Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

**30-Jan-2001**

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**English - Or. English**

**ENVIRONMENT DIRECTORATE**
**JOINT MEETING OF THE CHEMICALS COMMITTEE AND**
**THE WORKING PARTY ON CHEMICALS, PESTICIDES AND BIOTECHNOLOGY**

**PRESENTATION AND DISSEMINATION OF PRTR DATA: PRACTICES AND EXPERIENCES**

**Getting the Words and Numbers Out**

**JT00101999**

**OECD Environmental Health and Safety Publications**

**Series on Pollutant Release and Transfer Registers**

**No. 3**

# PRESENTATION AND DISSEMINATION OF PRTR DATA: PRACTICES AND EXPERIENCES

**Getting the Word and Numbers Out**

**IOMC**

**INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS**

A cooperative agreement among **UNEP, ILO, FAO, WHO, UNIDO, UNITAR and OECD**

**Environment Directorate**
**ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT**
**Paris 2000**

# Other Environmental Health and Safety publications on Pollutant Release and Transfer Registers

*Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development. Guidance Manual for Governments* (OECD/GD(96)32) (1996).

*PRTR Series No. 1: Proceedings of the OECD International Conference on Pollutant Release and Transfer Registers (PRTRs). PRTRs: National and Global Responsibility. Tokyo, 9-11 September 1998. Part 1* (1999).

*PRTR Series No. 2: Proceedings of the OECD International Conference on Pollutant Release and Transfer Registers (PRTRs). PRTRs: National and Global Responsibility. Tokyo, 9-11 September 1998. Part 2* (1999).

## ABOUT THE OECD

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation in which representatives of 30 industrialised countries in North America, Europe and the Pacific, as well as the European Commission, meet to co-ordinate and harmonise policies, discuss issues of mutual concern, and work together to respond to international problems. Most of the OECD's work is carried out by more than 200 specialised Committees and subsidiary groups made up of Member country delegates. Observers from several countries with special status at the OECD, and from interested international organisations, attend many of the OECD's Workshops and other meetings. Committees and subsidiary groups are served by the OECD Secretariat, located in Paris, France, which is organised into Directorates and Divisions.

The OECD began work on Pollutant Release and Transfer Registers (PRTRs) in 1993 as a follow-up to the United Nations Conference on Environment and Development. In co-operation with UN organisations and representatives of OECD Member governments, industry and the public, it prepared a Guidance Manual for governments considering the establishment of PRTRs. The Guidance Manual was published in 1996; a Recommendation on Implementing Pollutant Release and Transfer Registers was adopted by the OECD Council in the same year.

Environmental Health and Safety Publications appear in several series, including: **Testing and Assessment**; **Good Laboratory Practice and Compliance Monitoring**; **Pesticides**; **Risk Management**; **Harmonization of Regulatory Oversight in Biotechnology**; **PRTRs**; and **Chemical Accidents**. More information about the Environmental Health and Safety Programme and EHS publications is available on the OECD's web site (see next page).

*This publication was produced within the framework of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC).*

**This publication is available electronically, at no charge.**

**For the complete text of this and many other Environmental Health and Safety publications, consult the OECD's web site (http://www.oecd.org/ehs)**

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**The Inter-Organization Programme for the Sound Management of Chemicals (IOMC) was established in 1995 by UNEP, ILO, FAO, WHO, UNIDO, UNITAR and the OECD (the Participating Organizations), following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organizations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.**

## FOREWORD

OECD work on PRTRs began in 1993 as a follow-up activity to UNCED. In co-operation with UN organisations and representatives of OECD governments, industry and the public, a Guidance Manual was prepared for governments considering the establishment of PRTRs. This Guidance Manual was published in 1996. The OECD Council adopted a Recommendation on Implementing Pollutant Release and Transfer Registers [C(96)41/Final] in the same year.

In 1998, the OECD organised a conference in Tokyo (hosted by the Environment Agency of Japan) to take stock of the status and progress of PRTR systems world-wide and to share lessons learned in developing existing or emerging PRTRs. This conference focused particularly on the role of PRTRs as a policy tool for sustainable develpoent, future directions and challenges at the national and international level, and the exchange of information on developments in system design and use. The Proceedings of this conference were subsequently published by the OECD [ENV/JM/MONO(99)16 PART 1 & PART 2]. One of the recommendations from this conference was that the OECD should provide guidance to its Member countries on approaches that can be used to present and disseminate PRTR data.

*Presentation and Dissemination of PRTR Data: Practices and Experiences* describes a wide range of practices used by OECD countries to present and disseminate PRTR data to the public. This publication is accessible via the OECD's web page - as are the PRTR Guidance Manual, the 1996 PRTRs Council Recommendation, the Proceedings of the Tokyo conference, the report on PRTR Member county progress in implementing a PRTR and other material relating to PRTRs.

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## EXECUTIVE SUMMARY

The dissemination of Pollutant Release and Transfer Register data is a powerful tool for communicating information about the environment. How PRTR data are presented and disseminated, and to what extent, can affect how valuable and useful they are. Furthermore, the fundamental value of a PRTR can be enhanced by the techniques used to present and disseminate the data, thereby helping a wide variety of audiences to access PRTR data and better comprehend what they mean.

By making this information available to the public in a form that encourages tracking, comparison and improvement of environmental performance, PRTRs can promote pollution prevention. Government, industry, and the public all benefit from the data. While governments may use them to evaluate progress towards achieving their environmental policy goals, industry may use PRTR data to improve environmental management efforts. Public access to PRTR data may also constitute a basis for dialogue with individual facilities and can help the public better understand local conditions.

This document describes ways to present and disseminate PRTR data to the public that are currently in use in OECD countries. Chapter 1 presents specific points to consider when designing a PRTR system for public use. It discusses the degree and means by which the information will be disseminated, as these are important components of a public system. Moreover, this Chapter describes how the type of medium used to provide PRTR data, as well as its accessibility and availability, can affect the range of audiences that would be able to use the data. PRTRs have generally relied on published documents that give widespread access to summary data and analysis. Dissemination makes information available and the choice of a dissemination approach depends on the *means* by which information will be distributed. The *manner* in which data are presented provides users with a tool for understanding and using the data more effectively.

Chapter 2 describes the basic elements of a presentation and dissemination strategy. Such a strategy should be developed in light of PRTR goals, and the approaches selected for presenting and disseminating the data should support the goals of the PRTR system. Another important part of a strategy is determining who the audiences are and what they need. Ultimately, the strategy should address concerns about what kind of data are to be disseminated, how they are to be disseminated and presented, and in which context they are needed.

Chapter 2 also addresses the question of *who* presents and disseminates the data. The predominant agents for disseminating data in many countries have been the government with support from non-governmental organisations. However, there are many other affected and interested parties who have undertaken efforts to disseminate PRTR data. For example, more and more corporate environmental reports include PRTR data as a performance measure. State and provincial administrations often disseminate their region's data and have developed special tools, such as brochures, fact sheets and web sites, to provide data to the public. Academia frequently furnishes additional analysis of PRTR data, and complements it with contextual data specific to a research project. And more recently, regional intergovernmental bodies have begun to disseminate PRTR data to the public.

Tools that enhance the presentation and dissemination of data are described in Chapter 2. These tools play an important role in informing the public that the PRTR data for a specific year (or cycle) are available and where to find them. Marketing and publicity techniques, as well as training and educational practices, are discussed. Specific examples of practices used in OECD countries are found in the Annexes to the document.

This document is not intended to serve as a comprehensive catalogue of PRTR disseminators (i.e. the people who release the data) or of data presentation and dissemination methods, but rather as a guide to basic practices. It draws on an informal survey of existing and emerging PRTRs, which includes contacts with representatives of government, industry and non-governmental organisations.

PRTR dissemination and presentation tools have developed rapidly over the past decade. Undoubtedly, more change is coming. Even with the rapid expansion of access to data in recent years, PRTRs are still in the early stages of learning how best to use new technology to disseminate and present data to achieve their goals. Extensive web searches identified direct dissemination tools and a variety of pertinent supplementary information.

Approaches in individual countries or regions will differ according to their priority needs and their target audiences. Factors influencing the choice of dissemination tools also include the characteristics and purposes of the PRTR itself. As there are a number of approaches from which to choose, no single approach can be expected to serve all purposes. This document provides governments with a guide to the range of current PRTR data presentation and dissemination methods.

# CHAPTER 1

# PRESENTATION AND DISSEMINATION

## 1.1 Introduction

The dissemination of Pollutant Release and Transfer Register (PRTR) data is a powerful tool for communicating information about the environment. Government, industry, and the public all benefit from such data. The value of a PRTR can be enhanced by the techniques used to present the data, helping a wide variety of audiences to better comprehend what PRTR data mean.

The purpose of this document is to provide governments with information about current practices used for disseminating and presenting PRTR data and to provide examples of approaches used in OECD countries. Practices in data presentation and dissemination can differ according to the priority needs and audiences of individual countries and regions. This is because PRTRs are national systems: their characteristics vary, as do their purposes. The goals and objectives of a PRTR influence the choice of dissemination tools to be applied in a given situation. For instance, a system established with the single objective of responding to public right-to-know may use different techniques and communication tools than systems established with the objective of satisfying public right-to-know and identifying opportunities for cleaner technologies, or for monitoring environmental policy performance.

While many PRTR data presentation and dissemination methods are described in this document, they are not mutually exclusive. No one approach serves all purposes. PRTR disseminators, i.e. the people who release the data, have a variety of valid and useful tools from which to choose. This document examines many of the choices and methods currently used in OECD countries.

### 1.1.1 Methodology

This document is designed to first provide the reader with information about the presentation and dissemination of PRTR data. It answers questions such as who disseminates the data, how data are presented and which media can be used. It also provides strategies and choices for disseminating and presenting the data. The remainder of the document and its Annexes contain a variety of options and examples for disseminating and presenting PRTR data.

The information in this document was drawn from informal surveys of existing and emerging PRTRs, including contacts with organisations engaged in PRTR data dissemination and presentation. Personal conversations with numerous government, industry and NGO representatives contributed valuable insights throughout the development of this report. Extensive searches of Internet web sites identified direct dissemination tools and a variety of supplementary information pertinent to the dissemination and presentation of PRTR data. This document is not intended to serve as a comprehensive catalogue of

PRTR data dissemination and presentation methods, but as a guide to the best practices that have evolved while making PRTR data available and accessible to the public.

Governments revise and improve their PRTR dissemination and presentation practices over time, and Internet-based resources change very rapidly. New features to some sites have appeared as this document was being written, and many more such changes can be expected in the near future.

## 1.2 The importance of data dissemination and presentation approaches

Dissemination and presentation of data play a key role in Pollutant Release and Transfer Registers (PRTRs). PRTRs provide governments with information for evaluating progress toward environmental policy goals and they help governments better manage the environment. They can encourage pollution prevention by making the data publicly available in a form that encourages tracking, comparing, and improving environmental performance. At the local level, public access to PRTR data establishes a basis for initiating dialogue with individual facilities.

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**Box 1**

**What is a PRTR?**

A Pollutant Release and Transfer Register (PRTR) is a catalogue or register of potentially harmful pollutant releases or transfers to the environment from a variety of sources. A PRTR includes information about releases or transfers to air, water and soil, as well as about wastes transported to treatment and disposal sites. PRTRs contain reports about specific pollutants such as benzene, methane or mercury as contrasted with broad categories of pollution such as volatile organic compounds, greenhouse gases or heavy metals. The development and implementation of a PRTR system adapted to national needs represents a means for governments to track the generation, release and fate of various pollutants over time.

A PRTR can play an important role in the environment policy of a government by providing otherwise difficult to obtain information about the pollution burden, encouraging reporters to reduce pollution, and engendering broad public support for government environmental policies. Indeed, governments may wish to set forth long-term national environmental goals to promote sustainable development and then use a PRTR as a tool to examine objectively how well these goals are being met.[1]

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The importance of data presentation and dissemination is reflected in many OECD documents. The OECD *PRTR Guidance Manual for Governments* [OECD/GD(96)32] states that once the goals of a PRTR are selected, the next most important action is to identify how the PRTR data and results can be made accessible.

In their final statement, participants at the 1998 Tokyo Conference on *PRTRs: National and Global Responsibility* recommended that the OECD review the *Guidance Manual for Governments* to identify where further policy and technical guidance might be needed. Participants of the conference emphasised that among the areas where future guidance is needed are "methodologies for disseminating PRTR data" and "techniques used for data presentation".[2]

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1. *Pollutant Release and Transfer Registers: Guidance Manual for Governments*, *A Tool for Environmental Policy and Sustainable Development,* OECD, 1996 p.15.

2. *PRTRs: National and Global Responsibility,* Proceedings of the OECD International Conference on Pollutant Release and Transfer Registers, Part I, Tokyo, 9-11 September 1998, Executive Summary, p. 17.

Public dissemination of PRTR data is a key aspect of a PRTR. This fundamental aspect is supported in the 1996 *OECD Council Act on Implementing Pollutant Release and Transfer Registers* which calls for OECD countries to establish, implement and make publicly available a PRTR system following the Guiding Principles found in the Council Act and in the *Guidance Manual*. Principle 9 of the Council Act says: "The results of a PRTR should be made accessible to all affected and interested parties on a timely and regular basis."

The Council Act also notes that PRTRs help fulfil the intent of Principle 10 of the Rio Declaration on Environment and Development of Agenda 21, which states that "each individual shall have appropriate access to information concerning the environment that is held by public authorities, and the opportunity to participate in decision-making processes and that countries shall encourage public awareness and participation by making information widely available". This emphasises that the way in which data are presented and made available to the public is extremely important.

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**Box 2**

**Role of public information in Agenda 21**

Governments should: Undertake concerted activities to reduce the risks of toxic chemicals, taking into account the entire life cycle of the chemicals. These activities could encompass both regulatory and non-regulatory measures, such as . . . . emission inventories (Chapter 19.49(b)).

Industry should be encouraged to: Adopt, on a voluntary basis, community right-to-know programmes based on international guidelines including sharing of information on causes of accidental and potential releases and means of preventing them, and reporting on annual routine emissions of toxic chemicals to the environment in the absence of host country requirements (Chapter 19.50 (c)).

Governments should: Consider adoption of community right-to-know or other public information dissemination programmes . . . . (Chapter 19.61(c)).

Business and industry should be encouraged to report annually on their environmental records, as well as on use of energy and natural resources. (Chapter 30.10(a)).

In sustainable development, everyone is a user and provider of information . . . The need for information arises at all levels, from that of senior decision-makers at the national and international levels to the grass-roots and individual level . . . . (Chapter 40.1).

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Dissemination and presentation of data are an integral part of the PRTR process. Other elements in the PRTR process include data collection and management. The relationship of these elements is clearly illustrated in the following graphic from the Netherlands' report on its 1995 Pollutant Emission Register data:

**Figure 1**
**Schematic Overview of the Monitoring Process of Emission Data -- Netherlands**
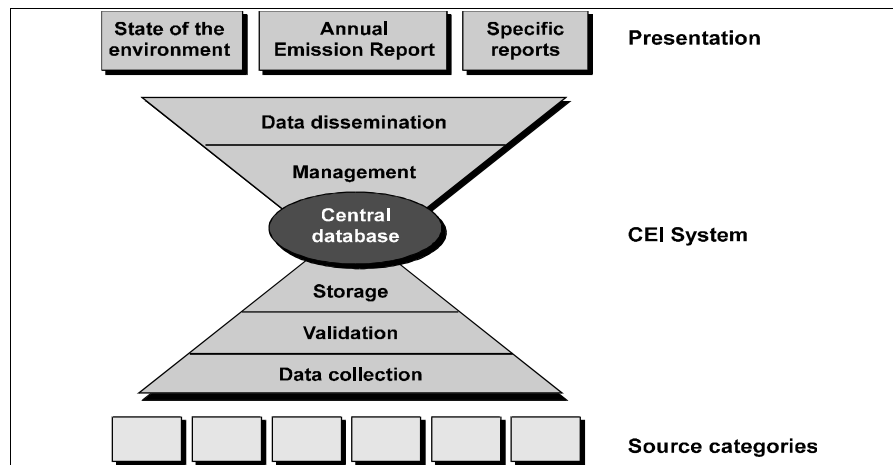


*CEI = Collective Emission Inventory;*
*Source categories include industry, public utilities, traffic, households, agriculture, and nature.*
*Source:  Emission Data for the Netherlands: 1995 and Estimates for 1996*

## 1.3      Designing a system for public use

Dissemination makes information available; choices in dissemination relate to the *degree* and the *means* by which information will be distributed.  The degree defines to which extent the public has access to PRTR data submitted by reporters, whereas the means defines the type of medium used to deliver the information to the public—for example on paper or electronically.  PRTR programmes have generally relied on published documents that give widespread access to summary data and analysis.  Some have also made use of electronic media, such as electronic bulletin boards and floppy disks, as a way to provide the public and interested parties access to PRTR data.  The Internet has increasingly become the means of choice in many countries for disseminating PRTR data.  Countries that do now or will soon make PRTR data available on their web sites are Australia, Canada, Ireland, the Netherlands, Norway, the United Kingdom and the United States.  Local and regional entities, such as the canton of Geneva in Switzerland, also make use of the Web to disseminate environmental information.  It is expected that this trend will continue as more and more countries implement a national PRTR.

