of which 75 percent is destined for the United States.

The US primary aluminum sector had a total production capacity of 9.3 million pounds (4.3 million tonnes) in 1997, coming from 23 smelting facilities operated by 13 firms. Four of these firms are integrated producers, including Alcoa Inc., Alumax Inc., Reynolds Metals Company and Kaiser Aluminum & Chemical Corporation. There are an estimated 68 secondary plants. US primary aluminum production is concentrated in the northwest and the Ohio River Valley. Secondary aluminum smelting is located in southern California and the Great Lakes region. In 1997, the industry produced a total of 22 billion pounds (10 million tonnes) of aluminum, of which about 30 percent drew on imported stock and 33 percent on recycled aluminum. US aluminum exports accounted for 13 percent of total production in 1997.

Canada and the United States are each other's largest trading partners in

aluminum. In 1997, imports and exports between the two countries totaled three million tons of aluminum, consisting of ingots, scrap and mill products.

Economic and Technological Trends

Aluminum production has remained relatively stable since the late 1980s, when fluctuations in price, supply and demand brought on downsizing and restructuring. World primary aluminum prices fell again in 1993 with increased exports from Russia and Eastern Europe. US aluminum sales increased in 1994 due to increased demand in automotive manufacturing and beverage container stock.

Recent developments in the aluminum industry include new applications for the rehabilitation of transportation infrastructure, such as bridges. The aluminum sector is also expanding by selling product to manufacturers of cruise ships and fast ferries, and attempting to capitalize on the trend toward lighter cars.

Pollutants and Pollution Reduction and Prevention Opportunities

Aluminum refining involves several steps that may produce pollutants and thus require pollution control equipment. These production steps, however, may also provide opportunities for pollution reduction and prevention. The various control and pollution prevention techniques are described here.

Extracting aluminum oxide from bauxite ore involves crushing the ore and mixing it with aqueous sodium hydroxide. This slurry is reacted at high temperatures to remove impurities such

as silicon, iron, titanium and calcium oxides. The aluminum oxide is then put in carbon-lined “pots,” through which an electric current is passed. The alumina is reduced, liberating oxygen in the form of carbon dioxide and carbon monoxide, and the aluminum collects in the bottom of the pots. The molten aluminum may be treated with chlorine gas or fluoride salts to react with any remaining metallic impurities.

Large amounts of particulates are generated during the extraction process. Typically, this dust is recycled, due to its economic value. Fluoride emissions from the reduction process are captured or recycled. Iron cyanide complexes form in the carbon portion of the pot linings, and these liners eventually crack and must be replaced. Longer-lasting carbon liners have been developed, reducing this waste.

Secondary aluminum processing involves melting aluminum scrap in furnaces to remove magnesium, using chlorine gas or salts. This produces slag that contains magnesium and metallic chlorides. Air emissions typically contain chlorine, metal chlorides of zinc, magnesium and aluminum, and various other metals, depending on the content of the original scrap. Fluorides are emitted both as gases and dust. Baghouse scrubbers are used for emission control.

7.4.2 Production of Other Nonferrous Metals

Economic Statistics

Other nonferrous primary metals producers include copper, zinc, nickel and lead smelters and refineries. More than half of the refined copper consumed

annually is used for electrical applications, mostly as wire. While aluminum has largely replaced copper in automobile radiators, an increase in demand for copper is expected due to the increase in the number of electrical circuits in automobiles and residential housing. Copper refineries in Canada produced 560,000 tonnes in 1997. In the United States, 2.4 million tonnes of copper were refined in 1997.

Zinc is used in the automotive and construction industries for the galvanization of steel. New applications for zinc are in the manufacture of zinc-air batteries and galvanized steel studs to replace wood ones in construction. Canada currently produces only a minor amount of secondary zinc. However, processing electric arc furnace dusts or de-zincing galvanized steel scrap could become important sources of refined zinc in the future. Canada produced 745,000 tonnes of zinc metal in 1997 while the United States produced 390,000.

Pollutants and Pollution Reduction and Prevention Opportunities

A variety of processes may be used to recover metals and control impurities during production of such nonferrous metals as zinc, copper, nickel and lead. Oxide ores can be leached with sulfuric acid to produce sulfide ores. Sulfide concentrates are produced from the sulfide ores at the mine site by separating valuable minerals from waste using physical methods. Concentrates may then be smelted at high temperature or treated by pressure leaching to produce metals that meet commercial specifications. The refining process also yields

valuable byproducts that may be marketed or further processed by another smelter or refinery. Such byproducts include antimony, arsenic, bismuth, cadmium, copper, lead, nickel, selenium, tellurium, zinc, silver, gold and platinum group metals. Impurities, such as mercury, are usually fixed in a stable form.

Copper oxide ores are processed at the mine site by leaching them with sulfuric acid. The acid is regenerated and reused. The result, copper sulfide concentrates, are then smelted by drying the concentrate and feeding it into a furnace that oxidizes and melts the ore into a mixed copper-iron sulfide. Most zinc sulfide concentrates are roasted and leached, but some can be pressure-leached with sulfuric acid and oxygen at elevated temperature and pressure. In either case, iron is then precipitated out from the solution and the solution is purified, with most of the acid being regenerated and reused. The copper or zinc is recovered by an electrorefining process. In this, an electric current is passed through the solution, coating rods with the metal and precipitating the impurities, which fall to the bottom as slag. Lead concentrates from sulfide or carbonate deposits are smelted prior to purification in an electrolytic or thermal refinery. Nickel sulfide concentrates are smelted to produce intermediate products. Final processing usually entails leaching, solution purification and electrorefining.

Smelters generally have high gas flows that contain particulate matter. They use wet scrubbers, electrostatic precipitators or fabric filters to minimize metal and particulate emissions,

and most control acid gas emissions by recovering and marketing sulfuric acid or liquid sulfur dioxide. Some impurities may be bled from the process to control levels of sulfuric acid and/or refined metal, improve workplace quality or reduce releases. Pressurized leaching processes have minimal air emissions and fix sulfur in the elemental form, which can be marketed or stored. Leaching processes and refineries also have minimal air emissions. The acid or other leaching agent is regenerated and reused, with any excess or bleed stream being treated prior to discharge.

Leaching or smelting of ores or concentrates produces solid wastes containing residual minerals or inorganic metal compounds that cannot be economically recovered. Waste must be managed to minimize the potential for such compounds to be dissolved and for dissolved metals or other contaminants to migrate from the impoundment area.

Metals are among the most highly recycled materials in North America. Recyclable materials, including manufacturing scrap from a variety of industries and post-consumer waste, are processed by primary and secondary copper, lead and zinc smelters and refineries and manufacturers of stainless steel and other nickel-based alloys. Metal-containing recyclable materials are important feedstocks for North American metal producers and recyclers, but are tracked as wastes in some jurisdictions to ensure environmentally sound management.

7.5 Legislative and Regulatory Framework for the Primary Metals Industry

7.5.1 Overview of Canadian Legislation and Regulations

General Framework

Under the Canadian environmental protection regime, toxic substances management is generally regulated at the federal level, while ambient and point source air standards, water standards and waste management practices are regulated at the provincial level. Few regulations are aimed exclusively at the steel sector. Rather, the industry's releases are regulated or managed substance by substance.

The federal Canadian Environmental Protection Act (CEPA) is the main enabling legislation for toxic substances management. Under CEPA, substances are evaluated to determine whether they should be designated as "CEPA-toxic," thus requiring special attention to control and reduce their release. Once deemed CEPA-toxic, these substances usually proceed through a Strategic Options Process, to determine the most effective means of control.

The federal Toxic Substances Management Policy (TSMP) provides the broad policy framework for addressing CEPA-toxic substances. Under TSMP, substances that are toxic, persistent, and

bioaccumulative are to be virtually eliminated ("Track 1"). Other substances that do not meet these criteria are designated for special lifecycle management to prevent or minimize their release ("Track 2"). The TSMP list includes 16 substances that are relevant to the primary metals industry: PCBs and dioxins and furans are Track 1 substances. Track 2 substances include benzo[a]pyrene, anthracene, other polycyclic aromatic hydrocarbons, arsenic, cadmium, chromium, lead, mercury, nickel, fluorides, dichloromethane, tetrachloroethylene, trichloroethane, and trichloroethylene. None of the Track 1 substances are reportable to NPRI, but all of the Track 2 ones are, with the exception of benzo[a]pyrene and other polycyclic aromatic hydrocarbons.

With regard to waste management, federal legislation deals primarily with the transportation of hazardous waste, under the Transport of Dangerous Goods Act and Regulations, which outline the conditions under which certain types of hazardous waste can be transported, both domestically and internationally. Regulations related to the registration of waste carriers and the licensing of waste sites are covered at the provincial level.

In terms of water discharges, smelters are subject to the federal Fisheries Act, which prohibits the release of effluent that is acutely lethal to fish. At the provincial level, regulatory mechanisms and requirements differ from facility to facility and from province to province. Many controls are stipulated through site-specific requirements, such as site permits, certificates

of approval, or licenses. Standards also exist for allowable pH levels and metal concentrations.

All provinces have regulatory requirements to control air emissions. Regulations usually cover common air pollutants and metals, and are often in the form of ambient air quality standards and/or limits on concentrations of emissions at source. Site-specific requirements in permits also include air emission limits, as well as monitoring and reporting requirements.

The 1994 Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) is also relevant to the primary metals industry, particularly the steel sector. COA is an agreement between the federal government and the Province of Ontario to help meet Canada's obligations under the Canada-US Great Lakes Water Quality Agreement (1978, amended 1987). The COA calls for restoration of degraded areas through the development and implementation of remedial action plans in 17 areas of concern. Steel mills discharge into two such areas, Hamilton Harbour and the St. Marys River. Remedial action plans are in place for both areas. The COA also calls for the prevention and control of pollution with specific targets and schedules for persistent, bioaccumulative, and toxic substances. The COA "Tier 1" substances, which are to be "virtually eliminated" (reduced by 90 percent between 1988 and 2000), include PCBs, dioxins and furans, benzo[a]pyrene and mercury. "Tier 2" substances, to be reduced by over 50 percent between 1988–2000, include anthracene and 17 other polycyclic aromatic hydro-

carbons, and cadmium. Mercury, anthracene and cadmium are reportable to NPRI.

Similarly, the St. Lawrence Vision 2000 is a cooperative action plan between the Government of Canada and the Government of Quebec to adopt a joint ecosystem-based approach to protecting the St. Lawrence River. The original agreement calls for a 90-percent reduction of toxic discharges by 50 industrial facilities along the St. Lawrence and Saguenay rivers. Another 56 facilities have been added, and the aim is for the virtual elimination of 11 persistent and bioaccumulative toxic substances.

Sector-specific Regulations and Standards

There is little in the way of sector-specific regulation at the federal level. No federal regulations exist for the steel sector. The only federal regulations specific to a nonferrous metal smelting subsector are the Secondary Lead Smelter Release Regulations, which limit the release of CEPA substances at source. The regulations, under CEPA, establish concentration standards for air emissions of lead in particulate matter and stipulate procedures for sampling, analysis and reporting. The Metal Mining Liquid Effluent Regulations and Guidelines may also be applied to some primary base metal smelters or refineries, under the federal Fisheries Act, if their discharge is combined with the effluent from an active mine.

In the last few years, Environment Canada has launched comprehensive reviews of both the steel sector and the

base metal (copper, lead, nickel and zinc) smelting sector. Under the CEPA Strategic Options Process, these multi-stakeholder reviews have assessed management options for toxic substances released by facilities in these sectors.

The Steel Strategic Options Process (SSOP), undertaken in 1996, reviewed the management of benzene, polycyclic aromatic hydrocarbons, arsenic, cadmium, chromium, nickel, lead, mercury, dioxins and furans, and PCBs. It concluded that most substances released by the steel sector were adequately managed through existing programs. However, it was recognized that special action was required to further reduce benzene and polycyclic aromatic hydrocarbon emissions. Through the SSOP, specific objectives were formulated for quantifying and setting reduction targets for these kinds of emissions. It was agreed that these objectives would form the basis of a voluntary Code of Practice for Steelmaking (see Voluntary Measures, below).

The Base Metal Smelting SOP, undertaken in 1997, investigated the management of arsenic, cadmium, nickel, lead, mercury, dioxins and furans. Smelting companies and other stakeholders agreed to voluntary measures to achieve reduction targets for these substances. It was also concluded that ambient air and water quality guidelines for substances released by the base metals smelting facilities would be developed. Progress toward these commitments will be reviewed in the spring of 2001.

The most comprehensive provincial sector-specific regulation for waste-

water discharges is found in Ontario. The Ontario Municipal Industrial Strategy for Abatement (MISA) regulations address levels of persistent toxic substances in industrial direct discharges entering Ontario's waterways from nine industrial sectors, including the iron and steel sector. The iron and steel regulation provides standards for total chromium, total lead and total nickel. It covers all four integrated mills in Ontario, as well as three non-integrated mills. It is based on source performance limits derived from analyses of Best Available Technology Economically Achievable (BATEA) and production levels. The regulation took effect in April 1998.

Another sector-specific provincial regulation is Manitoba's Inco Ltd. and Hudson Bay Mining and Smelting Co. Ltd., Smelting Complex Regulation. Introduced in 1988, the regulation requires emission controls at the two facilities for sulfur dioxide and particulate emissions and outlines monitoring requirements related to an acid rain control program.

Voluntary Measures

In recent years, the federal government has placed great emphasis on negotiating voluntary industrial agreements. Environment Canada opted for voluntary action under both the 1996 Steel Strategic Options Process and the Base Metals Smelting Process (see the above section). As agreed under the SSOP, a voluntary Environmental Code of Practice for Steelmaking is being developed, which will include a pledge to reduce CEPA-toxic metals in air emissions and in water effluent and with specific reduction targets for emissions of

benzene and polycyclic aromatic hydrocarbons.

The Canadian Steel Producers' Association released its Statement of Commitment and Action in June 1998. In it, the steel industry committed itself to reduce benzene emissions 57 percent per ton of coke produced by 2000, 83 percent by 2005, and 89 percent by 2015. Similarly, the steel industry has committed itself to reduce polycyclic aromatic hydrocarbon emissions 20 percent per ton of coke produced by 2000, 40 percent by 2005, and 50 percent by 2015. Reduction targets are based on 1993 levels and are subject to revision, based on additional information in the future. The Statement of Commitment and Action also outlines sector goals for reductions in other air emissions, reduced energy consumption, and improved water quality and waste management.

To help steel companies meet these reduction targets, the Canadian Steel Producers' Association has developed two environmental Best Practice Manuals on operating methods to reduce polycyclic aromatic hydrocarbon emissions from coke ovens and to reduce benzene emissions from byproduct operations. The draft manuals have been used by companies for a trial period and are expected to be issued in final form by the end of 1999. The Canadian Steel Producers' Association has also committed itself to reviewing and publicly reporting on progress toward the above commitments. Its first Environmental Progress report was released in November 1999.

Another voluntary initiative that has been integrated into the Code of Practice is the Accelerated Reduction/

Elimination of Toxics program (ARET). ARET is a national voluntary reporting and reduction program, which calls for the measurement and reduction of 117 substances released to air, to water and as waste (of which 48 are reportable to NPRI). The goal of ARET is to reduce persistent bioaccumulative toxic substances by 90 percent and the other listed substances by 50 percent between 1988 to 2000.

While the program is not specific to the steel sector, 80 percent of Canadian steel manufacturing capacity is covered by the ARET program. Thirteen steel companies have submitted action plans toward meeting the ARET targets. Targeted substances related to the iron and steel sector include most of the 16 CEPA-toxic substances, with the exception of nickel and trichloroethylene. The Aluminum Industry Association and 80 percent of its members also support and participate in ARET. Of ARET substances reported by the aluminum sector, polycyclic aromatic hydrocarbons accounted for 99 percent of emissions (with the exception of anthracene, polycyclic aromatic hydrocarbons are not reportable to NPRI).

The Base Metals Smelting SOP (see Sector-specific Regulations and Standards, above) resulted in a voluntary commitment on the part of the sector to reduce CEPA-toxic metals by 80 percent by 2008 and by 90 percent beyond 2008 (from 1988 levels). Facilities also agreed to develop site-specific environmental management plans, including specific management options for dioxins and furans emissions. Pollution prevention options will also be explored.

7.5.2 Overview of US Legislation and Regulations

General Framework

Legislative authority to regulate releases from the iron and steel sector comes under three federal statutes, the Clean Air Act and its 1990 amendments (CAAA), the Federal Water Pollution Control Act (referred to as the Clean Water Act—CWA—after its 1977 amendments) and the Resource Conservation and Recovery Act (RCRA).

Several general provisions in the CAAA relate to the primary metals industry. Title I of the Clean Air Act addresses requirements to meet the National Ambient Air Quality Standards (NAAQS). Standards for the “criteria pollutants” carbon monoxide, nitrogen dioxide, ozone, lead, sulfur dioxide, and particulate matter most directly affect primary metals producers. Of these, lead and ozone are reportable to TRI. The CAAA’s New Source Review (NSR) requirements apply to new facilities, expansions or process modifications. New sources of the “criteria” pollutants regulated under NAAQS, in excess of levels defined by EPA as “major,” are subject to the NSR requirements. These can include requirements for Best Available Control Technology (BACT) and continuous on-site monitoring or, in the worst cases, can include Lowest Achievable Emission Rate Standards (LAER) that may be achieved through emissions trading in specified areas.

The CAAA also requires EPA to regulate emissions of 188 hazardous air pollutants from large industrial

facilities. Of the 188 substances, all but eight are reportable to TRI. EPA has National Emission Standards for Hazardous Air Pollutants (NESHAPs) as well as a program to issue Maximum Achievable Control Technology (MACT) regulations for new and existing “major sources.” “Major sources” are those that emit 10 tons (9 tonnes) per year or more of a listed pollutant or 25 tons (23 tonnes) per year or more of a combination of pollutants.

The Clean Water Act regulates indirect and direct wastewater/effluent discharges. Industry-specific, technology-based standards have been developed that limit the amount of industrial wastewater pollutants being discharged into waterways, either directly to surface water or indirectly to public sewage treatment plants (see below). Surface water discharges are also covered by the Storm Water Rule, which requires the capture and treatment of storm water at primary metals industry facilities.

The Resource Conservation and Recovery Act (RCRA) classifies hazardous wastes and stipulates management and control requirements. These regulations establish a “cradle-to-grave” system governing hazardous waste from the point of generation to disposal. Facilities that generate hazardous waste are subject to waste accumulation, manifesting and record-keeping standards. Facilities that dispose of the waste must obtain a permit from the US EPA or authorized state agency. Most RCRA regulations are not industry specific but apply to any company that transports, treats, stores, or disposes of hazardous wastes. In addition to standards for record keeping and

emergency planning, land disposal restrictions apply that prohibit the disposal of hazardous wastes on land without prior treatment (in the case of metals this includes recovery processes, use in glass ceramics, as an ingredient in cement or stabilization).

RCRA-listed wastes can be produced during coke-, iron- and steel-making, forming, and cleaning/descaling operations. Emission control dust and sludge from the smelting and refining processes typically contain zinc, lead, cadmium, nickel and chromium. Spent pickle liquor from finishing may contain iron, chromium and nickel. Wastes containing these metals must be managed in accordance with RCRA regulations.

Sector-specific Regulations and Standards

Under the CAAA and NESHAPs, there are four national emission standards that pertain to the iron and steel industry. Specific standards are set for coke ovens, benzene emissions from coke byproduct recovery plants, halogenated solvent cleaning, and chromium from industrial process cooling towers. In a negotiated rule for coke ovens, the industry agreed to conduct daily monitoring, install flare systems to control upset events, and develop work practice plans to minimize emissions, in return for greater flexibility in meeting the standards.

Under the CAAA’s New Source Review requirements, EPA minimum standards for LAER and BACT in iron and steel mills are set out in four new standards of performance: one for electric arc furnaces plus one for electric arc furnaces that are equipped with

argon-oxygen decarburization vessels, as well as one each for primary and secondary emissions from basic oxygen furnaces. New performance standards for nonferrous metal smelters include those for primary aluminum, copper and zinc smelters and for secondary lead smelters. These generally address controls on particulates, gases (fluorides or sulfur dioxide), and emissions opacity. All of these standards require specific monitoring and testing procedures.

In addition to national standards for general processes and equipment there are national emission standards under NESHAPs for primary lead smelting that limit emissions of lead, and for secondary lead smelting that limit emissions of lead and total hydrocarbons. Total fluorides and polycyclic organic matter are limited for primary aluminum production facilities under NESHAPs and hydrochloric acid is limited for steel pickling facilities.

The MACT regulations require the application of air pollution reduction measures at all facilities covered by the regulations. Among the primary metals industries, such regulations have been issued for primary and secondary lead smelters, for primary and secondary aluminum smelters and for the steel pickling–hydrochloric acid process. Regulations have been proposed for primary copper smelters and are being developed for integrated iron and steel manufacturers, as well as for iron and steel foundries.

The MACT regulations for the secondary aluminum smelters, for example, establish emission standards for particulate matter (as a surrogate for metals), total hydrocarbons (as a

surrogate for organics) and hydrogen chloride (as a surrogate for hydrogen chloride and chlorine). The required emissions reductions can be achieved with pollution controls such as fabric filters or afterburners or through pollution prevention activities. The regulation also allows for “emissions averaging” among various emission sources at a facility in certain situations, to achieve the required emissions reductions in a cost-effective manner. In this way, some emission sources may be reduced further than required while others may be less controlled, as long as all sources at a facility, taken together, achieve the required reduction.

Steel mills’ surface water discharges are subject to Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category. The standards stipulate limits for total suspended solids, oil and grease, pH, ammonia-N, phenols, total cyanide, total chromium, hexavalent chromium, total lead, total nickel, total zinc, benzene, benzo[a]pyrene, naphthalene, tetrachloroethylene. All of these, except for

total suspended solids and oil and grease, are reportable to TRI. EPA completed a preliminary review of the Iron and Steel Manufacturing Point Source Category in 1995 and is currently reviewing the guidelines and standards to determine whether changes should be made in light of advances in manufacturing technologies. Revisions are expected by 2000.

Specific requirements under the CWA for the nonferrous industries include rules for the following Point Source Categories:

- metal molding and casting (40 CFR Part 464), applicable to aluminum, copper, and zinc casting;
- aluminum forming (40 CFR part 467);
- copper forming (40 CFR Part 468); and
- nonferrous metals forming and metal powders (40 CFR part 471). The nonferrous metals specified are lead-tin-bismuth, magnesium, nickel-cobalt, precious metals, refractory metals, titanium, uranium, zinc, and zirconium-hafnium.

Under RCRA, emission control dust and sludge from electric arc furnaces are a listed hazardous waste and are subject to land disposal restrictions. Slag, resulting from the treatment of pollution control dusts produced in scrap metal recycling (electric arc furnace dust), is not classified as hazardous if the toxic metals in the wastes have been reduced to safe levels.

Voluntary Measures

EPA’s 33/50 Program, which concluded in 1995, was designed to encourage voluntary commitments from TRI facilities for reductions of 17 targeted chemicals, including cadmium, chromium, lead, mercury and nickel. The program sought a reduction in total releases and transfers of 33 percent from 1988 to 1992 and 50 percent by 1995. More than 1,290 companies pledged reduction goals, including 174 that owned primary metals facilities. Of those, 58 companies owned iron and steel foundries, including all of the major companies mentioned above (in **Section 7.3.2**). TRI primary metals facilities, whose companies made a

commitment to the program, achieved a 59-percent reduction in total releases and transfers of the 33/50 Program chemicals from 1988 through 1995. The population of TRI primary metals facilities, as a whole, achieved a reduction of 45 percent, and all TRI facilities together achieved a reduction of 55 percent. In the baseline year (1988), the primary metals industry accounted for 10 percent of all releases and transfers of 33/50 Program chemicals; by 1996, this had increased to nearly 13 percent. While the national program ended with its 1995 goal, similar state and regional programs based on the 33/50 program are ongoing.

In 1995, the EPA and the US aluminum sector entered into a voluntary agreement to reduce perfluorocarbon (PFC) emissions. Under the voluntary Aluminum Industrial Partnership, the industry committed to reducing PFC emissions by 30–60 percent by 2000 from 1990 levels.

Table 7-3		Releases and Transfers for the Primary Metals Industry (US SIC Code 33), 1997								
M	1997	NPRI				TRI				
		Number		Average Forms per Facility		Number		Average Forms per Facility		
		Total Facilities		169		1,838				
		Total Forms		637		6,086		3.3		
		On-site Releases		kg		%		kg/Facility		
				kg/Form				kg/Form		
		Total Air Emissions	9,744,792	20.8	57,661	15,298	48,370,696	15.2	26,317	7,948
		Surface Water Discharges	671,989	1.4	3,976	1,055	21,324,497	6.7	11,602	3,504
		Underground Injection	0	0.0	0	0	170,771	0.1	93	28
		On-site Land Releases	8,593,216	18.3	50,847	13,490	101,141,817	31.7	55,028	16,619
		Matched On-site Releases	19,025,036	40.5	112,574	29,867	171,007,781	53.7	93,040	28,099
		Off-site Transfers								
		Treatment (except metals)	55,311	0.1	327	87	13,359,659	4.2	7,269	2,195
		Sewage/POTWs (except metals)	106,091	0.2	628	167	4,254,799	1.3	2,315	699
		Disposal (except metals)	274,780	0.6	1,626	431	1,361,361	0.4	741	224
		Treatment/Sewage/Disposal of Metals	27,483,585	58.5	162,625	43,145	128,742,848	40.4	70,045	21,154
		Matched Off-site Transfers	27,919,767	59.5	165,206	43,830	147,718,667	46.3	80,369	24,272
		Total Releases and Transfers	46,944,803	100.0	277,780	73,697	318,726,448	100.0	173,409	52,370

7.6 Overview of Primary Metals Industry PRTR Reporting

In 1997, primary metals industry facilities reporting to NPRI showed significant differences from those reporting to TRI. Total releases and transfers were significantly higher in TRI, as there are more than 10 times as many primary metals facilities in TRI as in NPRI. Facilities in this industry reported total releases and transfers of 46.9 million kg to NPRI and 318.7 million kg to TRI (Table 7-3).

- Metals in on-site releases to land and in off-site transfers are most often disposed of in landfills. Together, on-site land releases of metals and transfers of metals off-site constituted 72 percent of the TRI total releases and transfers from primary metals facilities. Likewise, NPRI primary metals facilities' combined on-site land releases and off-site transfers of metals equaled 77 percent of total releases and transfers. As noted in **Section 7.1.1**, on-site releases to land and off-site transfers of metals generally result in land disposal because metals in wastes cannot be

destroyed by treatment. The alternative to disposal is to recover the metals for recycling.

- Air emissions also figured prominently, accounting for 21 percent of NPRI releases and transfers and 15 percent in TRI. Air emissions from NPRI primary metals facilities averaged almost twice those from TRI primary metals facilities (15,298 kg/form for NPRI and 7,948 kg/form for TRI).

NPRI primary metals facilities also reported higher average releases and transfers per form than did TRI primary metals facilities (73,697 kg/form for NPRI and 52,370 kg/form for TRI). The

major difference was, again, in transfers of metals off-site, where NPRI primary metals facilities averaged almost twice as much as TRI primary metals facilities (43,145 kg/form for NPRI and 21,154 kg/form for TRI). TRI facilities reported higher average on-site land releases per form (13,490 kg/form for NPRI and 16,619 kg/form for TRI).

A recent CEC study investigated differences in NPRI and TRI average releases and transfers per form. The study, cited and discussed at the end of **Section 5.2.2** above, examined methanol and methyl ethyl ketone and also looked at kraft paper mill reporting. The study found that differences in

Table 7-4

NPRI and TRI Releases and Transfers for the Primary Metals Industry (US SIC Code 33), 1995–1997

M 1997

	NPRI					TRI				
	1995 Number	1996 Number	1997 Number	Change 1995–1997 Number	%	1995 Number	1996 Number	1997 Number	Change 1995–1997 Number	%
Total Facilities	166	166	169	3	1.8	1,852	1,855	1,838	-14	-0.8
Total Forms	602	590	637	35	5.8	6,030	6,034	6,086	56	0.9
On-site Releases	kg	kg	kg	kg	%	kg	kg	kg	kg	%
Total Air Emissions	8,992,889	10,317,729	9,744,792	751,903	8.4	50,296,816	52,219,043	48,370,696	-1,926,120	-3.8
Surface Water Discharges	1,006,268	790,847	671,989	-334,279	-33.2	12,676,668	13,554,209	21,324,497	8,647,829	68.2
Underground Injection	0	0	0	0	—	159,917	207,073	170,771	10,854	—
On-site Land Releases	8,555,020	8,112,326	8,593,216	38,196	0.4	96,278,156	104,209,269	101,141,817	4,863,661	5.1
Matched On-site Releases	18,575,952	19,240,477	19,025,036	449,084	2.4	159,411,557	170,189,594	171,007,781	11,596,224	7.3
Off-site Transfers										
Treatment (except metals)	167,176	112,679	55,311	-111,865	-66.9	4,870,995	4,674,076	13,359,659	8,488,664	174.3
Sewage/POTWs (except metals)	91,586	206,648	106,091	14,505	15.8	3,013,388	3,158,929	4,254,799	1,241,411	41.2
Disposal (except metals)	189,691	268,517	274,780	85,089	44.9	3,233,140	1,294,071	1,361,361	-1,871,779	-57.9
Treatment/Sewage/Disposal of Metals	18,313,300	21,101,808	27,483,585	9,170,285	50.1	81,066,969	97,445,849	128,742,848	47,675,879	58.8
Matched Off-site Transfers	18,761,753	21,689,652	27,919,767	9,158,014	48.8	92,184,492	106,572,925	147,718,667	55,534,175	60.2
Total Releases and Transfers	37,337,705	40,930,129	46,944,803	9,607,098	25.7	251,596,049	276,762,519	318,726,448	67,130,399	26.7

industry structure, particularly facility production capacity, and differences in pollution prevention and control practices between the two countries contributed to differences in the averages. Factors similar to those noted in the study may account for some of the differences between Canadian and US primary metals reporting.

7.7 Change in Total Releases and Transfers, 1995–1997

Between 1995 and 1997, total releases and transfers from primary metals facilities in both countries increased,

by 26 percent for NPRI and 27 percent for TRI, while the number of facilities reporting stayed relatively constant. Both NPRI and TRI primary metals facilities reported significant increases in off-site transfers of metals. NPRI on-site releases from primary metals facilities increased by two percent, despite a 33-percent drop in surface water discharges. NPRI air emissions increased eight percent. TRI on-site releases, meanwhile, increased by seven percent, primarily in surface water discharges and on-site land releases. TRI primary metals facilities reported a decrease in air emissions (by four percent—see **Table 7–4**).

Facilities with substantial changes from 1995 to 1997 were contacted and

asked to explain the differences, identifying factors that influenced their increases or decreases over this period. (Contact information for facility representatives who supplied explanations is available upon request.)

7.7.1 NPRI Facilities with Significant Changes, 1995–1997

This section describes NPRI primary metals facilities that reported the largest decreases and the largest increases in total releases and transfers from 1995 to 1997. The descriptions of the reasons for the changes were provided by the facilities, either on their NPRI form or in interviews.

As in shown in **Table 5–39**, nine of the 50 NPRI facilities with the largest decreases in total releases and transfers from 1995 to 1997 were primary metals facilities. These nine facilities reported decreases of five million kg. Six of the nine reported the majority of their decreases in off-site transfers or on-site releases to land of metals. Four of the nine facilities reported in the blast furnace and basic steel products industry (US SIC code 331) and two each reported as iron and steel foundries (US SIC code 332) and in the primary nonferrous metal industry (US SIC code 333).

Several facilities with large decreases reported that their efforts were made to meet commitments under

various reduction programs, such as the federal Strategic Options Process and associated commitments of the Canadian Steel Producers Association, federal and provincial acid rain reduction programs and the federal ARET program, described earlier in this chapter.

Sixteen of the 50 NPRI facilities with the largest increases in total releases and transfers from 1995 to 1997 were primary metals facilities (see **Table 5-40**). Together these 16 facilities reported increases of 15 million kg. For eight of the 16 facilities, the majority of the increases were on-site releases to land or off-site transfers of zinc and its compounds. Nine of the 16 facilities reported in the blast furnace and basic steel products sector (US SIC code 331).

NPRI Facilities with Large Decreases

Nine primary metals facilities were among the 50 NPRI facilities with the largest decreases in total releases and transfers from 1995 to 1997 (see **Table 5-39**). The reasons cited for the decreases varied. Three facilities reported changes in measurement methods rather than changes in actual amounts released. Two facilities indicated higher than usual transfers of waste in 1995, with levels returning to normal by 1997. Two facilities reported decreased production levels, and two identified increased efforts at recycling and reclamation. One facility reported improvements in process efficiency as well as variable amounts of contaminants in inputs from year to year. Another facility installed pollution control equipment.

The NPRI primary metals facility with the largest reported decrease from 1995 to 1997—and eighth among all NPRI facilities in the matched data set—was Algoma Steel Inc. (US SIC code 331), located in Sault Ste. Marie, Ontario. Algoma reported significant on-site land releases in 1995, an increase in air emissions in 1996, and a reduction in both in 1997. Algoma Steel reported that it has no transfers because it either stores or disposes of materials at its on-site permitted landfill. The reported increase in air emissions for 1996 was due to a misinterpretation of the fate of phosphoric acid in a process, where the acid is consumed rather than released to air. The 1997 NPRI data reflect this correction.

Algoma has introduced measures to reduce its benzene emissions, in response to the ARET challenge and the Canadian Steel Producers Association's commitments. Most reductions to date have been achieved by Algoma through improved maintenance and process controls. Benzene emission controls are being phased in, beginning with the year 2000.

In 1996, Algoma reported increased releases of cyanides and phenols, byproducts of the cokemaking process. Discharges of cyanides to surface waters were attributed to process control equipment upsets. The change in phenols was due to changes in analytical reporting methods. The 1997 report indicates a reduction in both of these releases. Future releases of these substances will be below the NPRI reporting threshold levels, due to the installation of engineering controls and a biological treatment plant, ammonia

still upgrades and a fixed ammonia step in the byproducts operations.

Co-Steel Lasco (US SIC code 331) in Whitby, Ontario, ranked ninth among NPRI facilities for decreases in releases and transfers from 1995 to 1997. This mini-mill, built in 1964, produces steel rods and beams used in construction. Co-Steel Lasco recycles half a million cars per year along with other steel scrap. It recovers 99.8 percent of the steel from the cars and other scrap metal. Co-Steel sells aluminum and copper that it recovers from the shredding operation, but its primary product is steel.

The metal is shredded and then melted in an electric arc furnace. Much of the facility's releases come from tiny pieces of wire and other materials which remain after the shredder operation. These materials are disposed of on-site in a permitted landfill. Furnace dust is sent off-site for disposal to a hazardous waste landfill near Sarnia, Ontario. Releases and transfers vary from year to year, due to growth in the business, improved efficiency, and the make-up of the feedstock. Starting in 1999, the mill will be expanded and the company will be sending its furnace dust to a recycling facility in Pennsylvania instead of the landfill site in Ontario. The facility expects to eliminate off-site transfers to disposal.

Dominion Castings Ltd., owned by NACO Inc. (US SIC code 332) and located in Hamilton, Ontario, ranked 10th among NPRI facilities for decreases. The company manufactures steel castings, largely for trains, including diesel locomotive frames and suspension units. In 1996, Dominion began to divert much of its waste away

from landfill disposal to recycling in an ongoing effort to reduce and reuse materials as much as possible. Reported decreases also reflected, in part, an overestimation of releases and transfers in 1995.

Titan Steel and Wire (US SIC code 331) is owned by Mitsui and Co., Ltd. and located in Surrey, British Columbia. It reported the 16th-largest reduction in total releases and transfers from 1995 to 1997 among all primary metals facilities. In the mid-1990s, Titan's total transfers and its transfers of zinc and lead increased, and then decreased considerably in 1996 and 1997. Titan explained that this was due to the removal of sludge from its sludge lagoons, which were at capacity. Regular levels of transfers have now resumed.

Titan's levels of phosphoric and nitric acid transfers increased in 1996. This was due to the timing of shipping dates. For example, nitric acid increased considerably because it had been accumulating in waste barrels and was shipped off in a large load in 1996.

QIT-Fer et Titane Inc. (US SIC code 339), the NPRI facility with the 18th-largest decrease from 1995 to 1997, is located in Tracy, Quebec. In 1996, it reduced its total transfers, as well as releases and transfers of zinc, lead, chromium and copper as oxides. However, a significant increase in manganese, again in oxide form, was recorded because of a one-time transfer of accumulated material on site. In 1995, a one-time transfer to disposal of red dust containing zinc had increased zinc transfers for that one year. This transfer was undertaken to create on-site space for a new plant that will

upgrade its titanium oxide product for more specialized markets.

To honor commitments under St. Lawrence Vision 2000, QIT-Fer et Titane installed a water treatment plant (for solid fines filtration) on-site, which became operational in 1994. While QIT-Fer et Titane once released significant volumes of mainly solid ore fines (finely crushed or powdered ores) into the river, its reported discharge is now less than 1,500 kg of chromium compounds and about 6,100 kg of zinc compounds. Most notably, water-insoluble mercuric compounds contained in ore fines (no elemental mercury is present in the ore) have been virtually eliminated. Also, acid is regenerated at the new plant for reuse. The new plant is fueled by carbon monoxide, which is recovered and scrubbed from the main plant on-site.

Sydney Steel Corporation (US SIC code 332), located in Sydney, Nova Scotia, ranked 25th in NPRI for decreases in releases and transfers. It is a mini-mill, which refines scrap metal in electric arc furnaces. The facility attributed its reduction in air emissions in the 1995–1997 period to declining levels of production. Sydney Steel reached maximum production levels in 1995 with 340,000 liquid tonnes of steel. Production declined in 1996 to 160,000 liquid tonnes and was further reduced in 1997 to 140,000 liquid tonnes. The facility estimates that for every tonne of production, 16 kg of emissions are produced. This dust is collected in a positive pressure baghouse and is disposed of on-site in a lined landfill. It is not transported off-site, as there are no disposal sites close to Sydney Steel.

In 1994–1995, the company installed clarifiers at effluent discharge points and enhanced its effluent treatment system. It has also replaced ethylene glycol-based hydraulic fluids, which were found to be toxic to fish before biodegrading in surface waters.

The company has responded to a combination of pressures, including regulatory requirements, voluntary commitments, and local community concerns. Sydney Steel has the Canadian Steel Producers Association's commitments made through the federal Strategic Options Process, as well as commitments made under ARET, the Voluntary Climate Change registry, and with the local joint action group on Monk Creek (tar ponds).

The Copper Cliff Nickel Refinery of the Ontario Division of Inco Ltd., located in Copper Cliff, Ontario, recorded an apparent decrease (ranking 39th) in the matched data set. It changed the SIC code it reported under from US SIC code 3339 (Canadian SIC code 2959, Other Nonferrous Smelting and Refining) to US SIC code 1061 (Canadian SIC code 0613, Nickel-Copper Mines). Since it reported as a primary metals facility in 1995, the amounts reported are included in this analysis. However, it reported as a mining facility for 1996 and 1997. Amounts for those years were excluded from the matched data set because the US mining industry was not required to report to TRI in 1997.

The Copper Cliff Nickel Refinery indicated that there have been no substantial reductions in emissions for the 1995 to 1997 period. In 1997, the facility reported an increase in its transfers of chromium. This was report-

edly due to a change in NPRI reporting rules that was designed for Ontario Hydro to account for production “vessels” that are consumed during production. In the case of Inco Ltd., this captured the waste from the demolition of its brick furnaces. This waste brick, which contains chromium, is transferred to a permitted landfill. Also, in 1997, Inco introduced a program to reroute effluent that had previously been directly discharged into surface waters to a wastewater treatment system on its smelter complex site.

The Ontario Division of Inco Ltd. has already met its commitments under ARET to reduce metals emissions by 50 percent (from 1988 levels). It is also working toward meeting the industry-wide commitments to reduce by 70 percent (from 1988 levels) releases of lead, arsenic, and nickel as part of an industry-wide commitment agreed to through the federal Strategic Options Process.

The Horne copper smelter of Métallurgie Noranda (US SIC code 333) in Rouyn-Noranda, Quebec, had the 41st-largest decrease in total releases and transfers. It is a custom smelter that processes concentrates and a wide variety of recyclable materials. It has also produced and marketed sulfuric acid since 1990. The facility produces approximately 200,000 tonnes of copper per year and about 400,000 to 500,000 tonnes of sulfuric acid. The resulting copper anodes are refined at another Noranda facility that removes impurities, which include silver, gold and platinum group metals.

From 1995 to 1996, releases from the Horne smelter remained relatively constant. Air emissions of specific

metals varied somewhat with changing inputs in concentrates. In 1997, the smelter began to significantly reduce emissions of lead, copper and zinc, which account for 90 percent of the facility's metal emissions. Reductions resulted from the introduction of a new process vessel, the Noranda continuous copper converter, and the installation of a new baghouse to capture secondary ventilation gases from the taphole of the Noranda reactor and for particulate removal from the Noranda continuous copper converter. The facility has little or no transfers from year to year, but is an important destination for transfers of recyclable materials from other sites for the recovery of copper and other metals.

Noranda's corporate policies drive environmental improvements. Sulfur fixation now exceeds 70 percent and a level of 90 percent is targeted. Noranda participates in the ARET program and achieved reductions of over 50 percent in emissions of several metals from 1988 levels in advance of the year 2000. Further emission reductions are anticipated as the Noranda continuous copper converter is progressively commissioned and the remaining batch converters are shut down.

The Ford Motor Company, Essex Aluminum Plant (US SIC code 335) is located in Windsor, Ontario. It manufactures and recycles aluminum and reported the 43rd-largest decrease in releases and transfers among NPRI facilities. Reductions from 1995 to 1997 in total transfers and releases were due both to fluctuations in production levels and also to facility initiatives to increase recycling and internal reclamation. Changes to the process and in

the composition of raw materials have been implemented.

Facility improvements are a result of voluntary measures. Ford participates in the Canadian Automotive Manufacturing Pollution Prevention Project. This is a Memorandum of Understanding, signed in 1992 between Environment Canada, the Ontario Ministry of Environment, Chrysler Canada Ltd., Ford Motor Company of Canada Ltd., General Motors of Canada Ltd., and the Canadian Vehicle Manufacturers' Association (CVMA). It focuses on reducing/eliminating releases through pollution prevention measures of Tier 1 and 2 substances under the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (July 1994).

Another important influence since 1997 has been the development of the company's environmental management system. Ford Canada's operations are fully certified under ISO 14000, which strives for continuous improvement, beyond mere compliance. Ford is increasingly adopting a risk management approach to environmental management, such as its initiative to take out its underground storage tanks, to reduce the risk of leaks in the future.

NPRI Facilities with Large Increases

Sixteen of the 50 NPRI facilities with the largest increases in total releases and transfers for the matched substances were primary metals industry facilities (see **Table 5-40**). Of these, eight facilities reported that favorable waste disposal costs prompted them to increase off-site transfers, especially those with limited on-site storage

capacity. Six facilities indicated that increases were associated with increased production levels. Three facilities changed their method of measuring or calculating their releases and transfers, which led to apparent increases. Two facilities reported increases due to new equipment start-up that should not occur in future years. (Some stated more than one reason.)

Dofasco Inc. (US SIC code 331) is located in Hamilton, Ontario. It is ranked number one for releases and transfers among NPRI facilities in the matched data set and for increases from 1995 to 1997. It is a combined integrated and mini-mill steel facility and operates Canada's only tinplating operation. From 1996 to 1997, Dofasco's off-site transfers increased due to two changes. First, an arrangement to send basic oxygen furnace sludge for use in a mine reclamation project was discontinued. As a result, the sludge was sent off-site for disposal. Second, Dofasco's new electric arc furnace came on-line, generating dust containing zinc, manganese and lead. This dust was also transferred off-site for disposal in a permitted landfill. The electric arc furnace, which uses 1.2 million tonnes of scrap, has allowed Dofasco to increase production with significantly lower environmental impacts, as compared to integrated operations. The process has also reduced energy consumption by two-thirds.

While Dofasco reported increases in total releases and transfers, it reduced its releases from 1996 to 1997, primarily with the installation of a benzene emission control system for its coke plant byproduct operations. Dofasco pledged to reduce benzene emissions

80 percent by 2000. The commitment formed part of Dofasco's voluntary Environmental Management Agreement, signed with Environment Canada and the Ontario Ministry of Environment and Energy. The Agreement sets targets for key parameters of air quality, waste management, community activities, energy usage and PCB waste destruction. Reduction targets that go beyond compliance are set for polycyclic aromatic hydrocarbons, benzene, and ARET substances.

Dofasco has also reduced its releases to surface waters from 126 tonnes, to 16 tonnes in 1995. This puts it well within water effluent limits set by Ontario's Municipal Industrial Strategy for Abatement (MISA). Following on-site primary and biological treatment of its coke-making effluent, Dofasco sends this effluent to the City of Hamilton sewage treatment plant for tertiary treatment.

The NPRI facility with the third-largest increase in total releases and transfers from 1995 to 1997 was Lake Erie Steel (US SIC code 339), owned by Stelco Co. and located in Nanticoke, Ontario. While total releases and transfers rose 3.4 million kg from 1995 to 1996, they decreased by 2.4 million kg from 1996 to 1997. The increase occurred in transfers off-site (the facility's transfers had been zero in 1995).

Lake Erie Steel explained that fluctuations in total releases and transfers were related to levels of production, special programs to reduce emissions (particularly benzene) and increased efficiency in its wastewater and biological treatment plants. Sludge that was transferred in 1996 was rich in zinc, hence the increase in zinc that year. The

increase in manganese was attributed to the slag which was reported as a transfer, but which was actually used as landfill cover and not put in the landfill.

Lake Erie Steel's most significant environmental program is the Benzene Reduction Program. This was started in 1994, in advance of the Canadian Steel Producers Association's commitment to reduce benzene emissions across the industry. Lake Erie anticipates that it will reduce its benzene emissions by 90 percent by 2000, at a cost of approximately C\$1 million (US\$670,000). Other benefits include reductions in anthracene, xylene and naphthalene releases. Lake Erie has also introduced a C\$10 million (US\$6.7 million) program to reduce emissions from its coke oven battery, by recycling exhaust back into the coke oven gas stream to be used as fuel rather than release it into the air.

Other initiatives include an enhanced spill control program in all mills, which puts emphasis on better equipment and maintenance and has led to reduction in ethylene glycol releases, use of waste oxides in the blast furnace, and screening slag for recycling back into the blast furnace. Lake Erie attributes recent improvements in its environmental performance to voluntary action in response to Canadian Steel Producers' Association commitments and internal policies.

The Inco Ltd. Copper Cliff Smelter Complex of the Ontario Division (US SIC code 333) is also located in Copper Cliff, Ontario, and reported NPRI's fourth-largest increase in releases and transfers from 1995 to 1997. From 1995 to 1996, air emissions containing sulfur

compounds from the smelting operations increased, while air emissions of metals decreased, as production stayed constant. The increase in air emissions was attributable to the commissioning of the C\$600 million (US\$400 million) rebuilt smelter. The system was installed primarily to meet commitments under the Ontario Countdown Acid Rain program. Other targets include a 70 percent reduction (from 1988 levels) for lead, arsenic, and nickel, which is part of an industry-wide commitment agreed to through the federal Strategic Options Process. Inco Ltd. continues to examine the feasibility of further reductions in sulfur and metal emissions.

The NPRI facility with the fifth-largest increase in releases and transfers was Gerdau MRM (US SIC code 331) located in Selkirk, Manitoba. It operates an electric arc furnace with scrap feed, which produces approximately 300,000 tonnes of steel per year. Gerdau reported an increase in on-site releases, particularly releases to land, from 1995 to 1996. Baghouse dust is disposed of on-site. The increase came in part from increased production, but was largely due to a change in the facility's reporting protocol. The methodology used in 1996 led to an overestimate in releases, but also to improved analytical data in some cases.

Gerdau MRM's improved environmental performance is due to parent company policy. Gerdau Groupe of Brazil instills a culture of continuous improvement at the facility. Gerdau has also made commitments under ARET, which it expects to meet with the installation of a new baghouse system in 1999. Gerdau MRM is also a member

of Canadian Steel Producers' Association's environmental committee.