Presentation determines the *manner* in which information is given to audiences, in particular, whether all reported data are disseminated and to what extent does government, industry or the public provide context to PRTR data.  The contextual data constitute additional information to help users to better understand what the PRTR data mean.

Under many PRTRs, data are analysed and presented geographically, using static maps to illustrate findings, or using interactive maps for dissemination (as in web sites).  PRTR data may also be aggregated by industry, by facility, by chemical substance or groups of substances, or by other subsets.  These presentations generally rely on data tables, whether published in printed reports or generated as a result of user searches on interactive web sites.  These choices are not mutually exclusive.  Printed publications and web sites that offer PRTR data to the public generally make use of most or all types of data presentation methods.

Under many PRTR programmes, reported data are actively disseminated.  The information is placed on the Internet, distributed on CD-ROMs and summarised in annual reports to make it widely available to the public.  A few PRTR programmes have a more passive approach to dissemination whereby data are made available upon request, but are not widely distributed to the public.

**1.4      Data presentation and dissemination strategy**

When a government elects to initiate a PRTR system, deciding on how to provide the data to affected and interested parties is of major importance.  The presentation of PRTR data communicates to the public information about their environment.  Placing it in a format that can be easily understood and used enhances the potential benefits of the data itself.  Similarly, the degree to which the data will be made available and accessible determines the effectiveness and scope of the PRTR system.

One of the first steps in designing a PRTR is to develop a strategy for data dissemination and presentation.  This strategy will help guide the development and implementation of a PRTR.  The first questions that need to be asked in developing a dissemination and presentation strategy are:

- What are the PRTR's goals?  How can the dissemination and presentation strategy help realise them?  What types of data tools are needed (e.g. GIS) to support the PRTR's goals?

- Who are the audiences?  PRTRs seldom, if ever, have a single audience.  The public, industry groups, individual companies, environmental citizens' organisations, government agencies, and others have needs for and interest in PRTR data.

- What do the audiences need?  As information needs vary widely among the groups that have a stake in PRTR data, it is important to identify each audience's needs and design a strategy that will meet these needs.

- What data are to be disseminated, e.g. full sets of reported data, aggregated data, data sorted by different themes or topics?  What additional information is to be disseminated, e.g. longitude and latitude data and trend data?

- How are data to be disseminated?  Which media will be used, e.g. paper (summary reports, fact sheets, special reports), or electronic (Internet, CD-ROM)?  Will data be actively disseminated?

- How are data to be presented?  How can they be presented so that all levels of affected and interested parties can easily understand them?

- What context data are needed (geography, economic, production volume, etc.)?

The following sections of this Chapter will address each of these points more fully.

*1.4.1      What are the goals of the PRTR?*

Governments institute or expand their PRTRs based on specific goals and objectives.  A government's goals are central to determining the methods of dissemination and presentation it will select.  Generally speaking, the aims of national PRTRs include, *inter alia*:

- Fulfilling the public's right-to-know;

- Identifying opportunities and encouraging pollution prevention;

- Encouraging cleaner production;

- Improving public participation in environmental policy decision-making;

- Identifying areas for action (e.g. hot spots of pollution or of a "specific" chemical) and setting priorities;

- Measuring progress toward environment goals and policy objectives;

- Monitoring policy performance; and

- Improving the public's understanding of environmental issues.

### 1.4.2   Who are the PRTR's audiences?

There is a great variety of users of PRTR data, ranging from all levels of government to the general public. This section deals with the primary audiences for PRTR data and what is needed to help them better understand and use the data. A good example of the range of audiences that would be interested in PRTR data is found in a report on environmental reporting by corporations. The Canadian Institute of Chartered Accountants identified the following audiences as being interested in environmental performance information: employees, investors, creditors, governments, communities, suppliers, consumers, environmental groups, educational institutions, professional and industry associations, and the media (*Reporting on Environmental Performance*, 1994, 34-40, The Canadian Institute of Chartered Accountants).

Policy-makers benefit from integrated release and transfer data as they provide them with a sounder basis for choosing and implementing new environmental programmes. Such data are important when evaluating existing incentives and controls. They can help identify trends that indicate potential environmental stress or improvements. For government regulators and other reporting facilities, PRTR data represent an additional tool for tracking compliance and other activities.

Individual facilities often find that the process of estimating releases and transfers reveals previously unrecognised opportunities to identify leaks, reduce waste and save money. Industry groups such as trade associations assess PRTR data to identify potential problems, encourage effective practices specific to the industry, and promote recognition of industry improvements. In addition, firms often use PRTR data to indicate progress in the reduction of releases or transfers of pollutants under Environmental Management Systems (EMS) they have implemented.

Public dissemination of PRTR data is critical for meeting access to environmental information/right-to-know goals. Communities depend on publicly available information to identify potential risks and priorities, as well as to facilitate industry-community co-operation toward improving local conditions for human health and environmental well-being. A public record can encourage all parties toward positive action by establishing a baseline and a means for measuring progress.

Non-governmental organisations—principally environmental citizens' organisations—both use and disseminate PRTR data. Their needs for PRTR data reflect their individual purposes and goals, as well as their constituencies. As a PRTR audience, NGOs priorities and interests are as diverse as the nation's citizenry.

In addition to NGOs, the financial sector, researchers, academics and factory workers all use PRTR data in different ways. Researchers and academics might use data for modelling or other studies. The financial sector use PRTR data for evaluating investment proposals or for considering insurance issues. Factory workers often use data to find out what is being released or transferred from their plant.

### 1.4.3    *What do PRTR audiences need?*

The different needs of PRTR audiences influence both dissemination and presentation choices. Summary data and presentations that emphasise overall trends principally serve as an overview, indicating to the broadest audiences what progress is being made and where such progress is lacking. On the other hand, detailed subsets of the data or complete raw data may be essential to meet many of the specific needs of particular audiences. Consultation with potential audiences or users of PRTR data—the public, industry and NGOs—is an essential step in identifying information needs that a PRTR could address. Doing this helps to focus resources and efforts on approaches that best meet the needs of the public. Careful examination of goals, audiences, and specific information needs may suggest particular delivery mechanisms for making data available in different ways to meet various aims.

Policy-makers can benefit from an analysis of aggregate PRTR data, looking at trends in:

- specific substances and groups of substances (such as carcinogens; persistent bio-accumulative toxins; VOCs; contributors to smog formation; ozone depleters, etc.);

- performance by the various industrial sectors;

- geographical distribution, including ecosystem analysis; and

- performance of particular environmental policies.

Some audiences can be partners in the dissemination process. Industry associations commonly disseminate a summary of PRTR data or this data is integrated into a company environmental report. Non-governmental organisations can serve as a bridge between local, regional and national concerns and will often analyse, interpret and deliver PRTR data for use at the local level. Inter-governmental organisations, tracking international mandates, could potentially offer the same service at the international level. Leveraging activities with these groups can help bridge any gaps in a national dissemination plan.

Government officials responsible for applying existing regulations can benefit from access to facility-specific PRTR data as this provides them with precise information to determine "hot spots" (specific geographic concentrations), opportunities for pollution reduction and prevention by source, and other detailed analyses. Data can be also used for land-use planning and for emergency preparedness planning. Research institutes use full PRTR data sets for modelling and other planning activities.

Industry can benefit both as users and disseminators of PRTR data as they prepare and track their own data. Facility and company personnel can identify cost-saving pollution prevention opportunities. Many companies use PRTR data as an input to their corporate environmental reports, which are themselves used by financial, environmental and community audiences. Opportunities for cleaner production and pollution prevention can be identified through the generation of site-specific data. Often facilities use PRTR data to compare environmental performance with others engaged in the same business activities. Trade associations and other business groups use PRTR data to track and publicise industry-specific progress in reducing releases and transfers of pollutants. PRTR data also help industry leaders identify needs for

technical assistance on particular problems, whether industry-wide or evident only among a subset of facilities.

Like governmental audiences, the public and NGOs have varying needs for PRTR data that affect how this data might be best presented and disseminated. Often public interests centre on a particular locality. Some interests extend to both human and ecological populations, locally or in wider geographic regions. NGOs generally focus their attention on potential risk for health problems, such as exposure to cancer-causing substances or to allergens. Academia and research organisations working on risk screening use PRTR data for a range of activities, including as an input into different models. Other groups might focus on working with particular industries.

### 1.4.4    What data are to be disseminated?

Decisions about audiences and their needs determine what data are made available and to whom. Typically, PRTRs require facilities to quantify the amounts of listed substances *released* to each environmental medium (air, water, land) or *transferred* to other locations for some form of waste management. National PRTRs vary considerably in terms of the list of chemicals that must be reported, the industries or business categories that must report, and the types of releases (by medium) and transfers (by waste management activity) identified. Another basic attribute of PRTRs is their regular collection of data, in most cases annually. These characteristics—critical for assessing trends and tracking progress—influence dissemination plans and practices. Table 1 provides a summary of PRTR programmes in OECD countries.

A key decision for governments is whether to disseminate all, some, or none of the full set of reported PRTR data and to what extent it will be disseminated. This decision is influenced by the goals of the system itself. The most extensive dissemination programmes offer readily available public access to the complete PRTR database. At the other end of the spectrum are PRTRs that offer the public only aggregated summary data. These may be limited to national totals summed by release medium (air, water, land) and by chemical, or the data may be aggregated by political subdivision (province, state, municipality). Therefore, the goals of the PRTR play an important role in determining what to disseminate. For example, if the goal is to provide national trends for groups of chemicals to the public, then aggregated data can suffice. If the goal is to provide government or academia with data for environmental research or modelling, then the reported data are needed. Aggregated data can help policy makers determine trends, but reported data helps them measure policy performance.

The amount of data made publicly available determines the kind of analyses interested parties can conduct. Different kinds of summary data are useful for tracking general trends. This can be done by theme, pollutant, annual releases or transfers, facility, or sector. In combination with other environmental information, the data can also contribute to an overall picture of pollutants being released and transferred. PRTR data for specific substances are necessary for inputs into evaluating potential risks and setting priorities for action. Industry-wide data can also serve priority-setting needs. Distribution of raw data, however, is essential for many applications, such as tracking environmental performance, assessing the effectiveness of existing emergency plans, modelling, analysing pollutant sources in a watershed or airshed, identifying the types of business activities associated with releases of chemicals of greatest concern, or for performing other valuable analyses.

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**Box 3**

**Issue: Commercial confidentiality and data dissemination**

While there are terms by which reporting facilities may claim confidentiality of data, the idea of confidentiality should not inhibit the dissemination of data. The OECD's PRTR Guidance Manual urges that "clear and concise guidance must be provided to reporters" and suggests that governments "may wish to…require reporting facilities to suggest generic information for each item claimed as confidential". The use of more general data to substitute for specific data claimed as confidential is important because PRTRs seek to characterise releases and transfers. If data are omitted, mistaken conclusions may be drawn.

Provisions governing confidentiality affect dissemination in two ways. First, clear guidance as to what constitutes a valid claim and the existence of procedures to deal with frivolous claims assure that confidentiality is not casually and needlessly invoked. Second, explicit limits on the information that may be withheld, including substitutions of generic data, assure that the privilege of confidentiality is limited to "trade secret" data, not to information needed to meet the public's right to know.

Existing PRTR systems have explicit and limited provisions under which businesses may claim that data are confidential. As a result, little data have been withheld from public view. In Canada and the United States, for example, only a dozen or so PRTR reports received in each country have claims of commercial confidentiality each year. In the United States, the following requirements are intended to discourage frivolous use of the confidentiality option:

- a top corporate official must review and sign the submission;
- information to substantiate the claim must be submitted at the time the TRI report is filed (not depending upon later agency requests or delays);
- only the chemical identity can be withheld, substituting a generic identification; and
- penalties apply for corporate officials who falsely claim trade secrecy.

While Canadian facilities can withhold from the public the reports for which they claim confidentiality, all data in a trade secret report, other than the chemical identity, is made publicly available. Annual dissemination of the US TRI data includes all amounts of reported releases and transfers. In the first year of reporting, only 40 submissions out of more than 74,000 claimed commercial confidentiality. In the 1997 data, 11 TRI forms out of 71,670 submitted claimed confidentiality, and their releases represented only a tiny fraction of the total in the database.

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**Table 1**
**Compiled results of government responses to the 1999 OECD PRTR questionnaire on Member country progress**

This table is based on responses made by governments to the OECD PRTR questionnaire.
Operating systems as of June 1999 are highlighted in grey.

| | First year of data collection | Environmental media covered | Mandatory or voluntary system | Number of listed chemicals | Transfers offsite included | Reporting of public facilities | Diffuse sources included | Report cycle | Public Dissemination of full (raw) data | Public Dissemination of aggregated data sets | Pilot Study | Consultation with affected and interested parties on design | Site specific reporting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 1998 | A,W,L | Mandatory | 90 | No | Yes | Yes | Annual | Yes | Yes | Yes | Yes | Yes |
| Austria[1] | N/A | | | | | | | | | | | | |
| Belgium Fl. (Air) | 1993 | Air | Mandatory[2] | 63 | | No | Yes | Annual | No | Yes | Yes | Yes | Yes |
| Belgium Fl. (Water) | 1993 | Water | Mandatory | 162 | Yes | No | No[3] | Annual | No | Yes | No | No | Yes |
| Canada | 1993 | A,W,L | Mandatory | 245 | Yes | Yes | Yes | Annual | Yes | Yes | Yes | Yes | Yes |
| Czech Republic | N/A | A,W,L | Mandatory | N/A | Yes | Yes | No | N/A | No | Yes | Yes | Yes | Yes |
| Denmark | 1989 | Water | Mandatory | 300 | Yes | Yes | No | Annual | Yes | Yes | Yes | Yes | Yes |
| Finland | 1988 | A,W,L | Mandatory | 50 | No | Yes | No | Annual | No | Yes | Yes | No | Yes |
| Hungary | N/A | A,W,L | Mandatory | 200-250 | Yes | N/A | No | N/A | N/A | N/A | Planned | Yes | Yes |
| Ireland | 1995 | A,W,L | Mandatory | PER list[4] | Yes | Yes | No | Annual | Yes | Yes | No | Yes | Yes |
| Italy | 1995 | Land | Mandatory | | Yes | Yes | No | Annual | Yes | Yes | Yes | Yes | Yes |
| Japan | 2001 | A,W,L | Mandatory | to be determined | Yes | Yes[5] | Yes | Annual | No[6] | Yes | Yes | Yes | Yes |
| Korea | 1999 | A,W,L | Mandatory | 80 | Yes | Yes | Yes | Annual | Yes | Yes | Yes | Yes | Yes |
| Mexico | 1997 | A,W,L | Both | 191 | Yes | Yes | No | Annual | No | Yes | Yes | Yes | Yes |
| Netherlands | 1976[7] | A,W,L | Mandatory | 180 | Yes | Yes | Yes | Annual | Yes | Yes | Yes | Yes | Yes |
| Norway | 1992 | A,W,L | Mandatory | 250 | Yes | Yes | Yes | Annual | No[8] | Yes | No | No | Yes |
| Slovak Republic | 1998 | A,W | Both | 200 | Yes | Yes | No | Annual | Yes | Yes | Yes | Yes | Yes |
| Sweden | N/A | A,W,L | Mandatory | N/A | N/A | N/A | Yes | N/A | N/A | N/A | Yes | Yes | Yes |
| Switzerland | N/A | A,W,L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Yes | Yes | N/A |
| United Kingdom | 1991[9] | A,W,L | Mandatory | 133 | No | Yes | Yes | Annual | Yes | Yes | No | Yes | Yes |
| United States | 1987 | A,W,L | Mandatory | 643 | Yes | Yes | No | Annual | Yes | Yes | No | Yes | Yes |

A,W,L = Air, Water, Land

NA = Not available or not answered

1. No PRTR or plans to develop a PRTR at this time

2. Started in 1980 as voluntary; since 1993, it is mandatory

3. Waste Register

4. Available through Republic of Ireland EPA, P.O. Box 300, Johnstown Castle Estate, Co. Wexford, Ireland

5. Planned

6. To be provided when requested

7. 1999 for new system

8. In 2000, data will be available on Internet

9. 1998 for new system

### *1.4.5 How are data to be disseminated?*

Data from PRTRs are shared with public audiences primarily through four media: print publications, Internet web sites, electronic media (floppy disks, CD-ROMs), and direct on-line data access. Print publications may also be preserved on microfiche.

Reporters and industry associations often disseminate summary reports of their PRTR data and annual environmental reports with PRTR data included. More and more companies are placing their PRTR data on company web sites. For example, the Canadian Chemical Producers Association's (CCPA) annual report, *Reducing Emissions: Emissions Inventory and 5 Year Projections*, provides a summary of reported data and reduction targets from their members.