Sorevco, Ispat Sidbec (US SIC code 331) is located in Coteau-du-Lac, Quebec, and reported the eighth-largest increase in total releases and transfers. In 1997, it produced approximately 135,000 tonnes of galvanized steel. Since it began operations in 1991, Sorevco has been steadily increasing its production. Its most significant environmental issue is the zinc dross that is a byproduct of the galvanizing process. The zinc dross is stored on-site in small quantities and regularly transferred off-site.

By 1997, with increased production, the company began to introduce operational changes to reduce the amount of zinc dross produced. Because zinc is expensive, the company sought ways of using it more efficiently in the production process. Changes included improvements in laboratory control and more frequent testing of the zinc bath. Sorevco also plans to install a C\$1 million (US\$670,000) coding gauge machine, which will accurately measure the optimal amount of zinc, aluminum, and antimony necessary for the galvanizing process. This is expected to result in the most efficient use of these inputs and a reduction in zinc dross per unit output.

The Hudson Bay Mining and Smelting Company's Metallurgical Complex (US SIC code 333) is located in Flin Flon, Manitoba, on the border with Saskatchewan. The site consists of two local mines, a milling facility, and copper and zinc refineries. Its Metallurgical Complex reported the 12th-largest increase in releases and transfers. Air emissions in 1995 were the

lowest on record. This followed a substantial upgrade in an off-gas baghouse, which in turn followed conversion of the zinc process to a hydrometallurgical leaching system. Emissions climbed in 1996 and 1997, but have continued to decrease relative to 1988 levels. Air emissions follow a three- to four-year cycle, beginning with the year that the smelter's off-gas baghouse is overhauled. Hudson Bay Mining will be replacing the aging baghouse system by 2000, at a cost of C\$25 million (US\$17 million). This will result in reductions in air emissions.

One impetus for replacing the aging baghouses is the commitments the company has made under the voluntary ARET program. Hudson Bay Mining has committed itself to reducing its cadmium emissions by 90 percent, and other base metals by 50 percent, by 2000 (from 1988 levels). The company expects to meet all commitments. In 1997, only those for cadmium and copper had not already been met. Cadmium has been reduced by about 75 percent so far, although copper emissions have been reduced by only 10 percent. Hudson Bay Mining noted that it is also committed to reducing gaseous air emissions to address local community concerns.

The Brunswick Smelting Division lead smelter (US SIC code 333) of Noranda Mining and Exploration Inc., in Belledune, New Brunswick, reported the 13th-largest increase in releases and transfers. The facility is one of two primary lead smelting operations in Canada and includes a sinter plant, blast furnace and refinery, as well as a battery breaker and two short rotary furnaces. The facility produces approximately

110,000 tonnes per year of refined lead and lead alloys and a variety of co-products containing antimony, bismuth, copper, silver and other metals. Eighty percent of its feed is from concentrates and 20 percent is from secondary materials, including used batteries and other recyclable materials. The increase in transfers from 1996 to 1997 resulted from off-site disposal of a quantity of accumulated dust. Most of this material was returned to the process, but some dust containing higher concentrations of cadmium and other impurities was stabilized and sent for disposal to maintain workplace quality and avoid excess on-site releases to air and water.

The facility attributes environmental performance to corporate policy and internal practices and has made community relations a priority. In 1995, the company began to introduce environmental management systems modeled on the ISO 14000 standard. The facility has improved its pollution control systems and general maintenance and invested C\$1 million (US \$670,000) in engineering and control improvements to its wastewater effluent treatment system from 1995 to 1996. In 1996, it conducted environmental awareness training for all employees.

Metalex Products Ltd. (US SIC code 333) is located in Richmond, British Columbia, and reported the 14th-largest increase in releases and transfers. It is a secondary lead refinery, which produced 4,500 tons (US) of lead oxide and lead antimony alloys in 1997. Most of its secondary lead feed is from used car batteries. Metalex showed an increase in total transfers from 1995 to 1996, and again in 1997. This was due to the transfer to a landfill of

furnace slag, containing 1.5 percent lead, that was being stored on-site. .

Metalex reported strong provincial and municipal regulatory pressure to improve its environmental performance. The Greater Vancouver Regional District (GVRD) is responsible for air and water regulations. Metalex has made considerable investments in its environmental control technology in recent years. In 1997, it invested C\$200,000 (US\$135,000) to build a new water treatment plant on site and C\$400,000 (US\$270,00) to replace two baghouses. It has also upgraded its battery breaking equipment, which improves overall efficiency.

Stelco McMaster Ltée (US SIC code 331) is located in Contrecoeur, Quebec. This facility ranked 16th among NPRI facilities for increases in releases and transfers. It is one of the largest scrap steel recyclers and secondary refineries in Canada, producing 600,000–700,000 tonnes of steel per year.

From 1995 to 1996, transfers off-site increased significantly, as Stelco McMaster cleared its stockpiled waste byproducts, which contained zinc and manganese. These were sent to a disposal site, as there are no recycling processes for such materials in Canada. Air emissions also increased in this period, due to an increase in production.

Stelco McMaster is working toward meeting voluntary commitments under ARET. It is working toward zero discharge and an increase in recycling and reuse of materials. New technology has been put in place to increase overall efficiency and reduce process byproducts.

Among other NPRI primary metals facilities with the largest increases in total releases and transfers, three attributed increases to increased production, some in conjunction with increased transfers of stored waste:

Zalev Brothers Ltd. (US SIC code 339), Windsor, Ontario (30th for increased releases and transfers in NPRI; increased production)

AltaSteel, Stelco Inc. (US SIC code 331), Edmonton, Alberta (38th; increased production and transfer of stored waste to disposal)

Stelco Inc., Hilton Works (US SIC code 331), Hamilton, Ontario (40th; increased production and one-time removal of asbestos)

Two facilities reported changes in estimating methods that led to apparent increases:

Falconbridge Ltd., Kidd Metallurgical Division, (US SIC code 333), Cochrane, Ontario (33rd)

Atlas Specialty Steels (US SIC code 331), Welland, Ontario (37th)

7.7.2 TRI Facilities with Significant Changes, 1995–1997

This section describes TRI primary metals facilities that reported the largest decreases and the largest increases in total releases and transfers from 1995 to 1997. The descriptions of the reasons for the changes were provided by the facilities in interviews.

As was seen in **Table 5–41**, 11 of the 50 TRI facilities with the largest

decreases of total releases and transfers from 1995 to 1997 were primary metals facilities. These 11 facilities reported decreases of 25 million kg. Ten of the 11 reported the majority of their decreases in off-site transfers or on-site releases to land of metals. Four of the 11 facilities reported in the blast furnace and basic steel products industry (US SIC code 331), and four reported in the primary nonferrous metals industry (US SIC code 333).

Twenty-eight of the 50 TRI facilities with the largest increases in total releases and transfers from 1995 to 1997 were primary metals facilities (see **Table 5–42**). Together these 28 facilities reported increases of 83 million kg from 1995 to 1997. For 22 of them, the majority of the increases were on-site releases to land or off-site transfers of zinc and its compounds. Twenty-three of the 28 facilities reported in the blast furnace and basic steel products sector (US SIC code 331).

TRI Facilities with Large Decreases

Eleven of the 50 TRI facilities with the largest decreases in total releases and transfers (see **Table 5–41**) were primary metals industry facilities. Seven were able to provide explanations for the decreases. Three reported efforts at pollution control or reduction through on-site recycling. Two cited changes in feed stock composition, and two reported decreased production. Another reported changes in methods used to estimate releases as the reason for the change.

The ASARCO Inc. Ray Complex copper smelter (US SIC code 333) in

Hayden, Arizona, reported the largest decrease in total releases and transfers of all TRI facilities. This facility reported decreases in on-site releases to land of copper compounds, zinc compounds and lead compounds and attributed them in part to more aggressive on-site recycling activities. Zinc is recycled from slag left from prior smelting of raw material.

Recycling also played a major role for National Steel Corp.'s Great Lakes Division (US SIC code 331) in Ecorse, Michigan. The facility reported decreases in transfers for off-site disposal of zinc compounds due to the installation of an on-site recycling briquette facility at the end of 1996. It ranked 10th among TRI facilities for reductions in releases and transfers from 1995 to 1997.

The Phelps Dodge Hidalgo Inc. facility of Playas, New Mexico (SIC code 333), had the 13th-largest reduction in releases and transfers among TRI facilities. Phelps Dodge Hidalgo indicated that about two-thirds of its decreases in on-site releases were due to changes in the composition of the feed stock and one-third to decreases in production.

Zinc Corp. of America, Horsehead Industries, Inc., (SIC codes 333 and 334) of Monaca, Pennsylvania, which ranked 15th, also attributed its decreases in releases to changes in the composition of feedstock.

Electralloy Corporation, G.O. Carlson Inc., (US SIC code 331) in Oil City, Pennsylvania, had apparent decreases from 1995 to 1997, ranking 24th for decreases among TRI facilities. However, this facility changed from report-

ing the entire metal compound in its slag to reporting just the amount of the base metal chromium, under EPA's direction. Actual releases and transfers have not changed appreciably during this time. This facility is a producer of specialty stainless steel products, using an electric arc furnace and argon-oxygen decarburization vessels to produce many grades of steel. Throughout this process, scrap steel and a variety of other raw materials are employed—either to contribute to the content of other metals (chromium, copper, etc.) in the resulting steel alloy or as an aid in the production (such as lime). Combined in a high temperature environment, the lime rises to the top of the molten metal and is removed as slag. Other wastestreams come from slag and metal vapors that are captured in a wet scrubber or baghouse. All contain some amount of the materials used as inputs to the process.

Magnesium Corporation of America (US SIC code 333) in Rowley, Utah, ranked 32nd for decreases among TRI facilities. This facility, owned by Renco Group Inc., is a manufacturer of elemental magnesium from magnesium chloride. Magnesium is used commercially as an alloying agent to strengthen aluminum, in the die-casting of automotive parts, and in the chemical industry. Chlorine gas is a major byproduct at the plant; at one point in the process, a magnesium oxide byproduct is treated with chlorine as a purifying agent and excess chlorine is emitted to the air. As chlorine gas is difficult to scrub, it is converted to hydrochloric acid. Between 1995 and 1997, the facility upgraded its scrubbers and hydrochloric acid emissions decreased.

Ranking 41st for decreases, Avesta Sheffield Plate (US SIC code 331) in New Castle, Indiana, manufactures stainless steel plate that is used to make such products as large storage tanks and machine parts. Chromium is a constituent of stainless steel. According to the company, 1995 was a high production year. Transfers decreased substantially in 1996.

Olin Brass (US SIC code 335) in Indianapolis, Indiana, makes copper and brass sheet, rod, tubing, and wire. Its products are used by the automotive, electrical, and plumbing industries. End products include condenser coil for home and automotive air conditioners, door knobs and lock sets. Copper, chromium, and zinc transfers are mostly in the form of scrap metal. According to the facility, the apparent decrease from 1995 to 1997 is the result of improved EPA guidance on TRI reporting which led to more accurate data. Olin Brass had TRI's 49th-largest reduction in releases and transfers.

TRI Facilities with Large Increases

Twenty-eight of the 50 TRI facilities with the largest increases in total releases and transfers were primary metals industry facilities (see **Table 5-42**). Eight of these facilities cited increased production as the reason for the increases in releases and transfers. Seven explained that they had switched from transfers to recycling to transfers to disposal for economic reasons. Other reasons included changes due to single events, such as equipment failure and on-site clean-up, and better estimates.

The USS Clairton Works (US SIC code 331) in Clairton, Pennsylvania,

reported the largest increase in total releases and transfers among all TRI facilities. It is a coke plant owned by the USX Corporation. The facility produces coke for use in blast furnaces at steel manufacturing facilities. Approximately 20 percent of the coke made at Clairton Works is used by USX facilities. The rest is sold to outside steel manufacturers. Ethylene is produced as a byproduct in coke manufacture. Clairton Works transfers the ethylene byproduct off-site to a sister facility, Irvin Works, via pipeline. This is reported as a transfer to treatment or to energy recovery. Irvin Works, a steel finishing plant, burns the ethylene as fuel in a blast furnace and flares off the excess. In 1997, a blast furnace outage at Irvin resulted in the flaring off of a significant amount of additional ethylene. Consequently, the amount reported as transfers to treatment went up.

Kennecott Utah Copper in Magna, Utah, a primary copper refinery (US SIC code 333), reported TRI's second-largest increase in total releases and transfers. Releases of copper compounds to land accounted for about 40 percent of the increase, and releases of arsenic compounds, lead compounds, and zinc compounds each accounted for about 20 percent of the total. The facility reported that the smelting process was changed in June 1995 to reduce sulfur dioxide emissions. The production rate has increased since that time. As a result of increased production, there was about a twofold increase in the generation of slag tailings from 1996 to 1997. This accounted for approximately two-thirds of the increase. The remaining increase

was due to clean-up activity that began in 1996. This involves the removal of sediment from old sludge ponds, and then drying and relocating it to a lined repository on-site that meets RCRA specifications. The clean-up process is expected to continue for a couple of years.

The TRI facility with the third-largest increase, Nucor-Yamato Steel Co. (US SIC code 331) in Blytheville, Arkansas, is a mini-mill that makes scrap metal into new steel for "structural long products" such as beams for buildings. The majority of its reporting is for zinc that is transferred off-site. In the process, the zinc, from galvanized scrap steel, is vaporized and collected in baghouses. Zinc concentrations can vary as much as 10 percent, depending on the scrap steel received. From 1996 to 1997, production at this facility increased 10 percent, causing the increase in zinc off-site transfers.

Armco Steel (US SIC code 331) in Butler, Pennsylvania, reported the fourth-largest increases in releases and transfers. This steel mill uses a nitric acid pickling process in the production of specialty steels. Increased releases of nitrate compounds were directly related to increased production.

The sixth-ranked TRI facility for increases was Steel Dynamics Inc. (US SIC code 331) of Butler, Indiana, which reported increases in transfers to off-site disposal of zinc compounds and manganese compounds. The facility began operation in January 1996 and has increased production since that time. Only minimal releases were reported in 1995, associated with equipment tests.

USS Gary Works (US SIC code 331) in Gary, Indiana, reported the seventh-largest increase in total releases and transfers of any TRI facility. The Gary Works facility, owned by the USX Corporation, is primarily a sheet steel producer. Products include galvanized steel for the automotive industry, tin for the canned food industry and other grades for the appliance industry. The facility reported that zinc is a minor impurity in its raw material, but greater concentrations are found in the steel scrap that is recycled.

Releases of zinc to land are mainly found in sludge that is produced from cleaning scrubbers and from the galvanizing process. The sludge is landfilled on-site. In 1994, the EPA conducted a facility inspection as part of an enforcement action. The agency was investigating why the plant was not reporting releases of some TRI chemicals that similar steel facilities were reporting. EPA maintained that exceeding “use thresholds” necessitated reporting of certain chemicals while USS Gary Works had assumed that reporting was triggered when releases exceeded thresholds. In part to address EPA’s concerns and in part to develop a more structured environmental management system at the plant, the facility initiated a program where wastestreams were sampled and analyzed for chemical identity and content. Wastestream sampling and analysis has subsequently led to a better understanding of the types and quantities of the chemicals present. This was primarily responsible for the increase in zinc reporting. The decision to test wastestreams was also intended to evaluate new technologies and methods for improving waste

minimization and pollution prevention programs at the plant level.

Other TRI primary metals facilities with the largest increases in total releases and transfers attributed their increases to increased production:

Nucor Steel (US SIC code 331), Plymouth, Utah (10th for increased releases and transfers in TRI)

Nucor Steel Arkansas Plant (US SIC code 331), Blytheville, Arkansas (15th; also due to increased galvanizing in scrap metal received)

BHP Copper Metals (US SIC codes 333 and 335), San Manuel, Arizona (16th; also due to increased sampling and monitoring)

Bar Techs Inc. (US SIC code 331), Johnstown, Pennsylvania (24th)

Other facilities attributed increases to a change in operating practice—redirecting waste from recycling to stabilization and landfill. The choice between waste management methods depends largely on their relative costs. For example, from 1995 to 1997, the major US recycler for steel mills, Horsehead Industries, raised its prices. In the same period, EnviroSAFE Co., with several disposal sites for metals in the United States, lowered its prices. The relative cost therefore favored disposal over recycling. Most facilities expect to switch back to recycling if costs are reduced. Facilities (all of which are US SIC code 331) citing this reason for increases include:

Birmingham Southeast LLC, Birmingham Steel Corp., Inc., Cartersville, Georgia (18th)

Birmingham Steel Corp., Kankakee Illinois Steel Division, Bourbonnais, Illinois (19th)

Ameristeel Corp., Jacksonville Mill Division, Baldwin, Florida (20th)

Birmingham Steel Corp., Washington Steel Division, Seattle, Washington (26th)

Ameristeel Corp., Charlotte, North Carolina (28th)

Koppel Steel Corp., NS Group Inc., Koppel, Pennsylvania (40th)

Auburn Steel Co., Auburn, New York (46th)

7.8 Industry Mix within the North American Primary Metals Sector

The primary metals industries in the two countries also differ in the types of facilities making up the industrial sector as a whole, which influences the types and amounts of releases and transfers reported. Any analysis of NPRI and TRI must take into account both the different subsectors within the primary metals industry and the different number of facilities within each subsector. The primary metals sector consists of a diverse set of industries, and the releases and transfers that pertain to a facility in one subsector can differ quite substantially from those found in another.

7.8.1 Industrial Subsectors

This section analyzes releases and transfers from facilities that reported

under subsectors of US SIC code 33 or the Canadian SIC code 29 (Table 7–5). The US SIC code 33 covers seven subsectors:

Blast Furnace and Basic Steel Products—US SIC Code 331. These mills manufacture hot metal and pig iron; plates, sheets, strips, rods or tubing; metallic additive alloys; steel nails and spikes; and cold-finished steel, including steel sheets, bars and steel pipe.

Iron and Steel Foundries—US SIC Code 332. These facilities manufacture iron and steel castings.

Primary Nonferrous Metals—US SIC Code 333. These facilities refine nonferrous metals from ore or alumina or refine nonferrous metals by electrolytic or other processes. This subsector includes aluminum, copper and other nonferrous smelters.

Secondary Nonferrous Metals—US SIC Code 334. These facilities recover nonferrous metals and alloys from new and used scrap, including production of alloys from purchased refined materials, recovery of precious metals and recovery of tin through secondary smelting and refining.

Nonferrous Rolling and Drawing—US SIC Code 335. These facilities produce basic shapes, such as nonferrous metal plates, sheets, strips, bars, tubing, pipes, rods and wire. Processes and materials employed include rolling, drawing, and extruding of copper, brass, bronze, and other copper alloys,

aluminum and aluminum-based alloys, and other nonferrous metals.

Nonferrous Foundries—US SIC Code 336. These facilities manufacture die-castings and other castings of nonferrous metals such as aluminum and copper.

Miscellaneous Primary Metals Products—US SIC Code 339. These facilities manufacture miscellaneous primary metals products, such as nonferrous nails, spikes, brads, and metal powder, flakes and paste.

The Canadian primary metals industry facilities generally report under Canadian SIC code 29, although the subsectors do differ. The Canadian primary metals industry subsectors are:

Ferro-alloys Industries and Steel Foundries (US SIC codes 331 and 332)

Steel Pipe and Tube Industries (US SIC code 331)

Iron Foundries (US SIC code 332)

Primary Production of Aluminum (US SIC code 333)

Other Nonferrous Smelting and Refining (US SIC code 333)

Aluminum Rolling, Casting and Extruding (US SIC codes 335, 336 and 339)

Copper Rolling, Casting and Extruding (US SIC codes 335, 336 and 339)

Other Metal Rolling, Casting and Extruding (US SIC codes 334, 335, 336 and 339)

In addition, this analysis includes 29 Canadian facilities that reported Canadian SIC codes 30 (Fabricated Metals) or 33 (Electrical/Electronic Products), because they reported a US SIC code within 33. Their 68 forms totaled 342,292 kg of releases and transfers.

The US SIC code system must be used because only the Canadian facilities report both.

7.8.2 Multiple SIC Codes

One challenge in comparing NPRI and TRI data is that each NPRI facility reports only one (US) SIC code that best describes the facility's operations, while a TRI facility must report all relevant SIC codes. For a TRI facility reporting multiple SIC codes, it is not possible to break down the reported releases and transfers of a pollutant into individual SIC codes. For example, a US facility that chooses SIC codes 333 and 335 to describe its operations may report 110,000 kg of aluminum off-site transfers. It is not possible to determine what proportion of the 110,000 kg is transferred due to operations within SIC code 333 and what proportion within SIC code 335.

Data for US facilities that report multiple SIC codes are thus not easily comparable to those for facilities reporting a single three-digit SIC code. Facilities reporting multiple SIC codes represent eight percent of the forms and 12 percent of the total releases and transfers from primary metals industry facilities in TRI (**Table 7-5**).

To investigate the effect of facilities reporting multiple SIC codes, TRI data at the three-digit subsector level are presented in two ways. First, only facilities reporting a single three-digit SIC code are listed, and second, to the single-SIC code group are added all facilities that reported the same three-digit SIC code among their multiple codes. Thus, except for **Tables 7-10** and **7-16**, further tables in this chapter provide a range of estimates for TRI, with the single three-digit estimates being a lower bound and the single-plus-multiple group an upper one.

7.9 Industrial Subsectors—Detailed PRTR Data

For both NPRI and TRI, the blast furnace and basic steel products sector (US SIC code 331) submitted the most forms and reported the largest total releases and transfers in 1997. Large off-site transfers from this subsector gave it the largest total releases and transfers in the primary metals industry.

The primary nonferrous metals sector (US SIC code 333) reported the largest on-site releases and the second-largest total releases and transfers for both NPRI and TRI. Together, these two subsectors represented 87 percent of total releases and transfers from NPRI primary metals facilities and 74 percent from those in TRI. Therefore, the following sections provide the PRTR data for these two subsectors that dominate PRTR reporting in the primary metals industry.

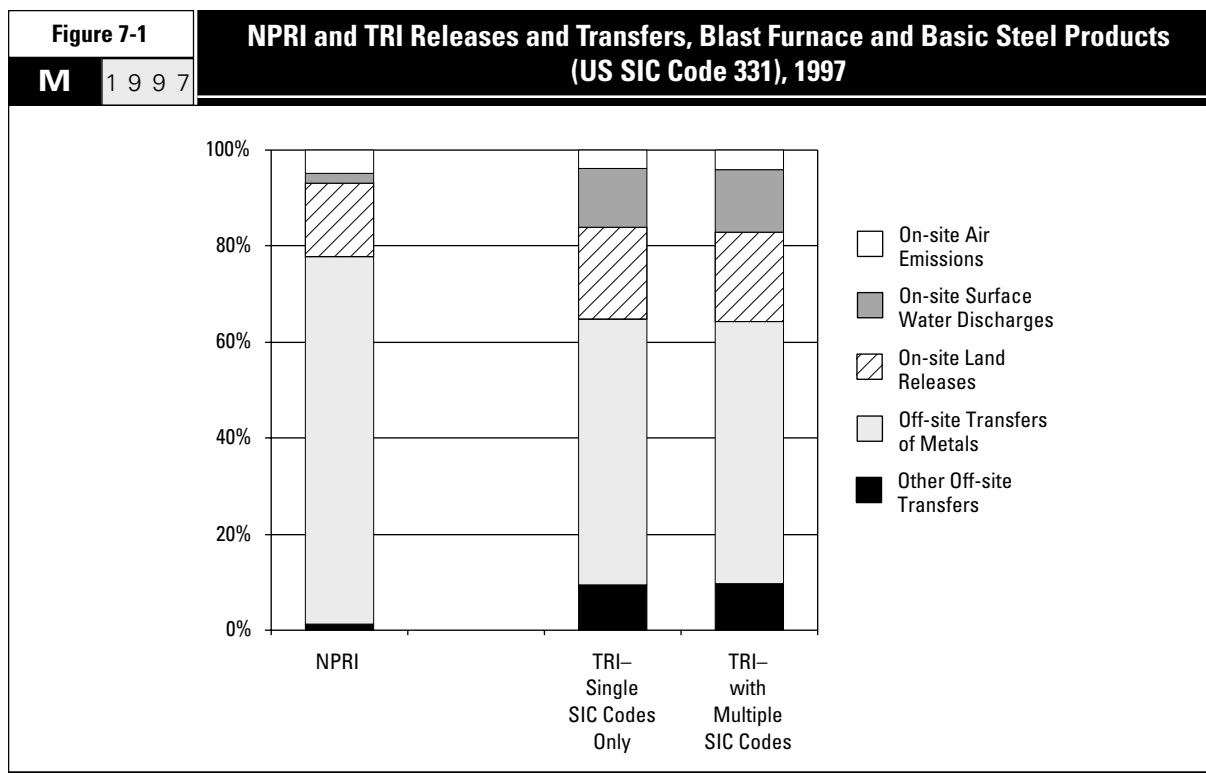
7.9.1 Blast Furnace and Basic Steel Products (US SIC Code 331)

Manufacturers of basic steel products represented 25 percent of the NPRI primary metals facilities and reported almost two-thirds of their total releases and transfers. For the TRI primary metals industry, these manufacturers represented over 20 percent of the facilities and reported almost half of the total releases and transfers. While NPRI and TRI facilities in this subsector submitted about the same number of forms per facility, average releases and transfers per form were 1.8 times higher for NPRI facilities than for TRI. This was primarily due to higher average off-site transfers (more than twice as high), since on-site releases were comparable (**Table 7-6**).

Table 7-5		Releases and Transfers for the Primary Metals Industry (US SIC Code 33), by Subsector, 1997						
M	1997							
US SIC Code	Industry	Number of Facilities	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
NPRI Facilities								
331	Blast Furnace and Basic Steel Products	43	205	1,500,475	597,703	0	4,785,227	6,891,149
332	Iron and Steel Foundries	25	93	86,282	5,607	0	2,658,404	2,751,438
333	Primary Nonferrous Metals	30	157	7,908,169	67,329	0	744,535	8,722,657
334	Secondary Nonferrous Metals	8	21	15,076	50	0	0	16,028
335	Nonferrous Rolling and Drawing	36	85	166,368	1,131	0	2,100	171,920
336	Nonferrous Foundries	17	39	47,849	0	0	0	48,150
339	Miscellaneous Primary Metal Products	10	37	20,573	169	0	402,950	423,694
Total for NPRI Facilities		169	637	9,744,792	671,989	0	8,593,216	19,025,036
TRI Facilities								
331	Blast Furnace and Basic Steel Products	365	1,755	5,842,909	18,060,754	87,958	28,395,088	52,386,709
332	Iron and Steel Foundries	342	1,139	2,070,301	26,610	0	9,419,219	11,516,130
333	Primary Nonferrous Metals	54	235	30,879,726	456,488	81,949	50,693,303	82,111,466
334	Secondary Nonferrous Metals	159	495	642,560	13,348	807	987,830	1,644,545
335	Nonferrous Rolling and Drawing	347	999	2,826,202	197,709	57	529,949	3,553,917
336	Nonferrous Foundries	320	651	565,759	2,670	0	161,390	729,819
339	Miscellaneous Primary Metal Products	146	309	595,894	1,689	0	85,112	682,695
	SIC code not valid within SIC 33	1	3	237	6	0	0	243
Subtotal for Single SIC Codes		1,734	5,586	43,423,588	18,759,274	170,771	90,271,891	152,625,524
331/332		2	31	87,750	545,021	0	462,562	1,095,333
331/332/336		1	2	5,896	0	0	0	5,896
331/334		3	18	2,593	6	0	0	2,599
331/335		6	24	137,729	15	0	0	137,744
331/335/339		2	8	2,942	0	0	0	2,942
331/339		12	80	66,434	1,516,710	0	73,681	1,656,825
332/333		1	2	0	0	0	0	0
332/334		1	3	5,501	0	0	0	5,501
332/336		21	76	95,015	22	0	565,462	660,499
332/336/339		1	1	0	0	0	0	0
333/334		3	15	275,027	424	0	0	275,451
333/335		3	92	3,719,560	501,119	0	9,500,759	13,721,438
334/335		20	54	83,933	757	0	0	84,690
334/335/336		2	8	205,296	0	0	0	205,296
334/335/339		4	28	170,861	730	0	2,943	174,534
334/336		1	3	15	6	0	0	21
334/336/339		1	3	1,395	4	0	0	1,399
334/339		5	11	16,754	1	0	264,353	281,108
335/336		8	24	30,625	387	0	166	31,178
335/339		5	11	24,047	18	0	0	24,065
336/339		2	6	15,735	3	0	0	15,738
Subtotal for Multiple SIC Codes		104	500	4,947,108	2,565,223	0	10,869,926	18,382,257
Total for TRI Facilities		1,838	6,086	48,370,696	21,324,497	170,771	101,141,817	171,007,781

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)	Total Releases and Transfers (kg)	% of Total Releases and Transfers
NPRI Facilities								
331	Blast Furnace and Basic Steel Products	49,315	103,520	247,396	23,706,819	24,107,050	30,998,199	66.0
332	Iron and Steel Foundries	0	2,571	24,553	992,155	1,019,279	3,770,717	8.0
333	Primary Nonferrous Metals	0	0	0	1,125,165	1,125,165	9,847,822	21.0
334	Secondary Nonferrous Metals	0	0	0	480,895	480,895	496,923	1.1
335	Nonferrous Rolling and Drawing	5,016	0	2,830	57,402	65,248	237,168	0.5
336	Nonferrous Foundries	60	0	0	16,098	16,158	64,308	0.1
339	Miscellaneous Primary Metal Products	920	0	1	1,105,051	1,105,972	1,529,666	3.3
Total for NPRI Facilities		55,311	106,091	274,780	27,483,585	27,919,767	46,944,803	100.0
TRI Facilities								
331	Blast Furnace and Basic Steel Products	12,430,168	1,033,327	644,198	82,497,536	96,605,229	148,991,938	46.7
332	Iron and Steel Foundries	52,447	15,196	466,338	9,769,096	10,303,077	21,819,207	6.8
333	Primary Nonferrous Metals	34,552	0	0	3,920,981	3,955,533	86,066,999	27.0
334	Secondary Nonferrous Metals	0	5,692	6,618	8,398,338	8,410,648	10,055,193	3.2
335	Nonferrous Rolling and Drawing	393,451	500,620	94,871	4,421,057	5,409,999	8,963,916	2.8
336	Nonferrous Foundries	52,898	19	63,163	1,910,794	2,026,874	2,756,693	0.9
339	Miscellaneous Primary Metal Products	24,358	321,967	55,709	1,386,137	1,788,171	2,470,866	0.8
	SIC code not valid within SIC 33	0	0	0	117	117	360	0.0
Subtotal for Single SIC Codes		12,987,874	1,876,821	1,330,897	112,304,056	128,499,648	281,125,172	88.2
331/332		60	0	0	342	402	1,095,735	0.3
331/332/336		0	0	0	0	0	5,896	0.0
331/334		0	0	0	486,683	486,683	489,282	0.2
331/335		22,239	0	0	5,618	27,857	165,601	0.1
331/335/339		28,178	0	0	0	28,178	31,120	0.0
331/339		263,881	616,462	3,271	1,371,024	2,254,638	3,911,463	1.2
332/333		0	0	0	0	0	0	0.0
332/334		2,795	0	0	0	2,795	8,296	0.0
332/336		5,274	340,318	23,930	96,709	466,231	1,126,730	0.4
332/336/339		0	0	0	340	340	340	0.0
333/334		0	0	0	13,855,648	13,855,648	14,131,099	4.4
333/335		49,358	0	2,905	215,552	267,815	13,989,253	4.4
334/335		0	0	0	21,890	21,890	106,580	0.0
334/335/336		0	54	0	59,486	59,540	264,836	0.1
334/335/339		0	1,421,144	18	298,082	1,719,244	1,893,778	0.6
334/336		0	0	0	6	6	27	0.0
334/336/339		0	0	0	0	0	1,399	0.0
334/339		0	0	0	189	189	281,297	0.1
335/336		0	0	0	25,492	25,492	56,670	0.0
335/339		0	0	340	1,731	2,071	26,136	0.0
336/339		0	0	0	0	0	15,738	0.0
Subtotal for Multiple SIC Codes		371,785	2,377,978	30,464	16,438,792	19,219,019	37,601,276	11.8
Total for TRI Facilities		13,359,659	4,254,799	1,361,361	128,742,848	147,718,667	318,726,448	100.0

Table 7-6		NPRI and TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), 1997					
M	1997	NPRI		TRI		Total Including Multiple	
		Number	% of Total	Number	% of Total	Number	% of Total
		kg		kg		kg	
Facilities		43		365		391	
Forms		205		1,755		1,918	
Total Air Emissions		1,500,475	4.8	5,842,909	3.9	6,146,253	4.0
Surface Water Discharges		597,703	1.9	18,060,754	12.1	20,122,506	13.0
Underground Injection		0	0.0	87,958	0.1	87,958	0.1
On-site Land Releases		4,785,227	15.4	28,395,088	19.1	28,931,331	18.7
Matched On-site Releases		6,891,149	22.2	52,386,709	35.2	55,288,048	35.7
Treatment (except metals)		49,315	0.2	12,430,168	8.3	12,744,526	8.2
Sewage/POTWs (except metals)		103,520	0.3	1,033,327	0.7	1,649,789	1.1
Disposal (except metals)		247,396	0.8	644,198	0.4	647,469	0.4
Treatment/Sewage/Disposal of Metals		23,706,819	76.5	82,497,536	55.4	84,361,203	54.5
Matched Off-site Transfers		24,107,050	77.8	96,605,229	64.8	99,402,987	64.3
Matched Releases and Transfers		30,998,199	100.0	148,991,938	100.0	154,691,035	100.0
Average Forms/Facility		4.8		4.8		4.9	
Average Releases per Facility		160,259		143,525		141,402	
per Form		33,615		29,850		28,826	
Average Transfers per Facility		560,629		264,672		254,228	
per Form		117,595		55,046		51,826	
Average Releases and Transfers per Facility		720,888		408,197		395,629	
per Form		151,211		84,896		80,652	



► Underground injection zero for NPRI and less than 1 percent for TRI.

Releases and Transfers from the Blast Furnace and Basic Steel Products Subsector

NPRI facilities' releases and transfers were almost all transfers off-site of metals or on-site land disposal. For NPRI facilities, 92 percent of total releases and transfers consisted of off-site transfers of metals and on-site land disposal, while for TRI the percentage was 75 percent. TRI facilities reported much greater surface water discharges than did NPRI facilities (**Figure 7-1**). As described above, one TRI facility

in this subsector reported a large increase in surface water discharges of nitric acid (Armco Steel in Butler, Pennsylvania, 12 million kg in 1997) due to increased production. TRI facilities also reported transferring nonmetals to treatment in greater proportion than NPRI facilities.

Chemicals from the Blast Furnace and Basic Steel Products Subsector

Zinc and its compounds was the substance with the greatest total releases and transfers for both NPRI and TRI

facilities in this subsector. The NPRI facilities reported 21 million kg of zinc and its compounds. This represented 66 percent of total releases and transfers for NPRI facilities in this subsector (**Table 7-7**). TRI facilities reported 79 million kg of zinc and its compounds, accounting for 53 percent of the total releases and transfers (**Tables 7-8 and 7-9**).

As described in **Section 7.3.4** above, zinc may be present in scrap metal, as it is used to coat steel to protect it from rust (called galvanizing), or it may be an impurity in raw materi-

als. Scrap steel is degalvanized (zinc is removed through chemical treatment), and this zinc may be found in dust from the electric arc furnace. In the case of impurities in iron ore, zinc is found in waste (slag) and in gases from the blast furnace. Zinc in dust from steelmaking can be recycled if the concentration is sufficiently high and if the economics of recycling versus land disposal either on- or off-site are favorable. Zinc that is recycled is not included in the total releases and transfers presented here.

Table 7-7

M 1997

NPRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical, 1997

CAS Number	Chemical	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	21	93,916	14,098	0	2,656,941	2,765,055
—	Manganese (and its compounds)	23	31,051	4,771	0	1,037,333	1,074,191
—	Lead (and its compounds)	15	7,392	2,666	0	320,324	332,656
—	Chromium (and its compounds)	17	3,723	357	0	20,813	25,843
—	Copper (and its compounds)	17	2,308	415	0	94,941	97,991
—	Nickel (and its compounds)	14	858	3,430	0	4,777	9,182
—	Cadmium (and its compounds)	2	0	0	0	0	100
—	Arsenic (and its compounds)	1	0	0	0	0	100
7440-62-2	Vanadium (fume or dust)	2	1	0	0	0	1
—	Antimony (and its compounds)	1	0	0	0	0	0
7429-90-5	Aluminum (fume or dust)	7	2,537	334	0	460,000	463,122
Subtotal for Metals		120	141,786	26,071	0	4,595,129	4,768,241
—	Nitric acid and nitrate compounds	6	22	551,890	0	0	552,512
7647-01-0	Hydrochloric acid	9	42,733	0	0	0	42,733
7664-93-9	Sulfuric acid	5	10,360	0	0	0	10,360
—	Cyanides	1	0	3,980	0	0	3,980
7664-39-3	Hydrogen fluoride	1	585	0	0	0	585
7664-38-2	Phosphoric acid	5	0	0	0	0	549
Subtotal for Acids/Bases		27	53,700	555,870	0	0	610,719
All Other Chemicals		58	1,304,989	15,762	0	190,098	1,512,189
Total		205	1,500,475	597,703	0	4,785,227	6,891,149

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)	Total Releases and Transfers (kg)	Average Total Releases and Transfers per Form kg/form
—	Zinc (and its compounds)	0	0	0	17,816,386	17,816,386	20,581,441	980,069
—	Manganese (and its compounds)	0	0	0	3,299,349	3,299,349	4,373,540	190,154
—	Lead (and its compounds)	0	0	0	1,367,297	1,367,297	1,699,953	113,330
—	Chromium (and its compounds)	0	0	0	599,300	599,300	625,143	36,773
—	Copper (and its compounds)	0	0	0	367,889	367,889	465,880	27,405
—	Nickel (and its compounds)	0	0	0	176,647	176,647	185,829	13,274
—	Cadmium (and its compounds)	0	0	0	929	929	1,029	515
—	Arsenic (and its compounds)	0	0	0	486	486	586	586
7440-62-2	Vanadium (fume or dust)	0	0	0	0	0	1	1
—	Antimony (and its compounds)	0	0	0	0	0	0	0
7429-90-5	Aluminum (fume or dust)	0	0	0	78,536	78,536	541,658	77,380
	Subtotal for Metals	0	0	0	23,706,819	23,706,819	28,475,060	237,292
—	Nitric acid and nitrate compounds	0	16,001	0	0	16,001	568,513	94,752
7647-01-0	Hydrochloric acid	0	0	0	0	0	42,733	4,748
7664-93-9	Sulfuric acid	0	0	0	0	0	10,360	2,072
—	Cyanides	0	0	0	0	0	3,980	3,980
7664-39-3	Hydrogen fluoride	0	0	0	0	0	585	585
7664-38-2	Phosphoric acid	0	1	0	0	1	550	110
	Subtotal for Acids/Bases	0	16,002	0	0	16,002	626,721	23,212
	All Other Chemicals	49,315	87,518	247,396	0	384,229	1,896,418	32,697
	Total	49,315	103,520	247,396	23,706,819	24,107,050	30,998,199	151,211

Table 7-8

**TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical, 1997
(Single SIC Codes Only)**
M 1 9 9 7

CAS Number	Chemical	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	155	953,908	68,828	340	14,006,214	15,029,290
—	Manganese (and its compounds)	228	385,262	276,191	952	12,387,899	13,050,304
—	Lead (and its compounds)	139	100,927	9,425	0	645,678	756,030
—	Chromium (and its compounds)	223	80,982	19,939	952	1,052,863	1,154,736
—	Nickel (and its compounds)	197	25,721	9,799	340	67,659	103,519
—	Copper (and its compounds)	97	15,460	7,046	340	63,238	86,084
—	Antimony (and its compounds)	14	1,481	5,889	0	23,561	30,931
—	Cadmium (and its compounds)	14	1,104	9	0	517	1,630
—	Cobalt (and its compounds)	19	1,013	201	0	5,610	6,824
—	Arsenic (and its compounds)	5	234	0	0	3,040	3,274
7440-62-2	Vanadium (fume or dust)	4	597	208	0	454	1,259
—	Silver (and its compounds)	2	0	0	0	265	265
—	Selenium (and its compounds)	2	0	0	0	263	263
—	Mercury (and its compounds)	3	2	0	0	150	152
7429-90-5	Aluminum (fume or dust)	16	18,158	14,276	0	0	32,434
Subtotal for Metals		1,118	1,584,849	411,811	2,924	28,257,411	30,256,995
—	Nitric acid and nitrate compounds	80	215,544	17,574,866	0	40,796	17,831,206
7647-01-0	Hydrochloric acid	53	775,621	0	0	0	775,621
7664-39-3	Hydrogen fluoride	31	117,283	30	0	5,306	122,619
7664-38-2	Phosphoric acid	65	19,654	2	0	59,466	79,122
—	Cyanides	22	114,377	26,282	21,769	7,434	169,862
7664-93-9	Sulfuric acid	15	45,107	0	0	0	45,107
74-90-8	Hydrogen cyanide	3	446	0	0	0	446
Subtotal for Acids/Bases		269	1,288,032	17,601,180	21,769	113,002	19,023,983
All Other Chemicals		368	2,970,028	47,763	63,265	24,675	3,105,731
Total		1,755	5,842,909	18,060,754	87,958	28,395,088	52,386,709

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)	Total Releases and Transfers (kg)	Average Total Releases and Transfers per Form kg/form
—	Zinc (and its compounds)	0	0	0	64,098,068	64,098,068	79,127,358	510,499
—	Manganese (and its compounds)	0	0	0	9,910,924	9,910,924	22,961,228	100,707
—	Lead (and its compounds)	0	0	0	4,636,742	4,636,742	5,392,772	38,797
—	Chromium (and its compounds)	0	0	0	1,914,130	1,914,130	3,068,866	13,762
—	Nickel (and its compounds)	0	0	0	930,285	930,285	1,033,804	5,248
—	Copper (and its compounds)	0	0	0	765,569	765,569	851,653	8,780
—	Antimony (and its compounds)	0	0	0	9,631	9,631	40,562	2,897
—	Cadmium (and its compounds)	0	0	0	26,807	26,807	28,437	2,031
—	Cobalt (and its compounds)	0	0	0	4,451	4,451	11,275	593
—	Arsenic (and its compounds)	0	0	0	546	546	3,820	764
7440-62-2	Vanadium (fume or dust)	0	0	0	572	572	1,831	458
—	Silver (and its compounds)	0	0	0	347	347	612	306
—	Selenium (and its compounds)	0	0	0	345	345	608	304
—	Mercury (and its compounds)	0	0	0	263	263	415	138
7429-90-5	Aluminum (fume or dust)	0	0	0	198,856	198,856	231,290	14,456
	Subtotal for Metals	0	0	0	82,497,536	82,497,536	112,754,531	100,854
—	Nitric acid and nitrate compounds	1,922,530	717,517	368,497	0	3,008,544	20,839,750	260,497
7647-01-0	Hydrochloric acid	0	0	0	0	0	775,621	14,634
7664-39-3	Hydrogen fluoride	382,860	16,162	46,232	0	445,254	567,873	18,318
7664-38-2	Phosphoric acid	30,221	2	167,281	0	197,504	276,626	4,256
—	Cyanides	724	35,279	1,122	0	37,125	206,987	9,409
7664-93-9	Sulfuric acid	0	0	0	0	0	45,107	3,007
74-90-8	Hydrogen cyanide	0	0	0	0	0	446	149
	Subtotal for Acids/Bases	2,336,335	768,960	583,132	0	3,688,427	22,712,410	84,433
	All Other Chemicals	10,093,833	264,367	61,066	0	10,419,266	13,524,997	36,753
	Total	12,430,168	1,033,327	644,198	82,497,536	96,605,229	148,991,938	84,896

Table 7-9

TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), by Chemical, 1997
(Single and Multiple SIC Codes)
M 1997

CAS Number	Chemical	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	160	986,323	69,684	340	14,120,273	15,176,620
—	Manganese (and its compounds)	248	394,909	282,223	952	12,687,012	13,365,096
—	Lead (and its compounds)	145	104,023	10,362	0	670,707	785,092
—	Chromium (and its compounds)	246	87,395	21,081	952	1,108,519	1,217,947
—	Nickel (and its compounds)	219	30,652	11,208	340	100,780	142,980
—	Copper (and its compounds)	110	15,976	8,072	340	72,309	96,697
—	Antimony (and its compounds)	14	1,481	5,889	0	23,561	30,931
—	Cadmium (and its compounds)	15	1,105	9	0	707	1,821
—	Cobalt (and its compounds)	24	1,704	541	0	5,614	7,859
—	Arsenic (and its compounds)	5	234	0	0	3,040	3,274
7440-62-2	Vanadium (fume or dust)	5	597	208	0	454	1,259
—	Silver (and its compounds)	2	0	0	0	265	265
—	Selenium (and its compounds)	2	0	0	0	263	263
—	Mercury (and its compounds)	3	2	0	0	150	152
7429-90-5	Aluminum (fume or dust)	20	18,938	14,276	0	0	33,214
Subtotal for Metals		1,218	1,643,339	423,553	2,924	28,793,654	30,863,470
—	Nitric acid and nitrate compounds	97	224,809	19,624,836	0	40,796	19,890,441
7647-01-0	Hydrochloric acid	54	776,342	0	0	0	776,342
7664-39-3	Hydrogen fluoride	41	122,026	38	0	5,306	127,370
7664-38-2	Phosphoric acid	71	20,111	2	0	59,466	79,579
—	Cyanides	22	114,377	26,282	21,769	7,434	169,862
7664-93-9	Sulfuric acid	17	48,829	0	0	0	48,829
74-90-8	Hydrogen cyanide	4	586	0	0	0	586
Subtotal for Acids/Bases		306	1,307,080	19,651,158	21,769	113,002	21,093,009
All Other Chemicals		394	3,195,834	47,795	63,265	24,675	3,331,569
Total		1,918	6,146,253	20,122,506	87,958	28,931,331	55,288,048

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)	Average Total Releases and Transfers (kg)	Transfers per Form kg/form
—	Zinc (and its compounds)	0	0	0	64,400,508	64,400,508	79,577,128	497,357
—	Manganese (and its compounds)	0	0	0	10,182,613	10,182,613	23,547,709	94,950
—	Lead (and its compounds)	0	0	0	4,650,937	4,650,937	5,436,029	37,490
—	Chromium (and its compounds)	0	0	0	2,811,959	2,811,959	4,029,906	16,382
—	Nickel (and its compounds)	0	0	0	1,291,384	1,291,384	1,434,364	6,550
—	Copper (and its compounds)	0	0	0	777,105	777,105	873,802	7,944
—	Antimony (and its compounds)	0	0	0	9,631	9,631	40,562	2,897
—	Cadmium (and its compounds)	0	0	0	26,807	26,807	28,628	1,909
—	Cobalt (and its compounds)	0	0	0	4,796	4,796	12,655	527
—	Arsenic (and its compounds)	0	0	0	546	546	3,820	764
7440-62-2	Vanadium (fume or dust)	0	0	0	572	572	1,831	366
—	Silver (and its compounds)	0	0	0	347	347	612	306
—	Selenium (and its compounds)	0	0	0	345	345	608	304
—	Mercury (and its compounds)	0	0	0	263	263	415	138
7429-90-5	Aluminum (fume or dust)	0	0	0	203,390	203,390	236,604	11,830
	Subtotal for Metals	0	0	0	84,361,203	84,361,203	115,224,673	94,602
—	Nitric acid and nitrate compounds	2,197,855	1,333,637	368,522	0	3,900,014	23,790,455	245,262
7647-01-0	Hydrochloric acid	0	0	0	0	0	776,342	14,377
7664-39-3	Hydrogen fluoride	398,007	16,164	46,232	0	460,403	587,773	14,336
7664-38-2	Phosphoric acid	53,589	2	170,527	0	224,118	303,697	4,277
—	Cyanides	724	35,279	1,122	0	37,125	206,987	9,409
7664-93-9	Sulfuric acid	0	0	0	0	0	48,829	2,872
74-90-8	Hydrogen cyanide	0	0	0	0	0	586	147
	Subtotal for Acids/Bases	2,650,175	1,385,082	586,403	0	4,621,660	25,714,669	84,035
	All Other Chemicals	10,094,351	264,707	61,066	0	10,420,124	13,751,693	34,903
	Total	12,744,526	1,649,789	647,469	84,361,203	99,402,987	154,691,035	80,652

NPRI average releases and transfers of zinc and its compounds were twice those for TRI facilities in this subsector. This was primarily due to higher average off-site transfers, but on-site releases were also one and one-half times as large on average, due to larger average on-site land disposal. This was also true for the metals as a group (Figure 7-2).

Metals are present in the ores and scrap metals that are used as inputs to the basic steelmaking processes and acids and bases are used to clean feedstock and products. Metals comprise the majority of releases and transfers from both NPRI and TRI facilities in this subsector (Figure 7-3).

The average releases and transfers of metals per form reported by NPRI facilities were more than twice those for TRI facilities. TRI facilities report, on average, higher releases and transfers of acids and bases than do NPRI facilities in this subsector (Figure 7-2). TRI facilities reported 3.6 times the average per form of NPRI facilities. If the one large form for nitrate compounds is not included, the TRI average per form is still 1.7 times that for NPRI. Releases and transfers of other substances average about the same per form.

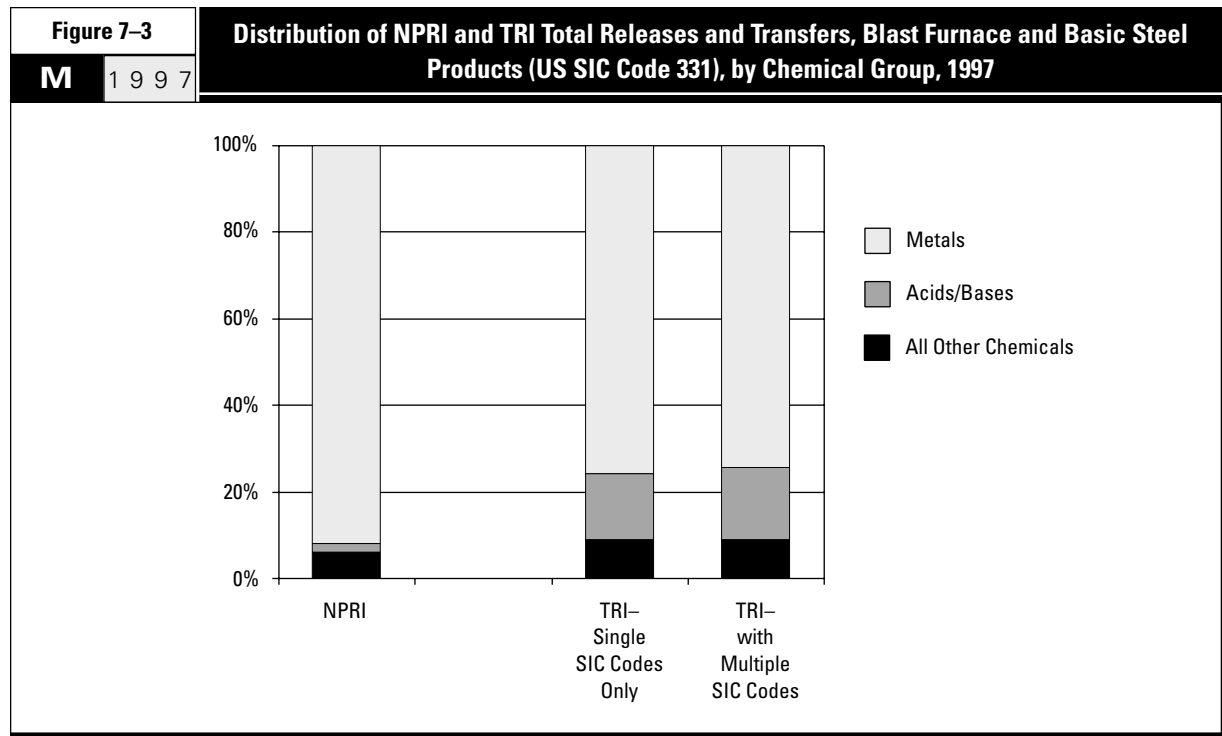
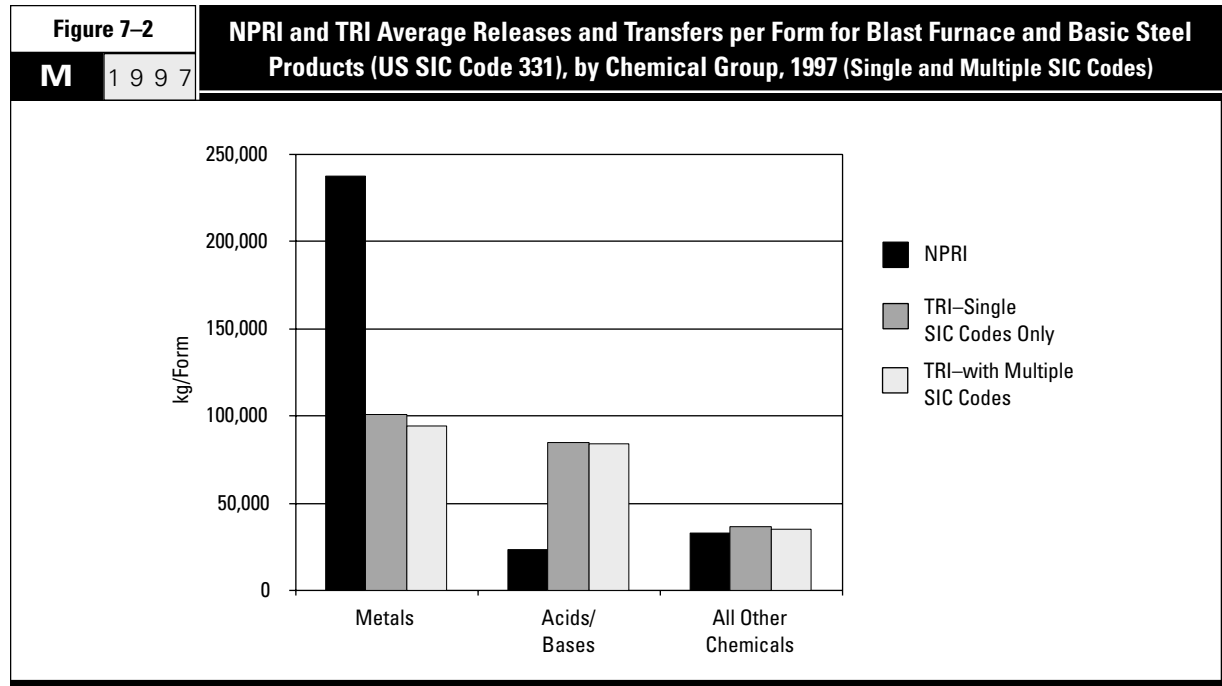


Table 7-10

NPRI and TRI Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), 1995–1997

M 1997

	NPRI				TRI*			
	1995 Number	1997 Number	Change 1995–1997		1995 Number	1997 Number	Change 1995–1997	
			Number	%			Number	%
Total Facilities	43	43	0	0.0	363	365	2	0.6
Total Forms	201	205	4	2.0	1,655	1,755	100	6.0
On-site Releases	kg	%	kg	%				
Total Air Emissions	1,641,019	1,500,475	-140,544	-8.6	6,924,451	5,842,909	-1,081,542	-15.6
Surface Water Discharges	858,780	597,703	-261,077	-30.4	9,747,350	18,060,754	8,313,404	85.3
Underground Injection	0	0	0	—	79,206	87,958	8,752	—
On-site Land Releases	6,472,122	4,785,227	-1,686,895	-26.1	22,290,285	28,395,088	6,104,803	27.4
Matched On-site Releases	8,978,485	6,891,149	-2,087,336	-23.2	39,041,292	52,386,709	13,345,417	34.2
Off-site Transfers								
Treatment (except metals)	151,376	49,315	-102,061	-67.4	3,283,073	12,430,168	9,147,095	278.6
Sewage/POTWs (except metals)	20,596	103,520	82,924	402.6	726,015	1,033,327	307,312	42.3
Disposal (except metals)	155,411	247,396	91,985	59.2	2,391,296	644,198	-1,747,098	-73.1
Treatment/Sewage/Disposal of Metals	13,355,792	23,706,819	10,351,027	77.5	32,864,109	82,497,536	49,633,427	151.0
Matched Off-site Transfers	13,683,175	24,107,050	10,423,875	76.2	39,264,493	96,605,229	57,340,736	146.0
Total Releases and Transfers	22,661,660	30,998,199	8,336,539	36.8	78,305,785	148,991,938	70,686,153	90.3

* TRI data for single SIC codes only.

Changes in Releases and Transfers for the Blast Furnace and Basic Steel Products Subsector, 1995–1997, and Projected Changes, 1997–1999

From 1995 to 1997, the blast furnace and basic steel products subsector reported substantial increases in total releases and transfers from essentially the same number of facilities. NPRI facilities reported a 37 percent increase due to a 78 percent increase in off-site transfers of metals. NPRI facilities reported decreases in on-site releases (nine percent reduction to air, 30 percent to water and 26 percent to on-site

landfills). TRI facilities in this subsector, on the other hand, reported increases of 90 percent in total releases and transfers, including increases of more than 150 percent in off-site transfers of metals, 27 percent in on-site land disposal, and 85 percent in on-site releases to water. TRI facilities reported decreases in on-site air emissions (16 percent) and off-site transfers to disposal of nonmetals (73 percent—see **Table 7–10**).

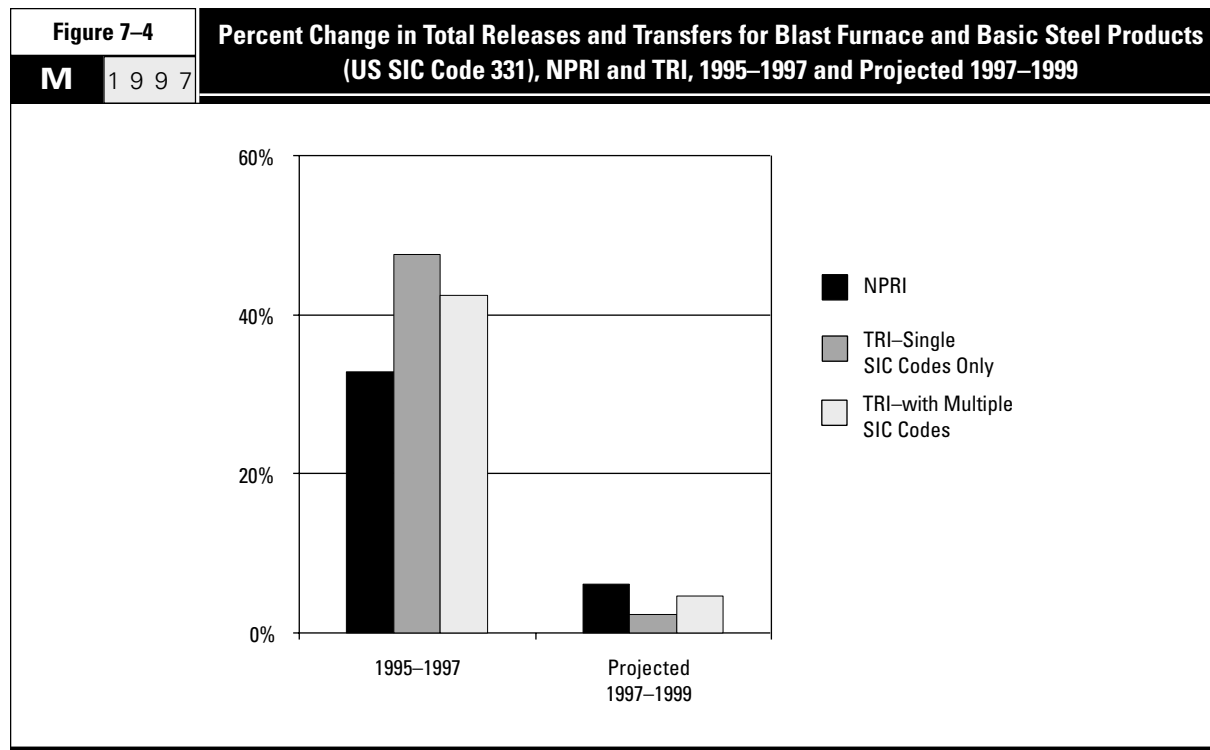
Neither NPRI nor TRI facilities project increases of this magnitude to continue. Particularly, total releases and transfers of the substances that TRI facilities reported in this subsector for

1997 showed an increase of more than 40 percent in total releases and transfers from 1995 to 1997, with a projected increase of less than five percent from 1997 to 1999. Similarly, total releases and transfers of substances that NPRI facilities reported in this subsector for 1997 showed an increase of 33 percent, with a projected increase of six percent from 1997 to 1999 (**Figure 7–4** and **Table 7–11**).

Twenty-three facilities in the blast furnace and basic steel products subsector were among the 50 TRI facilities with the largest increases in total releases and transfers from 1995 to 1997. (**Table 5–42** lists the 50 facili-

ties.) These 23 facilities reported increases of 67 million kg, which was 95 percent of the net increase reported by all TRI facilities in this subsector. As described above, these increases resulted primarily from larger production or from sending wastes to off-site land disposal that would previously have been sent to be recycled. The small projected increases may reflect the expectation of several of these facilities to switch back to off-site transfers to recycling in the future.

Nine facilities in the blast furnace and basic steel products subsector were among the 50 NPRI facilities with the largest increases in total releases and



transfers from 1995 to 1997. (Table 5-40 lists the 50 facilities.) These nine facilities reported increases of 9.2 million kg in total releases and transfers from 1995 to 1997, or more than the net increase of 8.3 million kg from all NPRI facilities in this subsector. As described above, these increases resulted from new equipment start-up and favorable waste disposal costs. The small projected increases may reflect expectations that equipment problems have been resolved.

7.9.2 Primary Nonferrous Metals (US SIC Code 333)

Primary smelters and refiners of nonferrous metals represented 18 percent of NPRI primary metals facilities and just three percent of those in TRI. This subsector reported the second-largest total releases and transfers of all subsectors in the primary metals industry: 21 percent for NPRI and 27 percent for TRI (see Table 7-5). While NPRI and TRI facilities in this subsector submitted about the same number of forms (an average of five per facility), average releases and transfers per form were substantially higher for TRI facilities, unlike basic steel products manufacturers and all industries as a whole. TRI manufacturers of primary nonferrous metals reported more than five times the average per form for releases and for total releases and transfers and more than seven times the average per form for transfers (Table 7-12).

Table 7-11
M 1 9 9 7

Change in Total Releases and Transfers for Blast Furnace and Basic Steel Products (US SIC Code 331), NPRI and TRI, 1995-1997 and Projected 1997-1999

	Total Releases and Transfers			% Change 1995-1997	Projected % Change 1997-1999
	1995* (kg)	1997 (kg)	1999 Projected (kg)		
NPRI	23,339,605	30,998,199	32,875,945	32.8	6.1
TRI—Single SIC Codes Only**	92,714,253	136,746,680	140,039,132	47.5	2.4
TRI—Single and Multiple SIC Codes**	99,905,438	142,249,273	148,832,874	42.4	4.6

* Data for same facility and chemical as reported for 1997.

** Data from Section 8 of TRI Form R.

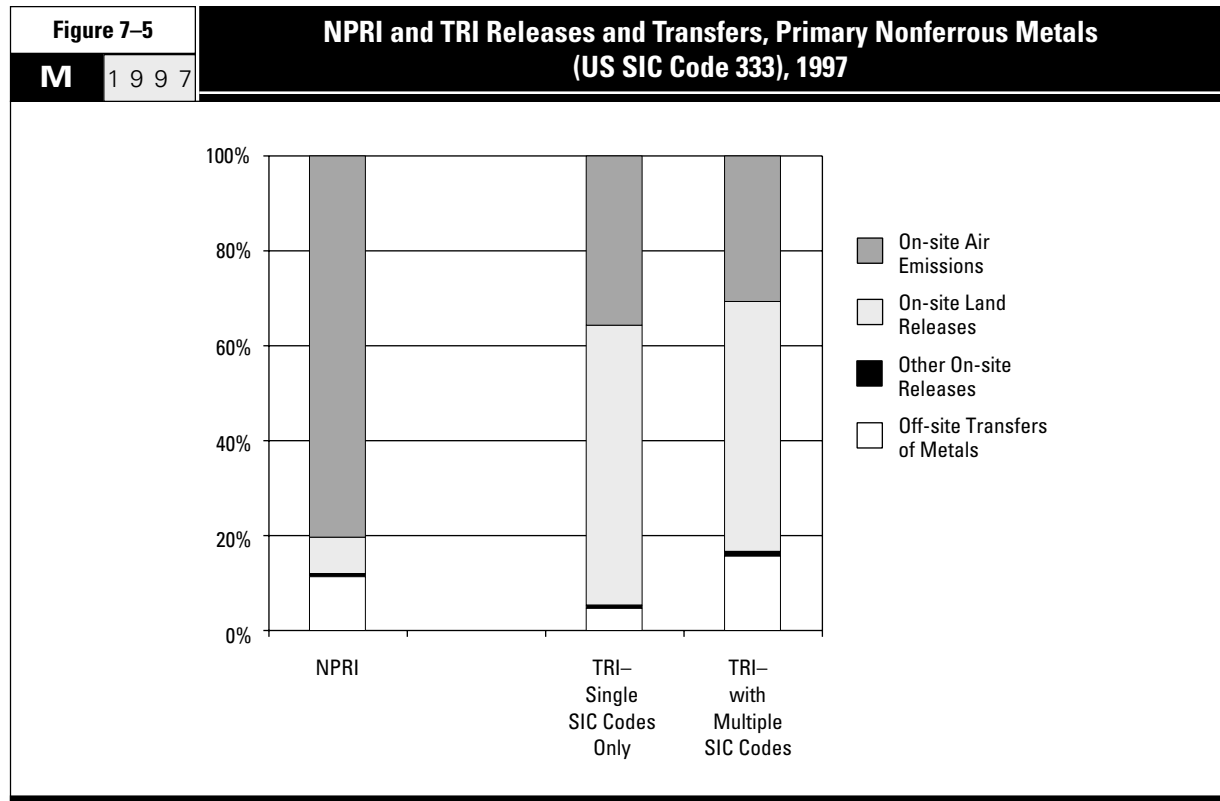
Table 7-12		NPRI and TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997					
M	1997						
	NPRI		TRI		Total Including Multiple		
	Number		Single SIC Codes		SIC Code Forms		
Facilities	30		54		61		
Forms	157		235		344		
	kg	% of Total	kg	% of Total	kg	% of Total	
Total Air Emissions	7,908,169	80.3	30,879,726	35.9	34,874,313	30.5	
Surface Water Discharges	67,329	0.7	456,488	0.5	958,031	0.8	
Underground Injection	0	0.0	81,949	0.1	81,949	0.1	
On-site Land Releases	744,535	7.6	50,693,303	58.9	60,194,062	52.7	
Matched On-site Releases	8,722,657	88.6	82,111,466	95.4	96,108,355	84.2	
Treatment (except metals)	0	0.0	34,552	0.0	83,910	0.1	
Sewage/POTWs (except metals)	0	0.0	0	0.0	0	0.0	
Disposal (except metals)	0	0.0	0	0.0	2,905	0.0	
Treatment/Sewage/Disposal of Metals	1,125,165	11.4	3,920,981	4.6	17,992,181	15.8	
Matched Off-site Transfers	1,125,165	11.4	3,955,533	4.6	18,078,996	15.8	
Matched Releases and Transfers	9,847,822	100.0	86,066,999	100.0	114,187,351	100.0	
	Number		Number		Number		
Average Forms/Facility	5.2		4.4		5.6		
	kg		kg		kg		
Average Releases							
per Facility	290,755		1,520,583		1,575,547		
per Form	55,558		349,410		279,385		
Average Transfers							
per Facility	37,506		73,251		296,377		
per Form	7,167		16,832		52,555		
Average Releases and Transfers							
per Facility	328,261		1,593,833		1,871,924		
per Form	62,725		366,243		331,940		

**Releases and Transfers
from the Primary Nonferrous
Metals Subsector**

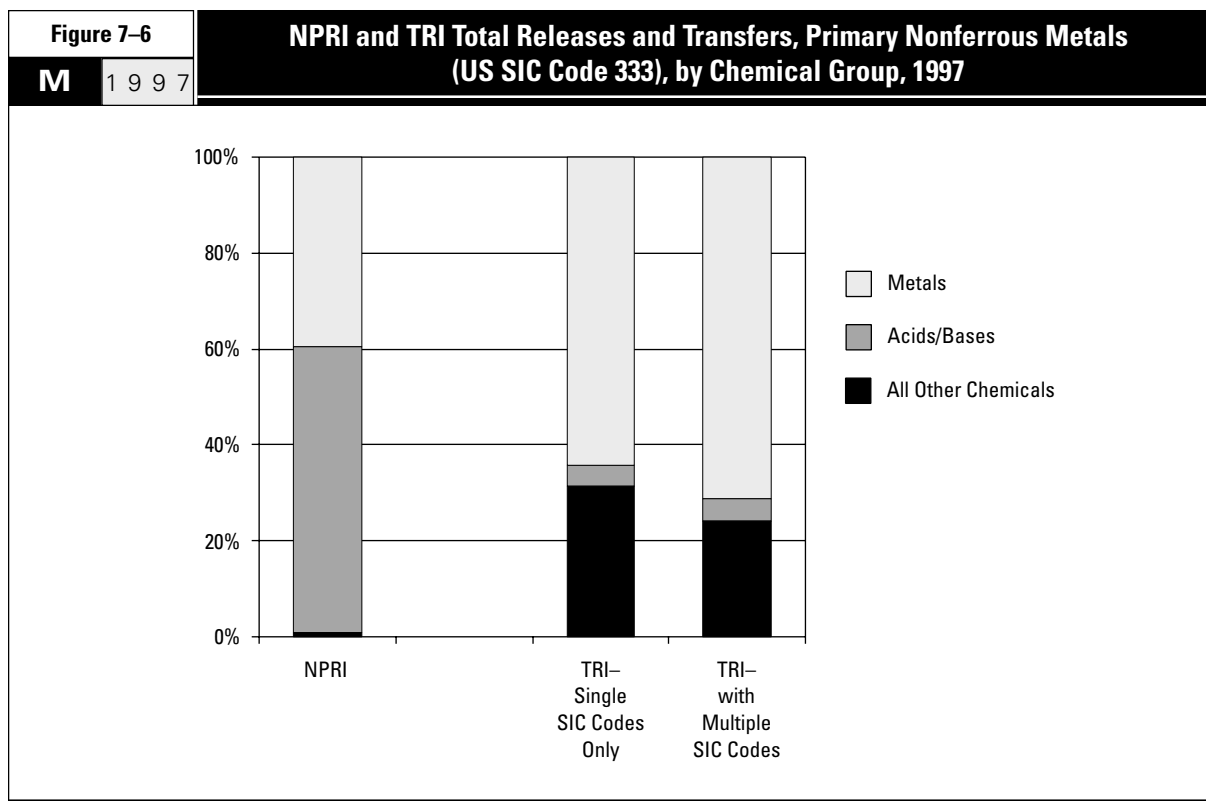
In contrast to the basic steel products manufacturers, the majority of the total in the nonferrous subsector consisted of on-site releases. Releases for NPRI nonferrous smelters and refiners represented 89 percent of their total releases and transfers; releases for the equivalent TRI group represented 95 percent. For NPRI facilities, air emissions accounted for the proportionately large on-site releases, amounting to 80 percent of total releases and transfers (**Figure 7-5** and **Table 7-12**). For TRI facilities, on-site releases to land were the largest category, accounting for over 50 percent of total releases and transfers. When on-site releases to land and off-site transfers of metals are considered together (i.e., as a form of disposal, whether on- or off-site), total disposal for this subsector was 19 percent for NPRI facilities and 64 percent for TRI facilities.

**Chemicals from the Primary
Nonferrous Metals Subsector**

Sulfuric acid was the subject of the largest total releases and transfers by NPRI facilities in this subsector. For TRI facilities, zinc and its compounds accounted for the largest percentage of total releases and transfers. More than 5.9 million kg of total releases and transfers of acids and bases were report-



► Other Off-site Transfers less than one percent for NPRI and TRI.



ed to NPRI, representing 60 percent of the total (**Figure 7-6** and **Table 7-13**). One NPRI facility (the Copper Cliff Smelter Complex of Inco Ltd.) reported 3.9 million kg of sulfuric acid releases to air, accounting for 95 percent of the subsector's total releases and transfers of this chemical. This facility also reported an increase of 1.1 million kg from 1995 to 1996 due to equipment start-up (see **Section 7.7.1**), but small increases in 1997.

On the other hand, TRI facilities reported about five million kg of acids and bases, but total releases and transfers of metals represented two-thirds (64 percent for single SIC codes and 71 percent including multiple SIC codes) of the TRI total releases and transfers for this subsector (**Tables 7-14** and **7-15** and **Figure 7-6**).

As mentioned above, overall TRI facilities reported much higher average releases and transfers per form than did NPRI facilities in this subsector. This was true for metals, where TRI facilities reported an average of total releases and transfers per form that was 10 times that of NPRI facilities. The difference was even greater for chemicals other than metals, acids and bases. However, for acids and bases, the NPRI facilities' per form average was about two and one-half times higher than that of TRI facilities because of high air emissions of sulfuric acid (**Figure 7-7** and **Tables 7-13** through **7-15**).

Table 7-13

NPRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997

M 1997

CAS Number	Chemical	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Lead (and its compounds)	11	530,533	1,534	0	409	533,081
—	Zinc (and its compounds)	13	610,331	26,139	0	320	636,799
—	Chromium (and its compounds)	10	6,169	719	0	649,004	655,934
—	Copper (and its compounds)	19	389,611	4,541	0	19,483	413,635
—	Nickel (and its compounds)	10	221,325	19,885	0	24,700	265,952
—	Arsenic (and its compounds)	10	146,593	1,535	0	0	148,843
—	Cadmium (and its compounds)	6	39,714	828	0	0	40,542
—	Manganese (and its compounds)	16	385	6,194	0	40,001	46,622
—	Selenium (and its compounds)	4	4,629	3,989	0	0	9,280
—	Cobalt (and its compounds)	4	3,135	1,030	0	10,565	14,730
—	Antimony (and its compounds)	4	5,578	600	0	0	6,178
—	Mercury (and its compounds)	1	0	0	0	0	6
—	Silver (and its compounds)	5	1,239	172	0	52	1,463
7440-62-2	Vanadium (fume or dust)	1	87	163	0	1	251
Subtotal for Metals		114	1,959,329	67,329	0	744,535	2,773,316
7664-93-9	Sulfuric acid	10	4,106,213	0	0	0	4,106,213
7664-39-3	Hydrogen fluoride	12	1,629,078	0	0	0	1,629,079
7647-01-0	Hydrochloric acid	6	128,304	0	0	0	128,304
—	Cyanides	1	0	0	0	0	0
—	Nitric acid and nitrate compounds	1	0	0	0	0	0
Subtotal for Acids/Bases		30	5,863,595	0	0	0	5,863,596
All Other Chemicals		13	85,245	0	0	0	85,745
Total		157	7,908,169	67,329	0	744,535	8,722,657

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)	Total Releases and Transfers (kg)	Average Total Releases and Transfers per Form (kg/form)
—	Lead (and its compounds)	0	0	0	750,846	750,846	1,283,927	116,721
—	Zinc (and its compounds)	0	0	0	30,555	30,555	667,354	51,335
—	Chromium (and its compounds)	0	0	0	1,806	1,806	657,740	65,774
—	Copper (and its compounds)	0	0	0	51,223	51,223	464,858	24,466
—	Nickel (and its compounds)	0	0	0	31,162	31,162	297,114	29,711
—	Arsenic (and its compounds)	0	0	0	48,630	48,630	197,473	19,747
—	Cadmium (and its compounds)	0	0	0	120,136	120,136	160,678	26,780
—	Manganese (and its compounds)	0	0	0	50,136	50,136	96,758	6,047
—	Selenium (and its compounds)	0	0	0	30,344	30,344	39,624	9,906
—	Cobalt (and its compounds)	0	0	0	2,655	2,655	17,385	4,346
—	Antimony (and its compounds)	0	0	0	4,276	4,276	10,454	2,614
—	Mercury (and its compounds)	0	0	0	3,301	3,301	3,307	3,307
—	Silver (and its compounds)	0	0	0	95	95	1,558	312
7440-62-2	Vanadium (fume or dust)	0	0	0	0	0	251	251
	Subtotal for Metals	0	0	0	1,125,165	1,125,165	3,898,481	34,197
7664-93-9	Sulfuric acid	0	0	0	0	0	4,106,213	410,621
7664-39-3	Hydrogen fluoride	0	0	0	0	0	1,629,079	135,757
7647-01-0	Hydrochloric acid	0	0	0	0	0	128,304	21,384
—	Cyanides	0	0	0	0	0	0	0
—	Nitric acid and nitrate compounds	0	0	0	0	0	0	0
	Subtotal for Acids/Bases	0	0	0	0	0	5,863,596	195,453
	All Other Chemicals	0	0	0	0	0	85,745	6,596
	Total	0	0	0	1,125,165	1,125,165	9,847,822	62,725

Table 7-14

**TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997
(Single SIC Codes Only)**
M 1 9 9 7

CAS Number	Chemical	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	16	118,809	3,233	83	29,101,241	29,223,366
—	Copper (and its compounds)	31	250,645	4,594	37,723	10,009,131	10,302,093
—	Lead (and its compounds)	17	195,515	1,576	230	5,990,953	6,188,274
—	Arsenic (and its compounds)	11	26,614	359	34,467	2,300,832	2,362,272
—	Nickel (and its compounds)	13	36,214	104	1,609	1,488,284	1,526,211
—	Manganese (and its compounds)	18	4,711	2,739	0	1,011,519	1,018,969
—	Antimony (and its compounds)	9	4,547	436	3,950	230,223	239,156
—	Chromium (and its compounds)	13	976	147	0	243,487	244,610
—	Cobalt (and its compounds)	4	278	124	0	126,208	126,610
—	Cadmium (and its compounds)	9	13,694	320	0	80,301	94,315
—	Selenium (and its compounds)	3	14,446	113	1,546	82,993	99,098
7429-90-5	Aluminum (fume or dust)	6	25,159	251	0	5	25,415
—	Silver (and its compounds)	7	1,114	130	71	14,490	15,805
7440-62-2	Vanadium (fume or dust)	1	0	0	0	0	0
Subtotal for Metals		158	692,722	14,126	79,679	50,679,667	51,466,194
7647-01-0	Hydrochloric acid	10	1,504,525	0	0	0	1,504,525
7664-39-3	Hydrogen fluoride	15	1,416,392	0	0	0	1,416,392
—	Nitric acid and nitrate compounds	9	33,154	437,755	2	7,710	478,621
7664-93-9	Sulfuric acid	10	305,470	0	0	0	305,470
—	Cyanides	2	0	0	0	0	0
7664-38-2	Phosphoric acid	1	0	0	0	0	0
Subtotal for Acids/Bases		47	3,259,541	437,755	2	7,710	3,705,008
7782-50-5	Chlorine	16	26,837,252	2,317	0	0	26,839,569
All Other Chemicals		14	90,211	2,290	2,268	5,926	100,695
Total		235	30,879,726	456,488	81,949	50,693,303	82,111,466

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)	Total Releases and Transfers (kg)	Average Total Releases and Transfers per Form (kg/form)
—	Zinc (and its compounds)	0	0	0	1,235,080	1,235,080	30,458,446	1,903,653
—	Copper (and its compounds)	0	0	0	340,897	340,897	10,642,990	343,322
—	Lead (and its compounds)	0	0	0	1,101,434	1,101,434	7,289,708	428,806
—	Arsenic (and its compounds)	0	0	0	667,337	667,337	3,029,609	275,419
—	Nickel (and its compounds)	0	0	0	4,932	4,932	1,531,143	117,780
—	Manganese (and its compounds)	0	0	0	15,073	15,073	1,034,042	57,447
—	Antimony (and its compounds)	0	0	0	479,367	479,367	718,523	79,836
—	Chromium (and its compounds)	0	0	0	1,511	1,511	246,121	18,932
—	Cobalt (and its compounds)	0	0	0	113	113	126,723	31,681
—	Cadmium (and its compounds)	0	0	0	21,370	21,370	115,685	12,854
—	Selenium (and its compounds)	0	0	0	356	356	99,454	33,151
7429-90-5	Aluminum (fume or dust)	0	0	0	44,317	44,317	69,732	11,622
—	Silver (and its compounds)	0	0	0	9,194	9,194	24,999	3,571
7440-62-2	Vanadium (fume or dust)	0	0	0	0	0	0	0
	Subtotal for Metals	0	0	0	3,920,981	3,920,981	55,387,175	350,552
7647-01-0	Hydrochloric acid	0	0	0	0	0	1,504,525	150,453
7664-39-3	Hydrogen fluoride	0	0	0	0	0	1,416,392	94,426
—	Nitric acid and nitrate compounds	11,066	0	0	0	11,066	489,687	54,410
7664-93-9	Sulfuric acid	0	0	0	0	0	305,470	30,547
—	Cyanides	23,299	0	0	0	23,299	23,299	11,650
7664-38-2	Phosphoric acid	0	0	0	0	0	0	0
	Subtotal for Acids/Bases	34,365	0	0	0	34,365	3,739,373	79,561
7782-50-5	Chlorine	0	0	0	0	0	26,839,569	1,677,473
	All Other Chemicals	187	0	0	0	187	100,882	7,206
	Total	34,552	0	0	3,920,981	3,955,533	86,066,999	366,243

Table 7-15

TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1997
(Single and Multiple SIC Codes)
M 1 9 9 7

CAS Number	Chemical	Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	20	370,507	3,408	83	30,504,149	30,878,147
—	Copper (and its compounds)	43	2,262,312	4,804	37,723	16,956,984	19,261,823
—	Lead (and its compounds)	21	210,763	1,626	230	6,374,872	6,587,491
—	Arsenic (and its compounds)	13	30,997	359	34,467	2,585,085	2,650,908
—	Manganese (and its compounds)	27	6,802	2,865	0	1,012,012	1,021,679
—	Nickel (and its compounds)	20	37,677	260	1,609	1,514,027	1,553,573
—	Antimony (and its compounds)	11	5,448	436	3,950	385,604	395,438
—	Chromium (and its compounds)	22	1,923	379	0	429,479	431,781
—	Cadmium (and its compounds)	12	15,559	329	0	129,089	144,977
7429-90-5	Aluminum (fume or dust)	9	29,835	251	0	23,588	53,674
—	Cobalt (and its compounds)	6	594	124	0	153,426	154,144
—	Selenium (and its compounds)	6	16,048	113	1,546	94,809	112,516
—	Silver (and its compounds)	8	1,341	130	71	17,302	18,844
—	Mercury (and its compounds)	1	68	0	0	0	68
7440-62-2	Vanadium (fume or dust)	1	0	0	0	0	0
Subtotal for Metals		220	2,989,874	15,084	79,679	60,180,426	63,265,063
7664-39-3	Hydrogen fluoride	25	2,128,778	34	0	0	2,128,812
7647-01-0	Hydrochloric acid	14	2,002,552	0	0	0	2,002,552
—	Nitric acid and nitrate compounds	12	36,492	933,187	2	7,710	977,391
7664-93-9	Sulfuric acid	11	379,846	0	0	0	379,846
—	Cyanides	3	0	544	0	0	544
7664-38-2	Phosphoric acid	2	0	499	0	0	499
Subtotal for Acids/Bases		67	4,547,668	934,264	2	7,710	5,489,644
7782-50-5	Chlorine	26	26,916,049	2,670	0	0	26,918,719
All Other Chemicals		31	420,722	6,013	2,268	5,926	434,929
Total		344	34,874,313	958,031	81,949	60,194,062	96,108,355

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)	Total Releases and Transfers (kg)	Average Total Releases and Transfers per Form (kg/form)
—	Zinc (and its compounds)	0	0	0	11,787,687	11,787,687	42,665,834	2,133,292
—	Copper (and its compounds)	0	0	0	1,393,728	1,393,728	20,655,551	480,362
—	Lead (and its compounds)	0	0	0	1,474,429	1,474,429	8,061,920	383,901
—	Arsenic (and its compounds)	0	0	0	667,342	667,342	3,318,250	255,250
—	Manganese (and its compounds)	0	0	0	1,224,143	1,224,143	2,245,822	83,179
—	Nickel (and its compounds)	0	0	0	365,008	365,008	1,918,581	95,929
—	Antimony (and its compounds)	0	0	0	479,367	479,367	874,805	79,528
—	Chromium (and its compounds)	0	0	0	157,718	157,718	589,499	26,795
—	Cadmium (and its compounds)	0	0	0	270,811	270,811	415,788	34,649
7429-90-5	Aluminum (fume or dust)	0	0	0	151,346	151,346	205,020	22,780
—	Cobalt (and its compounds)	0	0	0	113	113	154,257	25,710
—	Selenium (and its compounds)	0	0	0	2,678	2,678	115,194	19,199
—	Silver (and its compounds)	0	0	0	9,194	9,194	28,038	3,505
—	Mercury (and its compounds)	0	0	0	8,617	8,617	8,685	8,685
7440-62-2	Vanadium (fume or dust)	0	0	0	0	0	0	0
	Subtotal for Metals	0	0	0	17,992,181	17,992,181	81,257,244	369,351
7664-39-3	Hydrogen fluoride	0	0	0	0	0	2,128,812	85,152
7647-01-0	Hydrochloric acid	0	0	0	0	0	2,002,552	143,039
—	Nitric acid and nitrate compounds	11,066	0	161	0	11,227	988,618	82,385
7664-93-9	Sulfuric acid	0	0	0	0	0	379,846	34,531
—	Cyanides	35,997	0	340	0	36,337	36,881	12,294
7664-38-2	Phosphoric acid	0	0	0	0	0	499	250
	Subtotal for Acids/Bases	47,063	0	501	0	47,564	5,537,208	82,645
7782-50-5	Chlorine	0	0	0	0	0	26,918,719	1,035,335
	All Other Chemicals	36,847	0	2,404	0	39,251	474,180	15,296
	Total	83,910	0	2,905	17,992,181	18,078,996	114,187,351	331,940

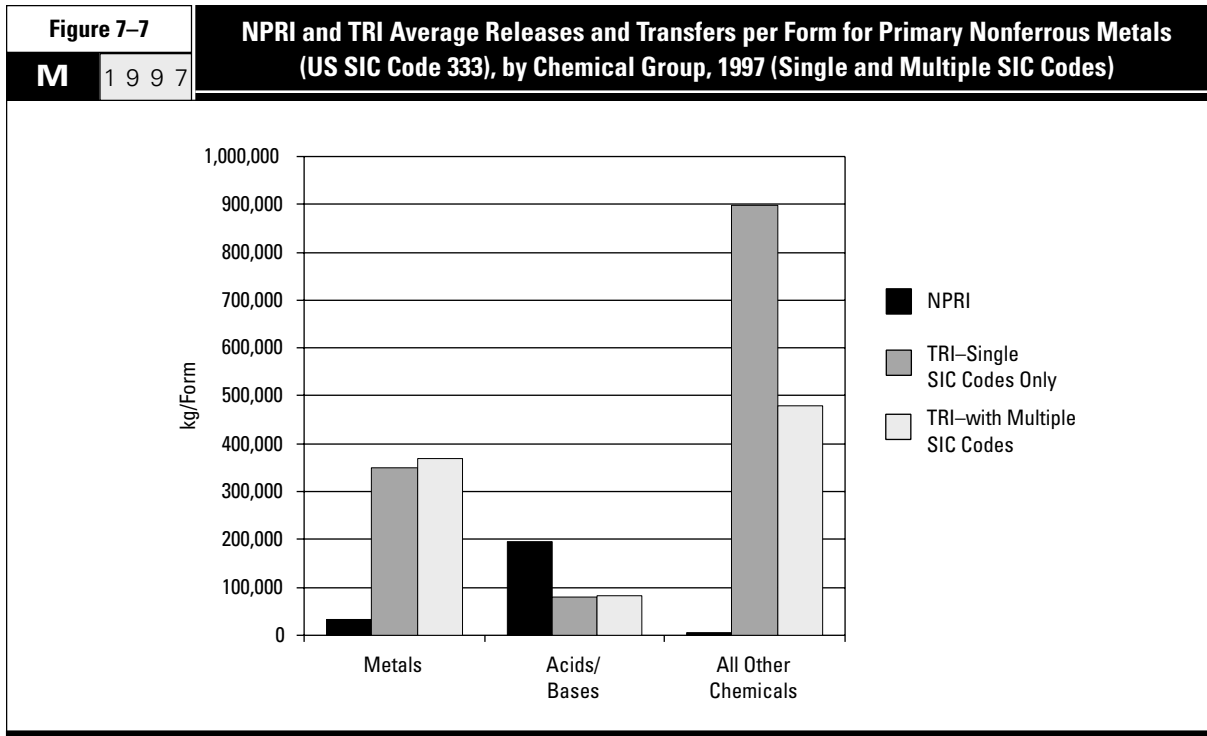


Table 7-16

NPRI and TRI Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), 1995–1997

M 1997

	NPRI				TRI*			
	1995 Number	1997 Number	Change 1995–1997		1995 Number	1997 Number	Change 1995–1997	
			Number	%			Number	%
Total Facilities	33	30	-3	-9.1	48	54	6	12.5
Total Forms	157	157	0	0.0	225	235	10	4.4
On-site Releases	kg	kg	kg	%	kg	kg	kg	%
Total Air Emissions	6,823,008	7,908,169	1,085,161	15.9	31,925,251	30,879,726	-1,045,525	-3.3
Surface Water Discharges	71,169	67,329	-3,840	-5.4	12,048	456,488	444,440	3,688.9
Underground Injection	0	0	0	—	79,753	81,949	2,196	2.8
On-site Land Releases	49,043	744,535	695,492	1,418.1	52,962,808	50,693,303	-2,269,505	-4.3
Matched On-site Releases	6,950,197	8,722,657	1,772,460	25.5	84,979,860	82,111,466	-2,868,394	-3.4
Off-site Transfers								
Treatment (except metals)	11,800	0	-11,800	-100.0	20,079	34,552	14,473	72.1
Sewage/POTWs (except metals)	70,990	0	-70,990	-100.0	0	0	0	—
Disposal (except metals)	30,000	0	-30,000	-100.0	31,301	0	-31,301	-100.0
Treatment/Sewage/Disposal of Metals	123,157	1,125,165	1,002,008	813.6	4,417,331	3,920,981	-496,350	-11.2
Matched Off-site Transfers	235,947	1,125,165	889,218	376.9	4,468,711	3,955,533	-513,178	-11.5
Total Releases and Transfers	7,186,144	9,847,822	2,661,678	37.0	89,448,571	86,066,999	-3,381,572	-3.8

* TRI data for single SIC codes only.

Changes in Releases and Transfers for the Primary Nonferrous Metals Subsector, 1995–1997, and Projected Changes, 1997–1999

From 1995 to 1997, NPRI facilities in the primary nonferrous metals sub-

sector reported substantial increases in both releases and transfers: 26 percent increase for on-site releases (largely due to an increase in releases of sulfuric acid) and a fourfold increase in off-site transfers (all of the latter was due to increases in off-site transfers of metals). Much of the fourfold increase was due

to transfers of wastes stored on-site to off-site landfills at two facilities, Noranda's Brunswick Smelting Division facility in Belledune, New Brunswick, with an increase of 484,370 kg, and Metalex Products Ltd. in Richmond, British Columbia, with an increase of 467,400 kg (see **Section 7.7.1**, above).

TRI facilities in this subsector, however, reported decreases of about three percent in releases and 12 percent in transfers, despite more facilities reporting in 1997 than in 1995. The TRI decreases were in air emissions, on-site land releases and off-site transfers of metals (**Table 7–16**).

Both NPRI and TRI facilities projected decreases from 1997 to 1999. While total releases and transfers of the substances that NPRI facilities reported in this subsector for 1997 showed an increase of 43 percent since 1995, the facilities projected a decrease of five percent from 1997 to 1999 for these same substances. For substances reported by TRI facilities in this subsector in 1997, small changes were reported from 1995 to 1997 and projected through 1999. For single SIC code reporters in 333, TRI facilities reported a two percent decrease from 1995 to 1997 and projected a six percent decrease from 1997 to 1999. When multiple SIC codes are included, the reported increase from 1995 to 1997 was five percent and the projected decrease from 1997 to 1999 was nine percent (Figure 7-8 and Table 7-17).

Four facilities (two reporting single SIC codes and two reporting multiple SIC codes) in the primary nonferrous metals subsector were among the 50 TRI facilities with the largest increases in total releases and transfers from 1995 to 1997. (Table 5-42 lists the 50 facilities.) These four facilities reported increases of 14.5 million kg. As described above, these increases resulted primarily from increased production.

Five facilities in the primary nonferrous metals subsector were among the 50 NPRI facilities with the largest increases in total releases and transfers from 1995 to 1997. (Table 5-40 lists the 50 facilities.) These five facilities reported increases of 3.0 million kg in total releases and transfers from 1995 to 1997, or more than the net increase of 2.7 million kg from all NPRI facilities in this subsector. As described above, these increases resulted from new equipment start-up.

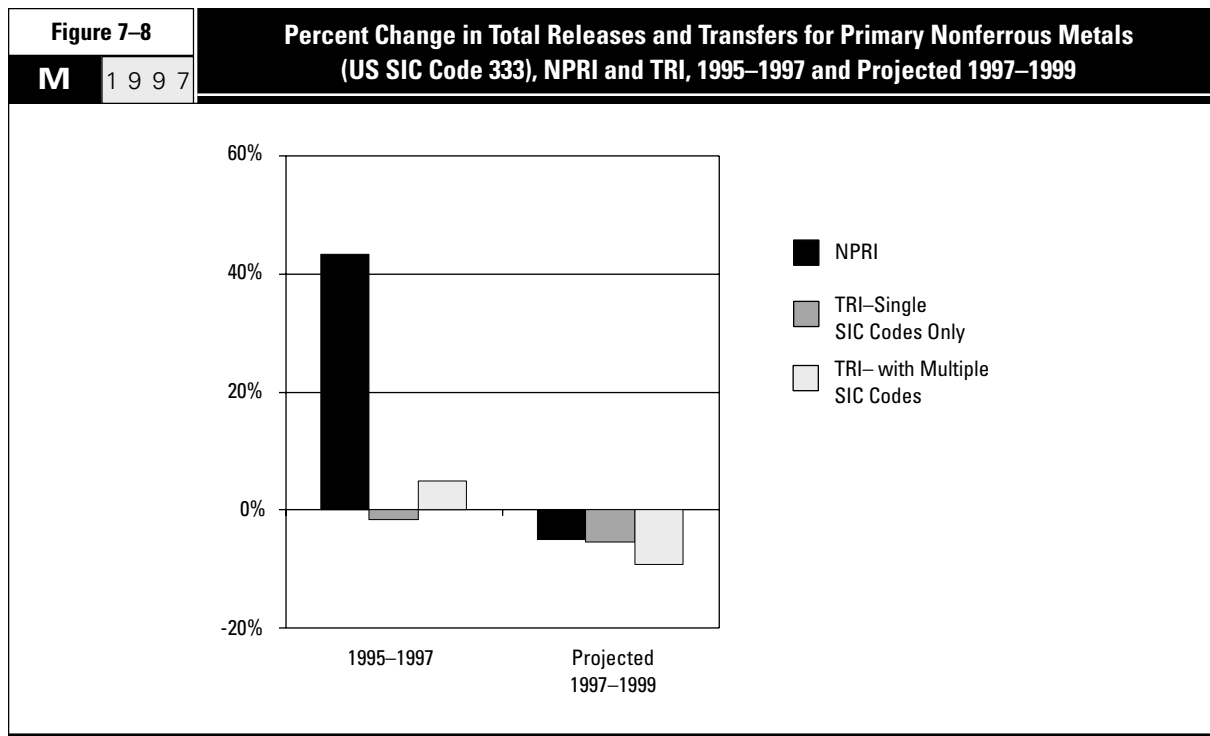


Table 7-17
M 1 9 9 7
Change in Total Releases and Transfers for Primary Nonferrous Metals (US SIC Code 333), NPRI and TRI, 1995-1997 and Projected 1997-1999

	Total Releases and Transfers			% Change 1995-1997	Projected % Change 1997-1999
	1995* (kg)	1997 (kg)	1999 Projected (kg)		
NPRI	6,865,411	9,847,822	9,345,494	43.4	-5.1
TRI—Single SIC codes only**	86,433,880	85,092,318	80,417,520	-1.6	-5.5
TRI—Single and Multiple SIC codes**	105,385,006	110,501,340	100,196,958	4.9	-9.3

* Data for same facility and chemical as reported for 1997.