In the US, public interest groups work together with local communities to create geographic databases, publish newsletters explaining local environmental conditions, and publish PRTR data in local newspapers.

The following table illustrates possible intersections of different types of PRTR information with available dissemination methods. A completed table that incorporates a PRTR dissemination plan could differ substantially from one government to another. A government may choose to make its complete PRTR database accessible via direct on-line access or an electronic Bulletin Board Service (BBS), while publishing summary reports both on the Internet and in print. Another country's PRTR may use the Internet to give the public access to its complete database and make selected subsets of data available on diskettes. Annual printed reports that summarise PRTR data will often be made available on the Internet as well—Acrobat® PDF files allow such print-based documents to be downloaded from web sites and read on-screen or printed locally by any interested web visitor.

**Table 2**
**Data Dissemination Methods**

| | Print Publications | Electronic | | | | Other (user request – newsletters, reports, fact sheets, data sheets) |
|---|---|---|---|---|---|---|
| | | Internet | Other on-line database | CD-ROM | Diskettes | |
| **Data** | | | | | | |
| Complete | | | | | | |
| Selected | | | | | | |
| Summary | | | | | | |
| Supplementary (Context data) | | | | | | |
| **Analyses** | | | | | | |
| Summary | | | | | | |
| Trends | | | | | | |
| Special | | | | | | |

Costs inevitably will affect the choice of dissemination options. For governments with limited resources, printed publications may be the primary tool for disseminating PRTR data. Simple and inexpensive printed materials can be easily and effectively used to promote the availability of PRTR data. For example, a simple flyer can be used to promote access and knowledge of how to find PRTR data, whether the data are Web-based, printed, or on computer diskette.

### 1.4.6 How are data to be presented?

PRTR data presentations should reflect the disseminators' priorities. National summaries, presented in tables and charts, inform audiences of progress toward broad environmental goals as well as trends. These general presentations can answer such questions as: what total quantity of listed substances was reported? How were these pollutants released (to air, water, land, or underground) and transferred (to recycling, treatment, disposal, etc.)? How have the amounts changed over the years?

PRTR data can be analysed by many factors, for example by chemical group, geographic region, industrial sector or activity, type of release or transfer, type of media, and other parameters. Presenting the results of these analyses focuses attention on particular problems and opportunities, whether at national, state/provincial, or local levels. Incorporating available facility-specific data serves community needs and can aid both local governments and citizens' groups with their analyses.

Visual tools serve particular purposes in presenting the findings of PRTR data analysis. Charts (bar charts, pie charts, line graphs) help to clarify the distribution and trends of many other analyses. These visual tools illustrate, but do not replace, the reported data. Charts and tables together are complementary tools for accurate and appropriate interpretation of data. Maps are the tool of choice for displaying the results of geographic analyses. Geographic presentation of data is fast-becoming an important feature of many PRTR systems. Maps and the geographic presentation of pollutant concentrations provide users with a simple and understandable presentation of conditions in a community, ecosystem or province.

Presentations of data by a specific theme or ranking could be helpful for many audiences. Ranking states/provinces or smaller regions, industry groups, and individual facilities by total amounts released to the environment could help audiences identify areas of the greatest potential importance. Ranking these or other groups by specific environmental media (air, water, land) can be a first step in setting priorities and developing practical action plans. Facility lists, in particular, can be made more useful by presenting the same data first in rank order and then by location.

Published reports—even those that include facility-specific information—usually offer only selected data from the PRTR database. Even the most detailed documents may, for example, provide the amounts of each chemical that a PRTR reporter ships to other facilities for waste management, but not identify the receiving locations. Publicly accessible electronic databases may also supply only selected subsets of data. Even where complete data are made available, choices among forms of presentation involve selecting the data to be presented and emphasised.

### 1.4.7 What context data or information are needed?

Governments and other PRTR disseminators may supply external data to help users put releases and transfers into context. These include geography, ecology, toxicity, demographics, economics, and other types of information. Economic data, for example, enhance PRTR analyses by business sector, while demographic data assist in priority-setting and decision-making processes. Local community contexts—

ranging from demographics and school locations to information on sewage and water treatment capabilities as well as details of land use—are especially important for many applications of PRTR data. Chemical/physical properties, health and environmental effects, and information on the fate and transport of a substance in the environment can provide important information for putting PRTR data in context. Information on common uses of reportable substances, their role in industrial processes, and their likely presence in products represents another category of contextual information.

Contextual information can be especially valuable for establishing the particular significance of PRTR data in local or regional conditions. Overlaying facility locations on watershed and airshed maps makes clear the potential influence the facilities' releases may have on the environment. Information on the persistence of chemicals in environmental media and their tendency to bio-accumulate through the "food web" can aid in assessing such releases. Stream flow data are essential to understanding the movement of pollutants discharged to rivers; equally important here is information on the environmental fate of the pollutants—does a particular substance settle quickly to the river bottom, evaporate to air, persist in water as it travels far downstream? These examples also suggest the potential value of considering information (usually from other government agencies) on non-PRTR substances emitted to air or to surface waters in conjunction with PRTR data.

Among the most keenly sought contextual data for PRTRs is information on the toxicity and hazard of listed chemicals. PRTR data providers and data users alike have focused increasing attention on such information in recent years. Health effects data and descriptions of toxicity can boost the applicability of chemical-specific release data reported to PRTRs, but information on health effects and toxicity can also be difficult to apply and interpret appropriately. Governments may refer audiences to reliable sources or collate and supply this information themselves.

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**Box 4**

**Types of contextual information
that are used with PRTR data**

- Geographic
- Economic
- Demographic
- Land use
- Chemical or physical properties
- Production
- Ecology-ecosystems
- Toxicity

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Industry observers are among those who have called for information on the toxicity and health effects of PRTR-listed substances to be provided as context when PRTR data are disseminated. Most governments make efforts to supply such information or to point data users to reliable sources of such information. As noted in Annex 1, some companies are now publishing their environmental report data with toxicity weightings. These weightings help them set priorities for pollution prevention and reduction activities.

Governments and other PRTR data disseminators may provide additional analyses that "normalise" data for production levels (often reported to PRTRs as a production index or ratio, comparing the current and previous years). It is important to note that these are supplemental analyses. Production-adjusted data do not allow tracking of progress toward policy goals. In publishing their own environmental reports,

corporations often choose particular contexts in which to place their environmental data. Many recast their release data in relation to production volumes, publishing only, or principally, production-related release data; these may be expressed in per unit of production or totals may be adjusted by a production index.

Table 14 in Annex 2 illustrates a variety of characteristics included in a number of PRTR web sites, as well as some of the contextual data that can be used to provide additional explanation and clarification for the data.

## 1.5    Strategies and choices

Developing an effective PRTR dissemination strategy will depend on the relationship of the PRTR's goals, the data collected, the data disseminated, and the available contextual data. As goals of a PRTR differ, strategies and choices in the type of dissemination and presentation techniques to be used will also differ. In particular, governments may have specific programme goals. A principal goal of the Netherlands' Pollutant Emission Register (PER) is to track environmental policy goals: "The database contains the necessary information about the emissions of all relevant species or compounds, for which an environmental policy or emission reduction target has been formulated…". PER data "can be aggregated to the level of environmental themes distinguished in the Netherlands' National Environmental Policy Plan", namely: climate change, ozone depletion, acidification, eutrophication, and dispersion.[3] Experience of OECD countries indicate that PRTRs change over time as environmental programmes progress and additional, or different, data are needed.

The very broad constituency that government serves may also influence assumptions and practices of government agencies engaged in disseminating PRTR data. As noted above, some PRTR audiences also have a role as disseminators themselves. Organisations outside the governmental structure, on the other hand, may represent quite specific constituencies and aims. Many NGOs, for example, advocate environmental improvement and protection of human health. A government's strategy will reflect its own priorities, but can also take into account the benefits of dissemination activities and presentation approaches of other potential disseminators. Company and trade associations often produce reports to show reductions in PRTR releases and transfers and will indicate goals and targets for future reductions. Data on potential health effects and comparable risk are also included. Inter-governmental bodies may be more likely to focus on long-range transport of pollutants, as it is well known that releases know no borders. Their constituencies, however, include member governments with different approaches to PRTR activities. Local communities will focus on local conditions. The assumptions and goals of the various agents of dissemination will influence their approaches to publishing and publicising PRTR data.

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3 .    *The Pollutant Emission Register in the Netherlands*, C.W.A. Evers, Ph.D., paper presented at PRTR Workshop for Countries of the Americas, Querétaro, Mexico, July 29-31, 1997.

CHAPTER 2

APPROACHES FOR PRESENTING AND DISSEMINATING PRTR DATA

2.1      Introduction

Governments have adopted a range of plans and practices for sharing PRTR data with the public and with targeted audiences.  This Chapter first examines options that disseminators of PRTR data have and then identifies specific PRTR dissemination and presentation methods, again looking at options and examples from current practice.  It also addresses the different approaches used by governments, NGOs, industry, state governments, local communities, and intergovernmental and regional bodies to present and disseminate PRTR data.  To provide additional information about using the Internet as a tool for data presentation and dissemination, Table 14 in Annex 2 lists characteristics from selected PRTR-related web sites.  These characteristics can also serve as a potential checklist of options for governments that are designing or expanding their plans for making PRTR data available and useful to targeted audiences.

2.2      Who presents and disseminates the data?

The predominant agents for disseminating PRTR data have been the governments that collect the data and non-governmental organisations.  In some countries, NGOs have played a substantial role in bringing PRTR data to the public and making them more understandable.  Over time, the interaction of governmental and non-governmental disseminators has helped to make PRTR information more widely disseminated and used.  Other distributors of PRTR data include intergovernmental bodies, industry groups, individual corporations, and academia.  Regional and intergovernmental bodies are also taking information on toxic-chemical releases and transfers to larger audiences for which the utility of such data across local and national boundaries is enhanced.

For PRTRs that are under development, a key question may be the extent to which the government itself undertakes the dissemination and presentation of PRTR data, not only making the data available to the public, but also educating the public to their meaning and use.  Some governments explicitly call on non-governmental entities, academia, and other bodies to publish the data and to help the public learn how to interpret them.  Some of these external disseminators help to make PRTR data available to the widest possible audience.  Others develop specific analyses and presentations of the data to address particular concerns and interests.  Some groups, in particular environmental citizens' organisations (ECOs) that are organised at the national level, may do both.

The existing national PRTRs have accumulated considerable experience with dissemination of the data they gather—some have a decade or more of such experience.  Some countries have identified widespread dissemination of information as a priority right from the start; others have taken an incremental approach. Governments that are planning, or have begun, implementation of a PRTR exhibit a range of commitments to data dissemination. Some have committed considerable resources to developing tools for public access even before their first year of full reporting.  Others plan to share only broadly aggregated data summaries for their initial reporting years.  Methods and means of sharing information collected through a PRTR show equally broad scope both for well-established PRTRs and those in the planning and development stages, thus offering useful examples of approaches to making data available, accessible, and

comprehensible to a large number of audiences. Examples found in Annex 2 illustrate the variety of practices used by OECD countries.

## 2.3    National government activities

Governments play a prominent role in PRTR data dissemination. This is especially important "to ensure that affected and interested parties are provided access to information on an equal and equitable basis".[4] While governments take the early lead in active dissemination, over time non-governmental organisations often play an increasing role in delivering PRTR data to the public and helping the public learn to use them.

In most countries, government is the principal actor in publicising PRTR results. Examples of some national governments that have the leading role in actively disseminating their PRTR data include Australia, Canada, the Netherlands, and Norway. Some of these countries have focused their activities directly on developing tools for public access to, and use of, PRTR data.

Australia's principal dissemination tool for the National Pollutant Inventory (NPI) is the World Wide Web on the Internet. Australia tested its searchable NPI pilot database on the Web before it made the NPI data for the first reporting year (ending June 1999) available on the Internet in January 2000. As the NPI develops, the structure of the Australian government suggests a potential future role by both governmental and non-governmental agencies at the state and territory level in the dissemination and interpretation of PRTR data.

The Netherlands began publishing summaries of its pollution emission inventory data in print in 1990 and has developed a detailed report format that illustrates the annual results and specific trends over time with numerous charts and graphs. The Netherlands has developed a Datawarehouse for its Pollutant Emission Register (PER) data that is available the on Web and on CD-ROM. The Datawarehouse allows interactive searching of the database.

The Ministry of Environment in Norway produces an annual report, *Pollution in Norway (Forurensning I Norge),* in which trends in the PRTR data are summarised. Full data sets are also made available to citizens upon request. The Norwegian PRTR database (i.e. the full set of reported data) will become available on the Internet by 2000.

## 2.4    Joint activities of governmental and non-governmental organisations

In the United States, both the government and NGOs have actively disseminated data from the US Toxics Release Inventory (US TRI). The US EPA has published annual reports and analyses of TRI data and in its first years of operation placed data on the National Library of Medicine's (NLM) Toxnet system. After a few years, the US EPA worked together with the RTK NET—a non-governmental entity—to provide the public on-line electronic access to the database. Operated by two non-profit organisations, OMB Watch and The Unison Institute, RTK NET (http://www.rtk.net) was established in 1989 specifically in support of the Emergency Planning and Community Right-to-Know Act of 1996 that established the US TRI and mandated public access to TRI data. It is worth noting that government agencies and private foundations fund the RTK NET.

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4.      *PRTR Guidance Manual for Governments,* OECD/GD(96)32, p. 93.

A decade later, the Environmental Defense Fund (now called Environmental Defense) has taken a prominent role in PRTR data dissemination with its Internet-based Environmental Scorecard (http://www.scorecard.org). The scorecard provides a database by which users can quickly identify releases in their local areas (by zip code) and find information on the potentiality of risk. This site offers many interactive features, covers several important environmental databases, provides useful contextual data, connects environmental information, and breaks new ground in publishing—for widespread citizen use—toxicity weightings of the pollutants.

Environment Canada publishes an annual summary report both on the Internet and in print and makes its National Pollutant Release Inventory available on a web site in several useful formats—summary reports, supplementary tables, searchable data, and downloadable databases (http://www.ec.gc.ca/pdb/npri). Environment Canada, having first taken the principal role in making data public, is now developing partnerships with Canadian environmental organisations to expand and improve public access to, and use of, NPRI data.

While Canadian NGOs have not been directly active in dissemination processes, they have been involved in PRTR issues, and Environment Canada has begun working with them to expand its PRTR outreach. The Canadian Institute for Environmental Law and Policy (CIELAP), for example, has participated in both Canadian and OECD activities on PRTR topics. CIELAP is currently developing a Citizens' Guide to the National Pollutant Release Inventory and is involved in developing local maps of NPRI releases and transfers. Both projects, which are funded by the Canadian government, are aimed at improving the general public's knowledge of PRTR data, their importance, and their uses (http://www.cielap.org/infocent/index.html). With public and private funding, three organisations— CIELAP, the Canadian Environmental Defense, and the Canadian Environmental Law Association—are now exploring development of an interactive Scorecard for NPRI data on the Web, similar to that recently instituted for the US Toxics Release Inventory by Environmental Defense. Tools such as the Citizens' Guide, local mapping, and the potential Scorecard are viewed as important aids to generating public awareness and expanding the use of NPRI data in coming years.

Since the initiation of the TRI, the US EPA has distributed TRI data on diskettes (for each US state) and more recently on CD-ROM (containing a full set of reported data). In recent years, the US EPA has also given TRI data users the opportunity to download complete data for each US state directly from the Web. With the advent of the Internet, the US EPA has also developed its own on-line access to the TRI data. In addition, EPA's Envirofacts offers one-stop access to seven EPA databases. Envirofacts includes mapping capability and offers extensive query options (http://www.epa.gov/enviro).

## 2.5     Non-governmental organisation activities

Under some PRTR systems, NGO's have played an increasingly important role as agents for disseminating PRTR data. During the first years of operation of their PRTR systems, some governments actively disseminated summary reports and made full data sets available upon request. In 1994, in the United Kingdom, the Friends of the Earth (FOE) obtained the Chemical Release Inventory (CRI) data from the government. Upon receipt, FOE made the data more widely available through the Internet. FOE developed maps and search tools so that users could locate data of local interest. The United Kingdom's Environment Agency, seeing the value of publishing such data on the Internet, now has a web site with current data from its updated and expanded Pollution Inventory, which replaces the CRI. The UK Environment Agency's site includes tools for searching and mapping the data. At the same time, the Friends of the Earth has introduced an advanced tool for presenting the data, Factory Watch

(http://www.foe.co.uk/campaigns/industry_and_pollution/factorywatch/). This tool is used to analyse Pollutant Inventory and CRI data and retrieves facility-specific information from the database.