** Data from Section 8 of TRI Form R.

References:

- The Aluminum Association Inc. web site: <<http://www.aluminum.org>>.
- American Iron and Steel Institute web site: <<http://www.steel.org>>.
- Apogee Research in association with Amendola Engineering, Charles Napier Company Inc. and GlobalTox. 1997. *Steel Manufacturing Sector Strategic Options Process: Final Phase I Report*. January.
- ARET Secretariat. 1997. *Environmental Leaders. 2 Update*—Chapter 3, Sector Progress: Aluminum,. Environment Canada. Ottawa.
- Canadian Steel Producers Association web site: <<http://www.canadiansteel.ca>>.
- Commissioner of the Environment and Sustainable Development. 1999. *Managing Toxic Substances*. Report of the Commissioner of the Environment and Sustainable Development to the House of Commons. Chapters 3 and 4. Ottawa.
- Environment Canada. 1999. *Control Measures in the Metal Finishing Industry: Backgrounder*. Ottawa. <http://www.ec.gc.ca/press/metal_b_e.htm>.
- Environment Canada. 1999. *Export and Import of Hazardous Wastes Regulations: User's Guide to Implementation*. Ottawa. < <http://www.ec.gc.ca/tmd/engimple.htm>>.
- Environment Canada. 1997. *Strategic Options for the Management of Toxic Substances from the Base Metals Smelting Sector*. Report of Stakeholder Consultations. Ottawa. June.
- Environmental Defense Fund. Scorecard web site: <www.scorecard.org>.
- Gibbs, Michael and Cindy Jacobs. 1996. Reducing PFC Emissions from Primary Aluminum Production in the United States. *Light Metal Age* 54 (2), p. 26–34. See: <<http://www.epa.gov/highgwp1/vaip/resources.html>>.
- Government of Canada. 1996. *Strategic Options for the Management of Toxic Substances from the Steel Manufacturing Sector: Report of Stakeholder Consultations*. Ottawa. December.
- Jett, George M. 1995. *Preliminary Study of the Iron and Steel Category. 4 CFR Part 42 Effluent Limitations, Guidelines, and Standards*. Office of Water, Office of Science and Technology, US EPA. Washington, DC. September. <<http://www.epa.gov/ostwater/ironsteel/pdf/prelim1.pdf>>.
- US EPA. 1999. *Effluent Limitations Guidelines and Standards for the Iron and Steel Point Source Category: Fact Sheet*. Office of Water, Office of Science and Technology. Washington, DC. February. <<http://www.epa.gov/OST/ironsteel/fact.html>>.
- US EPA. 1995. *Profile of the Nonferrous Metals Industry*. Office of Compliance. Washington, DC. September.
- US EPA. 1995. *Sector Notebook Project: Profile of the Iron and Steel Industry*. Office of Compliance. Washington, DC. September. <<http://es.epa.gov/oeca/sector/sectornote/pdf/iron&stl.pdf>>.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
50-00-0	Formaldehyde	Formaldéhyde	Formaldehído	X	X	X
50-29-3	DDT	DDT	DDT			X
51-03-6	Piperonyl butoxide	Pipéronyl butoxyde	Piperonil butóxido	X		
51-21-8	Fluorouracil	Fluoro-uracil	Fluorouracilo	X		
51-28-5	2,4-Dinitrophenol	2,4-Dinitrophénol	2,4-Dinitrofenol	X		
51-75-2	Nitrogen mustard	Moutarde azotée	Mostaza de nitrógeno	X		
51-79-6	Urethane	Uréthane	Uretano	X		
52-68-6	Trichlorfon	Trichlorfon	Triclorfón	X		
52-85-7	Famphur	Famphur	Famfur	X		
53-96-3	2-Acetylaminofluorene	2-Acétylaminofluorène	2-Acetilaminofluoreno	X		
55-18-5	N-Nitrosodiethylamine	N-Nitrosodiéthylamine	N-Nitrosodietilamina	X		
55-21-0	Benzamide	Benzamide	Benzamida	X		
55-38-9	Fenthion	Fenthion	Fentió	X		
55-63-0	Nitroglycerin	Nitroglycérine	Nitroglicerina	X	X	
56-23-5	Carbon tetrachloride	Tétrachlorure de carbone	Tetracloruro de carbono	X	X	X
56-35-9	Bis(tributyltin) oxide	Oxyde de bis(tributylétain)	Óxido de tributilestaño	X		
56-38-2	Parathion	Parathion	Paratión	X		
57-14-7	1,1-Dimethylhydrazine	1,1-Diméthylhydrazine	1,1-Dimetilhidracina	X		
57-33-0	Pentobarbital sodium	Pentobarbital sodique	Pentobarbital sódico	X		
57-41-0	Phenytoin	Phénytoïne	Fenitoina	X		
57-57-8	beta-Propiolactone	bêta-Propiolactone	beta-Propiolactona	X		
57-74-9	Chlordane	Chlordane	Clordano	X		X
58-89-9	Lindane	Lindane	Lindano	X		X
58-90-2	2,3,4,6-Tetrachlorophenol	2,3,4,6-Tétrachlorophénol	2,3,4,6-Tetraclorofenol			X
59-89-2	N-Nitrosomorpholine	n-Nitrosomorpholine	N-Nitrosomorfolina	X		
60-09-3	4-Aminoazobenzene	4-Aminoazobenzène	4-Aminoazobenceno	X		
60-11-7	4-Dimethylaminoazobenzene	4-Diméthylaminoazobenzène	4-Dimetilaminoazobenceno	X		
60-34-4	Methylhydrazine	Méthylhydrazine	Metilhidracina	X		
60-35-5	Acetamide	Acétamide	Acetamida	X		
60-51-5	Dimethoate	Diméthoate	Dimetoato	X		
60-57-1	Dieldrin	Dieldrine	Dieldrín			X
61-82-5	Amitrole	Amitrole	Amitrol	X		
62-53-3	Aniline	Aniline	Anilina	X	X	X
62-55-5	Thioacetamide	Thioacétamide	Tioacetamida	X		
62-56-6	Thiourea	Thio-urée	Tiourea	X	X	
62-73-7	Dichlorvos	Dichlorvos	Diclorvos	X		
62-74-8	Sodium fluoroacetate	Fluoroacétate de sodium	Fluoroacetato de sodio	X		
62-75-9	N-Nitrosodimethylamine	N-Nitrosodiméthylamine	N-Nitrosodimetilamina	X		X

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
63-25-2	Carbaryl	Carbaryl	Carbaril	X		
64-18-6	Formic acid	Acide formique	Ácido fórmico	X		
64-67-5	Diethyl sulfate	Sulfate de diéthyle	Sulfato de dietilo	X	X	
64-75-5	Tetracycline hydrochloride	Chlorhydrate de tétracycline	Clorhidrato de tetraciclina	X		
67-56-1	Methanol	Méthanol	Metanol	X	X	
67-63-0	Isopropyl alcohol	Alcool iso-propylique	Alcohol isopropílico	X	X	
67-64-1	Acetone	Acétone	Acetona			X
67-66-3	Chloroform	Chloroforme	Cloroformo	X	X	X
67-72-1	Hexachloroethane	Hexachloroéthane	Hexachloroetano	X	X	X
68-12-2	N,N-Dimethylformamide	N,N-Diméthyl formamide	N.N-Dimetilformamida	X		
68-76-8	Triaziquone	Triaziquone	Triaziquone	X		
70-30-4	Hexachlorophene	Hexachlorophène	Hexaclorofeno	X		
71-36-3	n-Butyl alcohol	Butan-1-ol	Alcohol n-butílico	X	X	
71-43-2	Benzene	Benzène	Benceno	X	X	X
71-55-6	1,1,1-Trichloroethane	1,1,1-Trichloroéthane	1,1,1-Tricloroetano	X		X
72-20-8	Endrin	Endrine	Endrín			X
72-43-5	Methoxychlor	Méthoxychlor	Metoxicloro	X		X
72-57-1	Trypan blue	Bleu trypan	Azultripán	X		
74-82-8	Methane	Méthane	Metano			X
74-83-9	Bromomethane	Bromométhane	Bromometano	X	X	X
74-85-1	Ethylene	Éthylène	Etileno	X	X	
74-87-3	Chloromethane	Chlorométhane	Clorometano	X	X	X
74-88-4	Methyl iodide	Iodométhane	Yoduro de metilo	X	X	
74-90-8	Hydrogen cyanide	Cyanure d'hydrogène	Ácido cianhídrico	X	X	
74-95-3	Methylene bromide	Bromure de méthyle	Bromuro de metilo	X		
75-00-3	Chloroethane	Chloroéthane	Cloroetano	X	X	
75-01-4	Vinyl chloride	Chlorure de vinyle	Cloruro de vinilo	X	X	X
75-05-8	Acetonitrile	Acétonitrile	Acetonitrilo	X	X	
75-07-0	Acetaldehyde	Acétaldéhyde	Acetaldehído	X	X	X
75-09-2	Dichloromethane	Dichlorométhane	Diclorometano	X	X	X
75-15-0	Carbon disulfide	Disulfure de carbone	Disulfuro de carbono	X	X	
75-21-8	Ethylene oxide	Oxyde d'éthylène	Óxido de etileno	X	X	
75-25-2	Bromoform	Bromoforme	Bromoformo	X		X
75-27-4	Dichlorobromomethane	Dichlorobromométhane	Diclorobromometano	X		
75-34-3	1,1-Dichloroethane	1,1-Dichloroéthane	1,1-Dicloroetano	X		
75-35-4	Vinylidene chloride	Chlorure de vinylidène	Cloruro de vinilideno	X	X	
75-43-4	Dichlorofluoromethane (HCFC-21)	Dichlorofluorométhane (HCFC-21)	Diclorofluorometano (HCFC-21)	X		
75-44-5	Phosgene	Phosgène	Fosgeno	X	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC [†]				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
75-45-6	Chlorodifluoromethane (HCFC-22)	Chlorodifluorométhane (HCFC-22)	Clorodifluorometano (HCFC-22)	X		X
75-55-8	Propylenimine	Propylènimine	Propilenimina	X		
75-56-9	Propylene oxide	Oxyde de propylène	Óxido de propileno	X	X	
75-63-8	Bromotrifluoromethane (halon 1301)	Bromotrifluorométhane (halon 1301)	Bromotrifluorometano (halon 1301)	X		X
75-65-0	tert-Butyl alcohol	2-Méthylpropan-2-ol	Alcohol tertbutílico	X	X	
75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	1-Chloro-1,1-difluoroéthane (HCFC-142b)	1-Cloro-1,1-difluoroetano (HCFC-142b)	X		X
75-69-4	Trichlorofluoromethane (CFC-11)	Trichlorofluorométhane (CFC-11)	Triclorofluorometano (CFC-11)	X		X
75-71-8	Dichlorodifluoromethane (CFC-12)	Dichlorodifluorométhane (CFC-12)	Diclorodifluorometano (CFC-12)	X		X
75-72-9	Chlorotrifluoromethane (CFC-13)	Chlorotrifluorométhane (CFC-13)	Clorotrifluorometano (CFC-13)	X		X
75-86-5	2-Methylacetonitrile	Acétonecyanhydrine	2-Metillactonitrilo	X		
75-88-7	2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	Chloro-1,1,1-trifluoroéthane (HCFC-133a)	2-Cloro-1,1,1-trifluoroetano (HCFC-133a)	X		
76-01-7	Pentachloroethane	Pentachloroéthane	Pentacloroetano	X		
76-02-8	Trichloroacetyl chloride	Chlorure de trichloroacétyle	Cloruro de tricloroacetilo	X		
76-06-2	Chloropicrin	Chloropicrine	Cloropicrina	X		
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113)	1,1,2-Trichloro-1,2,2-trifluoroéthane (CFC-113)	1,1,2-Tricloro-1,2,2-trifluoroetano (CFC-113)	X		X
76-14-2	Dichlorotetrafluoroethane (CFC-114)	Dichlorotetrafluoroéthane (CFC-114)	Diclorotetrafluoroetano (CFC-114)	X		X
76-15-3	Monochloropentafluoroethane (CFC-115)	Chloropentafluoroéthane (CFC-115)	Cloropentafluoroetano (CFC-115)	X		X
76-44-8	Heptachlor	Heptachlore	Heptacloro	X		X
76-87-9	Triphenyltin hydroxide	Hydroxyde de triphénylétain	Hidróxido de trifenilestain	X		
77-47-4	Hexachlorocyclopentadiene	Hexachlorocyclopentadiène	Hexaclorciclopentadieno	X	X	X
77-73-6	Dicyclopentadiene	Dicyclopentadiène	Dicloropentadieno	X		
77-78-1	Dimethyl sulfate	Sulfate de diméthyle	Sulfato de dimetilo	X	X	
78-48-8	S,S,S-Tributyltrithiophosphate	Trithiophosphate de S,S,S-tributyle	S,S,S-Tributiltritifosfato	X		
78-83-1	i-Butyl alcohol	2-Méthylpropan-1-ol	Alcohol i-butílico			X
78-84-2	Isobutyraldehyde	Isobutyraldéhyde	Isobutiraldehído	X	X	
78-87-5	1,2-Dichloropropane	1,2-Dichloropropane	1,2-Dicloropropano	X	X	
78-88-6	2,3-Dichloropropene	2,3-Dichloropropène	2,3-Dicloropropeno	X		
78-92-2	sec-Butyl alcohol	Butan-2-ol	Alcohol sec-butílico	X	X	
78-93-3	Methyl ethyl ketone	Méthyléthylcétone	Metil etil cetona	X	X	
79-00-5	1,1,2-Trichloroethane	1,1,2-Trichloroéthane	1,1,2-Tricloroetano	X	X	X
79-01-6	Trichloroethylene	Trichloroéthylène	Tricloroetileno	X	X	X
79-06-1	Acrylamide	Acrylamide	Acrilamida	X	X	X
79-10-7	Acrylic acid	Acide acrylique	Ácido acrílico	X	X	
79-11-8	Chloroacetic acid	Acide chloroacétique	Ácido cloroacético	X	X	
79-19-6	Thiosemicarbazide	Thiosemicarbazide	Tiosemicarbácida	X		
79-21-0	Peracetic acid	Acide peracétique	Ácido peracético	X	X	
79-22-1	Methyl chlorocarbonate	Chlorocarbonate de méthyle	Clorocarbonato de metilo	X		
79-34-5	1,1,2,2-Tetrachloroethane	1,1,2,2-Tétrachloroéthane	1,1,2,2-Tetracloroetano	X	X	X

[†] RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
79-44-7	Dimethylcarbanyl chloride	Chlorure de diméthylcarbamyne	Cloruro de dimetilcarbamil	X		
79-46-9	2-Nitropropane	2-Nitropropane	2-Nitropropano	X	X	X
80-05-7	4,4'-Isopropylidenediphenol	p,p'-Isopropylidenediphénol	4,4'-Isopropilidenodifenol	X	X	
80-15-9	Cumene hydroperoxide	Hydroperoxyde de cumène	Cumeno hidroperóxido	X	X	
80-62-6	Methyl methacrylate	Méthacrylate de méthyle	Metacrilato de metilo	X	X	
81-07-2	Saccharin	Saccharine	Sacarina	X		
81-88-9	C.I. Food Red 15	Indice de couleur Rouge alimentaire 15	Rojo 15 alimenticio	X	X	
82-28-0	1-Amino-2-methylantraquinone	1-Amino-2-méthylantraquinone	1-Amino-2-metilanttraquinona	X		
82-68-8	Quintozene	Quintozène	Quintoceno	X		
84-66-2	Diethyl phthalate	Phtalate de diéthyle	Dietil ftalato			X
84-74-2	Dibutyl phthalate	Phtalate de dibutyle	Dibutil ftalato	X	X	X
85-01-8	Phenanthrene	Phénanthrène	Fenantreno	X		
85-44-9	Phthalic anhydride	Anhydride phtalique	Anhídrido ftálico	X	X	
85-68-7	Butyl benzyl phthalate	Phtalate de benzyle et de butyle	Butil bencil ftalato			X
86-30-6	N-Nitrosodiphenylamine	N-Nitrosodiphénylamine	N-Nitrosodifenilamina	X	X	
87-62-7	2,6-Xylidine	2,6-Xylidine	2,6-Xilidina	X		
87-68-3	1,1,2,3,4,4-Hexachloro-1,3-butadiene	1,1,2,3,4,4-Hexachloro-1,3-butadiène	1,1,2,3,4,4-Hexacloro-1,3-butadieno	X		X
87-86-5	Pentachlorophenol	Pentachlorophénol	Pentaclorofenol	X		X
88-06-2	2,4,6-Trichlorophenol	2,4,6-Trichlorophénol	2,4,6-Triclorofenol	X		X
88-75-5	2-Nitrophenol	2-Nitrophénol	2-Nitrofenol	X		
88-85-7	Dinitrobutyl phenol	Dinosébé	Dinitrobutilfenol	X		
88-89-1	Picric acid	Acide picrique	Ácido pícrico	X		
90-04-0	o-Anisidine	o-Anisidine	o-Anisidina	X		
90-43-7	2-Phenylphenol	o-Phénylphénol	2-Fenilfenol	X	X	
90-94-8	Michler's ketone	Cétone de Michler	Cetona Michler	X	X	
91-08-7	Toluene-2,6-diisocyanate	Toluène-2,6-diisocyanate	Toluen-2,6-diisocianato	X	X	
91-20-3	Naphthalene	Naphtalène	Naftaleno	X	X	
91-22-5	Quinoline	Quinoléine	Quinoleína	X	X	
91-59-8	beta-Naphthylamine	bêta-Naphtylamine	beta-Naftilamina	X		X
91-94-1	3,3'-Dichlorobenzidine	3,3'-Dichlorobenzidine	3,3'-Diclorobencidina	X		
92-52-4	Biphenyl	Biphényle	Bifenilo	X	X	X
92-67-1	4-Aminobiphenyl	4-Aminobiphényle	4-Aminobifenilo	X		X
92-87-5	Benzidine	Benzidine	Bencidina	X		X
92-93-3	4-Nitrobiphenyl	4-Nitrobiphényle	4-Nitrobifenilo	X		X
93-65-2	Mecoprop	Mécoprop	Mecoprop	X		
94-11-1	2,4-D Isopropyl ester	2,4-Dichlorophénoxyacétate d'isopropyle	2,4-D isopropilester	X		
94-36-0	Benzoyl peroxide	Peroxyde de benzoyle	Peróxido de benzoilo	X	X	
94-58-6	Dihydrosafrole	Dihydrosafrole	Dihidrosafrol	X		

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†			
1997					
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI RETC
94-59-7	Safrole	Safrole	Safrol	X	X
94-74-6	Methoxone	Méthoxone	Metoxona	X	
94-75-7	2,4-D (Acetic acid)	Acide dichloro-2,4-phénoxyacétique	Ácido 2,4-diclorofenoxyacético	X	X
94-80-4	2,4-D Butyl ester	2,4-Dichlorophénoxyacétate de butyle	2,4-D butilester	X	
94-82-6	2,4-DB	Acide 4-(2,4-dichlorophénoxy)butyrique	2,4-DB	X	
95-47-6	o-Xylene	o-Xylène	o-Xileno	X	X
95-48-7	o-Cresol	o-Crésol	o-Cresol	X	X
95-50-1	1,2-Dichlorobenzene	o-Dichlorobenzène	1,2-Diclorobenceno	X	X X
95-53-4	o-Toluidine	o-Toluidine	o-Toluidina	X	
95-54-5	1,2-Phenylenediamine	o-Phénylènediamine	1,2-Fenilenediamina	X	
95-63-6	1,2,4-Trimethylbenzene	1,2,4-Triméthylbenzène	1,2,4-Trimetilbenceno	X	X
95-69-2	p-Chloro-o-toluidine	4-Chloro-o-toluidine	p-Cloro-o-toluidina	X	
95-80-7	2,4-Diaminotoluene	2,4-Diaminotoluène	2,4-Diaminotolueno	X	X
95-95-4	2,4,5-Trichlorophenol	Trichloro-2,4,5-phénol	2,4,5-Triclorofenol	X	X
96-09-3	Styrene oxide	Oxyde de styrène	Óxido de estireno	X	X
96-12-8	1,2-Dibromo-3-chloropropane	1,2-Dibromo-3-chloropropane	1,2-Dibromo-3-cloropropano	X	
96-18-4	1,2,3-Trichloropropane	1,2,3-Trichloropropane	1,2,3-Tricloropropano	X	
96-33-3	Methyl acrylate	Acrylate de méthyle	Acrilato de metilo	X	X
96-45-7	Ethylene thiourea	Imidazolidine-2-thione	Etilén tiourea	X	X
97-23-4	Dichlorophene	Dichlorophène	Diclorofeno	X	
97-56-3	C.I. Solvent Yellow 3	Indice de couleur Jaune de solvant 3	Solvente de amarillo 3	X	
98-07-7	Benzoic trichloride	Trichlorure de benzylidyne	Benzotricloruro	X	
98-82-8	Cumene	Cumène	Cumeno	X	X
98-86-2	Acetophenone	Acétophénone	Acetofenona	X	
98-87-3	Benzal chloride	Chlorure de benzale	Cloruro de benzal	X	
98-88-4	Benzoyl chloride	Chlorure de benzoyle	Cloruro de benzoilo	X	X
98-95-3	Nitrobenzene	Nitrobenzène	Nitrobencono	X	X
99-30-9	Dichloran	Chlorure de dichlorobenzalkonium	Cloruro de diclorobenzalconio	X	
99-55-8	5-Nitro-o-toluidine	5-Nitro-o-toluidine	5-Nitro-o-toluidina	X	
99-59-2	5-Nitro-o-anisidine	5-Nitro-o-anisidine	5-Nitro-o-anisidina	X	
99-65-0	m-Dinitrobenzene	m-Dinitrobenzène	m-Dinitrobencono	X	
100-01-6	p-Nitroaniline	p-Nitroaniline	p-Nitroanilina	X	
100-02-7	4-Nitrophenol	p-Nitrophénol	4-Nitrofenol	X	X
100-25-4	p-Dinitrobenzene	p-Dinitrobenzène	p-Dinitrobencono	X	
100-41-4	Ethylbenzene	Éthylbenzène	Etilbenceno	X	X
100-42-5	Styrene	Styrène	Estireno	X	X X
100-44-7	Benzyl chloride	Chlorure de benzyle	Cloruro de bencilo	X	X
100-75-4	N-Nitrosopiperidine	N-Nitrosopipéridine	N-Nitrosopiperidina	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
101-05-3	Anilazine	Anilazine	Anilacina	X		
101-14-4	4,4'-Methylenebis(2-chloroaniline)	p,p'-Méthylènebis(2-chloroaniline)	4,4'-Metilenobis(2-cloroanilina)	X	X	
101-61-1	4,4'-Methylenebis(N,N-dimethyl)benzeneamine	4,4'-Méthylènebis(N,N-diméthyl)benzèneamine	4,4'-Metilenobis(N,N-dimetil)bencenamina	X		
101-68-8	Methylenebis(phenylisocyanate)	Méthylènebis(phénylisocyanate)	Metilenobis(fenilisocianato)			X
101-77-9	4,4'-Methylenedianiline	p,p'-Méthylènedianiline	4,4'-Metilenodianilina	X	X	
101-80-4	4,4'-Diaminodiphenyl ether	Éther 4,4'-diaminodiphényle	Éter 4,4'-diaminodifenílico	X		
101-90-6	Diglycidyl resorcinol ether	Éther de résorcinol et de diglycidyle	Diglicidil resorcinol éter	X		
103-23-1	Bis(2-ethylhexyl) adipate	Adipate de bis(2-éthylhexyle)	Bis(2-etilhexil) adipato			X
104-12-1	p-Chlorophenyl isocyanate	Isocyanate de 4-chlorophényle	p-Clorofenil isocianato	X		
104-94-9	p-Anisidine	p-Anisidine	p-Anisidina	X		
105-67-9	2,4-Dimethylphenol	2,4-Diméthylphénol	2,4-Dimetilfenol	X		
106-42-3	p-Xylene	p-Xylène	p-Xileno	X	X	
106-44-5	p-Cresol	p-Crésol	p-Cresol	X	X	
106-46-7	1,4-Dichlorobenzene	p-Dichlorobenzène	1,4-Diclorobenceno	X	X	X
106-47-8	p-Chloroaniline	p-Chloroaniline	p-Cloroanilina	X		
106-50-3	p-Phenylenediamine	p-Phénylènediamine	p-Fenilenediamina	X	X	
106-51-4	Quinone	p-Quinone	Quinona	X	X	
106-88-7	1,2-Butylene oxide	1,2-Époxybutane	Óxido de 1,2-butileno	X	X	
106-89-8	Epichlorohydrin	Épichlorohydrine	Epiclorohidrina	X	X	X
106-93-4	1,2-Dibromoethane	1,2-Dibromoéthane	1,2-Dibromoetano	X		
106-99-0	1,3-Butadiene	Buta-1,3-diène	1,3-Butadieno	X	X	X
107-02-8	Acrolein	Acroléine	Acroleína	X		X
107-05-1	Allyl chloride	Chlorure d'allyle	Cloruro de alilo	X	X	
107-06-2	1,2-Dichloroethane	1,2-Dichloroéthane	1,2-Dicloroetano	X	X	X
107-11-9	Allylamine	Allylamine	Alil amina	X		
107-13-1	Acrylonitrile	Acrylonitrile	Acrilonitrilo	X	X	X
107-18-6	Allyl alcohol	Alcool allylique	Alcohol alílico	X	X	
107-19-7	Propargyl alcohol	Alcool propargylique	Alcohol propargílico	X		
107-21-1	Ethylene glycol	Éthylèneglycol	Etilén glicol	X	X	
107-30-2	Chloromethyl methyl ether	Éther de méthyle et de chlorométhyle	Éter clorometil metílico	X		
108-05-4	Vinyl acetate	Acétate de vinyle	Acetato de vinilo	X	X	
108-10-1	Methyl isobutyl ketone	Méthylisobutylcétone	Metil isobutil cetona	X	X	
108-31-6	Maleic anhydride	Anhydride maléique	Anhídrido maleico	X	X	
108-38-3	m-Xylene	m-Xylène	m-Xileno	X	X	
108-39-4	m-Cresol	m-Crésol	m-Cresol	X	X	
108-45-2	1,3-Phenylenediamine	m-Phénylènediamine	1,3-Fenilenediamina	X		
108-60-1	Bis(2-chloro-1-methylethyl) ether	Éther di(2-chloro-1-méthyléthyle)	Éter bis(2-cloro-1-metil etil)	X		
108-88-3	Toluene	Toluène	Tolueno	X	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
108-90-7	Chlorobenzene	Chlorobenzène	Clorobenceno	X	X	X
108-93-0	Cyclohexanol	Cyclohexanol	Ciclohexanol	X		
108-95-2	Phenol	Phénol	Fenol	X	X	X
109-06-8	2-Methylpyridine	2-Méthylpyridine	2-Metilpiridina	X		
109-77-3	Malononitrile	Malononitrile	Malononitrilo	X		
109-86-4	2-Methoxyethanol	2-Méthoxyéthanol	2-Metoxietanol	X	X	
110-49-6	2-Methoxyethyl acetate	Acétate de 2-méthoxyéthyle	2-Metoxietil acetato		X	
110-54-3	n-Hexane	n-Hexane	n-Hexano	X		
110-57-6	trans-1,4-Dichloro-2-butene	1,4-Dichloro-2- butène	Trans-1,4-Dicloro-2-buteno	X		
110-80-5	2-Ethoxyethanol	2-Éthoxyéthanol	2-Etoxietanol	X	X	X
110-82-7	Cyclohexane	Cyclohexane	Ciclohexano	X	X	
110-86-1	Pyridine	Pyridine	Piridina	X	X	X
111-15-9	2-Ethoxyethyl acetate	Acétate de 2-éthoxyéthyle	2-Etoxietil acetato		X	
111-42-2	Diethanolamine	Diéthanolamine	Dietanolamina	X	X	
111-44-4	Bis(2-chloroethyl) ether	Éther di(2-chloroéthyle)	Éter bis(2-cloroetil)	X		
111-91-1	Bis(2-chloroethoxy) methane	Méthane di(2-chloroéthoxy)	Bis(2-cloroetoxi) metano	X		
114-26-1	Propoxur	Propoxur	Propoxur	X		
115-07-1	Propylene	Propylène	Propileno	X	X	
115-28-6	Chlorendic acid	Acide chlorendique	Ácido cloréndico	X		
115-29-7	Endosulfan	Endosulfan	Endosulfan			X
115-32-2	Dicofol	Dicofol	Dicofol	X		
116-06-3	Aldicarb	Aldicarbe	Aldicarb	X		
117-79-3	2-Aminoanthraquinone	2-Aminoanthraquinone	2-Aminoantraquinona	X		
117-81-7	Di(2-ethylhexyl) phthalate	Phtalate de bis(2-éthylhexyle)	Di(2-etilhexil) ftalato	X	X	
117-84-0	Di-n-octyl phthalate	Phtalate de di-n-octyle	Di-n-octil ftalato		X	
118-74-1	Hexachlorobenzene	Hexachlorobenzène	Hexaclorobenceno	X		X
119-90-4	3,3'-Dimethoxybenzidine	3,3'-Diméthoxybenzidine	3,3'-Dimetoxibencidina	X		
119-93-7	3,3'-Dimethylbenzidine	3,3'-Diméthylbenzidine	3,3'-Dimetilbencidina	X		
120-12-7	Anthracene	Anthracène	Antraceno	X	X	
120-36-5	2,4-DP	Dichlorprop	2,4-DP	X		
120-58-1	Isosafrole	Isosafrole	Isosafrol	X	X	
120-71-8	p-Cresidine	p-Crésidine	p-Cresidina	X		
120-80-9	Catechol	Catéchol	Catecol	X	X	
120-82-1	1,2,4-Trichlorobenzene	1,2,4-Trichlorobenzène	1,2,4-Triclorobenceno	X	X	X
120-83-2	2,4-Dichlorophenol	2,4-Dichlorophénol	2,4-Diclorofenol	X	X	
121-14-2	2,4-Dinitrotoluene	2,4-Dinitrotoluène	2,4-Dinitrotolueno	X	X	X
121-44-8	Triethylamine	Triéthylamine	Trietilamina	X		
121-69-7	N,N-Dimethylaniline	N,N-Diméthylaniline	N,N-Dimetilanilina	X	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

TAKING STOCK: North American Pollutant Releases and Transfers

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
121-75-5	Malathion	Malathion	Malatión	X		
122-34-9	Simazine	Simazine	Simacina	X		
122-39-4	Diphenylamine	Dianiline	Difenilamina	X		
122-66-7	1,2-Diphenylhydrazine	1,2-Diphénylhydrazine	1,2-Difenilhidracina	X		
123-31-9	Hydroquinone	Hydroquinone	Hidroquinona	X	X	
123-38-6	Propionaldehyde	Propionaldéhyde	Propionaldehído	X	X	
123-63-7	Paraldehyde	Paraldéhyde	Paraldehído	X		
123-72-8	Butyraldehyde	Butyraldéhyde	Butiraldehído	X	X	
123-91-1	1,4-Dioxane	1,4-Dioxane	1,4-Dioxano	X	X	X
124-38-9	Carbon dioxide	Dioxyde de carbone	Bióxido de carbono			X
124-40-3	Dimethylamine	Diméthylamine	Dimetilamina	X		
124-73-2	Dibromotetrafluoroethane (halon 2402)	Dibromotétrafluoroéthane (halon 2402)	Dibromotetrafluoroetano (halon 2402)	X		
126-72-7	Tris(2,3-dibromopropyl) phosphate	Phosphate de tris(2,3-dibromopropyle)	Tris(2,3-dibromopropil) fosfato	X		
126-98-7	Methacrylonitrile	Méthacrylonitrile	Metacrilonitrilo	X		
126-99-8	Chloroprene	Chloroprène	Cloropreno	X		
127-18-4	Tetrachloroethylene	Tétrachloroéthylène	Tetracloroetileno	X	X	
128-03-0	Potassium dimethyldithiocarbamate	Diméthyldithiocarbamate de potassium	Dimetilditiocarbamato de potasio	X		
128-04-1	Sodium dimethyldithiocarbamate	Diméthyldithiocarbamate de sodium	Dimetilditiocarbamato de sodio	X		
128-66-5	C.I. Vat Yellow 4	Indice de couleur Jaune 4	Amarillo 4	X		
131-11-3	Dimethyl phthalate	Phtalate de diméthyle	Dimetil ftalato	X	X	
131-52-2	Sodium pentachlorophenate	Pentachlorophénate de sodium	Pentaclorofenato de sodio	X		
132-27-4	Sodium o-phenylphenoxide	2-Biphénylate de sodium	Ortofenilfenóxido de sodio	X		
132-64-9	Dibenzofuran	Dibenzofurane	Dibenzofurano	X		
133-06-2	Captan	Captan	Captan	X		
133-07-3	Folpet	Folpet	Folpet	X		
133-90-4	Chloramben	Chlorambène	Cloramben	X		
134-29-2	o-Anisidine hydrochloride	Chlorhydrate d'o-anisidine	o-Anisidina hidrocioruro	X		
134-32-7	alpha-Naphthylamine	alpha-Naphtylamine	alfa-Naftilamina	X		
135-20-6	Cupferron	Cupferron	Cupferron	X		
136-45-8	Dipropyl isocinchomerate	Pyridine-2,5-dicarboxylate de dipropyle	Dipropilisocincomeronato	X		
137-26-8	Thiram	Thirame	Tiram	X		
137-41-7	Potassium N-methyldithiocarbamate	Méthyldithiocarbamate de potassium	N-metilditiocarbamato de potasio	X		
137-42-8	Metham sodium	Métam-sodium	N-Metilditiocarbamato de sodio	X		
138-93-2	Disodium cyanodithioimidocarbonate	Cyanodithiocarbamate de disodium	Cianoditiocarbamato de disodio	X		
139-13-9	Nitriiotriacetic acid	Acide nitrilotriacétique	Ácido nitrilotriacético	X	X	
139-65-1	4,4'-Thiodianiline	4,4'-Thiodianiline	4,4'-Tiodianilina	X		
140-88-5	Ethyl acrylate	Acrylate d'éthyle	Acrilato de etilo	X	X	
141-32-2	Butyl acrylate	Acrylate de butyle	Acrilato de butilo	X	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†			
1997					
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI RETC
142-59-6	Nabam	Nabame	Nabam	X	
148-79-8	Thiabendazole	Thiabendazole	Tiabendazol	X	
149-30-4	2-Mercaptobenzothiazole	Benzothiazole-2-thiol	2-Mercaptobenzotiazol	X	
150-50-5	Merphos	Trithiophosphate de tributyle	Merfos	X	
150-68-5	Monuron	Monuron	3-(4-cloro fenil)-1,1-dimetilurea	X	
151-56-4	Ethyleneimine	Éthylène imine	Etilenimina	X	
156-10-5	p-Nitrosodiphenylamine	p-Nitrosodiphénylamine	p-Nitrosodifeniamina	X	
156-62-7	Calcium cyanamide	Cyanamide calcique	Cianamida de calcio	X	X
298-00-0	Methyl parathion	Parathion-méthyl	Metilparatió	X	X
300-76-5	Naled	Naled	Naled	X	
301-12-2	Oxydemeton methyl	Oxydémeton-méthyl	Metiloximetón	X	
302-01-2	Hydrazine	Hydrazine	Hidracina	X	X X
306-83-2	2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	2,2-Dichlo-1,1,1-trifluoroéthane (HCFC-123)	2,2-Dicloro-1,1,1-trifluoroetano (HCFC-123)	X	X
309-00-2	Aldrin	Aldrine	Aldrín	X	X
314-40-9	Bromacil	Bromacil	Bromacilo	X	
319-84-6	alpha-Hexachlorocyclohexane	alpha-Hexachlorocyclohexane	alfa-Hexaclorociclohexano	X	
330-54-1	Diuron	Diuron	3-(3,4 dicloro-fenil)-1,1-dimetil urea	X	
330-55-2	Linuron	Linuron	3-(3,4 dicloro-fenil)-1-metoxi-1-metil urea	X	
333-41-5	Diazinon	Diazinon	Diazinon	X	
334-88-3	Diazomethane	Diazométhane	Diazometano	X	
353-59-3	Bromochlorodifluoromethane (halon 1211)	Bromochlorodifluorométhane (halon 1211)	Bromoclorodifluorometano (halon 1211)	X	X
354-11-0	1,1,1,2-Tetrachloro-2-fluoroethane	1,1,1,2-Tétrachloro-2-fluoroéthane	1,1,1,2-Tetracloro-2- fluoroetano	X	
354-14-3	1,1,2,2-Tetrachloro-1-fluoroethane	1,1,2,2-Tétrachloro-1-fluoroéthane	1,1,2,2-Tetracloro-1-fluoroetano	X	
354-23-4	1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	1,2-Dichloro-1,1,2-trifluoroéthane (HCFC-123a)	1,2-Dicloro-1,1,2-trifluoroetano (HCFC-123a)	X	
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	1-Chloro-1,1,2,2-tétrafluoroéthane (HCFC-124a)	1-Cloro-1,1,2,2-tetrafluoroetano (HCFC-124a)	X	
357-57-3	Brucine	Brucine	Brucina	X	
422-44-6	1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225bb)	1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225bb)	1,2-Dicloro-1,1,2,3,3-pentafluoropropano (HCFC-225bb)	X	
422-48-0	2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225ba)	2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225ba)	2,3-Dicloro-1,1,1,2,3-pentafluoropropano (HCFC-225ba)	X	
422-56-0	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	3,3-Dicloro-1,1,1,2,2-pentafluoropropano (HCFC-225ca)	X	X
431-86-7	1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)	1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)	1,2-Dicloro-1,1,3,3,3-pentafluoropropano (HCFC-225da)	X	
460-35-5	3-Chloro-1,1,1-trifluoropropane (HCFC-253fb)	3-Chloro-1,1,1-trifluoropropane (HCFC-253fb)	3-Cloro-1,1,1-trifluoropropano (HCFC-253fb)	X	
463-58-1	Carbonyl sulfide	Sulfure de carbonyle	Sulfuro de carbonilo	X	
465-73-6	Isodrin	Isodrine	Isodrín	X	
492-80-8	C.I. Solvent Yellow 34	Indice de couleur Jaune de solvant 34	Solvente amarillo 34	X	
505-60-2	Mustard gas	Gaz moutarde	Gas mostaza	X	
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	1,3-Dicloro-1,1,2,2,3-pentafluoropropano (HCFC-225cb)	X	X
510-15-6	Chlorobenzilate	Chlorobenzilate	Clorobencilato	X	
528-29-0	o-Dinitrobenzene	o-Dinitrobenzène	o-Dinitrobenceno	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

TAKING STOCK: North American Pollutant Releases and Transfers

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
532-27-4	2-Chloroacetophenone	2-Chloroacétophénone	2-Cloroacetofenona	X		
533-74-4	Dazomet	Dazomet	Dazomet	X		
534-52-1	4,6-Dinitro-o-cresol	4,6-Dinitro-o-crésol	4,6-Dinitro-o-cresol	X	X	X
540-59-0	1,2-Dichloroethylene	1,2-Dichloroéthylène	1,2-Dicloroetileno	X		
541-41-3	Ethyl chloroformate	Chloroformiate d'éthyle	Cloroformiato de etilo	X	X	
541-53-7	2,4-Dithiobiuret	2,4-Dithiobiuret	2,4-Ditiobiuret	X		
541-73-1	1,3-Dichlorobenzene	1,3-Dichlorobenzène	1,3-Diclorobenceno	X		
542-75-6	1,3-Dichloropropylene	1,3-Dichloropropylène	1,3-Dicloropropileno	X		
542-76-7	3-Chloropropionitrile	3-Chloropropionitrile	3-Cloropropionitrilo	X		
542-88-1	Bis(chloromethyl) ether	Éther di(chlorométhylrique)	Bis(clorometil) éter	X		X
554-13-2	Lithium carbonate	Carbonate de lithium	Carbonato de litio	X		
556-61-6	Methyl isothiocyanate	Isothiocyanate de méthyle	Isocianato de metilo	X		
563-47-3	3-Chloro-2-methyl-1-propene	3-Chloro-2-méthylpropène	3-Cloro-2-metil-1-propeno	X		
569-64-2	C.I. Basic Green 4	Indice de couleur Vert de base 4	Verde 4 básico	X	X	
584-84-9	Toluene-2,4-diisocyanate	Toluène-2,4-diisocyanate	Toluen-2,4-diisocianato	X	X	
593-60-2	Vinyl bromide	Bromure de vinyle	Bromuro de vinilo	X		
594-42-3	Perchloromethyl mercaptan	Perchlorométhylmercaptan	Perclorometilmercaptano	X		
606-20-2	2,6-Dinitrotoluene	2,6-Dinitrotoluène	2,6-Dinitrotolueno	X	X	
612-82-8	3,3'-Dimethylbenzidine dihydrochloride	Dichlorhydrate de 4,4'-bi-o-toluidine	Dihidrocloruro de 3,3'-dimetilbencidina	X		
612-83-9	3,3'-Dichlorobenzidine dihydrochloride	Dichlorhydrate de 3,3'-dichlorobenzidine	Dihidrocloruro de 3,3'-diclorobencidina	X		
615-05-4	2,4-Diaminoanisole	2,4-Diaminoanisole	2,4-Diaminoanisol	X		
615-28-1	1,2-Phenylenediamine dihydrochloride	Dichlorhydrate d'o-phénylènediamine	Dihidrocloruro de 1,2-fenilendiamina	X		
621-64-7	N-Nitrosodi-n-propylamine	N-Nitrosodi-n-propylamine	N-Nitrosodi-n-propilamina	X		
624-18-0	1,4-Phenylenediamine dihydrochloride	Dichlorhydrate de benzène-1,4-diamine	Dihidrocloruro de 1,4-fenilendiamina	X		
624-83-9	Methyl isocyanate	Isocyanate de méthyle	Isocianato de metilo	X		
630-20-6	1,1,1,2-Tetrachloroethane	1,1,1,2-Tétrachloroéthane	1,1,1,2-Tetracloroetano	X		
636-21-5	o-Toluidine hydrochloride	Chlorhydrate de o-toluidine	o-Toluidina hidrocloruro	X		
639-58-7	Triphenyltin chloride	Chlorure de triphénylétain	Cloruro de trifenilestaño	X		
680-31-9	Hexamethylphosphoramide	Hexaméthylphosphoramide	Hexametilfosforamida	X		
684-93-5	N-Nitroso-N-methylurea	N-Nitroso-N-méthylurée	N-Nitroso-N-metilurea	X		
709-98-8	Propanil	Propanil	Propanilo	X		
759-73-9	N-Nitroso-N-ethylurea	N-Nitroso-N-éthylurée	N-Nitroso-N-etilurea	X		
759-94-4	Ethyl dipropylthiocarbamate	EPTC	Dipropiltiocarbamato de etilo	X		
764-41-0	1,4-Dichloro-2-butene	1,4-Dichloro-2-butène	1,4-Dicloro-2-buteno	X		
812-04-4	1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)	1,1-Dichloro-1,2,2-trifluoroéthane (HCFC-123b)	1,1,-Dicloro-1,2,2-trifluoroetano (HCFC-123b)	X		
834-12-8	Ametryn	Amétryne	Ametrín	X		
842-07-9	C.I. Solvent Yellow 14	Indice de couleur Jaune de solvant 14	Amarillo 14 solvente	X	X	
872-50-4	N-Methyl-2-pyrrolidone	N-Méthyl-2-pyrrolidone	N-Metil2-pirrolidona	X		

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†			
1997					
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI RETC
924-16-3	N-Nitrosodi-n-butylamine	N-Nitrosodi-n-butylamine	N-Nitrosodi-n-butilamina	X	
924-42-5	N-Methylolacrylamide	N-(Hydroxyméthyl)acrylamide	N-Metilolacrilamida	X	
957-51-7	Diphenamid	Difénamide	Difenamida	X	
961-11-5	Tetrachlorvinphos	Tétrachlorvinphos	Tetraclorvinfos	X	
989-38-8	C.I. Basic Red 1	Indice de couleur Rouge de base 1	Rojo 1 básico	X	X
1114-71-2	Pebulate	Pébulate	Pebulato	X	
1120-71-4	Propane sultone	Propanesultone	Propane sultone	X	
1134-23-2	Cycloate	Cycloate	Ciclolato	X	
1163-19-5	Decabromodiphenyl oxide	Oxyde de décabromodiphényle	Óxido de decabromodifenilo	X	X
1313-27-5	Molybdenum trioxide	Trioxyde de molybdène	Trióxido de molibdeno	X	X
1314-20-1	Thorium dioxide	Dioxyde de thorium	Dióxido de torio	X	X
1319-77-3	Cresol (mixed isomers)	Crésol (mélange d'isomères)	Cresol (mezcla de isómeros)	X	X
1320-18-9	2,4-D Propylene glycol butyl ether ester	(2,4-Dichlorophénoxy)acétate de 2-butoxyméthyléthyle	Ester de 2,4-D propilen glicolbutileter	X	
1330-20-7	Xylene (mixed isomers)	Xylène (mélange d'isomères)	Xileno (mezcla de isómeros)	X	X
1332-21-4	Asbestos (friable form)	Amiante (forme friable)	Asbestos (friables)	X	X X
1335-87-1	Hexachloronaphthalene	Hexachloronaphtalène	Hexacloronaftaleno	X	
1336-36-3	Polychlorinated biphenyls (PCBs)	Biphényles polychlorés (BPC)	Bifenilos policlorados (BPC)	X	X
1344-28-1	Aluminum oxide (fibrous forms)	Oxyde d'aluminium (formes fibreuses)	Óxido de aluminio (formas fibrosas)	X	X
1464-53-5	Diepoxybutane	Diépoxybutane	Diepoxibutano	X	
1563-66-2	Carbofuran	Carbofuran	Carbofurano	X	
1582-09-8	Trifluralin	Trifuraline	Trifluralín	X	
1634-04-4	Methyl tert-butyl ether	Oxyde de tert-butyle et de méthyle	Éter metil terbutílico	X	X
1649-08-7	1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	1,2-Dichloro-1,1-difluoroéthane (HCFC-132b)	1,2-Dicloro-1,1-difluoroetano (HCFC-132b)	X	
1689-84-5	Bromoxnyl	Bromoxnyl	Bromoxinilo	X	
1689-99-2	Bromoxnyl octanoate	Octanoate de 2,6-dibromo-4-cyanophényle	Bromoxinil octanoato	X	
1717-00-6	1,1-Dichloro-1-fluoroethane (HCFC-141b)	1,1-Dichloro-1-fluoroéthane (HCFC-141b)	1,1-Dicloro-1-fluoroetano (HCFC-141b)	X	X
1836-75-5	Nitrofen	Nitrofène	Nitrofén	X	
1861-40-1	Benfluralin	Benfluralin	Benfluralín	X	
1897-45-6	Chlorothalonil	Chlorothalonil	Clorotalonil	X	
1910-42-5	Paraquat dichloride	Paraquat-dichlorure	Dicloruro de Paracuat	X	
1912-24-9	Atrazine	Atrazine	Atracina	X	
1918-00-9	Dicamba	Dicamba	Dicamba	X	
1918-02-1	Picloram	Piclorame	Picloram	X	
1918-16-7	Propachlor	Propachlore	Propaclor	X	
1928-43-4	2,4-D 2-Ethylhexyl ester	2,4-Dichlorophénoxyacétate de 2-éthylhexyle	2,4-D 2-Etilexil ester	X	
1929-73-3	2,4-D Butoxyethyl ester	2,4-Dichlorophénoxyacétate de 2-butoxyéthyle	2,4-D Butoxyetilester	X	
1929-82-4	Nitrapyrin	Nitrapyrine	Nitrapirina	X	
1937-37-7	C.I. Direct Black 38	Indice de couleur Noir direct 38	Negro 38	X	

† RETC list of chemicals for voluntary reporting in Section V of COA.