Mexico has expressed interest in relying on NGOs to take the lead in disseminating PRTR data until their PRTR programme phases in. In the Czech Republic and other central European countries, non-governmental organisations and academia have been instrumental in moving forward on plans for PRTRs. In these countries, NGOs can be expected to take active roles in dissemination, including educating the public on the importance and use of PRTR data (see http://mole.utsa.edu/~matserv/iheal/). Environmental Citizens' Organisations (ECOs) from 33 European countries actively support establishing PRTRs to fulfil the right-to-know provisions of the 1998 Åarhus Convention, confirming their commitment to public dissemination and the use of such data (Chisinau Declaration, April 1999).[5]

Although Canada mounted its own NPRI data on the Internet and continues to do so, the complete NPRI database was first made available by way of RTK NET, an active US non-governmental organisation.

## 2.6    Industry activities

Industry has also contributed to the publishing of PRTR data. Using the data to track progress in reducing releases and transfers of PRTR substances, individual corporations and industry trade associations have both helped to foster awareness of PRTR data among various constituencies. In some cases, corporations have publicly reported data not only for facilities in countries covered by PRTRs, but also for facilities located in countries that have no such pollutant register in place. Collecting these data can be beneficial for the company itself, providing it with: a consistent overview of environmental releases and transferred waste; an opportunity to identify and prioritise risks; a means to identify opportunities to reduce pollution and cut costs; and a straightforward tool to track progress.

*a)        Corporate environmental reporting*

Corporate environmental reporting and PRTRs have grown in parallel over the past ten years. Environmental reports and PRTR data are increasingly available on company web sites. In contrast to governments and NGOs, businesses and trade associations make use of PRTR data to track and publicise environmental performance. Their publishing of these data brings company-specific environmental data, which may include PRTR information or similar data, to the attention of specific audiences who otherwise would not necessarily focus on broader environmental information tools such as PRTRs. Some examples of corporate environmental reporting are provided in Annex 1.

Corporate environmental reports, often containing PRTR data, are typically distributed to shareholders and employees. Other interested recipients include not only environmentally concerned citizens, but also financial analysts, as environmental issues assume a larger role in investment evaluations. To some extent, corporate environmental reports supplement—and resemble—companies' annual reports to shareholders. A principal difference lies in the financial statements that accompany annual corporate reports. These are expected to conform to generally accepted accounting standards and to provide an

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5.    Negotiated through the UN Economic Commission for Europe (UNECE) and adopted in 1998, the Åarhus Convention, provides an international legal framework that strengthens the environmental rights of citizens including rights to have access to information, participate in and influence decisions, and go to court. In the Chisinau Declaration (http://www.participate.org/convention/Eco-report.pdf), adopted in April 1999, representatives of Environmental Citizens' Organisations from 33 UNECE countries called on signatories of the Åarhus Convention to commit to a legally binding instrument requiring the establishment of PRTRs.

accurate view of the company's business performance. Despite the variety of guidelines issued for corporate environmental reporting, data standards have not become commonplace for these publications. The Global Reporting Initiative (see Annex 1) is working on standardised reporting, particularly for use by financial analysts.

Many corporations that publish environmental reports, especially those that have been doing so for several years, have begun setting their own targets for reducing emissions. The annual environmental publications thus become a public record for tracking progress toward these goals.

Over the last decade, three trends seem evident. More companies published annual environmental reports in the late 1990s than did so in the late 1980s. Companies with experience in publishing such reports have tended to expand the range of issues that they address. While these trends are encouraging, such activities are more likely to be undertaken by large corporations. According to a 1997 editorial in *Environmental Accounting & Auditing,* one out of three large multinational corporations publish an annual environmental report.[6]

The European Union's Eco-Management and Audit Scheme (EMAS), which went into effect in 1995, provides a legal framework for companies that choose to improve their environmental performance. If a company opts into EMAS, it collects, verifies, and reports data at the facility level, and makes the results of EMAS audits public. The environmental statement is to be designed for the public and written in a concise and comprehensible manner with technical information appended. Incorporating information on waste generation, pollutant releases, and the consumption of raw material, energy and water, EMAS's scope is broader than that of many PRTRs.[7]

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**Box 5**

**EMAS Evaluation**

A 1997 analysis of 465 EMAS environmental reports found that 83% included data on pollutant emissions and 99% on waste (*Swedish EMAS Survey Recommendations*, *Environmental Accounting and Auditing*, November 1997). PRTR data thus play a role in these reports. However, because there is no requirement to present the data in standardised form as in PRTRs, and there is no provision for establishing a single database, EMAS reports cannot be easily compared or analysed. Thus, dissemination is by individual facilities for local communities or other stakeholders.

The development of a European Pollutant Emissions Register (EPER) under the EU's Integrated Pollution Prevention and Control Directive may, in the future, provide a format for presenting data in a standardised manner. This could help public comprehension of what is being presented in the reports.[8]

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Countries, such as Denmark, in its Green Accounts Programme (see Box 6), and the Netherlands, now require their major companies to prepare environmental reports and make them publicly available.

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6.      *Expanding EMAS and Harmonising the Environmental Statement*, Environmental Accounting and Auditing, 2:15, November 1997.

7 .     See Council Regulation (EEC) No. 183/93 of 29 June 1993 allowing voluntary participation by companies in the industrial sector in a Community eco-management and audit scheme.

8 .     *Analysis of a European Polluting Emissions Register EPER*, Swedish Environmental Protection Agency, October 1998. For further information on data elements and categories reported under PRTRs for 87 corporate reports, refer to *A Benchmark for Reporting on Chemicals at Industrial Facilities*, prepared by the World Wildlife Fund and Hampshire Research Institute in 1995. This report analyse some 130 data elements and categories reported under national PRTRs and in 87 corporate reports.

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**Box 6**

**Green Accounts**

In 1996, a Danish law went into effect that requires polluting firms to declare their principal emissions of pollutants, generation of waste, and consumption of energy, water, and raw materials. The intent of the "green accounts" is to stimulate interest and action among both citizens and private firms in protecting the environment. Thus, the accounts are to be presented in a non-technical manner, easily understandable by the general public. The green accounts are made available by the Commerce and Companies Agency using the same system that collects and publishes financial accounts.

The Danish green accounts are similar to PRTRs in requiring data on emissions and wastes. They go beyond most PRTRs in also requiring information on energy, water, and raw materials. Like PRTRs, their purposes include providing an incentive for environmental improvement. Some companies, such as Rockwool, have developed detailed indicators that are available on the company's web site (http://www.rockwool.com/environment/default.htm.) However, each company decides how to present its green accounts. Unlike PRTRs, therefore, the information is not standardised so performance across facilities is difficult to compare. Moreover, the data are not entered into a database that allows aggregation or analysis by sector, region, or chemical.

The Danish Environmental Protection Agency, which has responsibility for quality of the content of the accounts, has sponsored an in-depth evaluation of the implementation of the green accounts by a consortium of the Centre for Alternative Social Analysis, Gallup A/S, and the Hanne Eriksen Consulting Company. (An English summary of the results can be found at http://www.mst.dk/activi/11000000.htm. The analysts found 1,032 green accounts were made public in 1998 with 173 of them voluntary. They looked at dissemination by examining the use of the accounts by stakeholders. They found that firms have the impression there is increasing interest in the accounts. However, half of all firms had themselves sent out fewer than 10 copies of their accounts. Generally demand is low. Among the public, about half of the neighbours to firms and consumers knew about green accounts and how to obtain them. About 10% had seen an account. Thus, green accounts have not had an immediate public impact in their early years.

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*b)*      *Individual companies*

The environmental reporting of individual companies described in Annex 1 illustrates how the field has developed over a short period and the value and limitations of some of the specific approaches. Indeed, PRTRs have exerted an influence on corporate environmental reporting. Companies that submit reports to government on their environmental releases and transfers, permitted air and water discharges, or waste generation and management, often make use of these data in compiling their environmental reports.

*c)*      *Evolving uses*

PRTR data are being used more and more by financial and other institutions for activities such as investment screening. Investment options, such as green mutual funds, are emerging in the US and PRTR data are used as one of the parameters in some of these funds.

## 2.7      State/province activities

Environmental issues in a country often have a local focus, reflecting both the nature of specific environmental problems that have developed and the mechanisms and opportunities for government, industry, and the public to work together to address them. Disseminating data on a state or province basis facilitates this process.

On 28 January 2000, Environment Australia's National Pollutant Inventory database web site became operational with its first year of reporting data. Users can conduct searches by substance, source, facility

and location.  Interactive maps and information on the national pollutant inventory for each state and territory can be obtained at http://www.environment.gov.au/epg/npi/database/index.html.

Environment Canada provides regional information and NPRI data customised to the province on the national Internet site (http://www.ec.gc.ca/pdb/npri/index.html).  The following are identified: the pollutants released in the largest quantities, pollutants transferred in the largest quantities, facilities within the region with the largest releases, industrial sectors with the largest releases and releases of CEPA and carcinogenic substances.  This information is also available from provincial offices in hard copy.

In the United States, the Environmental Protection Agency makes state-level data available.  Twenty-six of the 55 US states and territories also produce their own annual state TRI report, and 15 place TRI data on their web sites, according to the National Conference of State Legislatures *1998 State TRI Assessment*.  For example, the state of Louisiana distributes its state TRI data.  The Louisiana Department of Environmental Quality maintains a state TRI database and makes these data available to the public through its annual report, printed and published on the Internet.  A task force was created to prepare the annual reports.  This task force includes members from government, environmental groups, universities, and industry.  Louisiana's TRI reports have evolved over the years, but from the start the printed reports used graphics creatively to make the data easily understandable for citizens.  The entire series of Louisiana reports is available at http://www.deq.state.la.us/.  More recently, the reports have begun to make use of interactive mapping on the web site, allowing users to zoom in on TRI sites to locate releases by political jurisdiction and bodies of water.  Louisiana also makes available its historical TRI data (covering 1987 to 1992) in ArcInfo format, downloadable for users with Geographical Information System software.

In its *Analysis of a European Polluting Emissions Register EPER* (October 1998, p. 19), the Swedish Environmental Protection Agency notes that national authorities in Europe disseminate information collected by integrated (multi-media) pollutant inventories, whereas regional authorities have responsibility for disseminating information from non-integrated (single-medium) inventories.


## 2.8      Local/community activities

Local governments and NGOs play an important role in the dissemination of PRTR data.  Local groups often take the lead in presenting data in a form useful for local communities.  These groups can serve as a key point of access, helping to make the data accessible to audiences that would not otherwise be likely to obtain and use PRTR information.[9]  By the late 1990s, a few local groups were beginning to play a leading role in mediating the presentation and dissemination of PRTR and other environmental data over the Internet.

Some local groups may well become major nodes of dissemination as horizontal networks of NGOs that are building and using PRTRs develop across the Internet.  One example of such a group is the Silicon Valley Toxics Coalition, an NGO located in Silicon Valley, California.  The Coalition develops presentations of data at the county level and disseminates them to the local population.  Established in 1982 as groundwater contamination was identified from electronic plants in the area, the Coalition worked for legislation to provide information to the public about the sources of this pollution.  A local law was adopted in 1983 and a state law in 1985—one of a handful of state-level forerunners of TRI.  When

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9.        An early review of the uses of TRI data in the United States found this to be true in the TRI experience.  For more information, see *The Toxics Release Inventory: Environmental Democracy in Action,* prepared by Frances M. Lynn, Jack D. Kartez, and Cheryl Connelly, January 1992.

national US TRI data were first published, the Coalition prepared a database of releases from 41 facilities in the area, focusing particularly on CFCs, and worked with the press to present the data.

In recent years, the Coalition has shifted its presentation and dissemination techniques to the Internet. It works with Clary-Meuser and Associates, a small research group who have mapped TRI data in Santa Cruz, California, and are addressing environmental justice issues related to industrial siting and residential development (http://www.mapcruzin.com/projects/proj_ei.htm). The Clary-Meuser Research Network created the first interactive TRI maps on the Internet (http://www.mapcruzin.com/projects/proj_seek.htm). The maps prepared for the Coalition use many sources of the US EPA data including the TRI, and data collected under the Clean Air and Water Acts and waste laws. They show sources of toxic chemicals in relation to demographic data on income, home ownership, and minority status. The Coalition's Eco-Map Family at http://www.mapcruzin.com/svtc_ecomaps/ now includes: 1) interactive maps providing the locations of seven sources of toxic chemicals; 2) maps displaying concentrations of hazardous air pollutants; and 3) interactive maps that show the location of and information about contaminated groundwater. The web site provides demographic maps on minorities, age, income, education, and home ownership as well as caveats on interpreting the data (http://www.mapcruzin.com).

**Figure 2**
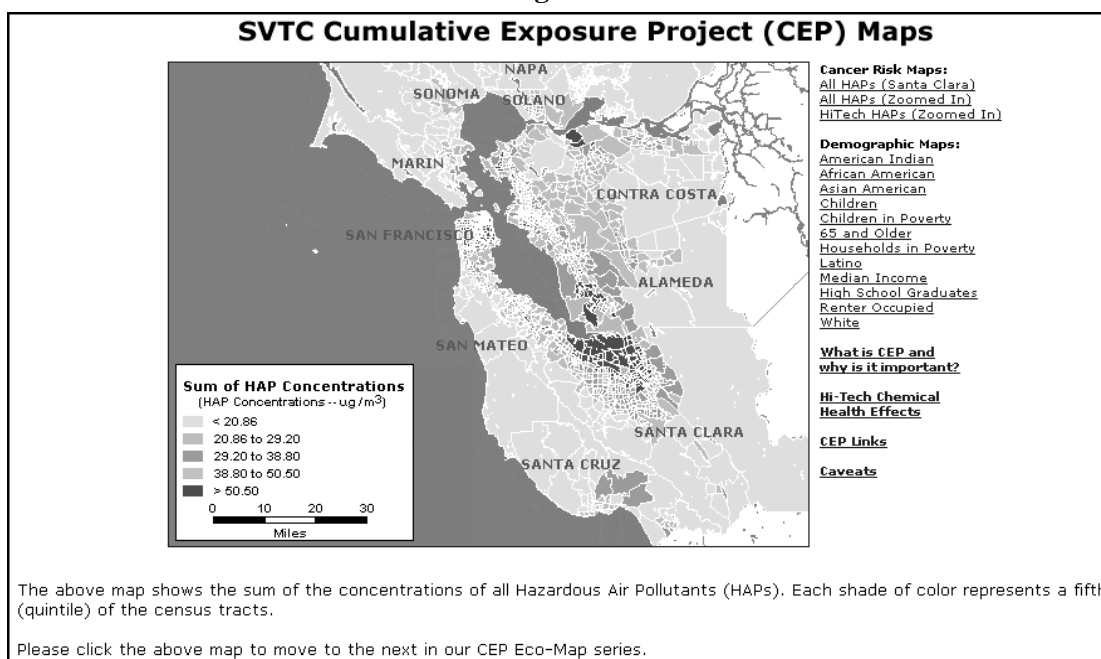


*Source: Clary-Meuser and Associates, 2000.*

Both the Coalition and the Clary-Meuser group are active members of international networks on PRTRs, for example the Interactive Health Ecology Access Links (IHEAL) Project (http://mole.utsa.edu/~matserv/iheal/). Global Chemical RTK Resources are posted on the web site at http://www.mapcruzin.com/globalchem.htm. (Further examples can be found in Annex 6, United States.) The Coalition is a key organiser in several international high tech campaigns. Their presentation and dissemination models circulate widely and have both influenced and been influenced by work at the national level, such as work on the Environmental [Defense] Scorecard.

Companies disseminate data about their own performance at the local level. In earlier years, the Imperial Chemical Industries PLC (ICI) prepared individual brochures on the releases and waste generation of its facilities. As an example, an "Environmental Update" pamphlet on ICI's Merseyside Operations (in

England) for 1992 focused on waste reduction goals and performance (see Annex 2, Figure 5). The one-page four-panel brochure supplied chemical-specific data for 1992 discharges to water, air, and land; summarised the year's compliance incidents and citizen complaints (and action taken); discussed recovery and recycling and presented plans for investing in treatment equipment. A similar publication put forth three years' data for air, water, and land releases (1991-1993) for ICI's Botany site in Australia. (More recent developments in ICI's environmental reporting are found in Annex 1.) This example illustrates the active role companies are beginning to take at the local level.

## 2.9    Regional inter-governmental bodies

The North American Commission for Environmental Co-operation (NACEC), a joint effort of Canada, Mexico, and the United States established under the North American Free Trade Agreement (NAFTA), publishes an annual report on North American PRTR data. The first three annual volumes of *Taking Stock: North American Pollutant Releases and Transfers* have reported and analysed Canada's NPRI and the US TRI data; subsequent reports will incorporate Mexico's *Registro de Emisiones y Transferencia de Contaminantes* (RETC) as data become available. The NACEC has also worked to help the three North American PRTRs find ways to make their individual PRTRs more comparable, to facilitate the continent-wide view of pollutant releases and transfers.