TAKING STOCK: North American Pollutant Releases and Transfers

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
1982-69-0	Sodium dicamba	3,6-Dichloro-o-anisate de sodium	Dicamba de sodio	X		
1983-10-4	Tributyltin fluoride	Fluorure de tributylétain	Fluoruro de tributilestaño	X		
2032-65-7	Methiocarb	Méthiocarbe	Metiocarb	X		
2155-70-6	Tributyltin methacrylate	Méthacrylate de tributylétain	Metacrilato de tributilestaño	X		
2164-07-0	Dipotassium endothall	Endothal-potassium	Endotal dipotásico	X		
2164-17-2	Fluometuron	Fluométuren	Fluometurón	X		
2212-67-1	Molinate	Molinate	Molinato	X		
2234-13-1	Octochloronaphthalene	Octochloronaphthalène	Octacloronaftaleno	X		
2300-66-5	Dimethylamine dicamba	Acide 3,6-dichloro-o-anisique, composé avec diméthylamine	Dicamba dimetilamina	X		
2303-16-4	Diallate	Diallate	Diallate	X		
2303-17-5	Triallate	Triallate	Triallato	X		
2312-35-8	Propargite	Propargite	Propargita	X		
2385-85-5	Mirex	Mirex	Mirex			X
2439-01-2	Chinomethionat	Chinométhionate	Quinometonato	X		
2439-10-3	Dodine	Dodine	Dodina	X		
2524-03-0	Dimethyl chlorothiophosphate	Thiophosphorochloridate de O,O-diméthyle	Clorotiofosfato de dimetilo	X		
2551-62-4	Sulfur hexachloride	Hexachlorure de soufre	Hexacloruro de azufre			X
2602-46-2	C.I. Direct Blue 6	Indice de couleur Bleu direct 6	Azul 6	X		
2655-15-4	2,3,5-Trimethylphenyl methylcarbamate	Méthylcarbamate de 2,3,5-triméthylphényle	Metilcarbamato de 2,3,5-trimetilfenilo	X		
2699-79-8	Sulfuryl fluoride	Fluorure de sulfuryle	Fluoruro de sulfurilo	X		
2702-72-9	2,4-D Sodium salt	2,4-Dichlorophénoxyacetate de sodium	Sal sodica del 2,4-D	X		
2832-40-8	C.I. Disperse Yellow 3	Indice de couleur Jaune de dispersion 3	Amarillo 3 disperso	X	X	
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	2-Chloro-1,1,1,2-tétrafluoroéthane (HCFC-124)	2-Cloro-1,1,1,2-tetrafluoroetano (HCFC-124)	X		X
2971-38-2	2,4-D Chlorocrotyl ester	(2,4-Dichlorophénoxy)acétate de 4-chlorobutén-2-yle	Ester clorocrotílico del 2,4-D	X		
3118-97-6	C.I. Solvent Orange 7	Indice de couleur Orange de solvant 7	Naranja 7 solvante	X	X	
3383-96-8	Temephos	Téméphos	Temefos	X		
3653-48-3	Methoxone, sodium salt	Acide (4-chloro-2-méthylphenoxy)acétique, sel de sodium	Sal sodica de metoxona	X		
3761-53-3	C.I. Food Red 5	Indice de couleur Rouge alimentaire 5	Rojo 5 alimentaire	X		
4080-31-3	1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	3-Chloroallylochlore de méthénamine	Cloruro de 1-(3-Cloroalil)-3,5,7-triasa-1-azoniaadamantano	X		
4170-30-3	Crotonaldehyde	Crotonaldéhyde	Crotonaldehído	X		
4549-40-0	N-Nitrosomethylvinylamine	N-Nitrosométhylvinylamine	N-Nitrosometilvinilamina	X		
4680-78-8	C.I. Acid Green 3	Indice de couleur Vert acide 3	Verde 3 ácido	X	X	
5234-68-4	Carboxin	Carboxine	Carboxina	X		
5598-13-0	Chlorpyrifos methyl	Chlorpyrifos-méthyl	Metil clorpirifos	X		
5902-51-2	Terbacil	Terbacile	Metilterbacilo	X		
6459-94-5	C.I. Acid Red 114	Indice de couleur Rouge acide 114	Índice de color rojo ácido 114	X		
6484-52-2	Amonium nitrate (solution)	Nitrate d'amonium (en solution)	Nitrato de amonio (solución)	X	X	
7287-19-6	Prometryn	Prométryne	Prometrín	X		

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†			
1997					
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI RETC
7429-90-5	Aluminum (fume or dust)	Aluminium (fumée ou poussière)	Aluminio (humo o polvo)	X	X
7439-92-1	Lead	Plomb	Plomo	X	
7439-96-5	Manganese	Manganèse	Manganeso	X	
7439-97-6	Mercury	Mercure	Mercurio	X	X
7440-02-0	Nickel	Nickel	Níquel	X	
7440-22-4	Silver	Argent	Plata	X	
7440-28-0	Thallium	Thallium	Talio	X	
7440-36-0	Antimony	Antimoine	Antimonio	X	
7440-38-2	Arsenic	Arsenic	Arsénico	X	X
7440-39-3	Barium	Baryum	Bario	X	
7440-41-7	Beryllium	Béryllium	Berilio	X	
7440-43-9	Cadmium	Cadmium	Cadmio	X	X
7440-47-3	Chromium	Chrome	Cromo	X	
7440-48-4	Cobalt	Cobalt	Cobalto	X	
7440-50-8	Copper	Cuivre	Cobre	X	
7440-62-2	Vanadium (fume or dust)	Vanadium (fumée ou poussière)	Vanadio (humo o polvo)	X	X
7440-66-6	Zinc (fume or dust)	Zinc (fumée ou poussière)	Zinc (humo o polvo)	X	
7550-45-0	Titanium tetrachloride	Tétrachlorure de titane	Tetracloruro de titanio	X	X
7632-00-0	Sodium nitrite	Nitrite de sodium	Nitrato de sodio	X	
7637-07-2	Boron trifluoride	Trifluorure de bore	Trifluoruro de boro	X	
7647-01-0	Hydrochloric acid	Acide chlorhydrique	Ácido clorhídrico	X	X
7664-38-2	Phosphoric acid	Acide phosphorique	Ácido fosfórico	X	X
7664-39-3	Hydrogen fluoride	Fluorure d'hydrogène	Ácido fluorhídrico	X	X
7664-41-7	Ammonia	Ammoniac	Amoniaco	X	X
7664-93-9	Sulfuric acid	Acide sulfurique	Ácido sulfúrico	X	X
7696-12-0	Tetramethrin	Tétraméthrine	Tetrametrina	X	
7697-37-2	Nitric acid	Acide nitrique	Ácido nítrico	X	X
7723-14-0	Phosphorus (yellow or white)	Phosphore (jaune ou blanc)	Fósforo (amarillo o blanco)	X	X
7726-95-6	Bromine	Brome	Bromo	X	
7758-01-2	Potassium bromate	Bromate de potassium	Bromato de potasio	X	
7782-41-4	Fluorine	Fluor	Fluor	X	
7782-49-2	Selenium	Sélénium	Selenio	X	
7782-50-5	Chlorine	Chlore	Cloro	X	X
7783-06-4	Hydrogen sulfide	Hydrogène sulfuré	Ácido sulfhídrico		X
7783-20-2	Ammonium sulfate (solution)	Sulfate d'ammonium (en solution)	Sulfato de amonio (solución)	X	X
7786-34-7	Mevinphos	Mevinphos	Mevinfos	X	
7803-51-2	Phosphine	Phosphine	Fosfina	X	
8001-35-2	Toxaphene	Toxaphène	Toxafeno	X	X

† RETC list of chemicals for voluntary reporting in Section V of COA.

TAKING STOCK: North American Pollutant Releases and Transfers

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
8001-58-9	Creosote	Créosote	Creosota	X		
9006-42-2	Metiram	Métirame	Metiram	X		
10028-15-6	Ozone	Ozone	Ozono	X		
10034-93-2	Hydrazine sulfate	Sulfate d'hydrazine	Sulfato de hidracina	X		
10049-04-4	Chlorine dioxide	Dioxyde de chlore	Dióxido de cloro	X	X	X
10061-02-6	trans-1,3-Dichloropropene	(E)-1,3-Dichloroprop-1-ène	Trans-1,3-dicloropropeno	X		
10102-43-9	Nitric oxide	Monoxyde d'azote	Óxido nítrico			X
10102-44-0	Nitrogen dioxide	Dioxyde d'azote	Bióxido de nitrógeno			X
10294-34-5	Boron trichloride	Trichlorure de bore	Tricloruro de Boro	X		
10453-86-8	Resmethrin	Resméthrine	Resmetrina	X		
12122-67-7	Zineb	Zinèbe	Zineb	X		
12427-38-2	Maneb	Manèbe	Maneb	X		
13194-48-4	Ethoprop	Éthoprophos	Etoprofos	X		
13356-08-6	Fenbutatin oxide	Fenbutatin oxyde	Óxido de fenbutaestaño	X		
13463-40-6	Iron pentacarbonyl	Fer-pentacarbonyle	Pentacarbonilo de hierro	X		
13474-88-9	1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	1,1-Dicloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	X		
13684-56-5	Desmedipham	Desmédiophame	Desmedifam	X		
14484-64-1	Ferbam	Ferbame	Ferban	X		
15972-60-8	Alachlor	Alachlore	Alaclor	X		
16071-86-6	C.I. Direct Brown 95	Indice de couleur Brun direct 95	Café 95	X		
16543-55-8	N-Nitrosornicotine	N-Nitrosornicotine	N-Nitrosornicotina	X		
17804-35-2	Benomyl	Bénomyl	Benomil	X		
19044-88-3	Oryzalin	Oryzalin	Orizalina	X		
19666-30-9	Oxydiazon	Oxydíazon	Oxidiazono	X		
20325-40-0	3,3'-Dimethoxybenzidine dihydrochloride	Dichlorure de 3,3'-diméthoxybiphényl-4,4'-ylènediammonium	Dicloruro de 3,3'-dimetoxibencidina	X		
20354-26-1	Methazole	Méthazole	Metazol	X		
20816-12-0	Osmium tetroxide	Tétroxyde d'osmium	Tetróxido de osmio	X		
20859-73-8	Aluminum phosphide	Phospure d'aluminium	Fosfuro de aluminio	X		
21087-64-9	Metribuzin	Métribuzine	Metribucina	X		
21725-46-2	Cyanazine	Cyanazine	Cianacina	X		
22781-23-3	Bendiocarb	Bendiocarbe	Bendiocarb	X		
23564-05-8	Thiophanate-methyl	Thiophanate-méthyl	Metiltiofanato	X		
23564-06-9	Thiophanate ethyl	Thiophanate	Etiltiofanato	X		
23950-58-5	Pronamide	Pronamide	Pronamida	X		
25311-71-1	Isofenphos	Isofenphos	Isofenfos	X		
25321-14-6	Dinitrotoluene (mixed isomers)	Dinitrotoluène (mélange d'isomères)	Dinitrotolueno (mezcla de isómeros)	X	X	
25321-22-6	Dichlorobenzene (mixed isomers)	Dichlorobenzène (mélange d'isomères)	Diclorobenceno (mezcla de isómeros)	X		
25376-45-8	Diaminotoluene (mixed isomers)	Diaminotoluène (mélange d'isomères)	Diaminotolueno (mezcla de isómeros)	X		

† RETC list of chemicals for voluntary reporting in Section V of COA.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
26002-80-2	Phenothrin	Phénothrine	Fenotrina	X		
26471-62-5	Toluenediisocyanate (mixed isomers)	Toluenediisocyanate (mélange d'isomères)	Toluendiisocianatos (mezcla de isómeros)	X	X	X
26628-22-8	Sodium azide	Azide de sodium	Azida de Sodio	X		
26644-46-2	Triforine	Triforine	Triforina	X		
27314-13-2	Norflurazon	Norflurazon	Norfurazona	X		
28057-48-9	d-trans-Allethrin	Alléthrine	d-trans-Alletrina	X		
28249-77-6	Thiobencarb	Diéthylthiocarbamate de S-4-chlorobenzyle	Tiobencarb	X		
28407-37-6	C.I. Direct Blue 218	Indice de couleur Bleu direct 218	Índice de color Azul directo 218	X		
29232-93-7	Pirimiphos methyl	Pirimiphos-méthyl	Metilpirimifos	X		
30560-19-1	Acephate	Acéphate	Acefato	X		
31218-83-4	Propetamphos	Propétamphos	Propetamfos	X		
33089-61-1	Amitraz	Amitraze	Amitraz	X		
34014-18-1	Tebuthiuron	Tébutiuron	Tebutiurón	X		
34077-87-7	Dichlorotrifluoroethane	Dichlorotrifluoroéthane	Diclorotrifluoroetano	X		
35367-38-5	Diflubenzuron	Diflubenzuron	Diflubenzurón	X		
35400-43-2	Sulprofos	Sulprofos	Sulprofos	X		
35554-44-0	Imazalil	Imazalil	Imazalil	X		
35691-65-7	1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	2-Bromo-2-(bromométhyl)pentanedinitrile	1-Bromo-1-(bromometil)-1,3-propanedicarbonitrilo	X		
38727-55-8	Diethyl ethyl	N-(chloroacetyl)-N-(2,6-diethylphenyl) glycinate d'éthyle	Etildietatil	X		
39156-41-7	2,4-Diaminoanisole sulfate	Sulfate de 2,4-diaminoanisole	Sulfato de 2,4-diaminoanisol	X		
39300-45-3	Dinocap	Dinocap	Dinocap	X		
39515-41-8	Fenpropathrin	Fenpropathrine	Fenpropatrina	X		
40487-42-1	Pendimethalin	Pendiméthaline	Pendimetalina	X		
41198-08-7	Profenofos	Profénofos	Profenofos	X		
41766-75-0	3,3'-Dimethylbenzidine dihydrofluoride	Dihydrofluorure de 3,3'-diméthylbenzidine	Difluoruro de 3,3'-dimetilbencidina	X		
42874-03-3	Oxyfluorfen	Oxyfluorène	Oxifluorfen	X		
43121-43-3	Triadimefon	Triadiméfon	Triadimefón	X		
50471-44-8	Vinclozolin	Vinclozoline	Vinclosolín	X		
51235-04-2	Hexazinone	Hexazinone	Hexacinona	X		
51338-27-3	Diclofop methyl	Diclofop-méthyl	Metildiclofop	X		
51630-58-1	Fenvalerate	Fenvalérate	Fenvalerato	X		
52645-53-1	Permethrin	Permétrine	Permitrina	X		
53404-19-6	Bromacil, lithium salt	Bromacil, sel de lithium	Sal de litio bromacilica	X		
53404-37-8	2,4-D 2-Ethyl-4-methylpentyl ester	(2,4-Dichlorophénoxy)acétate de 2-éthyl-4-méthylpentyle	2,4-D 2-Etil-4-metilpentil éster	X		
53404-60-7	Dazomet, sodium salt	Dazomet, sel de sodium	Sal de sodio diazoméctica	X		
55290-64-7	Dimethipin	Diméthipin	Dimetípina	X		
55406-53-6	3-Iodo-2-propynyl butylcarbamate	Butylcarbamate de 3-iodo-2-propynyle	3-yodo-2-propinil butilcarbamato	X		
57213-69-1	Triclopyr triethylammonium salt	Acide [(3,5,6-trichloro-2-pyridyl)oxy]acétique,	Sal de triclopir trietilamonio	X		

† RETC list of chemicals for voluntary reporting in Section V of COA.

TAKING STOCK: North American Pollutant Releases and Transfers

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC†				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
59669-26-0	Thiodicarb	Thiodicarbe	Tiodicarb	X		
60168-88-9	Fenarimol	Fénarimol	Fenarimol	X		
60207-90-1	Propiconazole	Propiconazole	Propiconazol	X		
62476-59-9	Acifluorfen, sodium salt	Acifluorfen, sel de sodium	Sal de sodio de acifluorfen	X		
63938-10-3	Chlorotetrafluoroethane	Chlorotétrafluoroéthane	Clorotetrafluoroetano	X		
64902-72-3	Chlorsulfuron	Chlorsulfuron	Clorsulfurón	X		
64969-34-2	3,3'-Dichlorobenzidine sulfate	Dihydrogénobis(sulfate) de 3,3'-dichlorobenzidine	Sulfato de 3,3'-diclorobencidina	X		
66441-23-4	Fenoxaprop ethyl	Fénoxaprop-p-éthyl	Etilfenoxaprop	X		
67485-29-4	Hydramethylnon	Hydraméthylnon	Hidrametilnona	X		
68085-85-8	Cyhalothrin	Cyhalothrine	Cialotrina	X		
68359-37-5	Cyfluthrin	Cyfluthrine	Ciflutrina	X		
69409-94-5	Fluvalinate	Fluvalinate	Fluvalinato	X		
69806-50-4	Fluazifop butyl	Fluazifop-butyl	Butil flucifop	X		
71751-41-2	Abamectin	Abamectine	Abamectina	X		
72178-02-0	Fomesafen	Fomésafène	Fomesafén	X		
72490-01-8	Fenoxycarb	Fénoxicarbe	Fenoxicarb	X		
74051-80-2	Sethoxydim	Séthoxydime	Setoxidime	X		
76578-14-8	Quizalofop-ethyl	Quizalofop	Etilquizalofop	X		
77501-63-4	Lactofen	Lactofène	Lactofén	X		
82657-04-3	Bifenthrin	Bifenthrine	Bifentrina	X		
88671-89-0	Myclobutanil	Myclobutanil	Miclobutanilo	X		
90454-18-5	Dichloro-1,1,2-trifluoroethane	Dichloro-1,1,2-trifluoroéthane	Dicloro-1,1,2-trifluoroetano	X		
90982-32-4	Chlorimuron ethyl	Chlorimuron	Etil clorimurón	X		
101200-48-0	Tribenuron methyl	Tribénuron	Metiltribenurón	X		
111512-56-2	1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	1,1-Dicloro-1,2,3,3,3-pentafluoropropano (HCFC-225eb)	X		
111984-09-9	3,3'-Dimethoxybenzidine hydrochloride	Hydrochlorure de 3,3'-ddiméthoxybenzidine	Hidrocloruro de 3,3'-dimetoxibencidina	X		
127564-92-5	Dichloropentafluoropropane	Dichloropentafluoropropane	Dicloropentafluoropropane	X		
128903-21-9	2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa)	2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa)	2,2-Dicloro-1,1,1,3,3-pentafluoropropano (HCFC-225aa)	X		
136013-79-1	1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225ea)	1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225ea)	1,3-Dicloro-1,1,2,3,3-pentafluoropropano (HCFC-225ea)	X		
	Antimony compounds**	Antimoine (et ses composés)**	Antimonio y compuestos**	X	X	
	Arsenic compounds	Arsenic (et ses composés)	Arsénico y compuestos	X	X	X

† RETC list of chemicals for voluntary reporting in Section V of COA.

** Elemental compounds are reported separately from their respective element in TRI and RETC and aggregated with it in NPRI.

Appendix A		A Comparison of Chemicals Listed under 1997 TRI, NPRI and RETC [†]				
1997						
CAS Number	Chemical Name	Nom Chimique	Sustancia	TRI	NPRI	RETC
	Barium compounds**	Baryum (et ses composés)**	Bario y compuestos**	X		
	Beryllium compounds	Béryllium (et ses composés)	Berilio y compuestos	X		
	Cadmium compounds	Cadmium (et ses composés)	Cadmio y compuestos	X	X	X
	Chlorophenols	Chlorophénols	Clorofenoles	X		
	Chromium compounds	Chrome (et ses composés)	Cromo y compuestos	X	X	X
	Cobalt compounds	Cobalt (et ses composés)	Cobalto y compuestos	X	X	
	Copper compounds	Cuivre (et ses composés)	Cobre y compuestos	X	X	
	Cyanide compounds	Cyanure (et ses composés)	Cianuro y compuestos	X	X	X
	Diisocyanates	Diisocyanates	Diisocianatos	X		
	Dioxins	Dioxines	Dioxinas			X
	Ethylenebisdithiocarbamic acid, salts and esters	Acide, sels et éthers éthylènebisdithiocarbamiques	Ácido etilenobisditiocarbámico, sales y ésteres	X		
	Furans	Furanes	Furanos			X
	Glycol ethers	Éthers glycoliques	Éteres glicólicos	X		
	Hydrobromofluorocarbons	Hydrobromofluorocarbures	Hidrobromofluorocarbonos			X
	Hydrofluorocarbons	Hydrofluorocarbures	Hidrofluorocarbonos			X
	Lead compounds	Plomb (et ses composés)	Plomo y compuestos	X	X	X
	Manganese compounds	Manganèse (et ses composés)	Manganeso y compuestos	X	X	
	Mercury compounds	Mercuré (et ses composés)	Mercurio y compuestos	X	X	X
	Nickel compounds	Nickel (et ses composés)	Níquel y compuestos	X	X	X
	Nicotine and salts	Nicotine et sels	Nicotina y sales	X		
	Nitrate compounds	Composés de nitrate	Compuestos nitrados	X		
	Perfluorocarbons	Perfluorocarbures	Perfluorocarbonos			X
	Polybrominated biphenyls	Biphényles polybromés	Bifenilos polibromados	X		
	Polychlorinated alkanes	Alcanes polychlorés	Alcanos policlorinados	X		
	Polycyclic aromatic compounds	Composés aromatiques polycycliques	Compuestos aromáticos policíclicos	X		
	Selenium compounds	Sélénium (et ses composés)	Selenio y compuestos	X	X	
	Silver compounds	Argent (et ses composés)	Plata y compuestos	X	X	
	Strychnine and salts	Strychnine et sels	Estricnina y sales	X		
	Thallium compounds	Thallium (et ses composés)	Talio y compuestos	X		
	Warfarin and salts	Warfarine et sels	Warfarina y sales	X		X
	Zinc compounds	Zinc (et ses composés)	Zinc y compuestos	X	X	

[†] RETC list of chemicals for voluntary reporting in Section V of COA.

** Elemental compounds are reported separately from their respective element in TRI and RETC and aggregated with it in NPRI.

Appendix B		List of Facilities that Appear in Tables									
1997		Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in					
		3M Canada Company (Perth)	Perth	ON	0000003201	3-32	5-39				
		3V Inc.	Georgetown	SC	29440VCHMCPENNY	3-6	3-20	3-45			
		A.G. Simpson Co Ltd.	Oshawa	ON	0000003120	4-19	4-23	4-32	4-42	4-48	5-49 5-55
		A.G. Simpson Co. Ltd.	Cambridge	ON	0000003121	4-43	4-49	5-56			
		A.P. Green Refractories (Canada) Ltd., A.P. Green Industries	Smithville	ON	0000003266	4-32	4-42	4-48	5-49	5-55	
		Abbott Health Prods. Inc., Abbott Labs.	Barceloneta	PR	00617BBTTCROADN	3-6	3-20	3-45	5-6	5-20	
		ABC Rail Prods. Corp.	Calera	AL	35040BCRLC14THS	4-50	5-57				
		Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan	QC	0000002752	3-32	3-42	5-39	5-49		
		Abitibi-Consolidated Inc.	Fort Frances	ON	0000000917	3-33					
		Abitibi-Consolidated Inc.	Kenora	ON	0000004030	3-32					
		Abitibi-Consolidated Inc., Division Port-Alfred	La Baie	QC	0000002636	3-19	3-43	4-32	4-48	5-19	5-50 5-55
		Abitibi-Consolidated, Division Laurentide	Grand-Mère	QC	0000002587	3-43					
		Able Electro Polishing	Chicago	IL	60623BLLCT2001S	4-6	4-20	4-45	5-52		
		Acadian Platers Co. Ltd.	Rexdale	ON	0000002541	4-23	4-49	5-56			
		Accuflex Industrial Hose Ltd., Kuriyama Corporation	Guelph	ON	0000000087	4-42					
		Acme Steel Co., Acme Metals Inc.	Riverdale	IL	60627CMSTL13500	4-8	4-12	4-24	4-35	4-51	5-8 5-24 5-42 5-58
		Advanced Monobloc Manufacturing, CCL Industries Inc.	Penetanguishene	ON	0000000092	3-32	3-42	5-49			
		Agrium Products Inc., Redwater Fertilizer Operations	Redwater	AB	0000002134	3-11	3-33	4-33	5-11	5-40	
		Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan	AB	0000004874	3-11	3-33	4-33	5-11	5-40	
		Agropur coopérative agro-alimentaire, Agropur La Fromagerie	Granby	QC	0000004341	4-11	4-32				
		Aimco Solrec Ltd.	Milton	ON	0000004893	4-3	4-11	4-33	5-11	5-40	
		Ainsworth Lumber Co. Ltd.	Grande Prairie	AB	0000004880	3-19	3-33	3-43	5-50		
		Air Prods. Inc., Air Prods. & Chemicals Inc.	Pasadena	TX	77506RPRDC1423H	4-3	4-12	4-34	5-3	5-12	5-41
		AK Steel Corp., AK Steel Holding	Middletown	OH	45043RMCNC1801C	3-24	4-20	4-45			
		Al Tech Specialty Steel Corp.	Dunkirk	NY	14048LTCHSWILLO	4-44					
		Alabama River Pulp Co. Inc., Parsons & Whittemore Inc.	Perdue Hill	AL	36470LBMRVOFFHI	3-24	3-51				
		Albemarle Corp.	Orangeburg	SC	29116THYLCCANNO	3-45					
		Albright & Wilson Americas, Albright & Wilson PLC	Charleston	SC	29415LBRGH2151K	4-44					
		Alcan Smelters and Chemicals Ltd.	Kitimat	BC	0000002788	3-11					
		Alcatel Cable	Montréal-est	QC	0000000959	3-49					
		Alcatel Canada Wire	Fergus	ON	0000000956	3-48					

Appendix B		List of Facilities that Appear in Tables												
1997														
Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in										
Alcoa	Riverdale	IA	52808LMNMCHIGHW	3-34										
Alcoa	Rockdale	TX	76567LMNMC SANDO	3-51										
Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie	ON	0000001070	3-19	3-32	3-48	5-19	5-39	5-55					
Algonquin Ind. Inc., Rea Magnet Wire Co.	Guilford	CT	06437LGNQN129SO	4-24	4-51	5-58								
Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Brackenridge	PA	15014LLGHN RIVER	4-44	4-50	5-51	5-57							
Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Latrobe	PA	15650TLDYNRROUTE	3-44	3-50									
Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Leechburg	PA	15656LLGHNPOBOX	4-34										
Allegheny Ludlum Corp., Allegheny Teledyne Inc.	New Castle	IN	47362LLGHNPOBOX	4-6	4-20	5-20								
AltaSteel Ltd., Stelco Inc.	Edmonton	AB	0000001106	3-8	3-11	3-19	3-23	3-33	3-49	4-11	4-23	4-33		
				4-42	4-49	5-11	5-19	5-23	5-40	5-56				
Aluminerie de Bécancour Inc., Reynolds Metal Company	Ville de Bécancour	QC	0000001071	4-48	5-55									
Alza Corp.	Vacaville	CA	95688LZCRP700EU	4-20	4-44									
American Alloys Inc.	New Haven	WV	25265MRCNLRT62	3-50										
American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi	TX	78407MRCNC3800B	3-3	3-6	3-8	3-12	3-20	3-24	3-35	3-45	3-51		
				4-6	4-8	4-12	4-20	4-24	4-35	4-45	4-51	5-3		
				5-6	5-8	5-12	5-20	5-24	5-42	5-52	5-58			
American Microtrace Corp., Tetra Techs. Inc.	Fairbury	NE	68352GLPCHPOBOX	4-3	4-6	4-8	4-12	4-20	4-24	4-35	4-45	4-51		
				5-6	5-8	5-20	5-24	5-42	5-52	5-58				
American Racing Equipment, Plant I, Noranda Aluminum Inc.	Rancho Dominguez	CA	90221MRCNR19200	3-50										
American Steel Foundries, Amsted Ind. Inc.	Alliance	OH	44601MRCNS1001E	3-50	4-34	4-44	4-50	5-41	5-51	5-57				
American Steel Foundries, Amsted Ind. Inc.	Granite City	IL	62040MRCNS1700W	3-8	3-20	3-24	3-45				3-50			
American Synthetic Rubber, Michelin Corp.	Louisville	KY	40216MRCNS4500C	3-35										
American Video Glass Co.	Mt Pleasant	PA	15601MRCNV777TE	4-20	4-45	5-52								
Ameristeel Corp.	Charlotte	NC	28213FLRDSHWY11	4-3	4-8	4-12	4-24	4-35	4-45	4-51	5-8	5-24		
				5-42	5-58									
Ameristeel Corp., Jacksonville Mill Div.	Baldwin	FL	32234FLRDSHWY21	4-3	4-8	4-12	4-20	4-24	4-35	4-45	4-51	5-8		
				5-24	5-42	5-52	5-58							
Ameristeel Corp., Knoxville Mill Div.	Knoxville	TN	37921FLRDS1919T	4-51										
Ameristeel Corp., WTN Steel Mill	Jackson	TN	38305FLRDSUSHIG	4-8	4-24	4-35	4-51	5-58						
Amoco Petroleum Prods., Amoco Corp.	Texas City	TX	77590MCLCM24015	3-35	5-42									
Angus Chemical Co.	Sterlington	LA	71280NGSCHLAHWY	3-3	3-6	3-12	3-20	3-35	5-6	5-20				
Anzon Inc., Cookson America Inc.	Philadelphia	PA	19125NZNNC2545A	4-50	5-57									

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
AOC Canada, Inc., Alpha/Owens-Corning (Canada) Inc.	Guelph	ON	0000003284	3-42
Apotex Fermentation Inc., Apotex Pharmaceutical Holdings Inc	Winnipeg	MB	0000005210	4-33
Aqua Glass Performance Plant, Masco Corp.	McEwen	TN	37101QGLSS155FO	3-6 3-20 3-45 5-52
Aquaglass Corp., Masco Corp.	Adamsville	TN	38310QGLSSINDUS	3-6 3-20 3-35 3-45 5-6 5-20 5-52
Arco Chemical Co.	Westlake	LA	70669RCCHM900AI	4-6 4-20 4-45 5-52
Arco Chemical Co., Atlantic Richfield Co.	South Charleston	WV	25303CWSTV437MA	4-44 5-51
Arco Chemical Co., Bayport Div., Atlantic Richfield Co.	Pasadena	TX	77507RCCHM10801	4-6 4-20 4-45 5-52
Aries Flexographics Ltd.	Mississauga	ON	0000004471	4-32 4-42 5-49
Armco Inc.	Zanesville	OH	43701RMCDV1724L	4-12 4-34
Armco Inc.	Coshocton	OH	43812CSHCTSTATE	3-35
Armco Inc.	Dover	OH	44622RMCNC303OX	4-51 5-58
Armco Inc. (Bantam Ave.)	Butler	PA	16001RMCDVBANTA	3-35
Armco Inc. (Route 8 S.)	Butler	PA	16003RMCDVROUTE	3-3 3-12 3-35 3-44 3-50 5-3 5-12 5-42
Armstrong World Indl. Inc.	Lancaster	PA	17604RMSTRLIBER	4-34 4-44 5-51
ASARCO Inc.	East Helena	MT	59635SRCNCSMELT	3-3 3-6 3-8 3-12 3-20 3-24 3-34 3-44 3-50 4-6 4-20 4-45 4-51 5-3 5-6 5-8 5-12 5-20 5-24 5-57
ASARCO Inc.	Omaha	NE	68102SRCNC500DO	4-3 4-6 4-8 4-12 4-20 4-24 4-45 4-51 5-6 5-8 5-20 5-24 5-52
ASARCO Inc.	El Paso	TX	79999SRCNCPOBOX	3-50 4-50 5-57
ASARCO Inc., Glover Plant	Annapolis	MO	63646SRCNCHIGHW	3-3 3-6 3-8 3-12 3-20 3-24 3-35 3-45 3-51 5-3 5-6 5-8 5-12 5-20 5-24 5-42 5-52 5-58
ASARCO Inc., Ray Complex/Hayden Smelter	Hayden	AZ	85235SRCNC64ASA	3-24 3-34 3-44 3-50 4-6 4-20 4-34 4-44 4-50 5-6 5-20 5-41 5-51 5-57
AT Plastics Inc., Edmonton Site	Edmonton	AB	0000000126	3-19 3-33 3-43 4-32 4-42 5-39 5-49
Atlas Steels Inc., Atlas Specialty Steels	Welland	ON	0000003158	3-33 3-42 3-48 4-11 4-19 4-23 4-33 4-43 4-49 5-19 5-23 5-40 5-49
Auburn Steel Co. Inc.	Auburn	NY	13021BRNSTQUARR	4-8 4-24 4-35 4-51 5-42 5-58
Austeel Lemont Co. Inc.	Lemont	IL	60439STLLMNEWAV	3-8 3-24 3-35 3-51 4-51 5-24 5-42 5-58
Avenor Inc., Dryden Mill	Dryden	ON	0000000928	3-11 3-33 3-43 5-11 5-40
Avenor Inc., Gold River Operations	Gold River	BC	0000000927	3-11 3-43
Avenor Inc., Thunder Bay Operations	Thunder Bay	ON	0000000930	3-11 3-32 3-43 5-11 5-39 5-50

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Avesta Sheffield East Inc., Avesta Sheffield N.A. Inc.	Baltimore	MD	21224STRNS7700R	4-34
Avesta Sheffield Plate Inc., Avesta Sheffield N.A.	New Castle	IN	47362VSTNCSTRD3	4-34 4-44 4-50 5-41 5-51 5-57
Bar Techs. Inc.	Johnstown	PA	15907FRNKL119WA	4-3 4-8 4-12 4-24 4-35 4-51 5-8 5-24 5-42 5-58
BASF Canada Inc., Sarnia Site	Sarnia	ON	0000000037	4-32 4-42 5-49
BASF Canada Inc., Windsor Site	Windsor	ON	0000000031	4-11 4-32 5-39
BASF Corp.	Geismar	LA	70734BSFCRRIVER	4-45 5-52
BASF Corp.	Freeport	TX	77541BSFCR602CO	3-3 3-12 3-34 5-3 5-12 5-41
Baycoat Ltd., Baycoat R.S.N.	Hamilton	ON	0000000015	4-43 4-49
Bayer Corp.	New Martinsville	WV	26155MBYCRSTATE	3-34 5-41
Bayer Corp.	Orange	TX	77631PLYSRFM100	3-44
Bayer Corp. Baytown	Baytown	TX	77520MBYCR8500W	4-44
Bayer Inc., Bayer AG	Sarnia	ON	0000001944	3-11 3-19 3-32 3-42 4-11 4-19 4-33 4-42 5-11 5-19 5-39 5-49
Beauce Composites Inc., ADS Groupe Composites Inc.	Ste-Clotilde-de-Beauce	QC	0000004996	3-43 5-50
Behlen Mfg. Co.	Columbus	NE	68601BHLNMHWY30	3-50
Belden Canada Inc., Cobourg Facility	Cobourg	ON	0000002670	4-48 5-55
Berridge Mfg. Co.	Houston	TX	77026BRRDG1720M	4-44
Beta Steel Corp.	Portage	IN	46368BTSTL6500S	3-51
Bethlehem Steel Corp.	Sparrows Point	MD	21219BTHLHDUALH	3-8 3-24
Bethlehem Steel Corp.	Burns Harbor	IN	46304BTHLHBURNS	3-50
BHP Copper Metals Co., BHP Copper Co.	San Manuel	AZ	85631MGMCPPHIGHW	3-3 3-8 3-12 3-24 3-35 3-45 3-51 5-8 5-24 5-42 5-52 5-58
Birmingham Southeast L.L.C., Birmingham Steel Corp.	Flowood	MS	39208BSCSTFOURT	4-34 4-44 4-50 5-41 5-51 5-57
Birmingham Southeast LLC, Birmingham Steel Corp.	Cartersville	GA	30120TLNTPPEEPL	4-3 4-8 4-12 4-24 4-35 4-51 5-8 5-24 5-42 5-58
Birmingham Steel Corp., Kankakee Illinois Steel Div.	Bourbonnais	IL	60914BRMNGRR1BO	4-3 4-6 4-8 4-12 4-20 4-24 4-35 4-45 4-51 5-8 5-24 5-42 5-52 5-58
Birmingham Steel Corp., Washington Steel Div.	Seattle	WA	98106SLMNB2424S	4-3 4-8 4-12 4-24 4-35 4-45 4-51 5-8 5-24 5-42 5-58
Blount Canada Ltd., Blount Inc.	Guelph	ON	0000003845	3-42 5-49
Boeing Co.	Wichita	KS	67277BNGML3801S	3-6 3-20 3-35 3-45 5-6 5-20 5-52

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Boise Cascade Corp.	Saint Helens	OR	97051BSCSC1300K	4-3 4-12 5-3 5-12
Boler Group, Hendrickson Spring	Stratford	ON	0000003778	4-32 4-48 5-39 5-55
Bombardier Inc., Bombardier Produits récréatifs	Valcourt	QC	0000000935	3-42
Bombardier Inc., Bombardier Produits récréatifs	St-Antoine-de-Tilly	QC	0000004351	3-42 4-19 4-43 5-19
Bonar Inc, Plastics Division, Low & Bonar PLC	Burlington/Halton	ON	0000000135	3-43 5-50
Borden Chemical Inc., Borden Inc.	Forest Park	IL	60130BRDNN1401C	4-34
Borden Chemicals & Plastics LP	Geismar	LA	70734BRDNCLOUIS	3-6 3-20 3-35 3-45 5-6 5-20 5-52
Bowater Inc., Coated Paper & Pulp Div.	Catawba	SC	29704BWTRC5300C	3-51
BP Chemicals Inc., BP America Inc.	Lima	OH	45805BPCHMFORTA	3-3 3-6 3-12 3-20 3-34 3-44 5-3 5-6 5-12 5-20 5-41 5-51
BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca	TX	77979BPCHMTexas	3-3 3-6 3-12 3-20 3-45 5-3 5-6 5-12 5-20 5-52
Brake Parts Inc., Echlin Inc.	Fredericksburg	VA	22405FRCTN1000F	4-44
Bremen Techs., Plant 1	Bremen	IN	46506BRMNM425IN	4-44
Bristol-Myers Barceloneta Inc., Bristol-Myers Squibb Co.	Barceloneta	PR	00617BRSTLSTATE	4-44 5-51
Brunswick Smelting Division, Fertilizer Operation	Belledune	NB	0000004027	3-48
Budd Plastics, Limited	Cobourg	ON	0000004558	4-43
Bundy of Canada, Division of John Crane Inc.	Bramalea	ON	0000000070	4-48
Burkart Foam Inc., Ohio Decorative Prods. Inc.	Cairo	IL	62914BRKRT36THS	3-45 5-52
Burlington Technologies Inc., Burlington Division	Burlington	ON	0000003096	3-49
BWX Techs., McDermott Intl. Inc.	Lynchburg	VA	24504BBCKMTATH	3-35
C & D Techs. Inc.	Conyers	GA	30207CDCHR1835I	4-6 4-8 4-20 4-24 4-35 4-45 4-51 5-6 5-20 5-52 5-58
Cabot Corp.	Ville Platte	LA	70586CBTCR412MI	3-34 5-41
Cabot Corp., Cab-o-sil Div.	Tuscola	IL	61953CBTCRRROUTE	3-34 5-41
Cabot Corp., Canal Plant	Franklin	LA	70583CBTCRSTATE	3-34 5-41
Cadorath Plating Co. Ltd.	Winnipeg	MB	0000002923	3-48
Cambridge Ind. Inc.	Marion	IN	46952DVRST1700F	4-44
Cambridge Ind. Inc.	Centralia	IL	62801RCKWL4002I	4-44
Cami Automotive Inc.	Ingersoll	ON	0000003480	3-32 5-39
Camoplast Inc, Division Roski I	Roxton Falls	QC	0000002561	3-42 5-49

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Can Mar Manufacturing Ltd. Inc.	Niagara Falls	ON	0000004533	3-49
Canac Kitchens Limited, Kohler Company	Thornhill	ON	0000004732	3-32 3-42 5-39
Canada Metal Company Limited, Canada Metal Investments Ltd.	Toronto	ON	0000000642	4-19 4-23 4-33 4-43 4-49 5-50 5-56
Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge	ON	0000003475	3-11 3-32 5-11 5-39
Canam Steel Works, Le Groupe Canam Manac Inc.	Mississauga	ON	0000004785	3-33
Canam Steel Works, Le Groupe Canam Manac Inc.	Calgary	AB	0000004946	3-33
Canfor Pulp & Paper Mills, Canadian Forest Products Ltd.	Prince George	BC	0000004063	3-11
Cargill Corn Milling, Cargill Inc.	Cedar Rapids	IA	52406CRGLL17101	4-34
Carpenter Canada Ltd.	Woodbridge	ON	0000002567	3-19 3-33 3-43 5-19 5-50
Carpenter Canada Ltd., Calgary Division	Calgary	AB	0000000152	3-19 3-43 5-19
Carpenter Co.	Richmond	VA	23234RCRPN2400J	3-6 3-20
Carpenter Co.	Russellville	KY	42276RCRPNFORRE	3-6 3-20 3-45 5-6 5-20 5-52
Carpenter Co.	Elkhart	IN	46516RCRPN195CO	3-6 3-20 3-45
Carpenter Co., Tupelo Div.	Verona	MS	38879RCRPNLEEIN	3-6 3-20 3-45 5-6 5-20
Cartons St-Laurent Inc.	LaTuque	QC	0000003140	3-11 3-23 3-32 3-43 3-49 4-23 4-33 4-49 5-11 5-23 5-39 5-50 5-56
Cascade Steel Rolling Mills, Schnitzer Steel Inds.	McMinnville	OR	97128CSCDS3200N	4-8 4-24 4-35 4-51 5-42 5-58
Caterpillar Inc.	Mapleton	IL	61547CTRPL8826W	3-50
CCL Industries Ltd., KG Packaging	Concord	ON	0000001553	3-42
Celanese Canada Inc.	Edmonton	AB	0000001162	3-3 3-6 3-11 3-19 3-33 3-42 3-48 4-19 4-23 4-33 4-43 5-3 5-6 5-11 5-19 5-40 5-49
Celanese Eng. Resins Inc., Hoechst Corp.	Bishop	TX	78343CLNSNONEMI	3-34 3-44 5-51
Celanese Ltd.	Bay City	TX	77414HCHSTPOBOX	3-44 5-51
Centrifugal Coaters Inc.	Oakville	ON	0000000675	4-32
Cerro Wire & Cable Co. Inc.	Hartselle	AL	35640CRRWR201TH	4-3 4-8 4-12 4-24 4-34 4-50 5-8 5-24 5-57
CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-de-Valleyfield	QC	0000002938	3-23 3-48 4-32 4-48 5-23 5-55
Champion Intl. Corp.	Bucksport	ME	04416CHMPNMAINS	3-50
Champion Intl. Corp.	Canton	NC	28716CHMPNMAINS	3-34
Champion Intl. Corp., Donohue Inc.	East Houston	TX	77044CHMPN11611	3-51
Chaparral Boats Inc., RPC Energy Services Inc.	Nashville	GA	31639CHPRRINDUS	3-45
Charter Mfg. Co. Inc., Charter Steel Div.	Saukville	WI	53080CHRTR1658C	4-51

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in																	
				3-8	3-24	3-34	3-50	5-8	5-24	5-57											
Chemetals Inc., Comilog	New Johnsonville	TN	37134CHMTLFOOTE	3-8	3-24	3-34	3-50	5-8	5-24	5-57											
Chemical Solvents Inc., Denison Facility	Cleveland	OH	44109CHMCL1010D	4-34	4-44	5-51															
Chemprox chimie Inc., Elf Atochem S.A.	Bécancour	QC	0000001492	4-32																	
Chemrec Inc.	Cowansville	QC	0000002413	4-11	4-19	4-43	5-19	5-50													
Chevron Canada Limited, Chevron Corp.	Burnaby	BC	0000002776	4-32																	
Chevron Chemical Co., Chevron Corp.	Port Arthur	TX	77640CHVRN2001S	4-45																	
Chevron Chemical Co., Polythylene Plant, Chevron Corp.	Orange	TX	77630CHVRNFM100	4-44	5-51																
Chicago Specialties Inc., PMC Inc.	Chicago	IL	60628PMCSPP735E1	4-34																	
Chino Mines Co., Phelps Dodge Corp.	Hurley	NM	88043CHNMN210CO	3-34	3-50	5-41	5-57														
Chrysler Canada, Ltd., Bramalea Assembly Plant	Bramalea	ON	0000004173	3-33	5-40																
Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor	ON	0000003476	3-32	3-43	3-48	5-39														
Ciba Specialty Chemicals Corp.	McIntosh	AL	36653CBGGYGEIGY	4-3	4-12																
Cirtronics a Division of Gandalf Canada Ltd.	Nepean	ON	0000004486	4-48																	
Cleveland Laminating Corp.	Cleveland	OH	44104LMTT 2909E	3-6	3-20	3-45															
Clinton Labs., Eli Lilly & Co.	Clinton	IN	47842LLLLYSTATE	3-50																	
Coastal Chem Inc., Coastal Corp.	Cheyenne	WY	82007WYCNC8305O	3-3	3-12																
Coatings 85 Ltd.,	Mississauga	ON	0000002545	4-11	4-23	4-49	5-23	5-56													
Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan	AB	0000004868	3-49	4-19	4-43	4-49	5-56													
Columbia/MBF, Glynwed Steels & Engineering	Mississauga	ON	0000004487	4-23	4-49	5-56															
Consumers Packaging Inc., Consumers Glass (Brampton)	Brampton	ON	0000000517	4-32	4-42	4-48	5-49	5-55													
Consumers Packaging Inc., Consumers Glass (Scoudouc)	Scoudouc	NB	0000000520	4-42	4-48	5-55															
Cookson Pigments Inc., Cookson America Inc.	Newark	NJ	07114CKSNP256VA	4-44	4-50																
Cooper Automotive Products., Wagner Div., Cooper Industries	Stratford	ON	0000004489	4-32	4-42	5-49															
Copperweld Steel Co., SBO Ltd.	Warren	OH	44482CPPRW4000M	4-51																	
Corhart Refractories Corp.	Buckhannon	WV	26201CRHRTRROUTE	4-44	4-50	5-51	5-57														
Corn Prods. & Best Foods, Argo Plants, CPC Intl. Inc.	Bedford Park	IL	60501CRNPR6400A	3-34																	
Corning Inc., Fall Brook Plant	Corning	NY	14831CRNNGTIOGA	4-6	4-20																
Co-Steel Lasco	Whitby	ON	0000003824	3-8	3-11	3-19	3-23	3-32	3-42	3-48	4-3	4-6	4-8	4-11	4-19	4-23	4-32	4-42	4-48	5-3	5-6
				5-8	5-11	5-19	5-23	5-39	5-49	5-55											
Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis	AL	36505CRTLDUSHIG	3-3	3-12	3-34	3-50	5-3	5-12	5-41											