On 17 July 2000, the European Commission adopted a Decision on the implementation of a European Pollutant Emission Register (EPER) in accordance with Article 15 of the Council Directive 96/61/EC on Integrated Pollution Prevention and Control (IPPC). The primary purpose of the IPPC Directive is to reduce pollution by industry and to control emissions from larger facilities. The objectives of the EPER will be to collect comparable emission data to air and water of individual polluting industrial sources, place them in a database and make them available to the public. The EPER will register emissions to air and water for 50 pollutants released by about 20 000 individual facilities in Europe.

National governments of all EU countries are required to inventory emission data from specified industrial sources and to report the emission data to the European Commission. Data will then be made available via the European Environmental Agency. The first reporting cycle shall be in June 2003 on emissions in 2001; the next reporting cycle will be in June 2006 on emissions in 2004. Every three years the Commission will publish a report on the inventoried emissions and their individual sources. Both government and the public will use the EPER as a public register providing accessible environmental information on major industrial activities. The present EPER can be considered as a first step towards the development of a fully integrated pollutant release and transfer register, or PRTR, for Europe.

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**Box 7**

**International Agreements**

PRTR data lend themselves to tracking progress in countries' implementation of various international agreements and conventions for environmental protection and improvement. Many national governments develop presentations of PRTR data for groups of substances that pose particular concerns, internationally or across borders. Trends analysis, illustrated with charts and graphs, and data tables itemising the sources of releases and transfers of the target substances, could serve international goals in the same way that they have served national PRTR goals.

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In North America, there are two key cross-border projects: one on the US-Mexican border and the other on the US-Canadian border around the Great Lakes. These projects have demonstrated international co-operation that includes dissemination of PRTR data focused on cross-border sources of pollutants. These

projects have not only collected and disseminated PRTR-type data, making information newly available to government entities and to the public, they have also laid foundations for collecting and presenting such data in border regions.

The 1992 US-Mexico Integrated Border Environmental Plan (IBEP), issued jointly by the two countries' environmental departments, incorporated several provisions that acknowledged the importance for the plan of environmental information that was not readily available. In the plan, the two governmental agencies agreed to establish "requirements for public availability of data on emissions and effluents of pollutants and other elements of a right-to-know programme in the border area" (IBEP, V-49). The plan also acknowledged the need for data on pesticide use because of concerns for both worker exposure and environmental contamination.

El Proyecto Fronterizo de Educación Ambiental (PFEA), a non-governmental organisation based in Tijuana, Mexico, collaborated with the Environmental Health Coalition in San Diego, California (US), to identify industrial sources of hazardous chemicals in Tijuana. In this effort, PFEA collected and analysed all publicly available information covering the period 1990 to 1996. PFEA's report, *Uso de Sustancias Peligrosas en la Industria de Tijuana, B.C.: Desde una Perspectiva del Derecho a la Información Ambiental*, presented the results while identifying the leading industrial sectors, the most common hazardous substances, and the potential risks of those substances to human health. The report has been distributed to interested parties, ranging from governmental representatives and NGOs to citizens in the border areas.

In 1998, the Great Lakes Commission published an initial, comprehensive inventory of toxic air emissions from the eight US states and Canadian province bordering the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario). Based on 1993 data, the inventory covered 49 toxic substances. A principal component of this effort was the development of the Regional Air Pollutant Inventory Development System (RAPIDS), billed as "the first ever multi-jurisdictional pollutant emissions inventory software". Information on this regional, cross-border project appears on the web at http://www.glc.org/air/air3.html. Results of the initial inventory can be found at http://www.glc.org/air/final1993/1993.html. The downloadable report offers a good example of the presentation and dissemination of data from multiple jurisdictions, including explanations of the data and methodology. Figures and tables are supplied in spreadsheet format. This facilitates a number of further applications for this data, such as conducting additional analyses, developing presentations incorporating local data, or reproducing the information on slides or overheads.

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**Box 8**

**European Inventories: CORINAIR**

CORINAIR represents one model for reporting emissions data at the European Community level. Summary CORINAIR data for 1990 and for 1994—for the eight targeted pollutants—have been made publicly available through the Internet at http://www.aeat.co.uk/netcen/corinair/94/. Data summaries are available by country and by pollutant, and the database may be queried by country and pollutant to identify the sectors contributing the largest emissions. Little explanatory or supporting information is provided directly, but this can be obtained by searching the European Environment Agency web site (http://www.eea.eu.int/).

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## 2.10    Academia

Publication of academic studies can bring PRTR data to the attention of new audiences.  These articles, appearing in academic, professional, or topical journals, illustrate the variety of methods used to analyse and present PRTR data almost always in conjunction with contextual information.

A recent Canadian study from Simon Fraser University, prepared for Canada's Department of Finance, estimated the "toxic intensity" of Canadian industries relative to employment and value of output.[10] Academic researchers in the United States have paired TRI data with economic information[11] and have correlated TRI reporting of source reduction activities and reductions in releases.[12]  Such reports usually reach more technical audiences, but they are also sometimes cited—or their authors invited to speak at hearings—by legislative bodies weighing proposed changes in environmental laws.

Other recent studies have evaluated TRI data to assess the mutual influence, if any, of environmental and financial performance.[13]  Work in this field is of interest to policy-makers evaluating the effectiveness of information tools such as TRI, as well as to financial analysts.

Useful information for developers of PRTR dissemination and presentation plans appears on a World Bank web site called New Ideas in Pollution Regulation (NIPR) at http://www.worldbank.org/nipr/.  Much of the material on this web site, developed by World Bank and academic researchers, emphasises dissemination strategies and the importance of making information available.  The NIPR also lists environmental web sites, including both government and NGO sites on PRTRs.  Research published on the NIPR web site contributes to informed public use of disseminated PRTR data.  A recent example is the publication *Empowering the Community: Information Strategies for Pollution Control*.  As described in the abstract, "Disclosure strategies, which involve public and/or private attempts to increase the availability of information on pollution, form the basis for what some have called the third wave in pollution control policy (after legal regulation—the first wave—and market-based instruments—the second wave)".[14]  The NIPR site has also published the results of Indonesia's PROPER ranking system (see description in Box 9) at http://www.worldbank.org/nipr/comrole.htm.

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10.    Nancy Olewiler and Kelli Dawson, *Analysis of NPRI Data on Toxic Emissions by Industry*, prepared for the Technical Committee on Business Taxation, Department of Finance, Working Paper 97-16, March 1998, http://www.fin.gc.ca/taxstudy/WP97-16e.html.

11.    For example, Paul H. Templet, Louisiana State University Institute for Environmental Studies, and Stephen Farber, University of Pittsburgh Graduate School of Public and International Affairs*, The Complementarity Between Environmental and Economic Risk: An Empirical Analysi*s, *Ecological Economics*, 9:2 (February 1994) 153-165.

12.    *Pollution drops when workers get involved, Cornell Study Finds*, Cornell University Science News Release, announcing study by Cornell's Work and Environment Initiative and the Center for Advanced Human Resource Studies, May 1995, http://www.news.cornell.edu/science/May95/st.emissions.html.

13.    For example, *Information as Regulation: The Effect of Community Right to Know Laws on Toxic Emissions*, Shameek Konar and Mark A. Cohen, Vanderbilt University, *Journal of Environmental Economics and Management 109 (1997a)*.

14.    *Empowering the Community:  Information Strategies for Pollution Control*, Tom Tietenberg and David Wheeler, presented at Frontiers of Environmental Economics Conference, Airlie House, Virginia, USA, 23-25 October, 1998, http://www.worldbank.org/nipr/work_paper/ecoenv/index.htm.

**Box 9**

**Publicising Facility Performance**

Indonesia's PROPER system obtains pollution data from and about facilities (focusing on regulatory compliance), rates their performance in a simple five-colour system, and publishes the resulting ratings. Although not a PRTR, PROPER's emphasis on public disclosure offers useful insights for PRTR dissemination.

PROPER publicly ranks Indonesian facilities on their compliance with environmental requirements by colour—gold, green, blue, red, or black—based on stated performance criteria. Gold and green facilities earn public praise. Blue facilities are just meeting regulatory criteria. Red and black facilities face both public pressure for compliance and legal enforcement. Indonesia developed PROPER from the conviction that these "reputational incentives" would work through both community pressure—via the media, non-governmental organisations, and local governments—and market forces, to bring about environmental improvement.

Critical to PROPER's potential success were: first, translating complex environmental regulations into a single rating system and, second, designing a data protocol to ensure accuracy. The rating system evolved into a list of yes/no questions (shown below), which also simplifies data collection and analysis. PROPER uses multiple data sources (including independent inspections), relies on user-friendly software for data analysis, and requires a multi-step review before ratings are made public.
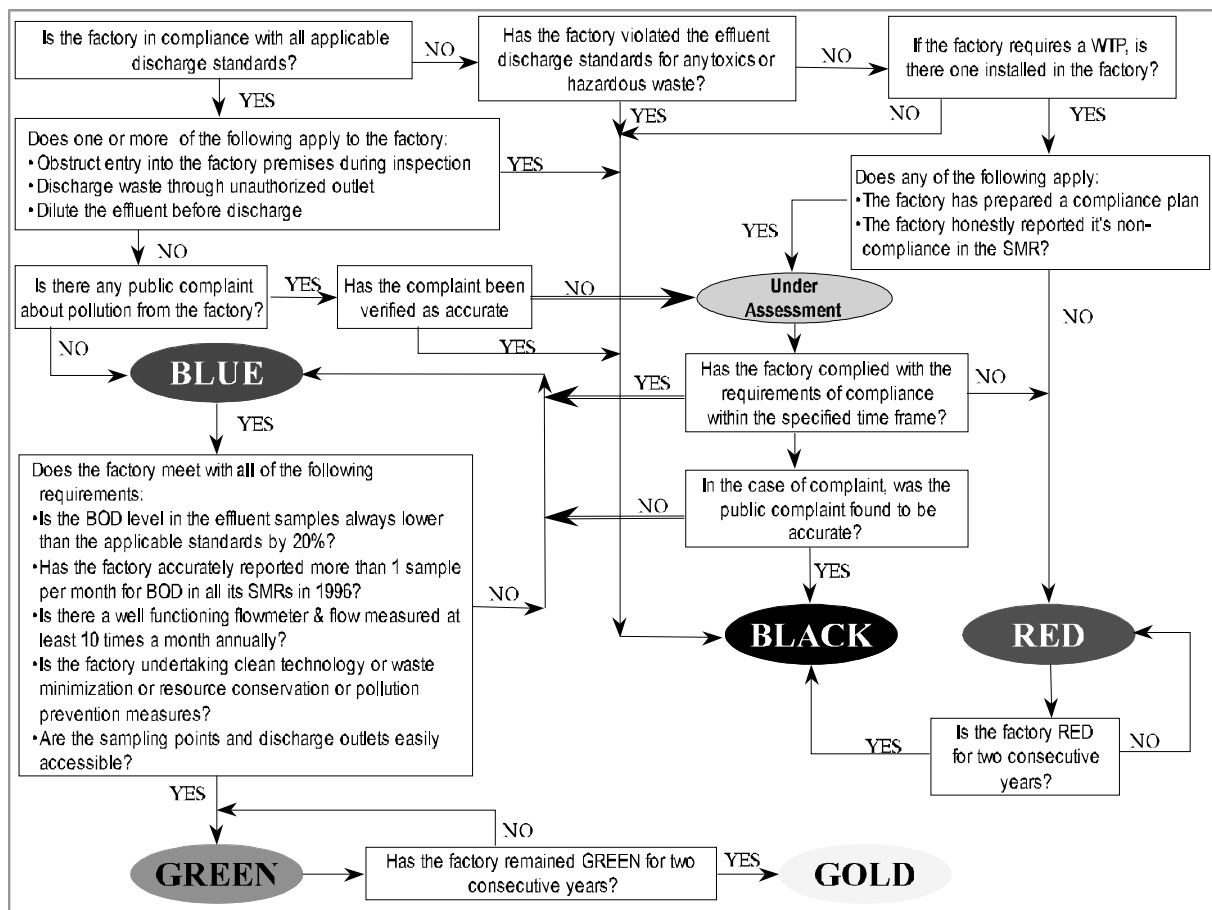


(continued)

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Box 9 (continued)

**PROPER's Rating Methodology**

By announcing positive results (blue, green, and gold facilities) first and then giving a six-month grace period before publicly naming the first red and black facilities, improvements were encouraged. Publication of the results also proceeded industry-by-industry, rather than rating all facilities at once. NGOs and media have had access to PROPER's system from its inception and can retrieve the ratings for any facility.

PROPER began as a pilot programme covering 187 facilities in 1995. Compliance increased from 35% in June 1995 to 51% in December of 1996. The initial facilities also showed a 43% reduction in biochemical oxygen demand (average concentration at source) in the first year. PROPER has expanded, rating 270 facilities by July 1997.

The Philippines Department of Environment and Natural Resources has adopted Indonesia's approach in its Industrial EcoWatch compliance monitoring system. From its pilot implementation in the National Capital Region of Metro Manila, EcoWatch announced 26 blue facilities in April 1998 (no green or gold ratings were earned in the first year). In November 1998, 19 black and red facilities were announced.

The World Bank's New Ideas in Pollution Regulation (NIPR) web site http://www.worldbank.org/nipr/comrole.htm provides information on both the Indonesian and Philippine programmes.

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## 2.11 Tools to enhance presentation and dissemination

Efforts to promote widespread awareness of PRTR data and to encourage their appropriate use are important, no matter which methods a government adopts for disseminating the data.

### 2.11.1 Marketing and publicity

Making data publicly available also means letting the public know that data are available. Both governmental and non-governmental agencies issue press releases to publicise the availability of PRTR data—governments when they announce public release of the data each year and NGOs when they make available major reports or new tools associated with PRTR data. Governments also hold press conferences. For web sites, governments may wish to put out a trigger notification to specific groups, informing them when data has been placed on the Internet.

The Citizens' Environmental Alliance of Southwestern Ontario is a non-profit, grassroots, bi-national education and research organisation. Formed in 1985 by citizens concerned about spills in the Chemical Valley, the group's membership has grown and the focus has broadened to toxins in the Great Lakes, air and water quality, and land use planning. CEA issues a *Toxic Tracker Report* each year, reporting on top chemicals, top facilities, and year-to-year changes in the Windsor area (http://www.mnsi.net/~cea/news/npri1996.html). The report also makes recommendations to improve the NPRI programme. Accompanied by a press release, the report usually attracts media attention in the Windsor (Canada)–Detroit (US) area.

The Commission on Environmental Co-operation's annual release of a North American perspective on PRTR data has also brought increased attention to Canada's NPRI data. Because *Taking Stock* establishes a common ground in data that are comparably reported in both countries, the report allows something of a side-by-side view of the two countries. Some observers note that Canadian audiences (including both

press and industry) have less experience with PRTR results than their US counterparts and have therefore been more engaged with PRTR data as "news", especially where comparisons are drawn.

The press provides prompt information to the public that PRTR data are available and often carries articles concerning the environment related to the PRTR data. It is worth noting that, over time, press attention can change and the focus and impact of annual data releases may change as well. For example, in the United States, national press attention to the annual release of TRI data has declined, while local attention is sustained both by news agencies and by activities of citizens' groups and other non-governmental organisations. While over time there has been a shift from TRI data being front-page national news, major city newspapers continue to use TRI data in stories about environmental policy. In addition, these data are often referenced in national press editorials concerning the environment and they are used as important input to broader national topics in the press confirming national interest.

Aside from press events, efforts to publicise PRTR data availability are usually on-going activities. Outreach programmes, whether governmental or non-governmental, seek opportunities to distribute information and promote hotlines, publications, and web sites in arenas such as gatherings of state or local officials or environmental groups. Tools can be as simple as a two-page brochure, such as the draft flyer on web access to US toxics-related data in Annex 5, or as elaborate as a full-fledged media campaign. An article titled "Scorecard Hits Home" in *Chemical Week* magazine (3 June 1998, p. 25), citing numerous indicators of the Environmental Defense Scorecard's success even in its first year, attributes much of the Scorecard's draw to coverage by major national news media and regional newspapers, as well as the Environmental Defense banner ads that have run on major web sites, such as ESPN SportsZone and Yahoo. Ads on the Internet invite web visitors to enter their postal codes and find out which toxic chemicals "polluters" are releasing into their community's air and water.

A convenient device for publicising PRTR information, including public release of data, is the on-line user group or listserv. Quick distribution of e-mail notices to interested parties on a listserv has been an effective tool for both established PRTRs (Community Toxics Watch list in the United States, Factory Watch list in the United Kingdom) and emerging PRTRs (in central Europe, for example, where an NGO representative in the Czech Republic distributes information on PRTR developments via e-mail lists). Listservs are inexpensive, and where computer resources permit, they can easily be structured to facilitate dialogue among interested parties.

### 2.11.2 *Training and education*

One of the key elements of a government outreach plan suggested in the PRTR *Guidance Manual for Governments* is training of both disseminators and user groups. A working group on outreach, training and education met at the 1998 Tokyo conference on PRTRs. One of its main findings urges that countries "establish PRTR outreach and education programmes to: 1) inform the public that the PRTR data exist, 2) ensure easy public access, and 3) provide information, education and training concerning the use of the data".

Conferences, workshops, the provision of tools at web sites, and the provision of on-site training for regional and local groups, are perhaps the most common approaches to training and education. Conferences are perhaps the most frequent venue. The US EPA has sponsored biennial data use conferences that include sessions on data presentation. NGOs in Europe held a conference in Moldova in the spring of 1999, which provided an opportunity for peer exchange on issues including dissemination and presentation of data.

Besides developing RTK NET, Unison Institute has provided extensive training for both government and citizen users of PRTR data. It has worked to establish community health and environmental management centres in several regions of the United States. Its role has included providing computer hardware and software and environmental literature, as well as training in disseminating and using the data.

Internet web sites also perform a training and education service. Many provide background documents that give perspective on PRTR developments and issues. Some also offer useful publications for downloading. Intergovernmental organisations such as OECD, national and regional information centres in many countries, and environmental citizens' organisations also publicise the availability of printed documents and reports in their catalogues and resource lists. Simple materials such as the two-page flyer in Annex 5, promoting access to web sites, also serve an educational function for audiences new to environmental data.

The MapCruzin web site (http://www.mapcruzin.com/) features many models of maps as well as tools that can be downloaded to allow individuals to generate their own maps and present data as they wish. The site also includes links to other resources such as bookshop and news updates on environmental disclosure for communities to use in preparing data for dissemination.

## 2.12    Conclusion

The dissemination of PRTR data is a powerful tool for communicating information about the environment. Government, industry, and the public all benefit from the data. The value of PRTR data can be enhanced by the techniques used to present the data. Providing a range of tools to communicate PRTR data will help a wide variety of audiences to better comprehend what the data mean.

PRTR reporters, policy-makers, data managers, and users of PRTR data have been leaders in disseminating and presenting standardised environmental data effectively for a broad range of uses. However, challenges remain in improving accuracy and timeliness, providing context and training and building links with related data. At the same time the explosion of information sharing associated with the Internet and the increasing use of information as an environmental policy tool offer significant opportunities for disseminating and presenting PRTR data in new ways.

PRTR dissemination and presentation tools have developed rapidly over the past decade. Undoubtedly, more change is coming. As the uses of PRTR evolve, so will the tools and approaches used to present and disseminate these data. Even with the rapid expansion of access to data in recent years, PRTRs are still in the early stages of learning how best to use changing technology to disseminate and present data to achieve their goals.

**ANNEXES**

**ANNEX 1**

**CORPORATE ENVIRONMENTAL REPORTING**

## 1. Introduction

All corporate environmental reporting models are aimed at communicating data effectively—many to the public, some more specifically to local communities, employees, customers and suppliers, or investors. However, relatively little explicit attention has been paid to developing and evaluating the most effective methods of dissemination and presentation to reach audiences. A few, mostly large, companies have taken the lead in developing reporting models. Professional groups and consultants have also had a role in helping corporations develop strategies for presenting and publishing information on their performance. In addition to the Europeans' Eco-Management and Audit Scheme (EMAS), described in the text, models of corporate environmental reporting include:

### 1.1 Public Environmental Reporting Initiative.

In 1994, nine companies issued guidelines through a Public Environmental Reporting Initiative (PERI). In answer to the question, "Why is PERI needed?" the corporations stated: "Customers, employees, shareholders, environmentalists, communities, legislators and government agencies, the media and many others desire more information on the environmental performance of organisations. PERI seeks to improve and encourage environmental reporting. This is considered a necessary component for constructive dialogue and co-operation among the different sectors of society."

### 1.2 Global Reporting Initiative.

Undertaken by the Coalition for Environmentally Responsible Economies (CERES) with partner companies and NGOs with SustainAbility and the Tellus Institute, the Global Reporting Initiative builds on both the North American and European experiences. The Initiative issued proposed guidelines for standardised reporting on sustainability (http://www.globalreporting.org/) in 1999 that are now being tested by about 20 companies in nine countries. The Initiative itself has not yet focused specifically on dissemination. It provides a standard format for presenting data.

**Evaluations**. Deloitte Touche Tohmatsu, an accounting and management consulting firm, has developed a Score Card to help corporate environment managers evaluate their own reports. The tool draws on international guidelines such as *Company Environmental Reporting—A Measure of the Progress of Business and Industry Towards Sustainable Development* (Technical Report No 24, UNEP and SustainAbility Ltd., 1994). The Canadian Institute of Chartered Accountants has contributed to setting standards by evaluating corporate environmental reports for awards programs.

### 1.3 Individual Companies

Changes in **Dow Canada**'s reporting over time illustrate the mutual influence of PRTRs and corporate environmental reporting. Dow Canada's early environmental publications reflect some of the initiatives that have influenced corporate environmental reporting. In June 1989, Dow Chemical Canada published "1988 Manufacturing Environmental Highlights", one of the earliest corporate environmental reports. For a three-year period, bar charts illustrated the number of reportable air quality and water quality incidents plus total amounts of priority pollutants (unidentified) and of total organic carbon discharged to rivers. Text consisted of bulleted statements highlighting the company's environmental activities (installing treatment equipment, results of monitoring and impact assessments, plans to substitute less harmful substances in products at three facilities, programs for recycling of paper and plastic waste, etc.). One such bulleted item cited an air emissions inventory in one division of the company that showed "an overall reduction from 1986 to 1988 of 29%, with volatile organic compounds reduced 44%, hydrogen reduced 51% and oxides of nitrogen ($NO_x$) reduced 9%". Many corporate environmental reports have relied on such general highlights.

Dow Canada's *1989 Environmental Progress Report* retained this basic format, adding topics such as research and development, environmental assessment, transportation, community awareness, and environmental expenditures. The 1989 report also included customer relations (focused largely on reducing CFCs in Dow Canada products) and product stewardship (focused on handling, use and disposal of products). Many of the new topics reflected the chemical industry's Responsible Care themes. Bulleted text and illustrative bar charts continued as in the first report.

Dow Canada's *1992 Environmental Progress Report* was the company's first report to include chemical releases to the environment. For "chemicals of interest", the data summarised "all chemical emissions to air, water, land, and chemicals in materials and waste sent off-site for processing or treatment and disposal". Dow Canada's inventory represented data to be submitted to the Canadian Chemical Producers' Association for use in its National Emissions Reduction Masterplan and to Environment Canada's National Pollutant Release Inventory.

Although Dow Canada estimated and reported this inventory in detail to CCPA and Environment Canada, the 1992 publication presented only summary data in a graphic form. However, this included total amounts for air, water, and land releases and for off-site waste treatment—an important addition. Within these categories, the report gave percentage distributions by release type (e.g., stack air emissions, fugitive air emissions, etc.). A comparable presentation in the following year (*Environmental Progress Report 1993)* supplied a two-year comparison and—for air emissions only—1989 baseline data. By the publication of *Dow Canada's 8th Annual Environmental Progress Report 1995,* this presentation offered a four-year view of the summary data (along with the 1989 baseline for air emissions).

Although Dow Canada presented only company-wide summary data—and did not list the "chemicals of interest" covered—the development of this corporate environmental report began to show the value to all audiences both of presenting actual data (amounts) and of presenting standardised data over time.

**BP Amoco** (formerly British Petroleum) has conducted one of the more ambitious series of environmental reports. In 1992, *New Horizons: The Environment and BP,* the company's second such report, opened with a quotation from Friends of the Earth staff describing as "paramount" the need for BP Amoco (BP) to improve its public disclosure of information. For two of BP's three business categories—chemicals and oil refining—the 1992 publication reported world-wide summary data for 1990 and 1991, with targets for reductions by 1997 in air and water emissions. For the third business group—exploration and production—the report gave four years' data (1989-1992). BP's exploration and production operations had already exceeded a 1993 target for reductions in oil discharges to water. In addition to graphs and charts, the 1992 *New Horizons* report supplied data tables. These summary data included the US PRTR

substances as a whole, although BP Amoco's report covered all facilities world-wide. A number of corporations with operations in PRTR-covered countries have similarly chosen to develop and publish comparable data for facilities not actually covered by those PRTRs.

BP's *New Horizons: Health, Safety and Environment Report 1993* added coverage of timely topics such as climate change and product stewardship. More US PRTR data were also included (e.g., air, water, and land releases by U.S. refineries for 1988 through 1993 with a reduction target specified for 1995).

With *BP HSE Facts 1995: Health, Safety and the Environment*, the company began publishing regional and site-specific data: 1990 baseline and 1995 data for hydrocarbon emissions to air, other air emissions, discharges to water, number of oil spills and routine waste disposal. The company also improved its data collection, emphasising a new level of consistency as well as increasing the scope to include some operations not previously reported. "The figures reported are our best estimate of the releases, obtained using a combination of direct measurement and estimation using industry standard methods. Data are intended primarily to show performance trends at each site".

Available with the 1995 report was a computer diskette containing more detailed data, including trends and product-related data. A CD-ROM accompanied BP's 1996 report, and it included "detailed inventories for each of our major chemicals sites". The 1995 diskette and the 1996 CD also included information on environmental issues and programs, along with other supplementary information. *BP HSE Facts 1996* also appeared on the World Wide Web. The 1997 report contained a similar CD and also appeared on the Web.

The 1996 and 1997 BP reports also included a printed supplement: *BP Chemicals: Site Reports*. Where the 1995 report gave one row of a table to data for each BP site, the later *Site Reports* devoted a page each to examining data for the eight BP facilities (located in Great Britain, France, and the United States) in the chemicals group. The document concluded with a chemical-specific table for the chemicals group as a whole, giving on-site air, water, and land releases and off-site disposals for each of 140 chemical substances for 1996.

In recent years, corporations have been invited and challenged to expand their public reporting in two directions. One trend represents widespread recognition that environmental releases and transfers represent only one aspect of a unified perspective. Materials accounting, throughput data, or other chemical use quantities can greatly extends the potential for identifying pollution prevention opportunities, prioritising and reducing risks, evaluating facility and industry performance, and other applications. Water and energy use, quantities of waste paper and other materials recycled, and many other data items can also expand the view of a company's environmental performance. Dow Canada's 1995 report, for example, covered both non-hazardous waste and recycled materials (paper, cardboard, metal, lumber, asphalt/concrete, and plastics). Notably, sustainable development looks not only at environmental performance but at the broader materials universe affected by corporate activity. Similarly in the US, there is a requirement to include on-site waste management or transfers off-site for further waste management. Because US companies must report this information under their PRTR, companies have begun to include waste management information in their corporate reports.

The second trend recognises that the environment itself is only one aspect of a larger perspective on corporate performance that includes social and economic as well as environmental performance. BP Amoco's *Environmental and Social Report 1998* covered the company's traditional health, safety and environmental performance measures, additional environmental topics (climate change, air quality/clean fuels, and solar energy), and social performance. Case studies discussed "how we do business in…" Alaska, China, Egypt, and South Africa through topics such as ethical conduct, employment, and

relationships with stakeholder groups, as well as health, safety and the environment. Supplemental reports separately addressed *BP Amoco in the Community* (the social report) and *Health, Safety and Environmental Data*. BP Amoco also published the main report and its two annexes on CD.

As noted in the report, corporations often adjust their release data to reflect production levels. They may publish both actual amounts released and the production-adjusted amounts (per unit of production or adjusted by a production index), or they may publish only the adjusted data. While this can show a company's progress in improving its efficiencies over time, production-weighted release data usefully supplement—not substitute for—actual year-by-year amounts.

Industry representatives are among those who have called for information on the toxicity and health effects of PRTR-listed substances to be provided as context when PRTR data are disseminated. Most PRTRs make efforts to supply such information or to point data users to reliable sources of such information. At least one company has gone beyond this step, however, publishing its data with toxicity weightings. **Solvay**, a chemicals, plastics, and pharmaceuticals producer, developed a reporting system (Solvay Environmental Releases File, SERF) to collect verified and unified emissions data from its 94 plants located in 17 countries. Solvay developed toxicological weighting factors used to calculate the emissions indexes that the company reports to the public. These factors along with Solvay's global summary data for 1996 appear in the corporation's Web site (http://www.solvay.com/sowe/sowe/envir.htm).

**ICI (Imperial Chemical Industries)** has also adopted a weighted approach to reporting its environmental performance. ICI weights its air and water emissions for their effects on acidity, global warming, human health, ozone depletion, smog creation, aquatic oxygen demand, and toxicity for aquatic life. *Environmental Burden Approach* spells out the factors and methodology applied in this approach. Data tables in the company's reports show both the raw amounts and the amounts weighted by ICI's calculation of environmental burden. Land disposal is reported without weighting. Data in the reports are chemical-specific, but not facility-specific. ICI has also set its own reduction goals, targeting 50-percent reductions, from 1995 to 2000, in four of the identified "burdens": acidity to air and water, hazardous air emissions, aquatic oxygen demand, and aquatic ecotoxicity. ICI also tracks improvement in energy efficiency. ICI's current reduction targets span the five-year period 1995 to 2000 and annual reports compare current-year data to the 1995 baseline.

ICI reports discuss activities in product stewardship and community awareness, and in 1998, ICI added additional topics: climate change, chemicals management, and endocrine disruption. ICI's Web site carries the company's annual environmental reports for the most recent three years (1998, 1997, and 1996), a five-year summary for the preceding period (1990-1995), and the explanatory *Environmental Burden Approach* (in the Safety, Health and Environment section of http://www.ici.com/iciportal/).

## 1.4 Trade Associations

Some industry associations publish data from PRTRs or from voluntary reporting to the association by its members. Those that publish such data tend to present summary numbers or statements. Trade associations in the United States that have made general public use of summary of their PRTR data include the Semiconductor Industry Association (http://www.semichips.org/), emphasising its reductions in releases of ozone-depleting chemicals, and the American Forest and Paper Association, citing industry participation in U.S. EPA's voluntary "33/50 Program" for reduction of 17 targeted substances from 1991 to 1995 (http://www.afandpa.org/).

In its Strategies for Today's Environmental Partnership (STEP) program, the American Petroleum Institute (API) uses chemical releases reported to US PRTR as one of eight measures of industry-wide environmental, health and safety performance. API publishes its results annually (*Petroleum Industry Environmental Performance)* in print and on the Web at http://www.api.org/step/piep.htm. Data tables summarise petroleum refinery releases and waste management (recycling, energy recovery, and treatment) of the US PRTR chemicals. Progress is tracked from a 1988 baseline, and data are presented on the carcinogens that refineries most commonly release. API does not publish company or facility-specific data, but the annual report lists the participating companies that submit data to the US PRTR.

Initiated in Canada in the late 1980s, the chemical industry's Responsible Care® program establishes voluntary codes for improving performance in safety, health, and environmental quality; it has been adopted in 36 countries. In the United States, the Chemical Manufacturers Association (CMA) publishes annual Responsible Care® progress reports, but these supply little data (summary numbers in the text with bar and pie charts). In part, this may reflect the public availability of facility-specific PRTR data by other routes. However, lack of detailed data—for programs such as Responsible Care® and for other industry-wide environmental initiatives—makes assessing progress difficult for the programs as a whole and impossible for individual companies and facilities.

Publishing its first *Reducing Emissions* report for 1992, the Canadian Chemical Producers' Association (CCPA) noted:

> The decision of our member companies to provide data for public analysis flows out of their commitment to the principles of Responsible Care whereby companies will be responsive and sensitive to community concerns, be aware of all effluent and emissions, and make information on risks available to the public….In adopting Responsible Care, member companies accept their responsibility to manage and reduce emissions to the best of their ability. This report is a demonstration of their ongoing commitment to continuous improvement in emissions reduction….We hope that the publication of the information in this report coupled with each individual company's disclosure of its own data will be the start of a dialogue process which will further support and enhance our commitment to ongoing emissions reductions.

> *[Preface], Reducing Emissions: 1992 Emissions Inventory and Five Year Projections*

For each chemical on CCPA's list, *Reducing Emissions 1992* itemised 1992 emissions by chemical and identified the companies that voluntarily reported data for that substance. Projected emissions for each year 1993-1997 were indexed to the 1992 data. For chemicals reported by only one company, *Reducing Emissions 1992* withheld amounts. The report also associated each chemical with pertinent issues of concern: carcinogenicity, smog formation, ozone depletion, and global warming. In addition, the publication listed company contact persons and telephone numbers.

*Reducing Emissions 1992* pre-dated Canada's National Pollutant Release Inventory (NPRI) by one year. In comparison to the complete NPRI data, first collected for 1993, *Reducing Emissions* did not supply facility-specific emissions data, chemical-specific data by environmental media, or data by company, facility, or chemical for transfers of listed substances to other locations for treatment or disposal. (The report included summary data for these and other categories.) However, *Reducing Emissions* expanded the level of company-specific information available to the Canadian public before NPRI.