Appendix B		List of Facilities that Appear in Tables																			
1997																					
Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in																	
Cox Creek Refining Co.	Baltimore	MD	21226CXCRK1000K	4-44	4-50	5-57															
CPI Kraft Div., Consolidated Papers Inc.	Wisconsin Rapids	WI	54494CNSLD950FO	4-3	4-12	5-3	5-12														
Craig Ind.	Teresita	MO	65573CRGNDCORD6	3-34	5-41																
Creanova Canada, Leaside Facility, Creanova America Inc.	Toronto	ON	0000003433	4-32	4-48																
Crest Foam, Leggett & Platt Inc.	Newburyport	MA	01950CRSTH122PA	3-44																	
Crestbrook Forest Industries, Pulp Division	Cranbrook	BC	0000001185	3-23	3-33	3-49															
Crown Cork & Seal Canada Inc., Plant 244	Concord	ON	0000003216	3-33	5-40																
Crown Packaging Ltd., Paper Mill Division	Burnaby	BC	0000003374	3-42																	
CXY Chemicals Canada LP, Canadian Occidental Petroleum Ltd.	North Vancouver	BC	0000003529	4-32	4-42	5-49															
CXY Chemicals LP, Canadian Occidental Petroleum	Nanaimo	BC	0000003526	4-32	4-42	5-39	5-49														
Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool	AZ	85532NSPRTPBOX	3-3	3-6	3-8	3-12	3-20	3-24	3-35	3-44	3-51	5-3	5-6	5-8	5-12	5-20	5-24	5-42	5-51	5-58
Cytec Canada Inc., Welland Plant	Niagara Falls	ON	0000000222	4-43																	
Cytec Ind. Inc., Fortier Plant	Westwego	LA	70094MRCNC10800	3-3	3-6	3-12	3-20	3-34	5-3	5-6	5-12	5-20	5-41								
Daishowa-Marubeni International, Peace River Pulp Div.	Peace River	AB	0000000223	3-11	3-19	3-23	3-33	3-49	5-11	5-19	5-23	5-40	5-56								
Dana Canada Inc., Barrie Axle Plant, Dana US Inc.	Barrie	ON	0000004737	3-48																	
Dana Canada Inc., Spicer Driveshaft Division	Thorold	ON	0000000376	4-11	4-23	4-33	4-43	4-49	5-23	5-40	5-56										
Davisco Lake Norden Food Ingredient Co., Davisco Foods Intl.	Lake Norden	SD	57248LKNRD408DA	4-35																	
DDE - Louisville Plant, DuPont Dow Elastomers LLC	Louisville	KY	40216DDL SV4242C	4-35																	
De Havilland Inc., Bombardier Inc.	Downsview	ON	0000001189	3-19	3-43																
Decor Products International, Kleco Corporation	Midland	ON	0000003850	4-32																	
Degussa Corp., Ivanhoe	Louisa	LA	70562SHLND2MILE	3-34	5-41																
Delhi Industries Inc.	Delhi	ON	0000000231	3-42																	
Demunno/Kerdoon, World Oil Corp.	Compton	CA	90222DMNNK2000N	4-35																	
Doe Run Co., Recycling Facility, Renco Group Inc.	Boss	MO	65440BCKSMHIGHW	4-6	4-20	4-45	4-51	5-6	5-20	5-52											
Doe Run Co., Renco Group Inc.	Herculaneum	MO	63048HRCLN881MA	3-3	3-6	3-8	3-12	3-20	3-24	3-44	3-51	5-3	5-6	5-8	5-12	5-20	5-24	5-51			
Dofasco Inc.	Hamilton	ON	0000003713	3-6	3-11	3-19	3-23	3-32	3-42	3-49	4-3	4-6	4-8	4-11	4-19	4-23	4-33	4-43	4-49	5-3	5-6
				5-8	5-11	5-19	5-23	5-40	5-50	5-56											

Appendix B		List of Facilities that Appear in Tables												
1997		Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in								
		Domfoam International Inc.	St-Léonard	QC	0000002601	3-19	3-43	5-19	5-50					
		Dominion Castings Ltd., NACO Inc.	Hamilton	ON	0000004739	4-6	4-11	4-19	4-23	4-32	4-42	4-48	5-6	5-11
						5-19	5-23	5-39	5-49	5-55				
		Dominion Colour Corp., Kikuchi Color & Chemicals Corp.	Ajax	ON	0000001495	4-3	4-11	4-19	4-23	4-33	4-43	4-49	5-3	5-11
						5-19	5-23	5-40	5-50	5-56				
		Domtar Packaging, Red Rock Mill	Red Rock	ON	0000003013	3-32	3-43	5-39						
		Domtar Papers, Cornwall Business Unit	Cornwall	ON	0000001197	3-19	3-32	3-43	5-19	5-39	5-50			
		Doorhandle Systems, Plating Plant, Ventra Group Inc.	Brampton	ON	0000001433	4-19	4-23	4-32	4-42	4-48	5-23	5-39	5-49	5-55
		Dow Chemical Canada Inc.	Varenes	QC	0000000281	4-11	4-19	4-33	4-43	5-19	5-50			
		Dow Chemical Canada Inc.	Sarnia	ON	0000003146	3-19	3-32	3-42	4-19	4-43	5-19	5-49		
		Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan	AB	0000000280	3-33	3-42	4-19						
		Dow Chemical Co.	Dalton	GA	30720DWCHM1468P	4-6	4-20							
		Dow Chemical Co.	Plaquemine	LA	70765THDWCHIGHW	3-20	3-45							
		Dow Chemical Co.	Freeport	TX	77541THDWCBUILD	3-12	3-44	5-51						
		Dow Corning Corp.	Midland	MI	48686DWCRN3901S	4-12								
		Dow North America, Allyn's Point Plant, Dow Chemical Co.	Gales Ferry	CT	06335DWCHMROUTE	4-6	4-20	4-45	5-20					
		DuPont	Towanda	PA	18848DPNTRD1B0	3-44	5-51							
		DuPont	Belle	WV	25015DPNTB901WE	3-35	5-42							
		DuPont	New Johnsonville	TN	37134DPNTJ1DUPO	3-3	3-8	3-12	3-24	3-35	3-45	3-51	5-3	5-8
						5-12	5-24	5-42	5-52	5-58				
		DuPont	Old Hickory	TN	37138DPNTL1002I	3-45								
		DuPont	Pass Christian	MS	39571DPNTD7685K	3-3	3-6	3-8	3-12	3-20	3-24	3-35	3-45	3-51
						5-3	5-8	5-12	5-24	5-42	5-52	5-58		
		DuPont	Louisville	KY	40216DPNTL4200C	4-34	5-41							
		DuPont	Circleville	OH	43113DPNTCUSRT2	3-45	4-34							
		DuPont	Beaumont	TX	77704DPNTBSTATE	3-3	3-12	3-34	3-44	5-41	5-51			
		DuPont	Victoria	TX	77902DPNTVOLDL	3-3	3-12	4-34	5-3	5-12	5-41			
		DuPont Canada Inc., Ajax Finishes Division	Ajax	ON	0000000286	4-11	4-32							
		DuPont Canada Inc., Maitland Site	Maitland	ON	0000001207	3-23	3-32	3-42	3-49	5-39	5-49			
		DuPont Cape Fear	Leland	NC	28451DPNT STATE	3-44	4-34	5-41						
		DuPont Chambers Works	Deepwater	NJ	08023DPNTCART130	3-35	3-45	3-50	5-42					
		DuPont Sabine River Works	Orange	TX	77631DPNTSFARMR	3-34	3-44							

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Duracell Canada Inc., Duracell Inc.	Mississauga	ON	0000004631	4-32 4-48 5-55
E.B. Eddy Forest Products Ltd., George Weston Ltd.	Espanola	ON	0000003185	3-42 5-49
E.I.S. Brake Parts, Cooper Ind. Inc.	Manila	AR	72442SBRKPONESI	4-6 4-20
Eagle Zinc Co., T. L. Diamond & Co. Inc.	Hillsboro	IL	62049GLZNCRR1	3-51
Eastman Chocolate Bayou	Alvin	TX	77511STMNCFM291	3-45
Eastman Kodak Co., Kodak Park	Rochester	NY	14652STMNK1669L	3-3 3-6 3-12 3-20 3-34 3-44 5-3 5-6 5-12 5-20 5-51
Electralloy Corp., G. O. Carlson Inc.	Oil City	PA	16301LCTRL175MA	3-50 4-34 4-44 4-50 5-41 5-51 5-57
Electro Finition	LaSalle	QC	0000004363	4-49
Electronic Concepts Inc.	Lee	MA	01238CPFLMGREYL	3-44
Elf Atochem N.A. Inc.	Crosby	TX	77532PNNWL18000	4-34
Elkem Metals Co.	Marietta	OH	45750LKMMTROUTE	3-3 3-6 3-8 3-12 3-20 3-24 3-50 5-3 5-8 5-12 5-24 5-57
Emballages Stone (Canada), Div. Chaleurs, Stone Container	New Richmond	QC	0000003292	3-33 5-40
Esco Limited	Port Coquitlam	BC	0000000606	3-23 3-48 5-55
Esco Limited, Poho Foundry	Port Hope	ON	0000000315	3-49
Essex Group Inc.	Lithonia	GA	30058SSXGR6588M	4-34 4-50 5-57
Ethyl Canada Inc., Ethyl Corp.	Corunna	ON	0000002734	4-32 4-43
ETI Canada Inc., Canadian Investment Capital Ltd.	North Bay	ON	0000000319	3-48
Eveready Battery Co. Inc., Ralston Purina Co.	Marietta	OH	45750VRDYBCOUNT	4-8 4-24 5-24
Eveready Division, Ralston Purina Canada	Walkerton	ON	0000002009	4-48 5-55
Exide Corp., General Battery	Muncie	IN	46302XDGRP2601W	4-44 4-50
Exxon Chemical, Baton Rouge Chemical Plant, Exxon Corp.	Baton Rouge	LA	70805XXNCH4999S	3-34 4-34 5-41
Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge	LA	70805XXNBT4050S	3-3 3-12 3-35 5-42
F & P Manufacturing Inc., American Honda Motor Co. Ltd.	Tottenham	ON	0000004537	4-23 4-49
F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup	QC	0000004790	3-23 3-48 4-23 4-33 4-49 5-23 5-56
F.W. Winter Inc. & Co.	Camden	NJ	08102FWWNTDELAW	3-50
Falconbridge Limited, Smelter Complex	Falconbridge	ON	0000001236	3-23 3-49
Falconbridge Ltd., Kidd Metallurgical Div.	District of Cochrane	ON	0000002815	3-19 3-23 3-33 3-43 3-49 5-23 5-40 5-50 5-56
Filpac Inc, Transformateur de pellicules d'emballage, Bunzl Distrib.	Terrebonne	QC	0000001263	4-32
Fina Oil & Chemical, American Petrofina Inc.	Big Spring	TX	79721FNLNDIS20E	3-34

Appendix B		List of Facilities that Appear in Tables														
1997		Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in										
		Finch Pruyn & Co. Inc.	Glens Falls	NY	12801FNCHP1GLEN	3-34	5-41									
		Firestone Synthetic Rubber & Latex, Bridgestone/Firestone Inc.	Sulphur	LA	70602FRSTNLA108	3-45										
		Fisher Controls Inc., Emerson Electric Company	Woodstock	ON	0000004515	3-48										
		Flakeboard Company Limited	St. Stephen	NB	0000004842	4-43										
		Fleet Industries Ltd., Magellan Aerospace Corp.	Fort Erie	ON	0000004990	3-43	5-50									
		Fletcher Challenge Canada, Elk Falls Mill	Campbell River	BC	0000000333	3-11	3-32	5-39								
		Flexel Indiana Inc.	Covington	IN	47932FLXLNUSHIG	3-34	5-41									
		Flexible Foam Prods. Inc., Ohio Decorative Prods. Inc.	Miami	FL	33167FLXBL3225N	3-45										
		Flexible Foam Prods., Ohio Decorative Prods. Inc.	Elkhart	IN	46515FLXBL1900W	3-6	3-20									
		FMC Corp.	Baltimore	MD	21226FMCCR1701E	4-3	4-12	4-35	5-42							
		FMC Corp.	Pocatello	ID	83202FMCCR3MIWE	3-3	3-6	3-8	3-12	3-20	3-24	3-50	5-6	5-8		
						5-12	5-20	5-24	5-57							
		Foamex Canada Inc., Foamex L.P.	Toronto	ON	0000002422	3-19	3-43	5-19								
		Foamex Intl. Inc.	Milan	TN	38358FMXPRKEFAU	3-6	3-20	3-45	5-6	5-20						
		Foamex L.P., Div. of Kihl	Corry	PA	16407FMXPR466SH	3-6	3-20	3-35	3-45	5-6	5-20	5-52				
		Foamex L.P., Foamex Intl. Inc.	Morristown	TN	37814FMXLP328HA	3-6	3-20									
		Foamex L.P., Foamex Intl. Inc.	La Porte	IN	46350RCTCLBOYDB	3-44	5-51									
		Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal	QC	0000004371	3-32	3-42	3-48	4-6	4-11	4-19	4-23	4-33	4-43		
						4-49	5-19	5-23	5-50	5-56						
		Ford Motor Co., Cleveland Casting	Brook Park	OH	44142FRDMT5600H	4-8	4-24									
		Ford Motor Co., Sheldon Rd. Plant	Plymouth	MI	48170FRDMT14425	3-44										
		Ford Motor Company of Canada Ltd., Windsor Aluminum Plant	Windsor	ON	0000004416	3-48										
		Ford Motor Company, Essex Aluminum Plant	Windsor	ON	0000001269	3-42	4-32	4-48	5-39	5-49	5-55					
		Ford Motor Company, Oakville Assembly Plant	Oakville	ON	0000003419	3-11	5-11									
		Ford Motor Company, Ontario Truck	Oakville	ON	0000001215	4-32	5-39									
		Ford Motor Company, St. Thomas Assembly Plant	St. Thomas	ON	0000003883	3-32	5-39									
		Ford Motor Company, Windsor Casting Plant	Windsor	ON	0000003416	3-48	4-11	4-19	4-23	4-48	5-23	5-55				
		Formica Canada Inc, Formica Corp.	St-Jean-sur-Richelieu	QC	0000004378	3-32	5-39									
		Fort James Camas LLC, Fort James Corp.	Camas	WA	98607JMSRVNE4TH	3-44										
		Fort James Corporation, Fort James - Marathon, Ltd.	Marathon	ON	0000000462	3-32	5-39									
		Fort Wayne Fndy. Pontiac Inc., Cole Pattern & Eng. Co. Inc.	Fort Wayne	IN	46803FRTWY2509E	4-50										

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Fortron Ind., Hoechst Celanese - Agent	Wilmington	NC	28402FRTRNHVY42	4-44 5-51
Frank Fair Industries Ltd., Motor Coach Industries Ltd.	Winnipeg	MB	0000001659	3-43 4-42
Franklin Bronze & Alloy Co.	Franklin	PA	16323FRNKLB0X87	4-50 5-57
Fraser Papers Inc., Noranda Forest Inc.	Edmundston	NB	0000001221	4-3 4-11 4-19 5-11
Freeport Brick Co., Freeport Refractories Inc.	Freeport	PA	16229FRPRTDRAWE	3-35
Freightliner of Canada Ltd., St. Thomas Truck Plant	St. Thomas	ON	0000001224	3-32 4-11
Friede Goldman Newfoundland Limited	Marystown	NF	0000005005	3-49
Frog Switch & Mfg. Co.	Carlisle	PA	17013THFRG600EH	4-51 5-58
Future Foam Inc.	Middleton	WI	53562FTRFM2210P	3-45
Garlock of Canada Ltd., Garlock Sealing Technology	Sherbrooke	QC	0000005419	4-19 4-43 5-50
Gaska Tape Inc.	Elkhart	IN	46517GSKTP1810W	3-44 5-51
Gaston Copper Recycling Corp., Southwire Co.	Gaston	SC	29053TTNSSHIGHW	4-50
Gates Canada Inc, Belt Manufacturing	Brantford	ON	0000003877	4-49
Gates Canada Inc, Hose Manufacturing	Brantford	ON	0000003880	4-43
Gates Rubber Co.	Iola	KS	66749GTSRB999MI	4-44 5-51
GB Biosciences Corp.	Houston	TX	77015FRMNT2239H	4-34 4-44 4-50
GE Co.	Ottawa	IL	61350BRGWRCANAL	3-6 3-20 5-20
GE Co., Silicone Prods.	Waterford	NY	12188GNRLL260HU	3-8 3-24 3-50
GE Co., Super Abrasives	Worthington	OH	43085GSPRB6325H	4-34
GE Lighting, Canada, Oakville Lamp Plant	Oakville	ON	0000001281	4-42 4-48 5-55
GE Plastics Co., GE Co.	Mount Vernon	IN	47620GPLSTLEXAN	3-6 3-20 3-44 5-51
GE Plastics, GE Co.	Pearlington	MS	39521BRGWRPORTB	4-6 4-20
Gencorp Inc.	Columbus	MS	39702DVRSTYORKV	3-35
General Battery Corp., Reading Smelter Div., Exide Corp.	Reading	PA	19605GNRLBSPRIN	4-6 4-20 4-24 4-44 4-50 5-6 5-20 5-57
General Foam Corp.	Bridgeview	IL	60455GNRLF7401S	3-44
General Foam Corp., PMC Inc.	West Hazelton	PA	18201GNRLFVALMO	3-6 3-20
General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw	MI	48605SGNWG1629N	3-8 3-24 3-50 5-57
General Motors of Canada Limited, London Diesel Division	London	ON	0000003766	3-49 4-48 5-55
General Motors of Canada Limited, Oshawa Battery Plant	Oshawa	ON	0000003221	3-48
General Motors of Canada Limited, St. Catharines Foundry	St. Catharines	ON	0000003621	3-48
General Motors of Canada Limited, Ste Therese Assembly Plant	Boisbriand	QC	0000003895	4-32

Appendix B		List of Facilities that Appear in Tables													
1997		Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in									
		General Motors of Canada Ltd., Oshawa Car Assembly Plant	Oshawa	ON	0000003893	3-11	3-32	5-11							
		General Motors of Canada Ltd., Oshawa Truck Assembly Centre	Oshawa	ON	0000003870	3-11	3-32	5-39							
		Geneva Steel	Vineyard	UT	84057GNVST1600W	3-8	3-24	3-35	3-51						
		Georgia-Pacific Corp.	Big Island	VA	24526NKSPCHIGHW	3-45									
		Georgia-Pacific Corp.	Palatka	FL	32078GRGPCSTATE	3-35									
		Georgia-Pacific Corp.	Zachary	LA	70791GRGPCZACHA	3-51									
		Georgia-Pacific Corp.	Ashdown	AR	71822NKSPPHIGHW	3-8	3-24	3-35	3-51						
		Georgia-Pacific Paper Ops., Georgia-Pacific Corp.	Crosssett	AR	71635GRGPCPAPER	3-50	5-57								
		Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge	ON	0000004169	3-23	3-48	4-11	4-19	4-23	4-33	4-43	4-49	5-11	
						5-19	5-23	5-40	5-50	5-56					
		Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk	MB	0000001651	3-8	3-11	3-19	3-23	3-33	3-43	3-49	5-8	5-11	
						5-19	5-23	5-40	5-50	5-56					
		Glenbrook Nickel Co., Cominco American Inc.	Riddle	OR	97469GLNBR5093R	3-6	3-8	3-20	3-24	3-35	3-45	3-51	5-6	5-20	
						5-52	5-58								
		GM Nao Mid-Lux Car Div., General Motors Corp.	Doraville	GA	30360GNRLM3900M	3-35									
		GM Powertrain Defiance, General Motors Corp.	Defiance	OH	43512GMC STATE	3-3	3-8	3-12	3-24	3-34	3-50	5-3	5-8	5-12	
						5-24	5-57								
		GMC Powertrain Div., General Motors Corp.	Danville	IL	61832GMC I74AT	3-50									
		GNB Techs. Inc., Pacific Dunlop GNB Corp.	Columbus	GA	31903GNBNC3639J	4-45									
		GNB Techs. Inc., Pacific Dunlop GNB Corp.	Leavenworth	KS	66048GNBNC1901S	3-50									
		GNB Techs. Inc., Pacific Dunlop GNB Corp.	Vernon	CA	90058GNBNC2717S	4-44	4-50	5-51	5-57						
		GNI Chemicals Corp. Inc., GNI Group Inc.	Deer Park	TX	77536CHMCL2525B	4-35	5-42								
		Goodyear Canada Inc., Goodyear Tire and Rubber Co.	St-Jean-sur-Richelieu	QC	0000000676	3-48									
		Goodyear Canada Inc., Goodyear Tire and Rubber Co.	Québec	QC	0000001325	4-48									
		Goodyear Canada Inc., Goodyear Tire and Rubber Co.	Medicine Hat	AB	0000002998	3-48									
		Goodyear Tire & Rubber Co.	Lincoln	NE	68501GDYRT4021N	3-34									
		Goodyear Tire & Rubber Co., Goodyear Canada Inc.	Napanee	ON	0000001322	4-48	5-55								
		Graham Products Ltd.	Inglewood	ON	0000000361	4-42									
		Granite City Steel, National Steel Corp.	Granite City	IL	62040GRNTC20THS	3-3	3-8	3-12	3-24	3-51	5-8	5-24			
		Grant Forest Products Corp., OSB Plant	Englehart	ON	0000004559	3-43	5-50								
		Graphic Packaging Canada Corporation, Winnipeg Facility	Winnipeg	MB	0000000369	4-42									
		Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga	ON	0000004311	3-11	3-33	5-11	5-40						

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Great Lakes Chemical Corp.	El Dorado	AR	71731GRTLKHIGHW	3-44 5-51
Great Southern Paper Co., Georgia-Pacific Corp.	Cedar Springs	GA	31732GRTSTHIGHW	3-8 3-24
Green River Steel Corp., All Acquisition Corp.	Owensboro	KY	42303GRNRV4701U	4-24 4-51 5-58
Griffin Canada Inc., Amsted Industries	Winnipeg	MB	0000001344	4-32 4-48 5-55
Griffin Pipe Prods. Co., Amsted Ind. Inc.	Florence	NJ	08518GRFFN1100W	3-51
Griffin Wheel Co., Amsted Ind. Inc.	Bessemer	AL	35020GRFFN2100G	3-8 3-24
Griffin Wheel Co., Amsted Ind. Inc.	Keokuk	IA	52632GRFFNCARBI	3-8 3-24
Griffin Wheel Co., Amsted Ind. Inc.	Kansas City	KS	66111GRFFN7111G	3-8 3-24
Griffin Wheel Co., Columbus Plant, Amsted Ind. Inc.	Groveport	OH	43125GRFFN3900B	3-8 3-24
Guertin Bros. Coatings & Sealants Ltd.	Winnipeg	MB	0000002454	4-11
Gulf Coast Recycling Inc.	Tampa	FL	33619GLFCS1901N	4-44
Gulf States Steel Inc., GSS Holding Corp.	Gadsden	AL	35904GLFST174SO	3-24 3-50 5-57
Gwaltney of Smithfield Ltd., Smithfield Foods Inc.	Smithfield	VA	23430GWLTNHIGHW	3-34 4-12 4-35
Hayes-Albion Corp., Harvard Ind. Inc.	Albion	MI	49224HRVRD601NO	3-50
Heatcraft Inc., Lennox Intl. Inc.	Grenada	MS	38901HTCRFHIGHW	3-44 5-51
Henkel Canada Ltd., Henkel Surface Technologies	Toronto	ON	0000001401	3-48
Hercules Inc.	Hopewell	VA	23860QLNCM1111H	4-3 4-12 5-12
Hexcel Corp.	Salt Lake City	UT	84044HRCLS6800W	3-44
Hilan Corporation, Hilan Wood Preservers	Kemptville	ON	0000001414	4-48
Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena	TX	77507HCHST9502B	3-12 3-34 3-44 4-3 4-12 4-35 4-45 5-3 5-12 5-41 5-51
Hoechst-Celanese Corp., Hoechst Corp.	Spartanburg	SC	29304HCHST185AT	3-44 5-51
Holnam Inc., Holdernam Inc.	Clarksville	MO	63336DNDCMPOBOX	3-51
Honda of America Mfg. Inc., American Honda Motor Co. Inc.	Anna	OH	45302HNDFM12500	4-34 4-50 5-57
Horton CBI Limited, CBI Industries Inc.	Fort Erie	ON	0000004510	4-48
Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon	MB	0000003414	3-8 3-11 3-19 3-23 3-33 3-43 3-49 5-11 5-19 5-23 5-40 5-50 5-56
Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur	TX	77641TXCCHGATE2	3-34 3-44 5-41 5-51
Hydrite Chemical Co.	Cottage Grove	WI	53527HYDRT150WD	4-45 5-52
IBM	Hopewell Junction	NY	12533BM EASTF	4-44
IBM	Endicott	NY	13760BM 1701N	4-44 5-51

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
ICI Canada Inc, ICI Explosifs	Brownsburg	QC	0000002852	3-23 3-43 3-49 5-50
ICI Canada Inc, ICI Forest Products, Cornwall Works	Cornwall	ON	0000003436	4-48 5-55
Ifastgroupe Inc., Galvano	Beloeil	QC	0000004406	4-23
Ifastgroupe Inc., Infasco Div.	Marieville	QC	0000000449	4-11 4-33
IMC-Agrico Co., IMC Global Inc.	Saint James	LA	70346GRCCHLAHIG	3-3 3-12
IMC-Agrico Co., IMC Global Inc.	Uncle Sam	LA	70792GRCCEASTB	3-35
IMC-Agrico Co., New Wales Plant	Mulberry	FL	33860MCFRTHIGHW	3-34 5-41
Imco Recycling Inc.	Morgantown	KY	42261MCRCY609GA	3-8 3-24 3-35 3-51
Imco Recycling Inc.	Sapulpa	OK	74066NTRNT15031	3-50
Imco Recycling of Ohio Inc., Imco Recycling Inc.	Uhrichsville	OH	44683MCRCY7335N	4-34 4-50 5-57
Imperial Oil, IOL Dartmouth Refinery	Dartmouth	NS	0000003698	3-32 4-43 5-39
Imperial Oil, IOL Sarnia Refinery	Sarnia	ON	0000003704	3-11 3-23 3-33 3-49 4-19 4-32 4-42 5-11 5-23 5-40 5-49 5-56
Imperial Oil, IOL Strathcona Refinery	Edmonton	AB	0000003707	3-32 4-42 5-49
Imperial Oil, Sarnia Chemical Plant	Sarnia	ON	0000001464	3-11 3-19 4-11 4-33 4-42 5-11 5-49
Inco Limited, Central Mills	Copper Cliff	ON	0000001465	3-42 3-48 5-55
Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff	ON	0000001467	3-32 3-42 3-48 5-39 5-49 5-55
Inco Limited, Copper Cliff Smelter Complex	Copper Cliff	ON	0000000444	3-3 3-6 3-8 3-11 3-19 3-23 3-33 3-43 3-49 5-3 5-6 5-11 5-19 5-23 5-40 5-50 5-56
Inco Limited, Copper Refinery	Copper Cliff	ON	0000001469	3-48 5-55
Inco Limited, Manitoba Division	Thompson	MB	0000001473	3-19 3-23 3-42 3-48 5-23 5-49 5-55
Inco Limited, Port Colborne Refinery	Port Colborne	ON	0000001471	3-23 3-49
Industries James Maclaren Inc., Division de la pâte kraft	Thurso	QC	0000001528	3-23 3-49
Industries Rehau, Incorporated, Baie d'Urfé Facility	Baie d'Urfé	QC	0000002547	4-43
Inland Technologies Inc., Debert Treatment Centre	Debert	NS	0000004936	4-11 4-33 5-40
Inspec USA Inc., Unit 1, Inspec Group PLC	Galena	KS	66739LLCCH22MIS	4-3 4-12
Inspec USA Inc., Unit 2, Inspec Group PLC	Galena	KS	66762KCHCH22MIL	4-8 4-24
Intermet Corp., Archer Creek Plant	Lynchburg	VA	24505LYNCHRT726	3-50 5-57
International Paper Co.	Riegelwood	NC	28456FDRLPRIEGE	3-51
International Paper Co.	Hampton	SC	29924WSTNGPOBOX	3-3 3-12
International Paper Co.	Augusta	GA	30913FDRLPHIGHW	3-51

Appendix B		List of Facilities that Appear in Tables													
1997															
Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in											
International Paper Co., Erie Mill	Erie	PA	16533HMMRM1540E	4-3	4-12										
International Paper Co., Mansfield Mill	Mansfield	LA	71052NTRNTHWY50	3-12	3-35	3-51									
International Paper Co., Mobile Mill	Mobile	AL	36652NTRNTPAPER	3-51											
International Paper Co., Natchez Mill	Natchez	MS	39120NTRNT312LO	3-44	3-51										
International Paper Co., Pineville Mill	Pineville	LA	71361NTRNTWILLI	3-51											
International Paper Co., Texarkana Mill	Domino	TX	75504NTRNTPOBOX	3-51											
International Wallcoverings Ltd.	Brampton	ON	0000003759	3-11	3-33	5-11	5-40								
loco Refinery — Imperial Oil	Port Moody	BC	0000003710	3-32											
Ipsco Steel Inc., Ipsco Ent. Inc.	Muscatine	IA	52761PSCST1770B	4-24	4-35	4-51	5-58								
Irving Oil Limited, Refining Division	Saint John	NB	0000004101	3-23	3-49										
Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John	NB	0000002604	3-11	3-32	5-11	5-39								
ISP Chemicals Inc., International Specialty Prods.	Calvert City	KY	42029GFCHMHIGHW	4-44											
Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur	QC	0000003649	3-3	3-8	3-11	3-19	3-23	3-33	3-43	3-49	5-8			
				5-11	5-19	5-23	5-40	5-50	5-56						
Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur	QC	0000003655	3-8	3-11	3-19	3-23	3-49	5-19	5-23	5-56				
Ivaco Rolling Mills	L'Orignal	ON	0000001520	3-23	3-48	4-3	4-8	4-11	4-19	4-23	4-33	4-43			
				4-49	5-8	5-11	5-19	5-23	5-56						
I-XL Industries Ltd., Medicine Hat Brick & Tile Plant	Medicine Hat	AB	0000002446	3-49											
J & L Fiber Services Inc., Precision Cast Parts Corp.	Waukesha	WI	53186GRTLN831PR	4-44											
J & L Specialty Steel Inc.	Midland	PA	15059JLSPC12THS	3-35											
Johnson Matthey Limited, Precious Metals Division	Brampton	ON	0000003991	4-48	5-55										
Johnstown Wire Techs. Inc.	Johnstown	PA	15906JHNST124LA	4-50	5-57										
Karo Mfg. Inc.	Naugatuck	CT	06770KRMNF285GR	3-44											
Kemira Pigments Inc., Kemira Holdings Inc.	Savannah	GA	31404KMRNCEASTP	3-50											
Kennecott Utah Copper, Kennecott Holdings Corp.	Magna	UT	84006KNNCT8362W	3-3	3-6	3-8	3-12	3-20	3-24	3-35	3-45	3-51			
				5-3	5-6	5-8	5-12	5-20	5-24	5-42	5-52	5-58			
Kenworth du Canada, Paccar Inc.	Ste-Thérèse	QC	0000002803	4-32											
Kerr-McGee Chemical LLC	Henderson	NV	89015KRRMC8000L	3-8	3-24	3-51									
Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton	MS	39746KRRMCUSHIG	3-3	3-8	3-12	3-24	3-51	5-8	5-24					
Keymark Corp.	Fonda	NY	12068KYMRKRTE33	3-50											
Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria	IL	61641KYSTN7000S	3-50	4-3	4-8	4-12	4-24	4-34	4-50	5-8	5-24			
				5-57											

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
KI Pembroke, Inc., Kreuger International Inc.	Pembroke	ON	0000004621	4-11 4-33
Kimberly-Clark Corp.	Mobile	AL	36652SCTTPBAYBR	3-6 3-20
Kimberly-Clark Corporation	Terrace Bay	ON	0000002607	3-11 3-43
Kindred Industries, Div. of Emco Ltd.	Midland	ON	0000001555	4-19 4-23 4-43 4-49
Kitchenkraft of Canada Ltd.	Winnipeg	MB	0000000476	3-33 5-40
Knoll North America Corp., Main Plant, E.M. Warburg Pincus	Toronto	ON	0000004751	3-33
Kodak, Colorado Div., Eastman Kodak Co.	Windsor	CO	80551KDKCLCOUNT	4-44
Koppel Steel Corp., NS Group Inc.	Koppel	PA	16136BBCKMOUNT	4-8 4-24 4-35 4-51 5-24 5-42 5-58
Koppers Ind. Inc.	Cicero	IL	60650KPPRS3900S	4-35 5-42
Kraft Canada Inc, Cheese Operations, Philip Morris Companies	Ingleside	ON	0000004441	4-11 4-33 5-40
Kronos Canada, Inc.	Varenes	QC	0000001561	3-23 3-48 4-8 4-11 4-19 4-23 4-33 4-42 4-49 5-11 5-23 5-40 5-56
Krupp Fabco Company, Krupp Hoesch Automotive of America Inc.	Dresden	ON	0000004912	3-49
Kuntz Electroplating Inc.	Kitchener	ON	0000003111	4-19 4-23
Lacks Ind. Inc., Airlane Plant, Lacks Ent's. Inc.	Kentwood	MI	49508LCKSN4260A	4-6 4-20 4-45 4-51 5-52 5-58
Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke	ON	0000003855	3-8 3-11 3-19 3-23 3-42 3-49 4-8 4-11 4-23 4-33 4-49 5-8 5-11 5-23 5-40 5-49 5-56
LDM Technologies Company	Leamington	ON	0000004431	4-11 4-33
Lee-Var Inc.	Andrews	TX	79714LVRNCHIGHW	3-45
Lenzing Fibers Corp.	Lowland	TN	37778LNZNGTENNE	3-3 3-12 3-34 3-51 4-50 5-3 5-12 5-41
Les Aciers Canam, Le Groupe Canam Manac Inc.	St-Gédéon	QC	0000004796	3-33 5-40
Les Forges de Sorel Inc., Slater Industries Inc.	St-Joseph-de-Sorel	QC	0000004797	4-19 4-23 4-32 4-42 4-48 5-55
Les Papiers Perkins Ltée, Cascades	Candiac	QC	0000002524	3-32 5-39
Les Produits chimiques Delmar Inc.	LaSalle	QC	0000004321	4-11 4-19 4-33 4-43 5-11 5-40 5-50
Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien	QC	0000003242	3-11 3-23 3-33 3-49 5-23 5-56
Lilly Industries, Inc.	Cornwall	ON	0000001353	3-43
Long Manufacturing Inc., Echlin Corporation	Cambridge	ON	0000000717	3-49
Long Manufacturing Ltd., Echlin Inc.	Mississauga	ON	0000001583	3-42
Long Manufacturing Ltd., Echlin Inc.	Oakville	ON	0000004756	4-43
Louisiana Pigment Co. L.P.	Westlake	LA	70669KRNSL3300B	3-8 3-24 3-44 3-51 5-24
Louisiana-Pacific Canada Ltd., Dawson Creek OSB	Dawson Creek	BC	0000000718	3-43 5-50

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
LPB Poles Inc., Bell Canada	Masson-Angers	QC	0000002478	4-42 4-48
LTV Steel Co. Inc.	Cleveland	OH	44127LTVST3100E	3-24 3-34 3-50 5-57
LTV Steel Co. Inc.	East Chicago	IN	46312LTVST3001D	3-8 3-24
Lubrizol Corp., Bayport Facility	Pasadena	TX	77507LBRZL12801	4-44 5-51
Lukens Steel Co., Lukens Inc.	Coatesville	PA	19320LKNSSMODEN	3-44 3-50 4-34 5-57
M.B. Paper, Alberni Specialties Division, MacMillan Bloedel	Port Alberni	BC	0000001593	3-33 4-32 4-42 5-49
MAAX Inc., Division Acrylica	Ste-Marie	QC	0000004323	3-43
MAAX Inc., Division fibre de verre moderne - usine 4	Tring-Jonction	QC	0000004324	3-42 4-42 5-49
MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction	QC	0000004916	3-19 3-43 4-43 5-50
MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke	ON	0000005609	3-19 3-33 3-43 5-19 5-40 5-50
MacMillan Bloedel, North Superior Forest Products	Wawa	ON	0000004892	3-43 5-50
Magnesium Corp. of America, Renco Group Inc.	Rowley	UT	84074MXMGNROWLE	3-3 3-12 3-34 5-3 5-12 5-41
Magotteaux Corp., Magotteaux Intl.	Pulaski	TN	38478MRCNM2360I	3-50 4-50 5-57
Magotteaux Inc., Magotteaux Canada	Magog	QC	0000004799	4-32 4-42 4-48 5-49 5-55
Malette Québec Inc., Panneaux Malette OSB	St-Georges de Champlain	QC	0000004386	3-19 3-42 5-49
Mallinckrodt Inc.	Saint Louis	MO	63147MLLNC3600N	4-34 5-41
Maple Manufacturing Inc., St. Catharines Machine Products Co	Smithville	ON	0000005651	4-43
Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor	ON	0000005627	3-11 3-33 4-11 4-33 5-11 5-40
Marine Shale Processors Inc.	Amelia	LA	70380MRNSHHIGHW	4-44
Maritime Electric Company Ltd., Thermal Generating Station	Charlottetown	PE	0000004268	3-48
Maritime Steel and Foundries Limited	New Glasgow	NS	0000004883	4-33
Marswell Metal Industries Limited	Burlington	ON	0000004834	4-19 4-23 4-43 4-49 5-50 5-56
Maynard Steel Casting Co.	Milwaukee	WI	53215MYNRD2856S	4-6 4-20 4-45 5-20
MB Paper Ltd., Powell River Division	Powell River	BC	0000000723	3-11
McCain Foods (Canada), Borden-Carleton Plants	Carleton	PE	0000005000	3-33 5-40
McQuay Intl.	Scottsboro	AL	35768SNYDRHWY35	3-51
Mead Coated Board Inc., Mead Corp.	Cottonton	AL	36868MDCTDALABA	3-51
Medusa-Crescent Inc., Medusa Corp.	Wampum	PA	16157MDSCMROUTE	4-45
Menasco Aerospace, Coltec Industries Inc.	Oakville	ON	0000004526	3-23 3-43 3-49 4-43 5-50 5-56
Merck & Co. Inc.	Rahway	NJ	07065MRCKC126EL	4-34 5-41
Merichem-Sasol USA LLC	Houston	TX	77015MRCHM1914H	4-34 5-41

Appendix B		List of Facilities that Appear in Tables												
1997		Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in								
		Meridian Operations Inc., Richmond Division	Long-Sault	ON	0000005684	3-23	3-49	4-49	5-23	5-56				
		Metal Koting, Continuous Colour Coat Ltd.	Rexdale	ON	0000004527	4-23	4-33	4-49	5-23	5-56				
		Metalex Products Ltd.	Richmond	BC	0000000732	3-48	4-6	4-11	4-19	4-23	4-33	4-43	4-49	5-19
						5-23	5-40	5-50	5-56					
		Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda	QC	0000003623	3-8	3-11	3-19	3-23	3-32	3-42	3-48	5-11	5-19
						5-23	5-39	5-49	5-55					
		Métallurgie Noranda, Affinerie CCR, Noranda Inc.	Montréal-est	QC	0000003916	4-19	4-23	4-42	4-49	5-23	5-56			
		Methanex Corporation	Medicine Hat	AB	0000001782	3-11	3-32	5-11	5-39					
		Michelin North America (Canada) Inc.	Bridgewater	NS	0000003468	3-23	3-49							
		Michelin North America (Canada) Inc.	Kitchener	ON	0000003472	4-23	4-49	5-56						
		Michelin North America (Canada) Inc., Granton, NS Plant	New Glasgow	NS	0000003466	4-23	4-49	5-23						
		Michelin North America (Canada) Inc., Waterville Plant	Cambridge Station	NS	0000003470	4-48	5-55							
		Millennium Inorganic Chemicals, Millennium Chemicals	Baltimore	MD	21226SCMCH3901G	3-8	3-24							
		Millennium Inorganic Chemicals, Plant 1, Millennium Chemicals	Ashtabula	OH	44004SCMCH2900M	4-8	4-24	4-35	4-51	5-42	5-58			
		Millennium Inorganic Chemicals, Plant 2, Millennium Chemical	Ashtabula	OH	44004SCMCH2426M	4-8	4-24	5-24						
		Millennium Petrochemical Inc., Millennium Chemicals	La Porte	TX	77571QNTMC11603	4-34	4-44	4-50	5-41	5-51				
		Milplex Circuit (Canada) Inc.	Scarborough	ON	0000004512	4-42								
		Mirolin Industries, MRL Incorporated	Toronto	ON	0000003573	3-19	5-19							
		Mirror Ind., Finley Investments Inc.	Houston	TX	77055MRRRN11510	4-44								
		Mitsubishi Electronics Industries Canada Inc.	Midland	ON	0000000734	3-42	3-48	4-32	4-42	4-48	5-49	5-55		
		Mobil Chemical Co., Mobil Corp.	Beaumont	TX	77704MBLCHGULFS	3-34	5-41							
		Mondo America Inc.	Laval	QC	0000004326	3-48								
		Monsanto Co.	Luling	LA	70070MNSNTRIVER	3-3	3-6	3-12	3-20	3-35	3-45	5-6	5-12	5-20
						5-42	5-52							
		Monsanto Co., Chocolate Bayou	Alvin	TX	77511MNSNTFM291	3-34	3-44	5-41	5-51					
		Morbern Incorporated	Cornwall	ON	0000000741	3-11	3-33	4-33	5-11	5-40				
		Motor Coach Industries, Fort Garry Plants 4&5, MCIL Holdings	Winnipeg	MB	0000001656	3-49								
		Mueller Co., Plant #4, Tyco Intl. (US) Inc.	Decatur	IL	62526MLLRC1226E	4-51	5-58							
		Mulberry Phosphates Inc., Mulberry Corp.	Mulberry	FL	33860RYSTRSTATE	3-3	3-12	3-35	5-12	5-42				
		National Steel Corp., Great Lakes Div.	Ecorse	MI	48229GRTLKNO1QU	4-3	4-8	4-12	4-24	4-34	4-50	5-3	5-8	5-12
						5-24	5-41	5-57						
		National-Standard Company of Canada, Ltd.	Guelph	ON	0000004538	4-19	4-23	4-33	4-43	4-49	5-50	5-56		

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in																
Neenah Fndy. Co., Neenah Corp.	Neenah	WI	54956NNHFN2121B	4-50	5-57															
Neste Resins, Neste Resins Canada	North Bay	ON	0000001687	3-42																
New Boston Coke Corp.	New Boston	OH	45662NWBST600RI	3-35																
New Haven Fndy., Wesley Ind. Inc.	New Haven	MI	48048NWHVN58391	4-6	4-8	4-20	4-24	4-35	4-45	4-51	5-6	5-20								
				5-42	5-52	5-58														
Newport Steel Corp., NS Group Inc.	Wilder	KY	41071NWPRTLICKI	4-8	4-24	4-34	4-50	5-57												
Niagara Piston, Div. of Court Valve Co. Inc.	Beamsville	ON	0000001715	4-19	4-43															
Nipa Hardwicke Inc., BTP PLC	Rock Hill	SC	29731TRYBR2550V	4-35																
Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune	NB	0000004024	3-23	4-6	4-11	4-19	4-23	4-33	4-43	4-49	5-6								
				5-11	5-19	5-23	5-40	5-50	5-56											
Norbord Industries Inc., Noranda Forest Inc.	La Sarre	QC	0000001748	3-42																
Norbord Industries Inc., Val d'Or Division	Val-d'Or	QC	0000001745	3-43																
Norcast Division de Trittech Precision Inc., fonderie Norcast	Mont-Joli	QC	0000004819	3-48	4-42	4-48	5-55													
Norkraft Quévillon Inc., Domtar Inc.	Lebel-sur-Quévillon	QC	0000000279	3-32	3-42	5-39														
Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour	QC	0000000747	3-23	3-49	4-49	5-56													
North American Lumber, Roblin Forest Products	Roblin	MB	0000005227	4-19	4-23	4-43	4-49	5-50	5-56											
North American Rayon Corp., North American Corp.	Elizabethton	TN	37643NRTHMWESTE	3-34	4-50	5-41														
North American Royalties Inc., Wheland Fndy. Div.	Chattanooga	TN	37343WHLND2800S	4-34	4-50	5-57														
North Atlantic Refining Ltd.	Come by Chance	NF	0000004316	3-23	3-49	5-23														
North Star Recycling, Cargill Inc.	Saint Paul	MN	55119NRTHS1678A	3-50																
North Star Steel Houston, Cargill Inc.	Houston	TX	77229NRTHS8603S	3-50																
Northwestern Steel & Wire Co.	Sterling	IL	61081NRTHW121WA	3-3	3-6	3-8	3-12	3-20	3-24	3-50	4-50	5-3								
				5-6	5-8	5-12	5-20	5-24	5-57											
Nova Chemicals (Canada) Ltd.	Corunna	ON	0000001776	3-19	3-48															
Nova Chemicals (Canada) Ltd	Sarnia	ON	0000001785	3-19	3-43	4-32	4-42	5-49												
Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna	ON	0000004700	3-3	3-11	3-32	4-19	5-11												
Novopharm Limited	Scarborough	ON	0000002469	3-19	3-32	3-42	5-19	5-49												
Novopharm Limited	Markham	ON	0000002472	3-19	3-33	3-43	5-19	5-40	5-50											
NRI Industries Inc.	Toronto	ON	0000004894	3-49																
NRI Industries Inc., Cawthra Plant	Toronto	ON	0000000743	3-23	3-49	5-56														
NRI Industries Inc., Symington Plant	Toronto	ON	0000000742	3-49																

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in																	
				4-3	4-6	4-8	4-12	4-20	4-24	4-35	4-45	4-51	5-3	5-8	5-12	5-24	5-42	5-52	5-58		
Nucor Steel	Plymouth	UT	84330NCRST7285W	4-3	4-6	4-8	4-12	4-20	4-24	4-35	4-45	4-51	5-3	5-8	5-12	5-24	5-42	5-52	5-58		
Nucor Steel - Texas, Nucor Corp.	Jewett	TX	75846NCRSTHWY79	4-34	4-50	5-57															
Nucor Steel Arkansas Plant, Nucor Corp.	Blytheville	AR	72315NCRST7301E	4-3	4-8	4-12	4-24	4-35	4-45	4-51	5-8	5-24	5-42	5-58							
Nucor Steel, Nucor Corp.	Huger	SC	29450NCRST1455H	4-24	4-35	4-51	5-58														
Nucor Steel, Nucor Corp.	Darlington	SC	29532NCRSTBOX52	4-24	4-35	4-51	5-58														
Nucor Steel, Nucor Corp.	Crawfordsville	IN	47933NCRST400SO	4-3	4-8	4-12	4-24	4-51	5-3	5-8	5-12	5-24	5-42	5-58							
Nucor-Yamato Steel Co., Nucor Corp.	Blytheville	AR	72316NCRYM5929E	4-3	4-6	4-8	4-12	4-20	4-24	4-35	4-45	4-51	5-3	5-6	5-8	5-12	5-20	5-24	5-42	5-52	5-58
Nu-Foam Prods. Inc., Ohio Decorative Prods. Inc.	Chattanooga	TN	37406NFMPPR1101W	3-6	3-20																
Nutra-Flo Co.	Sergeant Bluff	IA	51054NTRFL2717P	3-51																	
Oakside Chemicals Limited, Oakside Investments Limited	London	ON	0000003968	4-32	5-39																
Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne	NC	28429CCDNTOFFST	3-3	3-6	3-8	3-12	3-20	3-24	3-35	3-45	3-51	5-3	5-6	5-8	5-12	5-20	5-24	5-52	5-58	
Occidental Chemical Corp., Occidental Petroleum Corp.	Convent	LA	70723CCDNTHIGHW	4-20	4-45																
Olin Brass Indianapolis, Olin Corp.	Indianapolis	IN	46241BRDGP1800S	4-34	4-44	4-50	5-41	5-51	5-57												
Oregon Metallurgical Corp., Allegheny Teledyne Inc.	Albany	OR	97321RGNMT530W3	3-35																	
Oregon Steel Mills Inc.	Portland	OR	97203RGNST14400	4-3	4-8	4-12	4-24	4-50	5-8	5-24	5-57										
OSI Specialties Inc., Witco Corp.	Friendly	WV	26175NNCRBSTATE	4-34	5-41																
Osram Sylvania Prods. Inc., Osram GMBH	Versailles	KY	40383GTPRD900TY	3-34	5-41																
O'Sullivan Corp.	Winchester	VA	22601SLLVN1944V	3-34																	
Owen Electric Steel Co. of SC, Commercial Metals Co.	Cayce	SC	29033WNLCT310NE	4-51																	
Owens-Corning Canada Inc.	Edmonton	AB	0000001251	4-42	4-48	5-55															
Owens-Corning Canada Inc., Guelph Glass Plant	Guelph	ON	0000003287	3-48	4-32	4-48	5-39	5-55													
Owens-Corning Canada Inc., Owens Corning Fiberglas Corp.	Candiac	QC	0000001858	3-42	4-48																
Oxy Durez Holding Company Inc., Occidental Petroleum Corp.	Fort Erie	ON	0000000656	4-32																	
P4 Production L.L.C.	Soda Springs	ID	83276MNSNTHIGHW	3-8	3-24	3-35	3-45	3-51	5-58												
Paintplas Inc.	Ajax	ON	0000000733	3-11	3-33	5-11															
Palliser Furniture Ltd, Defehr Division	Winnipeg	MB	0000001866	3-33																	
Papiers Domtar - Centre d'affaires Windsor	Windsor	QC	0000001195	3-11	3-33	5-11	5-40														

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Parmalat Canada	Winchester	ON	0000003840	3-33 5-40
Parmalat Canada	Victoriaville	QC	0000005618	4-33 5-40
Patio Chef Co. LLC	Licking	MO	65542LCKNGRTE63	3-35
PCI Chemicals Canada Inc, Pioneer Companies Inc.	Cornwall	ON	0000003438	4-32 4-42 5-49
PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar	LA	70734RCDNCHIGHW	3-3 3-12 3-35 5-3 5-12 5-42
PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora	NC	27806TXSGLHIGHW	3-3 3-12 3-34 5-3 5-12
PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	White Springs	FL	32096CCDNTSTATE	3-3 3-12
PD Glycol, Occidental Petroleum Corp.	Beaumont	TX	77704PDGLYGULFS	4-34 4-44 5-41 5-51
Penford Prods. Co., Penford Corp.	Cedar Rapids	IA	52406PNFRD1001F	4-3 4-12
Petro-Canada, Burrard Products Terminal	Port Moody	BC	0000003905	4-11 4-19 4-33 4-43 5-19 5-40 5-50
Petro-Canada, Edmonton Refinery	Edmonton	AB	0000003903	3-32 4-43
Petro-Canada, Mississauga Lubricant Center	Mississauga	ON	0000003899	4-42 5-49
Petro-Canada, Raffinerie de Montréal	Montréal	QC	0000003897	3-23 3-32 3-42 3-48 4-43 5-39
Pétroles Coastal Canada Inc., Coastal Corporation	Montréal-est	QC	0000004569	3-33 3-43 5-40
Pétromont, Société en commandite	Varenes	QC	0000003634	3-11 3-42
Pétromont, Société en commandite	Montréal-est	QC	0000003635	3-32 5-39
Pfizer Inc.	Groton	CT	06340PFZRNEASTE	4-3 4-12 4-35
Pfizer Pharmaceuticals Inc., Pfizer Inc.	Barceloneta	PR	00617PFZRPHIGHW	4-6 4-20 4-34 5-6 5-20 5-41
Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo	PR	00617THPJHHIGHW	3-6 3-20 3-44 4-6 4-20 4-45 5-6 5-20
Pharmacia & Upjohn Inc.	Portage	MI	49001THPJH7171P	3-34 3-44 3-50 4-3 4-6 4-12 4-20 4-35 4-45 5-3 5-6 5-12 5-20 5-41
Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas	NM	88009PHLPSHDAL	3-3 3-6 3-8 3-12 3-20 3-24 3-34 3-50 5-3 5-6 5-8 5-12 5-20 5-24 5-41 5-57
Philip Services Corp., Philip Enterprises Inc.	Guelph	ON	0000001067	4-11 4-19 4-23 4-33 4-43 4-49 5-19 5-23 5-50 5-56
Philips Display Components Co., North American Philips Corp.	Ottawa	OH	45875PHLPS700NO	4-44 4-50 5-51 5-57
Phytogen Pharmaceuticals Inc., Phytogen Life Sciences Inc.	Delta	BC	0000004590	4-19 4-43 5-50
Pioga LLC, Creative Design & Mfg., Pioneer Intl. Inc.	Nashville	GA	31639CRTVDHWY12	3-45
Piper Impact Inc.	New Albany	MS	38652PPRMPBOX72	3-44 5-51
Plastcoat, Decoma International Inc.	Mississauga	ON	0000003030	3-32
Plum Creek Mfg. LP, Plum Creek Timber Co. LP	Columbia Falls	MT	59912PLMCRPOBOX	3-45

Appendix B		List of Facilities that Appear in Tables				
1997		List of Facilities that Appear in Tables				
Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in		
Polaroid Corp.	Waltham	MA	02254PLRDC1265M	4-34		
Potlatch Corp., Minnesota Pulp & Paper Div.	Cloquet	MN	55720PTLTCNORTH	4-3	4-12	4-35
PPG Canada Inc., Clarkson Coatings Facility	Mississauga	ON	0000001953	4-11	4-32	
PPG Ind. Inc.	Lake Charles	LA	70669PPGNDCOLUM	4-6	4-20	4-45
Prestolite Wire Corp.	Paragould	AR	72450PRSTLONEPR	4-24	4-35	4-51 5-58
Prévost Car Inc., usine du boulevard Gagnon, Volvo Bus Corp.	Ste-Claire	QC	0000004367	3-33		
Produits American Biltrite Ltée., American Biltrite Inc.	Sherbrooke	QC	0000001083	3-42	3-48	
Produits Shell Canada Ltée., Raffinerie de Montréal-est	Montréal-est	QC	0000003127	3-49	4-19	4-43 4-49 5-56
Pro-Line Boats Inc., American Marine Holdings	Homosassa	FL	32646PRLNB1520S	3-44		
Protec Finishing Ltd.	Mississauga	ON	0000002543	4-23	4-49	5-23 5-56
Prototype Circuits Inc, Plant 1	Scarborough	ON	0000001993	4-48	5-55	
QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy	QC	0000004806	3-48	4-32	4-42 4-48 5-39 5-49 5-55
Quality Automotive Co., U.S. Automotive Mfg.	Tappahannock	VA	22560QLTYTRT627	4-44		
Quality Chemicals Inc., Chemfirst Corp.	Tyrone	PA	16686QLTYCINDUS	4-3	4-6	4-12 4-20 4-35 4-45 5-42 5-52
Quemetco Inc., RSR Corp.	Indianapolis	IN	46231QMTCN7870W	4-6	4-8	4-20 4-24 4-45 4-51 5-6 5-20 5-52
Quemetco Inc., RSR Corp.	City of Industry	CA	91745QMTCN720SO	4-6	4-8	4-20 4-24 4-45 5-6 5-20 5-52
Quin-T Corp.	Erie	PA	16512QNTCR140EA	4-44	5-51	
R.J. Reynolds Tobacco, Avoca Div., RJR Nabisco Holding Corp.	Merry Hill	NC	27957RJRYNSTATE	3-50		
Racine Steel Castings Div., BR Holdings Ltd.	Racine	WI	53404RCNST1442N	4-50		
Ranger Board Ltd., West Fraser Mills Ltd.	Blue Ridge	AB	0000004830	3-19	3-43	5-50
Raylo Chemicals Inc., Argyll Road Site, Laporte PLC	Edmonton	AB	0000004720	4-11	4-19	4-33 4-43 5-40 5-50
Recyclage d'aluminium Québec Inc., Philip Services Corp.	Bécancour	QC	0000002799	3-23	3-49	5-23
Recyclage d'aluminium Québec, Ragueneau, Philip Services Corp.	Baie-Comeau	QC	0000002801	3-23	3-49	5-23
Regal Ware Inc.	Kewaskum	WI	53040RGLWR20120	4-3	4-12	4-35 5-3 5-12 5-42
Reichhold Chemicals Inc.	Jacksonville	FL	32236RCHHLWESTB	4-6	4-20	4-45 5-20 5-52
Reichhold Limited, Weston Plant	Weston	ON	0000002022	4-42		
Reinforced Plastic Systems Inc., Mahone Bay Plant	Mahone Bay	NS	0000002031	3-43		
René Matériaux composites Ltée	St-Éphrem-de-Beauce	QC	0000004981	3-19	3-43	5-50
Rexam Metallising, Rexam Canada Ltd.	Brantford	ON	0000003580	3-32	5-39	
Reynolds Metals Co.	Sheffield	AL	35660RYNLD501W2	3-34	5-41	
Rhone-Poulenc Basic Chemicals, Rhone-Poulenc Inc.	Martinez	CA	94553STFFR100MO	4-50	5-57	

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Riverside Brass Ltd.	New Hamburg	ON	0000004978	3-49
Riverside Brass, Riverside Brass & Aluminum Foundry Ltd.	New Hamburg	ON	0000002544	3-48 5-55
Riverwood Intl. Corp.	Macon	GA	31206MCNKR4891M	3-51
Roanoke Electric Steel Corp.	Roanoke	VA	24017RNKLC102WE	4-8 4-24 4-35 4-45 4-51 5-24 5-42 5-58
Roche Vitamins Inc., Hoffmann-La Roche Inc.	Freeport	TX	77541HFFMN1000C	4-20
Rockwell International of Canada, Tilbury Brake Plant	Tilbury	ON	0000004770	3-48
Rouge Steel Co., Rouge Ind. Inc.	Dearborn	MI	48121RGSTL3001M	4-3 4-8 4-12 4-24 4-35 4-51 5-3 5-8 5-12 5-24 5-42 5-58
Royal Oak Ents. Inc., Kenbridge Kilns	Kenbridge	VA	23944RYLKNHWY13	3-35
Rubicon Inc.	Geismar	LA	70734RBCNN9156H	3-3 3-12 3-20 3-45 5-3 5-6 5-12 5-20 5-52
S.D. Warren Co.	Westbrook	ME	04092SDWRR89CUM	4-50 5-57
S.D. Warren Co.	Muskegon	MI	49443SDWRR2400L	4-3 4-12
Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy	QC	0000003953	3-11 3-32 3-42 3-48 4-6 4-11 4-19 4-23 4-33 4-43 4-49 5-11 5-19 5-23 5-50 5-56
Sandvik Steel Canada, Sandvik Steel, Inc.	Arnprior	ON	0000004524	3-19 3-42 5-19
Schenectady Canada Ltd.	Scarborough	ON	0000004175	4-11 4-33
Schering-Plough Prods. Inc., Schering-Plough Corp.	Las Piedras	PR	00671KYPHRPRIDC	3-44 5-51
Schuylkill Metals Corp., Exide Corp.	Baton Rouge	LA	70874SCHYLWESTE	3-50
Scot Forge Co.	Spring Grove	IL	60081SCTFR8001W	4-6 4-20 4-45 5-52
Secal, usine Vaudreuil	Jonquière	QC	0000002978	3-33 5-40
Selmer Co. Inc., Vincent Bach Div.	Elkhart	IN	46515THSLM500IN	3-45
Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna	ON	0000003962	3-23 3-42 3-48 4-19 4-43 5-19
Shell Chemical Co., Shell Oil Co.	Belpre	OH	45714SHLLC2982W	4-35
Shell Chemical Co., Shell Oil Co.	Geismar	LA	70737SHLLCRIVER	3-45 5-52
Shell Oil Co.	Deer Park	TX	77536SHLLLHIGHW	3-34 4-6 4-20 4-45 5-6 5-20 5-41
Shepherd Chemical Co.	Cincinnati	OH	45212THSHP4900B	4-3 4-12
Sherritt International Corporation	Fort Saskatchewan	AB	0000002132	3-32 3-48 4-42 4-48 5-39 5-55
Shieldalloy Metallurgical, Metallurg Inc.	Newfield	NJ	08344SHLDLWESTB	4-6 4-20 4-45 5-20
Shieldalloy Metallurgical, Metallurg Inc.	Cambridge	OH	43725SHLDLSTATE	4-50
Sico Inc., Sico #2 Longueuil	Longueuil	QC	0000003456	4-32
Sifto Canada Inc., North American Salt Co.	Unity	SK	0000002152	3-48

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena	TX	77506SMPSNNORTH	3-44 4-3 4-12 4-34 5-3 5-12 5-41 5-51
Sivaco Québec	Marieville	QC	0000003812	4-23
Skeena Cellulose Inc., Skeena Pulp Operations	Skeena	BC	0000002158	3-11 3-32 5-39
Slater Steels, Ft. Wayne Spec. Alloys Div.	Fort Wayne	IN	46801SLTRS2400T	4-34 4-44 4-50 5-51 5-57
Slater Steels, Hamilton Specialty Bar Division	Hamilton	ON	0000002161	3-23 4-6 4-8 4-11 4-19 4-23 4-33 4-42 4-49 5-11 5-19 5-23 5-49 5-56
Smith & Nephew Inc.	Lachine	QC	0000002167	3-43
Société canadienne de métaux Reynolds, Reynolds Metals Co.	Baie-Comeau	QC	0000002038	3-11 4-49
Société d'électrolyse et de chimie Alcan, usine Arvida	Jonquière	QC	0000003406	3-33
Solutia Canada Inc., Produits chimiques	LaSalle	QC	0000001648	4-11 4-19 4-33 4-42 5-49
Solutia Inc.	Springfield	MA	01151MNSNT730WO	4-6 4-20 4-34 4-44 5-51
Solutia Inc.	Gonzalez	FL	32533MNSNT3000O	3-3 3-12 3-35 5-3 5-12 5-42
Solutia Inc.	Cahokia	IL	62206MNSNT500MO	4-34
Solutia Inc., Chocolate Bayou	Alvin	TX	77511SLTNCFM291	3-6 3-20 3-35 3-45 5-6 5-20 5-42 5-52
Sorevco, Société en commandite, Ispat Sidbec	Coteau-du-Lac	QC	0000004328	4-8 4-11 4-23 4-33 4-49 5-11 5-23 5-40 5-56
Southwire Co.	Carrollton	GA	30119CPRDCENTR	4-3 4-6 4-8 4-12 4-20 4-24 4-35 4-45 4-51 5-8 5-24 5-42 5-52 5-58
Specified Fuels & Chemicals	Channelview	TX	77530HWLLC1201S	4-6 4-20 4-45
Spectra Anodizing Ltd.	Woodbridge	ON	0000002168	4-23 4-49 5-56
Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster	SC	29720SPRNGGRACE	3-8 3-24 3-35 3-45 3-51 5-42 5-58
Spruce Falls Inc., Tembec Inc.	Kapuskasing/O'Brien	ON	0000002173	3-23 3-49
Squibb Mfg. Inc., Bristol-Myers Squibb Co.	Humacao	PR	00661SQBBMSTATE	4-6 4-20 4-35 4-45 5-52
St. Anne-Nackawic Pulp Company Ltd.	Nackawic	NB	0000002181	3-11 3-23 3-42 5-11 5-49
Standard Products (Canada) Limited, Rubber Plant #1	Stratford	ON	0000002176	3-11 3-32 5-39
Standard Products (Canada) Limited, Rubber Plant #2	Stratford	ON	0000004409	4-23 4-48 5-55
Standard Products (Canada) Limited, Rubber Plant #4	Mitchell	ON	0000004411	4-48 5-55
Star Enterprise	Delaware City	DE	19706TXCDL2000W	3-45 3-51
Steel Dynamics Inc.	Butler	IN	46721STLDY4500C	4-3 4-8 4-12 4-24 4-35 4-45 4-51 5-3 5-8 5-12 5-24 5-42 5-52 5-58
Stelco Inc., Hilton Works	Hamilton	ON	0000002984	3-19 3-23 3-33 3-43 4-11 4-19 4-33 4-43 4-48 5-11 5-19 5-40 5-50 5-55

Appendix B		List of Facilities that Appear in Tables										
1997												
Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in								
Stelco McMaster Ltée, Stelco Inc.	Contrecoeur	QC	0000002986	3-23	3-49	4-3	4-8	4-11	4-19	4-23	4-33	4-43
				4-49	5-8	5-11	5-19	5-23	5-40	5-50	5-56	
Stelfil Ltée, Stelco Inc.	Lachine	QC	0000003568	4-23	4-48	5-23						
Stelpipe Ltd, Steel Tube Manufacturing	Welland	ON	0000003403	4-48	5-55							
Stelwire Ltd., Parkdale Works	Hamilton	ON	0000004045	4-11	4-23	4-49	5-23	5-56				
Sterling Chemicals Inc.	Texas City	TX	77592STRLN201BA	3-3	3-6	3-12	3-20	3-34	5-6	5-20	5-41	
Stone Container Corp.	Hopewell	VA	23860STNHP910IN	4-3	4-12							
Stone Container Corp.	Panama City	FL	32401STNCN1EVER	4-3	4-12	4-35	5-3	5-12				
Structural Metals Inc., Commercial Metals Co.	Seguin	TX	78156STRCTPOBOX	4-51								
Sunworthy Wallcoverings, Borden Co. Ltd.	Brampton	ON	0000002263	3-11	5-11							
Suzorite Mica Products Inc., Mica Plant, Zemex Corp.	Boucherville	QC	0000004573	3-42	5-49							
Sydney Steel Corporation	Sydney	NS	0000004204	3-23	3-32	3-42	3-48	5-23	5-39	5-49	5-55	
Talley Metals Tech. Inc., Talley Ind. Inc.	Hartsville	SC	29550TLLYMSCHWY	4-34	4-44	4-50						
Tamis CAE Inc., CAE Inc.	Lennoxville	QC	0000004320	4-42	4-48	5-55						
Techno Caoutchouc Inc., Soucy International Inc.	Rock Forest	QC	0000002975	3-42								
Tenneco Packaging, Tenneco Inc.	Tomahawk	WI	54487NKSPCN9090	3-24	3-51							
Tennessee Eastman Div., Eastman Chemical Co.	Kingsport	TN	37662TNNSEASTM	3-3	3-12	3-34	5-12					
Tennessee Mat Co.	Nashville	TN	37210MCLQD1414F	3-45	5-52							
Terra International (Canada), Terra Nitrogen (Courtright)	Courtright	ON	0000002233	4-42								
Tesa Tape Inc.	Middletown	NY	10940TSTCKCROTT	3-35								
Teva Pharmaceuticals USA, Teva Pharmaceutical Ind. Ltd.	Mexico	MO	65265BCRFT5000C	4-34								
Texas Fibers, Leggett & Platt Inc.	Brenham	TX	77833TXSFB1200R	3-44								
Thomson Consumer Electronics, Thomson Multimedia S.A.	Circleville	OH	43113THMSN24200	4-20								
Three Rivers Refy., Ultramar Diamond Shamrock Corp.	Three Rivers	TX	78071DMNDS301LE	3-35								
Timken Co., Faircrest Steel Plant	Canton	OH	44706THTMK4511F	4-3	4-8	4-12	4-24	4-35	4-45	4-51	5-8	5-24
				5-42	5-52	5-58						
Timken Co., Harrison Steel Plant	Canton	OH	44706HRRSNHARRI	4-8	4-24	4-35	4-51	5-24	5-42	5-58		
Tippecanoe Labs., Eli Lilly & Co.	Shadeland	IN	47905LLLLYLILLY	3-34	3-44	4-35	4-45					
Titan Steel & Wire Co. Ltd., Mitsui & Co., Ltd.	Surrey	BC	0000004307	4-32	4-42	4-48	5-39	5-49	5-55			
Tokico USA Inc.	Berea	KY	40403TKCSN301MA	3-44								

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Tomkins Ind. Inc., Lasco Bathware Div.	Cordele	GA	31015PHLPS210S0	3-6 3-20 3-45
Tomkins Ind. Inc., Lasco Bathware Div.	Three Rivers	MI	49093PHLPS15935	3-6 3-20
Tonolli Canada Limited	Mississauga	ON	0000002256	4-6 4-11 4-19 4-23 4-33 4-43 4-49 5-19 5-23 5-50 5-56
Toyota Motor Manufacturing Canada Inc.	Cambridge	ON	0000003790	3-33
Trentonworks Ltd., Greenbrier Companies	Trenton	NS	0000004993	3-49
Trinity American Corp.	High Point	NC	27263TRNTYHWY31	3-44 5-51
Tuscaloosa Steel Corp., British Steel PLC	Tuscaloosa	AL	35404TSCLS1500H	4-8 4-24 4-35 4-51 5-42 5-58
TXI Ops. L.P.	Midlothian	TX	76065TXSND245WA	3-24 3-51
U.S. Pipe & Fndy. Co., Walter Ind. Inc.	Birmingham	AL	35207NTDST30003	3-24
U.S. Pipe & Fndy. Co., Walter Ind. Inc.	Union City	CA	94587NTDST1295W	4-50 5-57
U.S. Steel, USS Gary Works, USX Corp.	Gary	IN	46402SSGRYONENO	3-3 3-8 3-12 3-24 3-35 3-51 5-3 5-8 5-12 5-24 5-42 5-58
U.S. Sugar Corp.	Bryant	FL	33438NTDSTOFFUS	3-50
U.S. Sugar Corp./Western Div.	Clewiston	FL	33440NTDSTSOUTH	3-50
U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs	AR	71901SVNDM5911M	3-6 3-8 3-20 3-24 3-45 3-51
UCP Paints	Baie d'Urfé	QC	0000003450	4-32
Uniboard Canada Inc., Division Mont-Laurier	Mont-Laurier	QC	0000000758	3-19 4-42
Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec	QC	0000002989	3-19 3-33 3-43 4-11 4-19 4-33 4-43 5-19 5-40 5-50
Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc	Val-d'Or	QC	0000004060	3-19 3-33 3-43 5-50
Uniboard Canada Inc., Unires	Val-d'Or	QC	0000003381	4-42
Unicell Limited	Toronto	ON	0000005605	3-43
Union Camp Corp.	Franklin	VA	23851NNCMPHIGHW	4-51
Union Camp Corp.	Eastover	SC	29044NNCMPROUTE	3-51
Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County	AB	0000002316	3-11 3-32 5-39
Union Carbide Corp.	South Charleston	WV	25303NNCRB437MA	4-20 4-45
Union Carbide Corp.	Texas City	TX	77592NNCRB33015	4-12 4-44
Uniroyal Chemical Co. Inc., Crompton & Knowles Corp.	Geismar	LA	70734NRYLCPOBOX	4-34
Universal-Rundle Corp., Nortek Inc.	Ottumwa	IA	50501NVRSL2908N	3-45
Unocal Molycorp, Unocal Corp.	Mountain Pass	CA	92366MLYCRI15AN	3-34

Appendix B		List of Facilities that Appear in Tables											
1997													
Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in									
USS Clairton Works, USX Corp.	Clairton	PA	15025SSCLR400ST	4-3	4-12	4-35	5-3	5-12	5-42				
USS Fairfield Works, USX Corp.	Fairfield	AL	35064SSFRFVALLE	3-3	3-8	3-12	3-24	3-35	3-51	5-8	5-24		
USS Mon Valley Works, USX Corp.	Braddock	PA	15104SSDGRBRADD	4-3	4-8	4-12	4-24	4-35	4-51	5-8	5-24	5-42	
USS/Kobe Steel Co.	Lorain	OH	44055SSLRN1807E	3-50									
Valéo Engine Cooling Limited, Automotive Division	Stratford	ON	0000002329	4-42	4-48	5-55							
Valle Foam Industries Inc., Valle 1	Brampton	ON	0000004428	3-19	5-19								
Valle Foam Industries Inc., Valle 2	Brampton	ON	0000004429	3-19	3-42								
Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock	ON	0000001547	3-48	4-32	4-48	5-55						
Velcro Canada Inc., Velcro Industries B.V.	Brampton	ON	0000004210	3-32	5-39								
Versatech Industries, Apex Metals Inc.	Kitchener	ON	0000004703	4-32	4-48	5-39	5-55						
Vicksburg Chemical Co.	Vicksburg	MS	39180CDRCHPOBOX	3-3	3-12	3-35	5-3	5-12					
Vintex Inc.	Mount Forest	ON	0000002355	3-48									
Vitafoam Inc.	High Point	NC	27263LPFMN2222S	3-44	5-51								
Vitafoam Inc., British Vita PLC	Tupelo	MS	38801LPFMN1118C	3-6	3-20	3-45	5-52						
Vitafoam Inc., British Vita PLC	Tupelo	MS	38802LYMPC1116S	3-44	5-51								
Vitafoam Products Canada Ltd.	Calgary	AB	0000004553	3-19									
Vitafoam Products Canada Ltd.	Winnipeg	MB	0000004554	3-43									
Vitafoam Products Canada Ltd., Vita-Toronto	Downsview	ON	0000004552	3-19	4-42	5-19	5-49						
Vulcan Containers Ltd., Metal Decorating Lithographers	Toronto.	ON	0000005650	3-49									
Wabash Alloys L.L.C., Connell LP	Wabash	IN	46992WBSHLOLDUS	3-50									
Wabash Alloys, Wabash Alloys Ontario	Toronto	ON	0000002357	3-23	4-49								
Wagner Brake, Cooper Ind. Inc.	Scottsville	KY	42164WGNRB26400	4-6	4-20	4-45	5-6	5-20	5-52				
Waltec Forgings Incorporated, EMCO Limited	Wallaceburg	ON	0000004432	4-32									
Warner-Lambert Co., Parke-Davis Div.	Holland	MI	49424PRKDV188HO	4-12	4-34								
Wayne Pigment Corp.	Milwaukee	WI	53204WYNPG300SB	4-20	4-45	5-52							
WCI Steel Inc.	Warren	OH	44481WRRNW1040P	3-24									
West Fraser Mills Ltd., Westpine, MDF	Quesnel	BC	0000005108	3-43	5-50								
Westaim Corporation, Fort Saskatchewan Site	Fort Saskatchewan	AB	0000004885	4-49									
Western Co-Operative Fertilizers Limited	Calgary	AB	0000002376	4-32	4-42	5-39	5-49						

Appendix B

1997

List of Facilities that Appear in Tables

Facility Name	City	Province/ State	PRTR ID Number	Tables Facility Appears in
Western Pulp Limited Partnership, Port Alice Operation	Port Alice	BC	0000002377	3-33
Western Star Trucks Incorporated	Kelowna	BC	0000004303	3-33
Westvaco Corp., Bleached Board Div.	Covington	VA	24426WSTVCRIVER	3-3 3-12
Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops	BC	0000002924	3-23 3-49 4-23 4-33 4-49 5-23 5-56
Weyerhaeuser Canada Ltd.	Grande Prairie	AB	0000002875	3-23 3-49
Weyerhaeuser Canada Ltd., Drayton Valley O.S.B. Mill	Drayton Valley	AB	0000002760	3-19 5-19
Weyerhaeuser Canada Ltd., Edson O.S.B. Mill	Edson	AB	0000002762	3-19 5-19
Weyerhaeuser Canada Ltd., Slave Lake O.S.B. Mill	Slave Lake	AB	0000002764	3-19 3-43
Weyerhaeuser Co.	Valliant	OK	74764WYRHSHIGHW	3-51
Weyerhaeuser Co.	Longview	WA	98632WYRHS3401I	3-6 3-12 3-20 3-44 5-51
Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert	SK	0000003610	3-11 3-23 3-32 3-49 5-11 5-39
Wheatland Tube Co., John Maneely Co.	Chicago	IL	60609MNLYL4435S	3-44
Wheeling-Pittsburgh Steel Corp., Steubenville East Plant	Follansbee	WV	26037WHLNGROUTE	3-34
Wheeling-Pittsburgh Steel Corp., Wheeling-Pittsburgh Corp.	Martins Ferry	OH	43935WHLNG1134M	4-50 5-57
Wheeling-Pittsburgh Steel Corp., Wheeling-Pittsburgh Corp.	Mingo Junction	OH	43952WHLNGMCLIS	4-50 5-57
Willamette Ind. Inc.	Bennettsville	SC	29512WLLMTHWY9A	3-44
Willamette Ind. Inc.	Campiti	LA	71411WLLMTHIGHW	3-51
Witco Canada Inc., West Hill Plant	Scarborough	ON	0000003553	3-11 4-11 4-33 5-11 5-40
Witco Corp., Gretna Plant	Harvey	LA	70058WTCCR1805F	3-34 5-41
Witt Co., Muncie Galvanizing Div.	Muncie	IN	47302NDNGL2415S	4-50
Wolverine Tube (Canada) Inc.	London	ON	0000002396	3-19 3-42 5-49
Wolverine Tube (Canada) Inc., Strip Operation	Fergus	ON	0000002715	3-48
Woodbridge Foam Corporation, Kipling Plant, Woodbridge Group	Woodbridge	ON	0000002388	3-42
Wyeth - Ayerst, Canada Inc., American Home Products	St-Laurent	QC	0000003867	3-42 5-49
Zalev Brothers Limited	Windsor	ON	0000004980	4-8 4-11 4-19 4-23 4-33 4-43 4-49 5-11 5-19 5-23 5-40 5-56
Zinc Corp. of America, Horsehead Ind. Inc.	Monaca	PA	15061ZNCCR300FR	3-50 4-3 4-6 4-8 4-12 4-20 4-24 4-34 4-44 4-50 5-3 5-6 5-8 5-12 5-20 5-24 5-41 5-51 5-57
Zinc Corp. of America, Horsehead Ind. Inc.	Bartlesville	OK	74003ZNCCR11THA	4-6 4-20 4-24 4-44 4-50
ZTT Minerals Inc., Babcock Intl.	Caldwell	TX	77836ZTTMNBURLE	4-24 4-45 4-51 5-52 5-58

Appendix C-1

1997

Human Health Effects of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

Note 1: Chemicals can have a variety of health and environmental effects, and the fact that a chemical is reported to NPRI or TRI does not mean that it is considered to pose toxic risks to humans. In some cases, chemicals may be of greater concern for effects on ecosystems. For example, a relatively non-toxic chemical may serve as an excess nutrient in aquatic systems, leading to a buildup of algae that can deplete oxygen and kill fish and other aquatic life (eutrophication). Other chemicals may be of concern because they contribute to acid precipitation or lead to the formation of tropospheric ozone (photochemical smog). Further, all effects are dose-dependent and may not occur at levels found in the environment or associated with PRTR releases. Effects shown in workers are likely to reflect exposures significantly higher than those occurring in the environment. PRTRs do not collect data on exposure or risk associated with the releases they report.

Note 2: The data in this table reflect three sources:

- *ToxFAQs* distributed by the US Agency for Toxic Substances and Disease Registry
- *Chemical Fact Sheets* distributed by the Office of Pollution Prevention and Toxics of the US Environmental Protection Agency
- *Hazardous Substance Fact Sheets* distributed by the New Jersey Department of Health and Senior Services

Data from these sources were extracted in the above order, such that if multiple sources had documented toxic effects, the ATSDR data were taken as a first preference, followed by US EPA and New Jersey data.

CAS Number	Name	Source	High Exposure Effects	Longer and Lower Exposure Effects
75-07-0	Acetaldehyde	EPA	Inhalation can irritate respiratory system. Contact with liquid or vapor irritates eyes and skin.	Limited evidence from animal studies shows can affect developing fetus. Repeated inhalation in animals can severely damage respiratory tract and cause cancer.
75-05-8	Acetonitrile	EPA	Range from abnormal salivation, vomiting, confusion, rapid breathing and heart rate to coma and death. Contact with liquid or vapor is irritating to skin, eyes, nose and throat.	Adverse effects on blood, nervous system, lungs, liver and thymus, as well as fetal toxicity in laboratory studies.
7429-90-5	Aluminum (fume or dust)	ATSDR	Inhalation effects include coughing and asthma. Large doses in medical settings have led to bone disease.	Delays in skeletal and neurological development in laboratory studies. Association with Alzheimer's disease of uncertain nature.
1344-28-1	Aluminum oxide (fibrous forms)	NJDOH	Inhalation can irritate the lungs, can also irritate eyes, nose and throat.	Same as acute.
—	Antimony (and its compounds)	ATSDR	Inhalation effects include irritation (eyes and lung), heart and lung problems, stomach pain, diarrhea, vomiting and stomach ulcers. Ingestion can cause vomiting.	Eye irritation, hair loss, lung damage, heart problems, and fertility problems in laboratory studies; liver and kidney damage and death at higher exposures. Skin irritation with prolonged contact.
1332-21-4	Asbestos (friable)	ATSDR	Inhalation leads to asbestosis (scar tissue buildup in lungs and surrounding tissue)	A known carcinogen by inhalation: lung cancer and mesothelioma (cancer of the tissues lining the chest cavity). Some evidence for cancer of stomach, intestines, esophagus, pancreas, and kidneys. Risks from ingestion unclear.

Appendix C-1

1997

Human Health Effects of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS Number	Name	Source	High Exposure Effects	Longer and Lower Exposure Effects
71-43-2	Benzene	ATSDR	Inhalation leads to drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, unconsciousness and death. Ingestion can cause vomiting, irritation of stomach, dizziness, sleepiness, convulsions, rapid heart rate and death.	Harmful effects on bone marrow resulting in anemia, excessive bleeding and immune impairment. Can cause irregular menses and decreased ovary size. Developmental delays and bone marrow damage seen with prenatal exposure in animals. Long-term exposure to high levels is known to cause cancer (leukemia) in humans.
71-36-3	n-Butyl alcohol	EPA	Inhalation leads to headaches. Contact with liquid or vapor irritates eyes, nose, throat. Contact with liquid irritates skin.	Adverse eye effects and hearing loss in exposed workers. Adverse effects on thyroid, blood, lungs, intestine, liver, kidneys and nervous system in laboratory studies.
—	Cadmium (and its compounds)	ATSDR	Breathing high levels severely irritates lungs and can cause death. Ingesting very high levels severely irritates stomach.	Builds up in kidneys and can cause kidney disease, may also lead to lung damage and fragile bones. In animals, causes high blood pressure, iron deficiency in blood and damage to nervous system.
75-15-0	Carbon disulfide	ATSDR	Inhalation effects include headache, fatigue, sleep disturbance, breathing changes and chest pains. Skin burns from dermal contact.	Nerve changes in workers. Effects on brain, liver, and heart, as well as fetal toxicity in laboratory studies.
7782-50-5	Chlorine	EPA	Effects range from coughing and chest pain to water retention in the lungs; irritation to skin, eyes, and respiratory system.	Adverse effects on immune system, blood, heart, and respiratory system in laboratory studies.
10049-04-4	Chlorine dioxide	N/A	No source distinguishes from chlorine.	No source distinguishes from chlorine.
—	Chromium (and its compounds)	ATSDR	Hexavalent forms (Cr VI) are more toxic than trivalent (Cr III). Inhalation effects include irritation/damage to nose, lungs, stomach and intestines. Some persons are allergic and high exposure may trigger asthma. Ingestion effects include stomach upset and ulcers, convulsions, damage to kidneys and liver, and death.	Some Chromium VI compounds are known human carcinogens, based both on exposed workers and also on laboratory studies. Animal studies indicate reproductive effects and fetal toxicity.
—	Copper (and its compounds)	NJDOH	Exposure to dust and fumes can irritate eyes, nose and throat. May also cause "metal fume fever," with symptoms similar to flu. Onset may be delayed for hours or days following exposure.	May decrease fertility in both males and females. Repeated exposure can cause chronic irritation of nose and even perforation of septum. May also lead to thickening and greenish coloration of skin, coloration of teeth and hair. Repeated high exposure can affect liver.
110-82-7	Cyclohexane	EPA	Nervous system effects ranging from headaches to anesthesia, tremors and convulsions. Contact with liquid or vapor can damage eyes.	Repeated exposure to large doses causes nervous system effects, eye damage and respiratory effects in animals. Under investigation for reproductive and developmental effects.

Appendix C-1

1997

Human Health Effects of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS Number	Name	Source	High Exposure Effects	Longer and Lower Exposure Effects
75-09-2	Dichloromethane	ATSDR	Inhalation effects include slower reaction time, loss of fine motor control, dizziness, nausea, tingling or numbness in fingers and toes, increasing up to unconsciousness or death. Dermal contact causes burning sensation and skin reddening; contact with eyes can burn cornea.	Impairment of hearing and vision. Causes cancer in laboratory studies.
74-85-1	Ethylene	NJDOH	Inhalation can cause dizziness and lightheadedness and lead to unconsciousness. Skin contact with liquid can cause frostbite	None listed.
107-21-1	Ethylene glycol	ATSDR	Ingestion can lead to nausea, convulsions, slurred speech, disorientation, heart and kidney problems or death. Increased acidity of body tissues (metabolic acidosis).	Fetal toxicity at large doses in laboratory studies.
50-00-0	Formaldehyde	NJDOH*	Inhalation irritates nose mouth and throat. Higher concentrations can lead to fluid buildup (pulmonary edema) or spasm of windpipe, which can cause death. Contact with liquid can cause severe eye burns, irritation or burning of skin.	Causes cancer of the nasal passages in laboratory studies. Repeated exposure can cause bronchitis and asthma-like allergy. May cause skin allergy with heightened sensitivity to future low-level exposures.
7647-01-0	Hydrochloric acid	NJDOH	Inhalation can irritate the lungs, as well as mouth, nose and throat; higher exposures can lead to fluid buildup (pulmonary edema), a medical emergency. Dermal contact can cause severe, permanent eye and skin damage.	Repeated inhalation can lead to bronchitis. Exposure to vapor may cause erosion of teeth. Some evidence of increased lung cancer in exposed workers.
7664-39-3	Hydrogen fluoride	ATSDR	Inhalation effects include damage to lungs and heart, death. Dermal contact will burn skin and eyes.	Irritation of eyes, skin, and lungs.
—	Lead (and its compounds)	ATSDR	Exposure can affect almost every organ and system; most sensitive is central nervous system, particularly in children. Kidneys and immune system also affected. Premature births, growth deficits and mental impairment in offspring of exposed mothers.	Effects are more commonly observed after higher exposures; effects of low levels in adults are uncertain.
—	Manganese (and its compounds)	NJDOH*	Exposure to heated fumes can cause "metal fume fever" with symptoms similar to flu, as well as congestion and coughing (manganese "pneumonia").	Repeated exposure may cause brain damage, with ultimate effects resembling Parkinson's disease. May damage liver, kidney, lungs.
67-56-1	Methanol	EPA	Ingestion effects range from headaches and lack of coordination to severe pain in abdomen, leg, and back and blindness following inebriation.	Headaches, sleep disorders, and gastrointestinal problems ranging up to optic nerve damage in workers and in laboratory studies.
78-93-3	Methyl ethyl ketone	ATSDR	Inhalation effects include irritation of nose, throat, skin and eyes. Laboratory studies have shown birth defects, unconsciousness and death; neural impairment at lower levels.	Studies not reported.

* Formaldehyde and manganese fact sheets issued in 1989 are being revised.

Appendix C-1

1997

Human Health Effects of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS Number	Name	Source	High Exposure Effects	Longer and Lower Exposure Effects
108-10-1	Methyl isobutyl ketone	EPA	Range from headaches, dizziness, nausea and numbness in fingers and toes to unconsciousness and death. Vapor irritates eyes, nose and throat. Liquid irritates eyes and skin.	Nausea, headaches, weakness and adverse liver effects in workers. Kidney and liver effects, as well as fetal toxicity, in laboratory studies.
—	Nickel (and its compounds)	ATSDR	Inhalation effects include bronchitis and reduced lung function. Ingestion leads to stomach problems, blood and kidney effects, as well as liver, immune system, and reproductive effects in laboratory studies.	Small amounts are essential for animal nutrition, may be for humans. Allergic skin rashes. Cancer of lung and nasal sinus seen in nickel workers, inhalation of insoluble nickel compounds caused cancer in laboratory studies.
—	Nitric acid and nitrate compounds	NJDOH	Inhalation of nitric acid can irritate the lungs, as well as mouth, nose and throat; higher exposures can lead to fluid buildup (pulmonary edema), a medical injury. Dermal contact can cause severe, permanent eye and skin damage.	Exposure to vapor may cause erosion of teeth.
108-95-2	Phenol	NJDOH	Can cause headache, dizziness, fatigue, fainting, weakness, nausea, vomiting and lack of appetite; at high levels may lead to collapse and death. Inhalation can irritate mouth, nose, throat and lungs. Can irritate the skin, causing deep damage without immediate pain; even gangrene may result.	May damage liver, kidneys, and heart, is a mutagen (causes cell mutations) and may therefore be carcinogenic. May cause nervous system damage.
7664-38-2	Phosphoric acid	NJDOH	Contact can severely damage skin and eyes, causing permanent damage. Breathing vapor can irritate nose, throat and lungs.	Repeated exposure to vapor can cause bronchitis. Long-term exposure to skin can cause drying and cracking.
85-44-9	Phthalic anhydride	EPA	Workers repeatedly exposed to large amounts have experienced irritation of eyes, skin and respiratory system. Lung sensitization has also been seen in humans and animals.	Repeated exposure has led to allergic bronchitis and asthma in workers. Animal studies show adverse effects in lungs, kidney, adrenal gland and thalamus (part of the brain). Limited evidence of effects on reproductive system.
115-07-1	Propylene	NJDOH	May cause dizziness, unconsciousness or death (due to lack of oxygen).	Long-term exposure may cause liver damage and irregular heartbeat.
100-42-5	Styrene	ATSDR	Inhalation effects include depression, trouble concentrating, muscle weakness, fatigue and nausea; possibly irritation of eye, nose and throat. Laboratory studies show damage to nose and liver, reproductive and fetal toxicity. Ingestion led to damage of liver, kidney, brain and lungs in laboratory studies.	Studies not reported.

Appendix C-1

1997

Human Health Effects of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS Number	Name	Source	High Exposure Effects	Longer and Lower Exposure Effects
7664-93-9	Sulfuric acid	NJDOH	Inhalation can irritate the lungs; higher exposures can lead to fluid buildup (pulmonary edema), a medical injury. Contact with skin and eyes can cause third-degree burns and blindness.	Repeated inhalation can lead to bronchitis, and may lead to emphysema. Exposure to vapor may cause chronic runny nose, tearing of the eyes, nosebleeds and stomach upset, as well as erosion and pitting of teeth. Some evidence of increased lung cancer in exposed workers.
108-88-3	Toluene	ATSDR	Dizziness, fatigue, unconsciousness and death. Permanent brain and nervous system damage from repeated high-level exposure, including speech damage, vision and hearing problems, loss of muscle control and poor balance. Also affects kidneys and leads to fetal toxicity.	Fatigue, confusion, weakness, appearance of intoxication, memory loss, nausea, loss of appetite, hearing loss.
79-01-6	Trichloroethylene	ATSDR	Inhalation leads to impaired heart function, coma and death; prolonged exposure can cause nerve, lung, kidney and liver damage. Ingestion may cause nausea, liver and kidney damage, convulsions, impaired heart function, coma and death.	For even short durations, small amounts by inhalation can cause headache, lung irritation, dizziness, poor coordination and difficulty concentrating. Ingestion can cause liver and kidney damage, nervous system effects, impaired immune function and impaired fetal development. Some (inconclusive) evidence of carcinogenicity.
1330-20-7	Xylene (mixed isomers)	ATSDR	Effects include headaches, lack of coordination, dizziness, confusion, and changes in balance. Short high levels can also cause irritation of skin, eyes, nose, and throat, difficulty breathing, lung problems, delayed reaction time, memory difficulties, stomach discomfort and possibly liver and kidney changes; unconsciousness and death at highest levels.	Prolonged exposure can lead to headaches, lack of coordination, dizziness, confusion and changes in balance. Fetal toxicity observed in high-dose laboratory studies.
—	Zinc (and its compounds)	ATSDR	Ingestion can lead to stomach cramps, nausea and vomiting. Inhalation can cause "metal fume fever," probably an immune reaction of lungs and body temperature. Dermal exposure causes skin irritation in laboratory studies.	An essential element in the human diet. Prolonged ingestion of excessive levels can cause anemia, damage to pancreas and reduction of beneficial cholesterol. Laboratory studies indicate effects on fertility and fetal size.

Appendix C-2

1997

Uses of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

Note 1: Releases and transfers reported to PRTRs may result from particular uses of the listed substances themselves. For example, many of the PRTR-listed substances are used as chemical agents in the production of other substances. Many also serve as solvents, which may be used in industrial processes or in cleaning (such as removing grease and oil from metal parts). PRTR-listed substances may be constituents of products sold for consumer uses, such as pesticides. Uses of chemicals reported in large amounts in 1997 are summarized below. However, uses described in this table and in other sources do not necessarily represent the majority of sources of releases and transfers of a substance. Releases and transfers also result from generation of listed substances as byproducts of production processes. A prime example is methanol, generated as a byproduct of a variety of processes, including chemical pulping in paper manufacture and the production of anhydrous ammonia (a fertilizer).

Note 2: Data in this table are drawn from:

- *ChemExpo Commercial Chemical Profiles* (< www.chemexpo.com > and click on Chemical Profiles)
- *ToxFAQs*, Agency for Toxic Substances and Disease Registry <www.atsdr.cdc.gov/toxfaq.html>
- *OPPT Chemical Fact Sheets*, EPA Office of Pollution Prevention and Toxics <www.epa.gov/chemfact/>
- *Chemical Backgrounders*, Environment Writer, National Safety Council's Environmental Health Center <www.nsc.org/EHC/ew/chemical.htm>
- *Kirk-Othmer Concise Encyclopedia of Chemical Technology* (New York and Toronto: John Wiley & Sons, 1985).

CAS Number	Name	Uses
75-07-0	Acetaldehyde	Principally used in production of other chemicals, especially acetic acid and related substances, also chemicals such as pyridine, pentaerythritol and peracetic acid. Used in producing perfumes, polyester resins and dyes. Used as a denaturant for alcohol and in fuel compositions and as a solvent in the rubber, tanning and paper industries. In food industries, used to preserve fruit and fish, as a flavoring agent and to harden gelatin.
75-05-8	Acetonitrile	Primarily used by chemicals industry to extract inorganic and organic chemicals, especially butadiene. Also used in the manufacture of pesticides.
7429-90-5	Aluminum (fume or dust)	Aluminum is often used in cooking utensils, containers (including cans and packaging), appliances and building materials, also in automotive and aircraft manufacture. Also used in paints and fireworks and to produce glass, rubber and ceramics. Compounds of aluminum are used in antacids and deodorants and to treat drinking water.
1344-28-1	Aluminum oxide (fibrous forms)	Most aluminum oxide is used in production of aluminum. Also used in flame-retardant fillers, preparation of aluminum compounds, pigments, adsorbents, catalysts, ceramics, refractories and abrasives.
—	Antimony (and its compounds)	A byproduct of smelting lead and other metals, antimony is used in alloys for lead storage batteries, solder, sheet and pipe metal, bearings, castings and pewter. Antimony oxide is added to as a fire retardant to plastics, textiles, rubber, adhesives, pigments and paper. Antimony oxide is also used in paints, ceramics and fireworks and in enameling plastics, metal and glass.
1332-21-4	Asbestos (friable)	Principal use is in asbestos cement products. Resistant to heat and most chemicals, asbestos fibers are also used in roofing shingles, paper products and friction products (automobile clutch, brake and transmission parts).
71-43-2	Benzene	Widely used in industry, including in production of other chemicals (especially styrene) used to make plastics, resins, nylon and synthetic fibers. Also used to make some types of synthetic rubbers and fibers, lubricants, dyes, detergents, drugs and pesticides. Used in plastic containers, adhesives, radios, toys, sporting goods, appliances, automobiles, tires and textiles. Benzene is also a component of gasoline.