CCPA has maintained the *Reducing Emissions* series and its format, adding categories of concern: substances defined as toxic under the Canadian Environmental Protection Act, chemicals listed for further

assessment, and those targeted for Accelerated Reduction/Elimination of Toxics (ARET). *Reducing Emissions 7: 1998 Emissions Inventory and Five-Year Projections* is the CCPA's latest report.

In contrast, the Mining Association of Canada's *Environmental Progress Report* furnishes company and facility-specific data for air and water releases of a dozen substances, including a base year, annual data for 1993-1997, and reduction targets for 2000 and 2008. These data are also chemical-specific, enabling interested parties to see clearly how much of what substance (of the few covered) is released to air and to water by what facility. This represents a substantial difference with the data presentation practices of most trade associations. Company contacts including phone, fax, mailing address, and e-Mail are also provided. Notably, the association's Data Integrity Group—which has developed guidance to improve emissions estimation and reporting of its members' smelting, refining, milling, and mining operations— assumed a leading role in publication of the 1997 and 1998 *Environmental Progress Reports*.

## 1.5    Others: Non-governmental Organisations and Consultants

Corporate environmental reports are disseminated more widely by the NGOs, consultants, and trade associations working with companies to improve the reports.

SustainAbility is a consulting firm and think tank that encourages companies to pay attention to a "triple bottom line" of socially responsible, environmentally sound, and economically viable business practices. It has worked with the United Nation's Environment Programme to benchmark corporate reporting. Its Web site (http://www.sustainability.co.uk/) features discussion of the issues involved in moving toward sustainability. Related publications can be ordered from the Web site, including the recent *Internet Reporting Report*, which reviews the development of corporate reporting on the Web and examines likely futures, including how the Web will "drive—or impede—the sustainability transition [and]...whether the Internet will spur new forms of accountability". The site also links to the reports of the companies with whom SustainAbility works. SustainAbility regularly reviews corporate environmental reports in *Tomorrow* magazine, a further contribution to publicising environmental performance information and, indirectly, PRTR data.

The International Institute for Sustainable Development (IISD) notes: "If we are to assess our progress, the figures must be comparable, from year to year and from place to place. And the public must trust the measurement system". IISD's Corporate Reporting Toolbox on the Web site offers access to some corporate environmental reports (http://iisd.ca/business/corpreport.htm). Many IISD publications, especially those from its Measurements and Indicators Program, address sustainability reporting issues (http://iisd.ca/measure/default.htm). The International Corporate Environmental Reporting Site, offered as a service by a consultant in the Netherlands, also includes directories that link to such reports on the Web (http://www.enviroreporting.com/). CERES makes the reports of some of its partners available on its site (http://www.ceres.org/).

The corporations described in this section and many others have invested considerable resources in presenting to the public information on their environmental activities and—to some extent—performance. Few environmental reports, however, have encompassed the range of data called for by initiatives such as the Global Reporting Initiative's proposed guidelines. Publications that tell the story of a corporation or sector's environmental activities and progress do not support the types of analysis—especially comparative performance—sought by many among the diverse audiences for environmental information.

## ANNEX 2

## HOW IS PRTR INFORMATION DISSEMINATED AND PRESENTED?

### 2.1    Options and Member Country Examples

Governments establishing PRTRs should take into consideration the need to plan for the distribution of PRTR data to other disseminators, where appropriate.  Listed below are descriptions and examples from Member countries.  For example, in the United States, facilities reporting under the Toxics Release Inventory (TRI) submit their reports to both state and federal governments. RTK NET receives TRI data in advance of its publication, so that its searchable electronic database on the Web can be available the day the US EPA makes TRI data available to the public.  Other disseminators in the United States, and in other countries, depend on access to the government's PRTR databases.

### 2.2    Option: Print Publications

Printing of PRTR reports is often the first strategy of dissemination plans.  Printed publications serve two particular benefits for disseminating data from PRTR systems: They provide a permanent record of the data reported and published in a given year, and they make information available to audiences whose access to electronic media is limited.

Presentation methods for printed publications often emphasise overviews and summaries of the data and their trends (presented in tables, charts and graphs).  Tables that rank substances by total releases and transfers and by releases to the individual environmental media are common.  Geographic summaries (displayed in maps) can draw attention to areas of high concentrations of pollutants and/or to regions where releases and transfers are increasing or decreasing.  A key issue is presentation of facility data. Some governments have issued PRTR reports that identify facilities reporting the largest amounts. National and local media especially value publication of these ranking tables, and they are of particular importance when electronic access to the PRTR data is limited.  Industry representatives often particularly object to rankings that compare facilities in different industrial activities.  However, there are many PRTR users who find that rankings that compare facilities and operations in the same industrial activity can help identify both good performers, whose experience in reducing releases may serve as examples for industry-wide improvement, and poor performers, whose operations may warrant closer examination.

Another value of printed PRTR reports is that they often include more detailed special analysis than appears in Web-based and other access tools.  Such analyses may, in fact, be difficult or impossible to perform using data obtained in Web-based searches.  To date, however, few if any PRTRs have conducted and published extensive special analyses of their data outside their regular reporting cycle.

Where PRTR data are widely available via Web sites (whether hosted by governmental or non-governmental entities), governments continue to publish printed reports each year, summarising and analysing the data. Annex 3 to this report presents the Tables of Contents of two printed publications: the national report on the first year of US Toxics Release Inventory data (the 1987 data report) and the

Commission for Environmental Co-operation's report on North American PRTR data for 1996. The contents of these pages clearly demonstrate the wide range of publicly useful analyses that PRTR data support.

## 2.3    Examples of Print Publications

The following sections provide examples of a range of print publications from Member countries.

### 2.3.1    *The Netherlands' Pollutant Emission Register (PER)*

Printed publications resulting from the Netherlands' PER summarise two inventories: the Individual Emission Inventory system which collects air, water, and waste data from large point sources and the Collective Emission Inventory system which estimates releases from small facilities and diffuse sources. The Dutch system originated as a tool for monitoring environmental policy, which has led to presentations that emphasise trends over time in the amounts of specific chemical groupings emitted to specific media. Reports from the Netherlands' inventory incorporate many charts and graphs to illustrate the sometimes complex data. (Please refer to Box 1 as an example from a report.)

Some publications in the Dutch series summarise only the data for large combustion sources. *Emissions from Large Combustion Plants in 1997 and Estimates for 1998* highlighted both the Netherlands' target group approach to environmental policy (targeting "important groups of polluters such as refineries, energy sector, chemical industry and other industry") and the European Community's sectors. Use of the two together results in parallel presentations of the data "cut" both ways—by target group and by EC sector. This suggests one approach that may become more common in dealing with differences in national and regional systems, as countries maintain and develop their existing inventories (generally single medium) in light of a forthcoming European Pollutant Emissions Register.

It is worth noting that Dutch publications of inventory data result from co-operation by several ministries and institutes. More than 45 publications have been issued since 1990 (as listed in the back of the printed reports).

**Box 1**
**Example of data presentation from the Netherlands' report**
**(Fuel consumption in 1995)**

The total fuel consumption in the combustion plants ≥50 MWth in 1995 has in-
creased with about 3% relative to 1994. However, consumption since 1990 has
remained more or less the same [11]. Over 57% of the energy consumption was
accomplished in power plants, while the total consumption in the chemical indus-
try and in the refineries were 23% and 15% (figures 2.1 and 2.2).

**Figure 2.1    Total and NL target group consumption of fossil fuels in Large
                Combustion Plants in the Netherlands in 1995.**
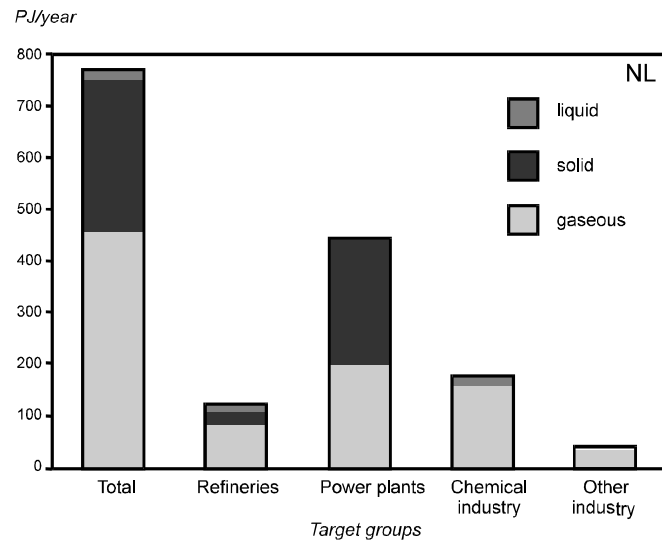


**Figure 2.2    Total and EC sectoral consumption of fossil fuels in Large
                Combustion Plants in the Netherlands in 1995.**
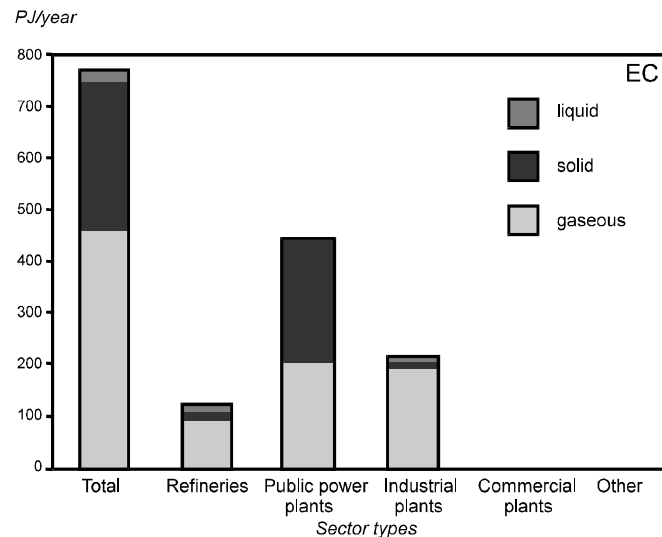


*Source: Emission from Large Combustion Plants in The Netherlands in 1995,*
*Nr. 36, February 1997, p. 16.*

### 2.3.2    Canada's National Pollutant Release Inventory (NPRI)

The NPRI Annual Summary Report provides an overview of the release and transfer data submitted for that reporting year and trends from previous years.  Data are presented by substance, by industrial sector, and by province or territory.  The report also contains data from other inventories such as mobile sources and criteria air contaminants.  Appendices rank facilities by on-site releases for each pollutant, listing releases by environmental medium, and compare facilities that reported specified groups of chemicals ("toxic" under Canada's environmental law or carcinogenic) within each province and territory.  Figure 3 presents on-site releases from the different industrial sectors.

**Figure 3**
**Industrial sectors reporting the largest on-site releases in 1996**

| SIC Code and Industrial Sector | On-site Releases | Facilities |
|---|---|---|
| 10 - Food | 1,065 | (22 facilities) |
| 35 - Non-metallic Mineral Products | 1,175 | (37 facilities) |
| 25 - Wood | 1,599 | (26 facilities) |
| 49 - Other Utility | 1,993 | (22 facilities) |
| 30 - Fabricated Metal Products Except Machinery and Trans. Equipment | 2,157 | (93 facilities) |
| 45 - Transportation | 3,108 | (55 facilities) |
| 41 - Industrial and Heavy (Engineering) Construction | 4,342 | (16 facilities) |
| 16 - Plastic Products | 5,444 | (79 facilities) |
| 06 - Mining | 6,540 | (54 facilities) |
| 32 - Transportation Equipment | 7,981 | (100 facilities) |
| 07 - Crude Petroleum and Natural Gas | 8,019 | (71 facilities) |
| 36 - Refined Petroleum and Coal Products | 10,496 | (33 facilities) |
| 27 - Paper and Allied Products | 20,251 | (102 facilities) |
| 29 - Primary Metal | 20,372 | (101 facilities) |
| 37 - Chemical and Chemical Products | 41,965 | (304 facilities) |

*Source:  National Pollutant Release Inventory: Summary Report 1996*
*Environment Canada [1998]*

The annual summary report is available in hardcopy, in French and English, free of charge from a number of Environment Canada offices, by mail or in person.  The annual report also describes supplementary

tables that are not printed in the report, but available on the Web.  These supplementary tables list all facilities reporting to NPRI and other information presented by pollutant and industrial sector.  Tables 1 and 2 and Figure 4 provide further examples from the Canadian NPRI Report.

| Table 1 Data Presentation Examples | | |
|---|---|---|
| WATER BODIES RECEIVING OVER 500 TONNES OF POLLUTANTS IN CANADA FOR 1996 | | |
| Water Body | Province | Releases (Tonnes) |
| Saint John River | New Brunswick | 2,468 |
| St. Lawrence River | Quebec | 1,540 |
| Detroit River | Ontario | 849 |
| St. Mary's River | Ontario | 665 |
| Columbia River | British Columbia | 660 |
| South Saskatchewan River | Alberta | 537 |
| Ottawa River | Quebec | 514 |
| Onsite Releases to Surface Water | | 7,233 |
| National Total of On-site Releases to Surface Water | | 12,999 |
| % of National Total | | 55.6% |

*Source: NPRI Canada*

**Figure 4**
**Actual and Anticipated on-site Releases (1995-1999)**
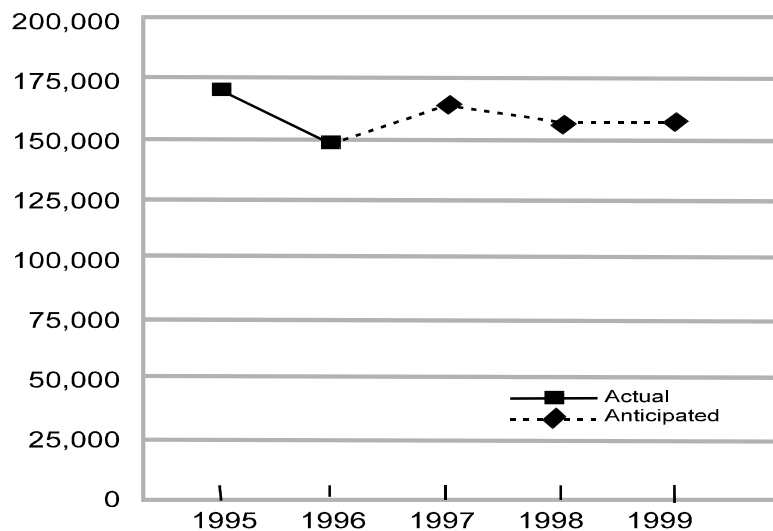


*Source:  NPRI Canada*

**Table 2**
**List of Reporting Facilities per Chemical**

| Toluene | | | CAS # 108-88-3 | Total Number of Reports: 314 | | | | Total Releases (tonnes): 6,116.701 | |
|---|---|---|---|---|---|---|---|---|---|
| NPRI Id no. | Company Name | Facility Name | City | Province/ Territory | Air | Under- ground | Water | Land | Total Releases |
| 3893 | General Motors of Canada | Car Plant - Autoplex | Oshawa | ON | 391.426 | 0.000 | 0.000 | 0.000 | 391,426 |
| 4399 | Canadian Technical Tape | | St-Laurent | QC | 296.800 | 0.000 | 0.000 | 0.000 | 296.800 |
| 2263 | Sunworthy Wallcoverings | Division of Borden Co. | Brampton | ON | 282.300 | 0.000 | 0.000 | 0.000 | 282.300 |
| 3447 | Quebecor Printing Canada | Quebecor Printing PE&E | Etobicoke | ON | 255.334 | 0.000 | 5.391 | 0.000 | 260.725 |
| 4734 | Consoltex Inc. | | Alexandria | ON | 234.933 | 0.000 | 0.000 | 0.000 | 234.933 |
| 3475 | Canadian General-Tower Ltd. | | Cambridge | ON | 184.353 | 0.000 | 0.000 | 0.000 | 184.353 |
| 3759 | International Wallcoverings Ltd. | | Brampton | ON | 166.500 | 0.000 | 0.000 | 0.000 | 166.500 |
| 0741 | Morbern Incorporated | | Cornwall | ON | 166.600 | 0.000 | 0.000 | 0.000 | 166.600 |
| 3198 | 3M Canada Company | | London | ON | 142.819 | 0.000 | 0.000 | 0.000 | 142.819 |
| 3989 | Jacobs & Thompson Inc. | | Weston | ON | 142.000 | 0.000 | 0.000 | 0.000 | 142.000 |

*Source:  National Pollutant Release Inventory: Summary Report 1996*
*Environment Canada [1998]*

### 2.3.3    United States' Toxics Release Inventory (TRI)

The first TRI summary report, analysing 1987 data—TRI's first year, ran nearly 350 pages (the Table of Contents from this report can be found at Annex 3, Table 2).  It summarised the national data, introduced the TRI, briefly analysed by reporting by industry sector and by chemical.  In the first report, environmental releases and transfers were thoroughly reviewed.  The report concluded by indicating other uses for TRI data (Chapter 12 of that report).