Appendix C-2		Uses of Chemicals on the "Top 25" Lists for Releases, Transfers or Both
1997		
71-8AS Number	n-Butyl alcohol Name	Main use (more than half) is in production of butyl acrylate and methacrylate esters, used in making latex (water-based) paints. Added to plastics, hydraulic fluids and detergent formulations. Also used by pharmaceutical industry as an extractant and as an additive in certain medicines.
—	Cadmium (and its compounds)	Cadmium is used principally for electroplated coatings on steel and cast iron parts and in rechargeable nickel-cadmium batteries. Cadmium compounds are used in metal finishing and electronics manufacture, as well as in pigments, batteries and plastic stabilizers and as catalysts.
75-15-0	Carbon disulfide	Primarily used (more than half) in production of rayon. Also in production of chemicals for agriculture (fumigants), for production of rubber and cellophane. Some uses as an industrial solvent, including metal cleaning. Formerly, a principal use was as a feedstock for production of carbon tetrachloride, an ozone-depleting chemical.
7782-50-5	Chlorine	Used to make ethylene dichloride/vinyl chloride, polyurethanes and other organic chemicals. Used as a bleach in pulp and paper production. Also used in water and wastewater treatment.
10049-04-4	Chlorine dioxide	Used for bleaching (including pulp and paper, where it is replacing chlorine), in water treatment and for odor control. Used in the food industry to disinfect fruits and vegetables, meat and poultry, flume waters, and processing equipment. Also used in ammonia plants, pulp mills (slime control, paper machines), oil fields, scrubbing systems/odor control, textile bleaching and electronics manufacture. (Information in part from Sterling Pulp Chemicals' ClO ₂ Water Treatment Resource Center < www.clo2.com/qa/qa.html >.)
—	Chromium (and its compounds)	Used in steel and other alloys, in making refractories (bricks used in industrial furnaces), dyes and pigments and in plating chrome, tanning leather and preserving wood. Chromium and its compounds are also used as cleaning agents in electroplating, as mordants in textile manufacture and in other processes.
—	Copper (and its compounds)	Used in electrical and electronic products, building construction and industrial machinery and equipment. Copper and its compounds appear in electroplated coatings, cooking utensils, piping, dyes and dye processes, wood preservatives and pesticides. Also used in mildew preventives, corrosion inhibitors, fuel additives, printing and photocopying, pigments for glass and ceramic production. Copper compounds are also used as catalysts, as a purifying agent in the petroleum industry and in alloys and metal refining.
110-82-7	Cyclohexane	Primarily used (more than half) to make adipic acid and caprolactam, which are both used in making nylon. Also used in production of benzene, cyclohexanone. Other uses include solvents, insecticides and plasticizers.
75-09-2	Dichloromethane	Widely used as a solvent in paint strippers, including furniture strippers, home paint removers and aircraft maintenance products. Used as a solvent and degreasing agent in metal cleaning and a process solvent in pharmaceutical production. Also used in production of plastics (polycarbonate and triacetate fiber) and polyurethane foam. Other uses include electronics manufacture, film processing, food processing and production of pesticides, synthetic fibers, paints and coatings. No longer widely used as an aerosol propellant.
74-85-1	Ethylene	Principally used (more than half) in producing low-density and high-density polyethylenes. Also serves as an intermediate in production of vinyl chloride, ethylene oxide, ethylbenzene and others. Used as a solvent, a refrigerant, a raw material for anesthetics and a medication. Also used to regulate plant growth and, as a compressed gas and to ripen various fruits.
107-21-1	Ethylene glycol	Primary use (about one-third) in antifreeze and de-icing solutions (for cars, airplanes, boats). Also used in manufacturing polyester fiber and PET resins (for bottles and film). Also used as a solvent by the paint and plastics industries and as a constituent of photographic developing solutions, hydraulic brake fluids and inks.

Appendix C-2

1997

Uses of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS Number	Name	Uses
50-00-0	Formaldehyde	Largest use is in production of resins including urea-formaldehyde (UF) and phenolic resins (used in particleboard and plywood, respectively) and acetal resins. Also in production of acetylenic chemicals (butanediol isomers), methylene diisocyanate (MDI) and other industrial chemical products. Also serves as a preservative in medical laboratories and as an embalming fluid and sterilizer.
7647-01-0	Hydrochloric acid	Uses include brine treatment for chloralkali, steel pickling, food processing (including production of corn syrup) and production of calcium chloride. Also used in oil well acidulation (to stimulate oil and gas production), in production of chlorine and in water treatment for swimming pools. Other uses (together representing more than 40 percent of usage) include metal recovery from used catalysts, pH control, sludge removal, sand and clay purification and production of inorganics such as sodium chlorate, metal chlorides, activated carbon and iron oxide pigments and organics like polycarbonate resins, bisphenol-A, polyvinyl chloride resins and synthetic glycerine. Hydrochloric acid is also a byproduct of the manufacture of isocyanates.
7664-39-3	Hydrogen fluoride	Used mainly to make aluminum and chlorofluorocarbons (CFCs). Used in oil well acidulation (to stimulate oil and gas production) and in froth flotation (to separate metals from ores). Used as a chemical intermediary for fluorocarbons, aluminum fluoride, cryolite, uranium hexafluoride, and fluoride salts. Used in fluorination processes (especially in the aluminum industry, in dye chemistry and in fluoride manufacture), as a catalyst (especially in the petroleum industry) and in alkylation, isomerization, condensation, dehydration, and polymerization reactions. Used as a cleaning agent (for cast iron, copper, brass, brick and stone) and in etching and polishing.
—	Lead (and its compounds)	Most important use is in producing batteries. Also used in ammunition, metal products (solder and pipes), roofing and devices to shield X-rays. Uses in gasoline, paints and ceramic products, caulking and pipe solder have been dramatically reduced. Lead compounds appear in dyes, explosives, asbestos brake linings, insecticides and rodenticides, ointments and other products. Also used as catalysts, cathode material, flame retardant, metal and wire coating, agent or constituent in glass manufacture and agent for recovering precious metals, notably gold.
—	Manganese (and its compounds)	Manganese is used in steel production to improve hardness, stiffness and strength. Manganese compounds are used in production of dry-cell batteries, in glazes, ceramics and fertilizers, as fungicides, as oxidizing agents and disinfectants and in other uses.
67-56-1	Methanol	Largest use of methanol in the United States has been in production of methyl tert-butyl ether (MTBE), added to gasoline to improve octane and reduce hydrocarbons and carbon monoxide (concerns about its safety have been raised in both Canada and the United States). Also used in production of formaldehyde, acetic acid, chloromethanes and methyl methacrylate. Also used as a solvent in paint strippers, aerosol spray paints, wall paints, carburetor cleaners and windshield-washing products. Methanol is used in coating wood and paper, in producing synthetic fibers (acetate and triacetate) and in manufacturing pharmaceuticals.
78-93-3	Methyl ethyl ketone	The largest use (two-thirds) is as a solvent in protective surface coatings, although this use is decreasing. Also added to adhesives, used in lube-oil dewaxing and added to printing inks. Used in manufacture of organic chemicals, including drugs and cosmetics.
108-10-1	Methyl isobutyl ketone	The largest use (two-thirds) is as a solvent in protective surface coatings, although this use is decreasing. Also added to adhesives. Also used in production of other chemicals, including rubber antioxidants and acetylenic surfactants (for inks, paints and pesticides) and in solvent extraction.

Appendix C-2

1997

Uses of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS Number	Name	Uses
—	Nickel (and its compounds)	In alloys, used in making metal coins and jewelry and metal parts for industrial uses. Nickel compounds are also used for nickel plating (electroplating), in nickel-cadmium battery manufacture, to color ceramics and as catalysts.
—	Nitric acid and nitrate compounds	The chief use of nitric acid is in producing ammonium nitrate fertilizer. Also used in the manufacture of cyclohexanone and as a raw material for adipic acid and caprolactam, both used in making nylon. Nitrates are used in producing explosives, including gunpowder.
108-95-2	Phenol	Primarily used as an intermediate in the production of phenolic resins, which are used in the plywood adhesive, construction, automotive and appliance industries. Also used as an intermediate in producing caprolactam (used to make nylon and other synthetic fibers) and bisphenol-A (used to make epoxy and other resins). Other uses include as a slimicide against bacteria and fungi, as a disinfectant and as an anesthetic in medicinal preparations.
7664-38-2	Phosphoric acid	Used in production of sodium phosphates, as well as calcium, ammonium and potassium phosphates. (Phosphates are used in salts, soaps and detergents.) Also used in fertilizers, yeasts, fire control agents, waxes and polishes, gelatin and soft drinks. Used in chemical production (of ethylbenzene, propylene and cumene) and as an antioxidant, acidulant and flavor agent in food products.
85-44-9	Phthalic anhydride	Primary uses in manufacture of plasticizers (principally dioctyl phthalate with uses in flexible PVC for medical applications), unsaturated polyester resins and alkyd resins (used in coatings). Also used to make polyester polyols, dyes and pigments, halogenated anhydrides, polyetherimide resins and isatoic anhydride.
115-07-1	Propylene	Largest use is in plastics as polypropylene. Other chemical derivatives include acrylonitrile, propylene oxide, isopropyl alcohol and cumene. As a refinery feedstock, used in gasoline production (produces a polymer gasoline for blending, to improve octane).
100-42-5	Styrene	Mainly used (two-thirds) in producing polystyrene. Also used in production of acrylonitrile-butadiene-styrene (ABS) resins and acrylonitrile-styrene resins; these are used in automobile parts, appliances (including refrigerators and freezers), pipe, business machines and luggage and recreational goods. Also used to produce styrene-butadiene latex and rubber, unsaturated polyester resins, thermoplastics elastomers and various styrene copolymers.
7664-93-9	Sulfuric acid	Principal use (almost three-quarters) is in fertilizer production, generally produced by fertilizer manufacturers themselves. Sulfuric acid generated during smelting is sold for numerous chemical and industrial uses, but is also used in leaching copper, a mining operation. Industrial uses include production of explosives, other acids, dyestuffs, glue, wood preservatives and lead-acid vehicle batteries. Also used in purifying petroleum, pickling metal, electroplating and nonferrous metallurgy.
108-88-3	Toluene	By far, the largest use is in gasoline; most toluene is never separated from petroleum crude oil (its largest source), but is pumped from refineries to other locations where it is added directly to gasoline. Toluene "recovered" from crude oil is principally used to make benzene. Toluene is also a byproduct of gasoline production, the manufacture of coke from coal and production of styrene. Uses include paints, lacquers, thinners and strippers, adhesives, cosmetic nail products and others.


Appendix C-2

1997

Uses of Chemicals on the "Top 25" Lists for Releases, Transfers or Both

CAS		Uses
Number	Name	
79-01-6	Trichloroethylene	Mainly used (two-thirds) in vapor degreasing of fabricated metal parts, an increasing use with the phase-out of the ozone depleter, 1,1,1-trichloroethane. Also used in producing fluorocarbons, especially HFC-134a, one of the most widely used hydrofluorocarbons. HFC-134a has been the principal replacement for CFC-12, and it is being used in both new manufacture and retrofitting of automotive air conditioners. As a solvent, trichloroethylene is used in adhesives, lubricants, paints, varnishes and pesticides. Also used in extraction (of greases, oils, fats, etc.), textile processing and chemical manufacture (pharmaceuticals, polychlorinated aliphatics, flame-retardants and insecticides).
1330-20-7	Xylene (mixed isomers)	Used as a solvent in the printing, rubber and leather industries. Also used as a cleaning agent, a thinner for paint and in paints and varnishes.
—	Zinc (and its compounds)	The most common use of zinc is in galvanizing metals (including steel). Zinc is also used in dry cell batteries and in alloys such as brass and bronze. Zinc compounds are used in production of paint, rubber, dye, wood preservatives and ointments. Zinc sulfate, as one example, is used principally in fertilizers, but also in animal feed, water treatment, chemical manufacture and froth flotation (to extract metals from ore).

(IMPORTANT: Type or print; read instructions before completing form)

 United States Environmental Protection Agency	<h1 style="margin: 0;">FORM R</h1>	TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM
Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act		

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center P.O. Box 3348 Merrifield, VA 22116-3348 ATTN: TOXIC CHEMICAL RELEASE INVENTORY	2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)
Enter "X" here if this is a revision	For EPA use only

IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION	
SECTION 1. REPORTING YEAR	19 —
SECTION 2. TRADE SECRET INFORMATION	

Are you claiming the toxic chemical identified on page 2 trade secret? 2.1 <input type="checkbox"/> Yes (Answer question 2.2; Attach substantiation forms)	Is this copy <input type="checkbox"/> Sanitized <input type="checkbox"/> Unsanitized (Answer only if "YES" in 2.1)
2.2 Do not answer 2.2; go to Section 3	2.2

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)
 I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date signed:
--	------------	--------------

SECTION 4. FACILITY IDENTIFICATION	
4.1 Facility or Establishment Name	TRI Facility ID Number
Street	Facility or Establishment Name or Mailing Address (if different from street address)
City/County/State/Zip Code	Mailing Address
City/County/State/Zip Code	City/County/State/Zip Code

4.2 This report contains information for: (Important: check a or b, check c if applicable)															
a. <input type="checkbox"/> An entire facility		b. <input type="checkbox"/> Part of a facility		c. <input type="checkbox"/> A Federal facility											
Telephone Number (include area code)															
Telephone Number (include area code)															
4.3 Technical Contact Name		4.3 SIC Code(s) (4 digits)		a.		b.		c.		d.		e.		f.	
4.4 Public Contact Name		4.4 Dun & Bradstreet Number(s) (9 digits)		4.4 EPA Identification Number(s) (RCRA I.D. No.) (12 characters)		4.4 Facility NPDES Permit Number(s) (9 characters)		4.4 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)							
4.5 Latitude		4.5 Longitude		4.5 Facility NPDES Permit Number(s) (9 characters)		4.5 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)									
a.		b.		a.		b.									
b.		a.		b.		a.		b.							

SECTION 5. PARENT COMPANY INFORMATION	
5.1 Name of Parent Company	<input type="checkbox"/> NA
Parent Company's Dun & Bradstreet Number	<input type="checkbox"/> NA (9 digits)

EPA Form 9350-1 (Rev. 04/97) - Previous editions are obsolete.

EPA FORM R		TRI FACILITY ID NUMBER
PART II. CHEMICAL - SPECIFIC INFORMATION		Toxic Chemical, Category, or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY

(Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS NUMBER (IMPORTANT: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes". Generic name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY

(Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)
------------	---

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY (Important: Check all that apply.)

3.1	Manufacture the toxic chemical:	3.2	Process the toxic chemical:	3.3	Otherwise use the toxic chemical:
a.	<input type="checkbox"/> Produce <input type="checkbox"/> Import				
	<i>If produce or import:</i>				
c.	<input type="checkbox"/> For on-site use/processing	a.	<input type="checkbox"/> As a reactant		<input type="checkbox"/> As a chemical processing aid
d.	<input type="checkbox"/> For sale/distribution	b.	<input type="checkbox"/> As a formulation component		<input type="checkbox"/> As a manufacturing aid
e.	<input type="checkbox"/> As a byproduct	c.	<input type="checkbox"/> As an article component		<input type="checkbox"/> Ancillary or other use
f.	<input type="checkbox"/> As an impurity	d.	<input type="checkbox"/> Repackaging		

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	<input type="text"/> (Enter two-digit code from instruction package.)
------------	---

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

	A. Total Release (pounds/year)(enter range from instructions or estimate)	B. Basis of estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions NA <input type="checkbox"/>		
5.2	Stack or point air emissions NA <input type="checkbox"/>		
5.3	Discharges to receiving streams or water bodies (enter one name per box)		
	Stream or Water Body Name		
5.3.1			
5.3.2			
5.3.3			
5.4.1	Underground Injection on-site to Class I Wells NA <input type="checkbox"/>		
5.4.2	Underground Injection on-site to Class II-V Wells NA <input type="checkbox"/>		

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box and indicate which Part II, Section 5.3 page this is, here (example: 1,2,3, etc.)

EPA Form 9350-1 (Rev. 04/97) - Previous editions are obsolete.

Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R		TRI FACILITY ID NUMBER
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)		Toxic Chemical Category, or Generic Name
SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM		
	NA	A. Total Release (pounds/year) (enter range code from instructions or estimate)
		B. Basis of Estimate (enter code)
5.5	Disposal to land on-site	
5.5.1A	RCRA Subtitle C landfills <input type="checkbox"/>	
5.5.1B	Other landfills <input type="checkbox"/>	
5.5.2	Land treatment/application farming <input type="checkbox"/>	
5.5.3	Surface impoundment <input type="checkbox"/>	
5.5.4	Other disposal <input type="checkbox"/>	
SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS		
6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)		
6.1.A. Total Quantity Transferred to POTWs and Basis of Estimate		
6.1.A.1. Total Transfers (pounds/year) (enter range code or estimate)		6.1.A.2 Basis of Estimate (enter code)
6.1.B. ——— POTW Name		
POTW Address		
City	State	County Zip
6.1.B. ——— POTW Name		
POTW Address		
City	State	County Zip
If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box <input type="text"/> and indicate which Part II, Section 6.1 page this is here <input type="text"/> (example: 1,2,3, etc.)		
SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS		
6.2 — OFF-SITE EPA IDENTIFICATION NUMBER (RCRA ID NO.)		
Off-Site Location Name		
Off-Site Address		
City	State	County Zip
Is location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input type="checkbox"/> No		

EPA Form 9350-1 (Rev. 04/97) - Previous editions are obsolete.

Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)		TRI FACILITY ID NUMBER	
		Toxic Chemical Category or Generic Name	
SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (continued)			
A. Total Transfers (pounds/year) (enter range code or estimate)		C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)	
B. Basis of Estimate (enter code)		1.M	
1.		2.M	
2.		3.M	
3.		4.M	
4.			
6.2 OFF-SITE EPA IDENTIFICATION NUMBER (RCRA ID NO.)			
Off-Site Location Name			
Off-Site Address			
City		State	County
Zip			
Is location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input type="checkbox"/> No			
A. Total Transfers (pound/year) (enter range code or estimate)		B. Basis of Estimate (enter code)	
C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)		1.M	
1.		2.M	
2.		3.M	
3.		4.M	
4.			
SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY			
<input type="checkbox"/> Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.			
a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence (enter 3-character code(s))	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate
7A.1a	7A.1b	7A.1c	7A.1d
3	1	%	7A.1e
6	4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	7		
7A.2a	7A.2b	7A.2c	7A.2d
3	1	%	7A.2e
6	4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	7		
7A.3a	7A.3b	7A.3c	7A.3d
3	1	%	7A.3e
6	4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	7		
7A.4a	7A.4b	7A.4c	7A.4d
3	1	%	7A.4e
6	4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	7		
7A.5a	7A.5b	7A.5c	7A.5d
3	1	%	7A.5e
6	4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	7		

If additional pages of Part II, Sections 6.2/7A are attached, indicate the total number of pages in this box and indicate which Part II, Sections 6.2/7A page this is, here. (example: 1.2.3. etc.)

EPA FORM R		TRI FACILITY ID NUMBER	
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)			
SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES			
<input type="checkbox"/> Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.			
Energy Recovery Methods [enter 3-character code (s)]			
1	2	3	4
SECTION 7C. ON-SITE RECYCLING PROCESSES			
<input type="checkbox"/> Not applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.			
Recycling Methods [enter 3-character code(s)]			
1	2	3	4
6	7	8	9
5			10
SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES			
<i>All quantity estimates can be reported using up to two significant figures.</i>			
8.1	Quantity released*	Column A Prior Year (pounds/year)	Column B Current Reporting Year (pounds/year)
8.2	Quantity used for energy recovery on-site	Column C Following Year (pounds/year)	Column D Second Following Year (pounds/year)
8.3	Quantity used for energy recovery off-site		
8.4	Quantity recycled on-site		
8.5	Quantity recycled off-site		
8.6	Quantity treated on-site		
8.7	Quantity treated off-site		
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)		
8.9	Production ratio or activity index		
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.		
Source Reduction Activities [enter code(s)]		Methods to Identify Activity (enter codes)	
8.10.1	a.	b.	c.
8.10.2	a.	b.	c.
8.10.3	a.	b.	c.
8.10.4	a.	b.	c.
8.11	Is additional optional information on source reduction, recycling, or pollution control activities included with this report? (Check one box)		YES <input type="checkbox"/> NO <input type="checkbox"/>

* Report releases pursuant to EPCRA Section 329(b) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated on-site or off-site.



NPRI - The National Pollutant Release Inventory

PART A - FACILITY IDENTIFICATION

All fields are mandatory unless otherwise noted.
Please print and refer to the guide for additional information.

A1.0	Reporting Year :	1997
A1.1	NPRI ID :	

A2.0	FACILITY IDENTIFICATION & SITE ADDRESS	
A2.1	Company Name :	
A2.2	Facility Name :	
A2.3	Street Address :	
A2.4	Street Address :	
A2.5	City / District :	
A2.6	Province / Territory :	
A2.7	Postal Code :	

A3.0	NUMBER OF FULL-TIME EMPLOYEES OR EQUIVALENT
A3.1	Number of Employees :

A4.0	FACILITY PUBLIC CONTACT	
A4.1	Title :	Dr () Mr () Mrs () Miss () Ms ()
A4.2	First Name :	
A4.3	Last Name :	
A4.4	Position :	
A4.5	Telephone No :	() - - Ext. :
A4.7	Facsimile No :	() - -

A5.0	FACILITY PUBLIC CONTACT ADDRESS	
Is the mailing address for the public contact in A4.0 different from the facility's site address in A2.0 ?		() Y/N
If you answer Yes, please provide the address below.		
A5.1	Company Name :	
A5.2	Facility Name :	
A5.3	Mailing Address :	
A5.4	Mailing Address :	
A5.5	City / District :	
A5.6	Province / Territory :	Postal Code :
A5.8	State :	Zip Code/Other :
A5.10	Country :	





NPRI - The National Pollutant Release Inventory

PART A - FACILITY IDENTIFICATION

FACILITY TECHNICAL CONTACT	
A6.0	Title :
A6.1	Dr () Mr () Mrs () Miss () Ms ()
A6.2	First Name :
A6.3	Last Name :
A6.4	Position :
A6.5	Telephone No : () - () Ext :
A6.7	Facsimile No : () - ()

FACILITY TECHNICAL CONTACT ADDRESS	
A7.0	Is the mailing address for the technical contact in () Y/N If you answer Yes, A6.0 different from the facility's site address in A2.0 ? please provide the address below.
A7.1	Company Name :
A7.2	Facility Name :
A7.3	Mailing Address :
A7.4	Mailing Address :
A7.5	City / District :
A7.6	Province / Territory
A7.8	State : Postal Code : Zip Code/Other :
A7.10	Country :

COMPANY COORDINATOR	
A8.0	A company coordinator is responsible for receiving all NPRI correspondence for all your facilities. Do you wish that we send all correspondence to a company coordinator ? () Y/N If you answer Yes, please provide the information below.
A8.1	Title :
A8.2	First Name :
A8.3	Last Name :
A8.4	Position :
A8.5	Telephone No : () - () Ext.:
A8.7	Facsimile No : () - ()

COMPANY COORDINATOR ADDRESS	
A9.0	Is the mailing address for the company coordinator in A8.0 different from the facility's site address in A2.0 ? () Y/N If you answer Yes, please provide the address below.
A9.1	Company Name :
A9.2	Facility Name :
A9.3	Mailing Address
A9.4	Mailing Address :
A9.5	City / District :
A9.6	Province / Territory :
A9.8	State : Postal Code : Zip Code/Other :
A9.10	Country :





NPRI - The National Pollutant Release Inventory

PART A - FACILITY IDENTIFICATION

A10.0	STANDARD INDUSTRIAL CLASSIFICATION CODE (SIC)
A10.1	2-Digit Canadian SIC Code :
A10.2	4-Digit Canadian SIC Code :
A10.3	4-Digit American SIC Code :

A11.0	PARENT COMPANY INFORMATION
A11.1	Is the facility controlled by another company or companies ? () Y/N If Yes, please use Appendix A.

A12.0	REGULATIONS AND PERMITS (Optional)
A12.1	Do you report under other environmental regulations or permits ? () Y/N If Yes, please use Appendix B.

A13.0	OFF-SITE TRANSFERS
A13.1	Do you send waste containing NPRI substances, for which you are reporting, to an off-site facility or municipal sewage treatment plant? OR Do you send NPRI substances, for which you are reporting, for recovery /re-use / recycling to an off-site facility ? () Y/N If Yes, please use Appendix C to list all off-site facilities.

A14.0	RELEASES TO SURFACE WATER BODIES
A14.1	Do you release any NPRI substances to surface waters ? () Y/N If Yes, please use Appendix B to list all surface water bodies.

A15.0	COMMENTS ON THE FACILITY (Optional)

A16.0	EXECUTIVE CONTACT CERTIFYING THIS SUBMISSION
A16.1	Title : Dr () Mr () Mrs () Miss () Ms ()
A16.2	First Name :
A16.3	Last Name :
A16.4	Position :





NPRI - The National Pollutant Release Inventory

PART A - FACILITY IDENTIFICATION

EXECUTIVE CONTACT ADDRESS	
A17.0	<p>Is the mailing address for the executive contact in A16.0 different from the facility's site address in A2.0 ?</p> <p>() Y/N If Yes, please provide the address below.</p>
A17.1	Company Name :
A17.2	Facility Name :
A17.3	Mailing Address :
A17.4	Mailing Address :
A17.5	City / District :
A17.6	Province/Territory :
A17.8	State :
A17.10	Country :
	Postal Code :
	Zip Code/Other :



NPRI - The National Pollutant Release Inventory

PART B - SUBSTANCE SPECIFIC INFORMATION

Please photocopy Part B of the form for each reportable NPRI substance. All fields are mandatory unless otherwise noted. Please print and refer to the guide for additional information.

B1.0	SUBSTANCE IDENTITY	
B1.1	CAS Registry Number :	
B1.2	Substance Name :	

B2.0	NATURE OF ACTIVITIES (Select at least one activity)
B2.1	MANUFACTURE THE SUBSTANCE <input type="checkbox"/> For On-Site Use / Processing <input type="checkbox"/> For Sale / Distribution <input type="checkbox"/> As a By-product <input type="checkbox"/> As an Impurity
B2.2	PROCESS THE SUBSTANCE <input type="checkbox"/> As a Reactant <input type="checkbox"/> As a Formulation Component <input type="checkbox"/> As an Article Component <input type="checkbox"/> Repackaging Only <input type="checkbox"/> As a By-product
B2.3	OTHERWISE USE THE SUBSTANCE <input type="checkbox"/> As a Chemical Processing Aid <input type="checkbox"/> As a Manufacturing Aid <input type="checkbox"/> Ancillary / Other Use <input type="checkbox"/> As a By-product

B10.0	ON-SITE RELEASES	
B10.1	Do you release this substance on site ?	<input type="checkbox"/> Y / N If No, go directly to section B14.0

B11.0	REPORTING RELEASES LESS THAN ONE TONNE	
B11.1	If the total releases are less than one (1) tonne, are you reporting this amount as a sum for all media ?	<input type="checkbox"/> Y/N If Yes, go directly to section B12.5

B12.0	ON-SITE RELEASES OF THE SUBSTANCE TO THE ENVIRONMENT	
B12.1	AIR RELEASES	RELEASE AMOUNT (Tonnes / Year)
a)	Stack / Point C / E / M / O	
b)	Storage / Handling C / E / M / O	
c)	Fugitive C / E / M / O	
d)	Spills C / E / M / O	
e)	Other Non-Point C / E / M / O	
B12.2	UNDERGROUND INJECT.	C / E / M / O



Environment Canada / Environnement Canada



NPRI - The National Pollutant Release Inventory

PART B - SUBSTANCE SPECIFIC INFORMATION

B12.3	RELEASES TO SURFACE WATERS	BASIS OF ESTIMATE (Select one method)	RELEASES (Tonnes / Year)	SURFACE WATER BODY CODES (Appendix B)
a)	Direct Discharges	C / E / M / O		
b)	Spills	C / E / M / O		
c)	Leaks	C / E / M / O		
B12.4	RELEASES TO LAND	BASIS OF ESTIMATE (Select one method)	RELEASES (Tonnes / Year)	
a)	Landfill	C / E / M / O		
b)	Land Treatment	C / E / M / O		
c)	Spills	C / E / M / O		
d)	Leaks	C / E / M / O		
e)	Other	C / E / M / O		
B12.5	TOTAL RELEASES	C / E / M / O		

B13.0	YEARLY BREAKDOWN OF RELEASES BY PERCENTAGE IN EACH QUARTER (Total must be 100 %)		
	(Jan.-March)	(April-June)	(July-Sept.) (Oct.-Dec.)
B13.1	%	%	%

B14.0	REASONS FOR CHANGES IN QUANTITIES RELEASES FROM PREVIOUS YEAR (Select at least one reason)
a)	Changes in Production Levels
b)	Changes in Estimation Methods
c)	Pollution Prevention Activities
d)	Changes in On-site Treatment
e)	Changes in Off-site Transfers for Final Disposal
f)	Changes in Off-site Transfers for Recycling
g)	Other (specify in comments field B14.2)
h)	No Significant Change (i.e. < 10%) or No Change
i)	Not Applicable (First year reporting this substance)
B14.2	COMMENTS ON RELEASES (Optional) :

B15.0	ANTICIPATED RELEASES (Tonnes / Year)	
	1998	1999 2000
	2001 (Optional)	2002 (Optional)



Environment
Canada

Environment
Canada



NPRI - The National Pollutant Release Inventory

PART B - SUBSTANCE SPECIFIC INFORMATION

B20.0	DO YOU TRANSFER THIS NPRI SUBSTANCE TO OFF-SITE LOCATIONS
B20.1	For Final Disposal ? () Y/N
B20.2	For Recycling ? (Optional) () Y/N

B21.0	REASONS WHY SUBSTANCE WERE TRANSFERRED OFF-SITE FOR DISPOSAL or RECYCLING (Select at least one reason)
a)	Production Residues
b)	Off-specification Products
c)	Expiration Date Passed
d)	Contaminated Materials
e)	Unusable Parts or Discards
f)	Pollution Abatement Residues
g)	Machining or Finishing Residues
h)	Site Remediation Residues
i)	Other

B22.0	OFF-SITE TRANSFERS IN WASTE FOR FINAL DISPOSAL	
B22.1	DISPOSAL METHOD	AMOUNT (Tonnes / Year)
a)	Physical Treatment	
b)	Chemical Treatment	
c)	Biological Treatment	
d)	Incineration / Thermal	
e i)	Containment: Landfill	
e ii)	Containment: Other Storage	
f)	Mun. Sewage Treatment Plant	
g)	Underground Injection	
h)	Land Treatment	
B22.2	TOTAL	

B23.0	REASONS FOR CHANGES IN QUANTITIES DISPOSED FROM PREVIOUS YEAR (Select at least one reason)
a)	Changes in Production Levels
b)	Changes in Estimation Methods
c)	Pollution Prevention Activities
d)	Changes in On-site Treatment
e)	Changes in Off-site Transfers for Recycling
f)	Other (specify in comments field B23.2)
g)	No Significant Change (i.e. < 10%) or No Change
h)	Not Applicable (First year reporting this substance)



Environment
Canada

Environment
Canada

Part B / Page 3



NPRI - The National Pollutant Release Inventory

PART B - SUBSTANCE SPECIFIC INFORMATION

B23.2	COMMENTS ON QUANTITIES DISPOSED (Optional)		
B24.0	ANTICIPATED DISPOSALS (Tonnes / Year)		
B24.1	1998	1999	2000
	2001 (Optional)	2002 (Optional)	
B25.0	OFF-SITE TRANSFERS FOR RECYCLING		
Section B25.0 is Optional. You may fill this section if you answered Yes at question B20.2			
B25.1	RECYCLING METHOD	AMOUNT (Tonnes/Year)	OFF-SITE CODES (see Appendix C)
a)	Energy Recovery		
b)	Recovery of Solvents		
c)	Recovery of Organic Substances (Not Solvents)		
d)	Recovery of Metals and Metal Compounds		
e)	Recovery of Inorganic Materials (Not Metals)		
f)	Recovery of Acids and Bases		
g)	Recovery of Catalysts		
h)	Recovery of Pollution Abatement Residues		
i)	Refining or Re-use of Used Oil		
j)	Other		
B25.2	TOTAL		
B26.0	REASONS FOR CHANGES IN QUANTITIES RECYCLED FROM PREVIOUS YEAR (Select at least one reason) (Optional)		
a)	Changes in Production Levels		
b)	Changes in Estimation Methods		
c)	Pollution Prevention Activities		
d)	Changes in On-site Treatment		
e)	Changes in Off-site Transfers for Final Disposal		
f)	Other (specify in comments field B26.2)		
g)	No Significant Change (i.e. < 10 %) or No Change		
h)	Not Applicable (First year reporting this substance)		





NPRI - The National Pollutant Release Inventory

PART B - SUBSTANCE SPECIFIC INFORMATION

B26.2	COMMENTS ON RECYCLING (Optional)	

B27.0	ANTICIPATED RECYCLING (Tonnes / Year) (Optional)		
B27.1	1998	1999	2000
	2001	2002	

B30.0	POLLUTION PREVENTION ACTIVITIES (P2) (Select at least one activity)	
a)	Materials or Feedstock Substitution	
b)	Product Design or Reformulation	
c)	Equipment or Process Modifications	
d)	Spill or Leak Prevention	
e)	On-site Recovery, Re-use or Recycling	
f)	Inventory Management or Purchasing Techniques	
g)	Good Operating Practice or Training	
h)	Other (specify in comments field B30.2)	
i)	No Pollution Prevention Activities	
B30.2	COMMENTS ON P2 (Optional)	

B40.0	PRODUCTION RATIO / ACTIVITY INDEX (Optional)
B40.1	



Environment
Canada

Environnement
Canada



NPRI - The National Pollutant Release Inventory

APPENDIX A PARENT COMPANIES

NPRI ID :

If you answered Yes in section A11.1, please list parent company or companies

PARENT COMPANY	
P1.0	
P1.1	Ownership percentage : %
P1.2	Parent Company Name :
P1.3	Mailing Address :
P1.4	Mailing Address :
P1.5	City / District :
P1.6	Province / Territory : Postal Code :
P1.8	State : Zip Code / Other :
P1.10	Country :

PARENT COMPANY	
P1.0	
P1.1	Ownership percentage : %
P1.2	Parent Company Name :
P1.3	Mailing Address :
P1.4	Mailing Address :
P1.5	City / District :
P1.6	Province / Territory : Postal Code :
P1.8	State : Zip Code / Other :
P1.10	Country :

PARENT COMPANY	
P1.0	
P1.1	Ownership percentage : %
P1.2	Parent Company Name :
P1.3	Mailing Address :
P1.4	Mailing Address :
P1.5	City / District :
P1.6	Province / Territory : Postal Code :
P1.8	State : Zip Code / Other :
P1.10	Country :



NPRI - The National Pollutant Release Inventory

APPENDIX C OFF-SITE FACILITIES

NPRI ID :

OFF-SITE FACILITY	
S1.0	
S1.1	Off-Site Code : 01 Use off-site codes (i.e. 01, 02, 03 etc...) to indicate off-site facilities or MSTPs in sections B22.0 and B25.0
S1.2	Facility or MSTP Name :
S1.3	Mailing Address :
S1.4	Mailing Address :
S1.5	City / District :
S1.6	Province / Territory : Postal Code :
S1.8	State : Zip Code / Other :
S1.10	Country :

OFF-SITE FACILITY	
S1.0	
S1.1	Off-Site Code : Use off-site codes (i.e. 01, 02, 03 etc...) to indicate off-site facilities or MSTPs in sections B22.0 and B25.0
S1.2	Facility or MSTP Name :
S1.3	Mailing Address :
S1.4	Mailing Address :
S1.5	City / District :
S1.6	Province / Territory : Postal Code :
S1.8	State : Zip Code / Other :
S1.10	Country :

OFF-SITE FACILITY	
S1.0	
S1.1	Off-Site Code : Use off-site codes (i.e. 01, 02, 03 etc...) to indicate off-site facilities or MSTPs in sections B22.0 and B25.0
S1.2	Facility or MSTP Name :
S1.3	Mailing Address :
S1.4	Mailing Address :
S1.5	City / District :
S1.6	Province / Territory : Postal Code :
S1.8	State : Zip Code / Other :
S1.10	Country :



Environment
Canada

Environnement
Canada

Appendix-C



FORM COA

CERTIFICATE FOR THE OPERATION OF INDUSTRIAL FACILITIES UNDER FEDERAL JURISDICTION FOR THE YEAR _____

TO BE COMPLETED BY INE-SEMARNAP	
1) APPLICATION NUMBER:	2) ENVIRONMENTAL REGISTRATION NUMBER:
3) RECEIVED BY: <div style="border-bottom: 1px solid black; width: 80%; margin-left: 0;"></div> <p style="text-align: right; margin-top: 5px;">Name and signature</p>	<div style="border-bottom: 1px solid black; width: 80%; margin-left: 0;"></div> <p style="text-align: right; margin-top: 5px;">(Signature with date received)</p>

In compliance with Articles 5, sections VI, XII and XVII, 109 BIS, 109 BIS 1 and 111, of the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA); Articles 86, 88, 89, 90 and 91 of the Law on National Waters; and pursuant to the Agreement through which the National Ecological Institute (INE), shall issue a Single Environmental License and request an Annual Operation Certificate, the company I represent hereby provides the following information to INE regarding the annual facility operations covered by Environmental Registration Number: _____

TO BE COMPLETED BY THE INDUSTRIAL FACILITY	
5) PLACE AND DATE OF CERTIFICATE COMPLETION: Day: <input style="width: 30px;" type="text"/> Month: <input style="width: 30px;" type="text"/> Year: <input style="width: 30px;" type="text"/>	<div style="border-bottom: 1px solid black; width: 80%; margin-left: 0;"></div> <p style="text-align: right; margin-top: 5px;">Name and signature of the legal representative</p>
I declare that the information contained in this request and the appendices thereto is true. In case of any omissions or false declarations, SEMARNAP may cancel this application or apply appropriate administrative sanctions.	<div style="border-bottom: 1px solid black; width: 80%; margin-left: 0;"></div> <p style="text-align: right; margin-top: 5px;">Name and signature of the technical officer</p>

WHO SHOULD MAKE THIS APPLICATION?

This form shall be submitted by industrial facilities having a Single Environmental License or an Operating License.

INSTRUCTIONS FOR THE COMPLETION OF THIS FORM:

The data in the tables provided in the General Catalogue of Instructions shall be used to complete this form. The following instructions must also be followed:

- One certificate form shall be completed for each facility.
- 2) This form shall be completed in typewritten or in clearly printed letters in blue or black ink.
- 3) Those spaces where facility data are identical to those reported in the LAU (Single Environmental License) or to those reported previously with this same form for the last Operation Certificate shall not be completed. If an electronic version of the form is being used, ensure that the previously reported data which the form included have not been altered.
- 4) The Operation Certificate Form shall be prepared in one original and one copy and/or in electronic form (floppy disk), with a printed cover page duly signed by the legal representative and the technical officer.
- 5) If the requested information is not available, this should be indicated by ND (Not Available); if the information is nil, this should be indicated by 0 (zero). If the information is not applicable, this should be indicated by NA (Not Applicable).
- 6) If the space provided on the printed form is not large enough to contain the requested information, additional pages should be appended following the model of that heading.
- 7) The General Operational Diagram requested shall be prepared according to the example included in Appendix 3 of the General Instructions.
- 8) Section V of the Operation Certificate shall be completed only for substances or chemical categories listed in Table 18 of the General Catalogue of Instructions.
- 9) Facilities using this Operation Certificate form for the first time shall also complete as an appendix, on a one-time basis, the Registration Data on the application form for the Single Environmental License, pages 3 and 4.

I. GENERAL TECHNICAL INFORMATION

If the facility is using this reporting form for the first time, it shall complete the general technical information requested in this section of the Certificate. If the facility has a Single Environmental License or has used this reporting form previously, it shall enter only the changes made for the reported year. We remind you that changes of Name, Company Name, process or reductions or increases in production should have been reported when they took place at the Applications Office. If there was a change of address or transfer of the facility, the company would have applied for a new License and would therefore have a new Environmental Registration Number. Annual data on raw material and fuel consumption and production shall also be reported in this section.

1.1 CHANGE OF NAME OR COMPANY NAME Date of notice : Day Month Year

1.2 CHANGE OF LEGAL REPRESENTATIVE Date of notice : Day Month Year

1.3 COMPANY REPRESENTATIVE ¹

Name or company name:	RFC:
Address: _____	
Street: _____	
Building and Floor Numbers: _____	Neighbourhood: _____
Locality (except Mexico City): _____	Postal Code: _____
Municipality or Delegation: _____	Federal Body: _____
Telephones: _____	Fax: _____
	Electronic Mail: _____

1.4 EQUIVALENT NUMBER OF EMPLOYEES ² :

1.5 RISKS AND CONTINGENCIES

- 1.5.1 Date of submission of the last Risk Assessment: Day Month Year
- 1.5.2 Date of the last update of the Accident Prevention Program: Day Month Year
- 1.5.3 If applicable, date of update of the Contingency Program: Day Month Year
- 1.5.4 If located in the Metropolitan Area of Mexico City, or in an area having an Environmental Contingency Program, give the date your Participation Plan for the Program was submitted: Day Month Year

¹ Information on the facility representative authorized to deal with the public and clarify any information supplied in this Certificate.
² Divide the total number of man hours (total facility staff) by 2000 hours.

1.6 PROCESS DESCRIPTION

If necessary due to changes in the facility or if using this form for the first time, prepare the *General Operating Diagram* and the *Table of consumption, generation and/or release points*, following the example included in the General Instructions. The diagram shall include all areas (production, wastewater treatment, waste management, services, etc.) where there are consumption points of raw materials, water or energy, or where pollutants are generated, stored or released.

1.7 RAW MATERIALS (not applicable to hazardous waste treatment facilities)

Name ³		CAS Number	Consumption point ⁴	Physical state ⁵	Type of storage ⁶	Annual consumption	
Commercial	Chemical					Amount ⁷	Unit ⁸

1.8 PRODUCTS (not applicable to hazardous waste treatment facilities)

Product name	Type of storage ⁶	Installed production capacity		Annual production	
		Amount ⁷	Unit ⁸	Amount ⁷	Unit ⁸

1.9 ENERGY CONSUMPTION

Consumption points ⁹	Energy type ¹⁰	Annual consumption	
		Amount ⁷	Unit ⁸

³ Indicate both names when possible and if available the Chemical Abstracts Service identification number (CAS number).

⁴ **Consumption point.** Number appearing in the General Operating Diagram.

⁵ **Physical state.** Physical State Codes may be consulted in Table 1 of the General Catalogue.

⁶ **Type of storage.** According to Table 2 of the General Catalogue.

⁷ **Amount.** According to the Table in which it appears, referring to value of, consumption, release, transfer, storage, etc.

⁸ **Unit.** Any unit customarily used in the facility may be used; we recommend use of the Decimal Metric System or by default the Imperial System.

⁹ When energy consumption per process is unknown, consumption point could refer to the facility's input point(s).

¹⁰ Indicate whether the energy comes from an electrical current input (EE) or if it is internally generated in the facility through fossil fuel combustion (CF), use of combustible waste (RC) or through another generation method (OM).

1.10 FUEL(S) USED

Combustion equipment	Capacity		Burner type	Fuel type	Consumption point ¹¹	Is it pre-heated? ¹²	Annual consumption	
	Amount	Unit					Amount	Unit

#####

II. ATMOSPHERIC POLLUTION

Pursuant to Article 19 of the LGEEPA Regulations on Atmospheric Pollution Prevention and Control, the following data shall be provided the first time this reporting form is used or when the facility data are different from those reported in the Single Environmental License, the Release Inventory or the last Operating Certificate:

2.1 POLLUTANT RELEASE POINTS

Name of machine, equipment or activity	Release point ¹³	Release expense		Estimation method ¹⁴	Control equipment or method	Estimated efficiency of control equipment ¹⁵
		Amount	Unit			

¹¹ When energy consumption per process is unknown, consumption point could refer to the facility's input point(s).

¹² State Yes or No.

¹³ **Release point.** Number appearing in the General Operating Diagram.

¹⁴ **Estimation method.** According to Table 3 of the General Catalogue, when no standard applies.

¹⁵ Efficiency of the pollutant reduction control equipment, in percent.

If this form is being used for the first time or if the data requested are different from those called for in the Application for a Single Environmental License or in the last Operation Certificate, the following data shall be provided for purposes of information.

3.1 ANNUAL WATER USE

Concession or assignment license number ²⁵		Amount ⁷	Unit ⁸
Water extraction source:			
Drinking water network			
Surface			
Underground			
Salt water			
Treated (reuse)			
Other (specify)			

3.2 DISCHARGE OF WASTEWATERS

3.2.1 Changes to the permit or authorized discharge registration

Discharge permit or registration number	
Certificate of change number issued by the Public Registry of Water Rights (REPDA)	

3.2.2 General discharge data

Discharge type ²⁶	Release point ²⁷	Discharge number ²⁸	Hydrological region ²⁹	Discharge frequency ³⁰	Crop Irrigation ³¹	Treatment <i>in situ</i>	
						Code ³²	Amount

²⁵ If there is no grant of concession or assignment, append a copy of the confirmation of connection to the drinking water system.

²⁶ **Discharge type.** According to Table 4 of the General Catalogue.

²⁷ **Release point.** Number appearing in the General Operating Diagram

²⁸ When pertinent, state the relationship between the release points identified in the diagram of the facility's consumption and release points and the discharge numbers appearing in the application made to the National Water Commission.

²⁹ According to Table 17 of the General Catalogue.

³⁰ Indicate if continuous (C), intermittent (I) or occasional (F).

³¹ Indicate whether restricted (R) or not restricted (N).

³² **Treatment methods.** See Tables 5, 6 and 7 of the General Catalogue.

3.2.3 Wastewater discharge quality description ³³

Parameter	Discharge number ³⁴	
Annual volume [liters]		
Hydrogen potential (pH)		
Temperature [°C]		
Fats and oils [mg/l]		
Floating matter (present or absent)		
Sedimentable solids [ml/l]		
Total suspended solids [mg/l]		
Biochemical oxygen demand (DBO ₅) [mg/l]		
Total nitrogen [mg/l]		
Total phosphorus [mg/l]		
Fecal coliform bacteria [NMP/100 ml]		
Helminth eggs [organisms/l]		

#####

IV. HAZARDOUS WASTE GENERATION, TREATMENT AND TRANSFER

Pursuant to NOM-052-ECOL-93, NOM-053-ECOL-93 or when providing hazardous waste treatment services, industrial facilities shall provide the following information when this form is used for the first time or when the data requested are different from those reported in the Single Environmental License or the last Certificate of Operation:

4.1 HAZARDOUS WASTE GENERATION AND TREATMENT WITHIN THE FACILITY

Generation point ³⁵	Waste identification		Annual generation		Treatment or disposal method	
	NOM-052-ECOL-93 ³⁶	Code ³⁶	Amount	Unit	Code ³⁷	Treatment capacity
						Amount
						Unit

³³ Annual average as a function of the volume. Value estimated based on the data presented during the reported year to the authorities (if the CNA, use the figures given in the quarterly declarations for the right to release).

³⁴ Enter discharge numbers appearing in the application made to the National Water Commission.

³⁵ Generation point. Number appearing in the General Operating Diagram.

³⁶ Hazardous waste code according to Table 8 of the General Catalogue.

³⁷ Treatment or disposal methods. See Tables 5, 6, 7, 9, 10, 11, 12, 13 and 14 of the General Catalogue.
³⁸ Waste identification number according to NOM-052-ECOL-93, indicating Table number and appendix where listed or CRETIB code. If the waste is not listed, the corresponding CRETIB analysis should be attached.

4.2 HAZARDOUS WASTE STORAGE WITHIN THE FACILITY

Generation point	Waste identification		Type ⁴¹	Storage ³⁹				Time (days)		
	NOM-052-ECOL-93 ⁴³	Code ⁴⁰		Storage description ⁴²	Site	Material	Ventilation		Lighting	
								Capacity	Amount	Unit

4.3 HAZARDOUS WASTE TRANSFERS⁴⁴

Generation point	Waste identification		Handling company ⁴⁵	Total transferred	
	NOM-052-ECOL-93	Code		Amount	Unit

4.4 HAZARDOUS WASTE TREATMENT COMPANIES⁴⁶

Waste identification	Treatment or disposal method ⁴⁷	Annual total handled	
		Amount	Unit
NOM-052-ECOL-93			

³⁹ Pursuant to Articles 14 to 21 of the LGEEPA Hazardous Wastes Regulations, append a detailed description of how the waste is stored and the site or sites within the facility, indicating drainage and water networks within the storage area as well as the safety measures taken.

⁴⁰ **Hazardous waste code**, according to Table 8 of the General Catalogue.

⁴¹ **Type of storage**, See Table 2 of the General Catalogue.

⁴² **Storage features**, See Table 15 of the General Catalogue.

⁴³ Waste identification number according to NOM-052-ECOL-93, indicating Table number and appendix where listed or CRETIB code. If the waste is not listed, the corresponding CRETIB analysis should be attached.

⁴⁴ The hazardous wastes generator shall contract only the services of companies authorized to handle such wastes by the INE (Articles 151 BIS of the LGEEPA and 10 of the Hazardous Wastes Regulations).

⁴⁵ Enter the Hazardous Wastes Treatment Permit Number issued by the INE.

⁴⁶ This section is to be completed only by companies providing hazardous waste treatment services.

⁴⁷ **Treatment method code**, See Tables 5, 6 7, 10, 11, 12, 13 and 14 of the General Catalogue.