In the decade since that publication, TRI reports have added year-to-year change as a focus, and they have also taken various approaches to analysing and presenting the data.  With release of the 1990 data, US EPA offered simpler presentations of summary data, but added a separate publication of State Fact Sheets, laying out highlights of the data for each state or territory on two pages.  The purpose of including the Fact Sheets was to provide state by state data and to facilitate dissemination.  The State Fact Sheet volume now appears annually with the main TRI data release, which has expanded to include more extensive analyses.

Over the last decade, the US EPA has adapted its annual reports to serve changing needs.  For the 1996 TRI data report, the US EPA devoted a chapter to each of the 20 manufacturing sectors required to report, extending the main publication to two volumes for that year.  In the 1997 data report, EPA modified its approach to measuring progress under TRI.  In the early years of TRI, EPA identified 1988 as its baseline year, and published reports generally compare three recent years of reporting with that baseline. Beginning with the report on 1997 data, EPA has identified 1995 as a recent baseline year for tracking progress.  In part, this reflects expansion of TRI's coverage to include more than 300 additional chemicals (added in reporting year 1995) as well as waste management categories that were added under the Pollution Prevention Act of 1990.  Over the last two years, US EPA has also re-categorised certain categories of off-site transfers and designated them as "off-site releases".  These changes do not generally affect reporting, but they make a difference in analysis and presentation of the data.  Envirofacts, the interactive EPA Web site which gives access to TRI data, follows this revised presentation of releases. (Other tools and older reports do not reflect these changes.)

### 2.3.4    North American Commission on Environmental Co-operation

The experience of the North American Commission on Environmental Co-operation (NACEC) in its annual PRTR data reports indicates the challenges and benefits of comparing, analysing, and disseminating data from different PRTR systems.  NACEC's data analyses build on the preliminary report, aptly titled, *Putting the Pieces Together: The Status of Pollutant Release and Transfer Registers in North America* (May 1996).

For its annual data series, *Taking Stock: North American Pollutant Releases and Transfers* (Annex 3, Table 3 contains the Table of Contents of the 1995 report)*,* NACEC in essence builds a North American database from the data elements that Canada's NPRI and the US TRI have in common.  The chemical lists, industry coverage, and specific data elements in NPRI and TRI differ—in some cases significantly. However, these two systems address a substantial core of industries and chemicals, and they incorporate a substantial body of comparable data elements.  From these common elements, a North American view begins to emerge.  The largest gap in this view is that Mexico's RETC has not yet collected national data that can be incorporated in NACEC's analyses.  These North American reports illustrate the types of analyses possible with PRTR data.

NACEC's *Taking Stock* reports have had their most visible impact in Canada, where PRTR information and publicity is still a relatively new phenomenon for industry, the press, and the public.  Having Mexican data available will extend the value and impact of this continent-wide PRTR dissemination tool.  As noted below, NACEC plans to make its North American dataset available on the Web along with the annual print publication.

### 2.3.5    United Kingdom (England and Wales) – Pollutant Inventory and Chemical Release Inventory

The original UK pollutant inventory, the Chemical Release Inventory (CRI) presented a summary of data in a printed form.  The original data release for 1992 and 1993 was organised under a series of topics that included statistics and explanations.  This report included media releases, top ten substance releases and maps indicating releases per country of greenhouse and ozone-depleting chemicals.  It includes the total quantity of substances released per year, county-by-county releases in table format, and releases by industry type.  The second report changed somewhat and was organised by topics of environmental concern and environmental policies.  Topics addressed included: the greenhouse effect and stratospheric ozone depletion, acid deposition and nitrogen deposition, volatile organic compounds and photochemical oxidants, particles, and toxic substances.

Tables, figures, and maps summarising pertinent national data supplemented the substantive discussions of these topics.  Some contextual information were also included.  In the discussion of acid deposition, for example, maps compared predicted deposition of sulphur (1989 to 1992) from all non-marine sources to empirical estimates of critical loads for soil acidity on a county-level basis.

CRI data for all counties in England and Wales (one county to a page) appeared in map and table form. Industry pages were similar to county presentations, but substituted a photographic illustration for the industry in lieu of a map.  The CRI report also itemised releases of each substance to all media for 1994, the year of the report, and for each year 1991-to-1993 where data were available.   The following examples, Tables 3-4 and Figure 5, indicate how data were presented in this report.

**Table 3**
**CRI Sources of Methane, England & Wales, 1994**

Tonnes

| District | Process | Emissions |
|---|---|---|
| East Lindsey | Gasification | 8,508 |
| Langbaurgh | Manufacture & use of organic chemicals | 3,700 |
| Purbeck | petroleum process | 885 |
| Langbaurgh | Petrochemical processes | 570 |
| Langbaurgh | Manufacture & use of organic chemicals | 231 |
| Ellesmere Port and Neston | Manufacture & use of organic chemicals | 193 |
| Holderness | Gasification | 94 |
| Langbaurgh | Manufacture & use of organic chemicals | 57 |
| Crewe and Nantwich | Gasification | 30 |
| Stockton-on-Tees | Manufacture & use of organic chemicals | 17 |
| Trafford | Gasification | 8 |
| East Lindsey | Gasification | 7 |
| Glanform | Combustion processes | 4 |
| Holderness | Combustion processes | 3 |
| Glanford | Combustion processes | 1 |

*Source: The Chemical Release Inventory 1994*
*Her Majesty's Inspectorate of Pollution, London: HMIP, February 1996*

**Table 4**
**CRI Emissions of Volatile Organic Compounds from the Manufacture of Organic Chemicals,**
**England & Wales, 1994**

| SI 1991/472 reference[1] | Process | Emissions (tonnes) | % |
|---|---|---|---|
| 4.2a | Manufacture of styrene or vinyl chloride | 1,900 | 2.9 |
| 4,2b | Process of manufacture involving use of vinyl chloride | 0 | 0.0 |
| 4.2c | Manufacture of acetylene, aldehydes, amines, isocyanates, nitriles, carboxylic acids or their anhydrides, organic sulphur compounds, or phenols | 23,000 | 39.9 |
| 4.2d | Manufacture of a chemical involving the use of any substances mentioned in 4.2c | 21,000 | 47.0 |
| 4.2e | Manufacture or recovery of carbon disulphide | 0 | 0.0 |
| 4.2f | manufacturing processes resulting in the release to air of carbon disulphide | 1 | 0.0 |
| 4.2g | Manufacture or recovery of pyridine or any substituted pyridines | 2 | 0.0 |
| 4.2h | Manufacture of organo-methallic compounds | 4,400 | 7.6 |
| 4.2I | Manufacture, purification or recovery of designated acrylates | 300 | 0.5 |
| 4.2j | Manufacture of a chemical involving the use of any designated acrylate | 1,300 | 2.1 |

[1] Environmental Protection (Prescribed processes and Substances Regulations (SI 1991/472), as amended.
*Source: The Chemical Release Inventory 1994*
*Her Majesty's Inspectorate of Pollution, London: HMIP, February 1996*

## Figure 5
## Example of Geographic Presentation

**Merseyside**  *Area 64162*
*Population 1425292*
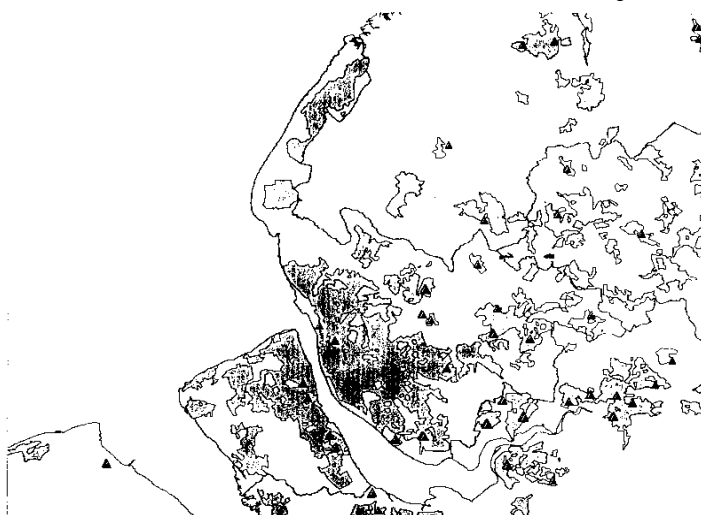


| Local Release of "Commentary" Substances | | Tonnes | % Nat |
|---|---|---|---|
| Greenhouse Effect | | 0.00 | 0.00 |
| Ozone Depleters | | 0.00 | 0.00 |
| Acid Deposition | | 6,615.76 | 0.24 |
| Particulates | | 221.70 | 0.26 |
| VOCs | | 543.02 | 0.70 |
| Toxic Organics | | 0.00 | 0.00 |
| Toxic Metals | | 0.00 | 0.00 |

| Local "Top 10" | Media | Tonnes | % Nat |
|---|---|---|---|
| NP – Solids NOS | Land | 23,020.00 | 1.28 |
| NP – Total Organic Carbon | Water | 7,686.00 | 33.80 |
| NP – Chemical Oxygen Demand | Water | 6,696.00 | 16.14 |
| NP – Organic Residues NOS | Land | 258.40 | 3.80 |
| Sodium Sulphate | Air | 120.30 | 3.78 |
| Iron Sulphate | Air | 40.62 | 100.00 |
| Iron Oxide | Air | 30.61 | 100.00 |
| Divanadium Pentaoxide | Air | 4.88 | 20.21 |
| Carbon Monoxide | Air | 0.90 | >0.00 |
| Mineral Fibres (exc. asbestos & glass) | Air | 0.38 | 100.00 |

| Industry Type | No | %Nat | Unauthorised Releases | Tonnes | % Nat |
|---|---|---|---|---|---|
| Fuel & Power | 5 | 1.43 | Air | 0.00 | 0.00 |
| Metals | 0 | 0.00 | Land | 0.00 | 0.00 |
| Mineral | 3 | 40.5 | Water | 0.00 | 0.00 |
| Chemical | 43 | 4.88 | **Total** | **0.00** | **0.00** |
| Waste | 4 | 4.21 | | | |
| Other | 1 | 9.09 | | | |
| **Total** | **563.94** | | | | |

*Source: The Chemical Release Inventory 1994*

*Her Majesty's Inspectorate of Pollution, London: HMIP, February 1996*

## 2.4    Electronic Option: World Wide Web

In the information revolution of the 90s, the World Wide Web has exponentially expanded the reach of data in all dimensions.  More information is available to more people—and much faster—than ever before.  The Web also greatly expands the audience for any given type of information. PRTR reports published in print are generally distributed to pertinent federal and state/province government officials, non-governmental organisations, and the press; placed in libraries for public access; and sent to other interested persons on request.  In contrast, PRTR data on the Web are immediately available to anyone with a computer, a modem, an Internet service, and a Web browser.  Similarly, where corporate reports once went to shareholders and the financial community, companies that now choose to place their environmental reports on the Web are sharing that information with any interested Web-site visitor.

PRTR data users have many needs.  A dissemination approach that meets one set of priority needs will not necessarily address another.  The clearest instance of this is in data made available on the World Wide Web. Users seeking to answer narrowly defined questions (e.g. what chemical substances do the factories and power plants in my community release to the air? have these emissions increased or decreased over the last five years? what ecological and human health effects may be associated with these chemicals?) will probably find Web search mechanisms and the supporting information supplied with them most effective. Some larger analyses, however, cannot be readily conducted by one-at-a-time searches.  Users with these interests need access to complete data, and such users most often have the database skills to make good use of them.

Similarly, PRTR data in Web-based presentations are seldom "portable".  Even users with modest database skills may wish to collect and review data for several facilities or several localities.  These users may find themselves printing numerous Web pages and adding up numbers by hand.  Despite the rapid increase in both computer and user sophistication, most Web-based systems will leave many persons retrieving too little or too much to answer the questions that arise as users gain experience in making good use of PRTR data.

One principal distinction among Web sites is whether they offer mapping.  Some sites rely on maps as a principal tool for navigating the data and displaying results.  These include not only maps of facility locations but also maps that illustrate data via shading or other signals.  Other sites offer mapping as an optional output. Some Web systems do not use maps—interactive or illustrative—at all.  Maps are clearly a valuable visual tool—words and tables cannot convey the many physical relationships between sources of releases and the world and its inhabitants.  At the same time, however, mapping is resource-intensive. Community groups and citizens without access to high-end computer resources find map-based systems slow and unwieldy.  Mapping also calls into question the accuracy of the geographical co-ordinates assigned to reporting facilities.  The United States and Canada have both found this an area in which facilities themselves make many errors.  US EPA supplies alternative co-ordinates based on postal codes. While these are adequate for mapping large areas, they would not serve for detailed local maps.  In rural areas, where postal codes cover large territories, assigned co-ordinates may distort the siting of facilities in relation to geographic and other features.

Both governmental and non-governmental entities have taken leading roles in disseminating PRTR data via the World Wide Web, as suggested in the earlier discussion of disseminators.

Table 14 at the conclusion of this Annex, itemises characteristics of selected Web sites that supply PRTR data and one example (CORINAIR) of non-integrated data.

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**Box 2**
**Caught in the Web?**

Web-based interfaces not only make PRTR data accessible to far more users, they also help make the data more comprehensible to users who are not expert at analysing raw data and applying the necessary database and spreadsheet software for such analysis.

Such an interface, however, also sets limits on what can be learned from the data. For example, a user may obtain summary data for a specific industry's total releases to surface waters over time, but may have to conduct repeated searches to obtain all the detailed facility-specific data reflected in that summary.

Seemingly small technical issues can sometimes be an obstacle to successful aggregations—for example, how to conduct such an industry-wide analysis when facilities often redefine their business activities over time. Geographic analyses may be similarly complicated when facilities that are quite near each other and have potential impacts on the same ecological and human environments are located in different political subdivisions (counties, municipalities, etc.) Even such factors as the difference between a facility's mailing address and its actual location can influence the reliability of geographic analyses. Facilities may report their names differently from year to year (an acronym in one year, for example, and a full name in another).

Search mechanisms that facilitate user access to PRTR data on the Web cannot address each of these individual factors in fulfilling users' requests for data. Savvy users rapidly learn both the benefits and the limitations of the tools they're applying.

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### 2.4.1 Searchable PRTR Data on the Web

In practical terms, World Wide Web dissemination of complete PRTR data almost inevitably involves some electronic interface between the data user and the full set of reported data. (The next section below, "Complete Data Files on the Web", discusses the exception—downloading data files from the Web.) These search mechanisms not only deliver data in response to specific user requests, their very structure can help to make clear the nature of PRTR data and the kinds of questions that PRTR might appropriately begin to address. Facility, industry, location, chemical substance, environmental medium, and year are typical PRTR elements on which Web interface mechanisms can search and deliver data.

Mapping has proven a useful tool in these Web sites. Several of these interactive tools allow users to find facilities and data by zooming in geographically to the area of their interest. More significantly, search results are mapped, the first step in making clear the relationships of releases and transfers to human populations and ecological systems.

---

**Box 3**
**WSYWIG**

**What You See Is What You Get**. To minimise potentially lengthy descriptions of existing and prototype PRTR search vehicles on the Web, this report incorporates selected "screen captures" to demonstrate their use and the results. These screens should be particularly useful in assessing the types of data made available by the various Web disseminators: Does a Web site supply facility-specific data? Can a user search the database by chemical? What contextual information, if any, does the Web site offer?

Although these images illustrate major features of the dissemination vehicles, they do not necessarily depict all the functions available in any given Web site. Web site features also change over time and those exhibited here may well alter or be replaced. Features are being updated or added even as this report is published.

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## 2.5 Examples: World Wide Web

The following examples are Internet presentation methods used by Member countries, as each country uses a different method to present data. Examples of the query form used to access a country's data are also included.

### 2.5.1 *Canada's National Pollutant Release Inventory (NPRI)*

Environment Canada takes a who? what? when? where? why? approach to its National Pollutant Release Inventory (NPRI) Web-site user interface (http://www.ec.gc.ca/pdb/npri/).

**Figure 6**
**Example of a search page**



*Source: NPRI, Environment Canada, 1998*

Pick lists of chemical names and Chemical Abstracts System (CAS) numbers facilitate accurate identification of substances. The NPRI query form also specifies the effective date of the database being searched. For some users, this detail could be important. Because PRTR systems are typically under constant revision, as facilities correct previous submissions, this date can be significant for comparing analyses developed at different times. Such a date is rarely posted in Web-based PRTR dissemination tools and seldom appears in printed PRTR publications; it should be included to help users and readers understand and resolve discrepancies over time.

**Figure 7**
**Example of how facilities are listed**



*Source: NPRI Environment Canada, 1998.*

NPRI searches result in a list of facilities (searching for a specific facility generates a "list" of one). Search results are nested—clicking on a facility name calls up general information on that facility (including, for many facilities, a photograph of the site) and a summary of its total releases, total transfers, and total reuse-recycling-recovery (RRR) amounts for each chemical. Data are displayed in both table and chart form. The user can click on the appropriate link for greater detail about the facility, more years of data, or more detail on—respectively—releases, transfers, and RRR.

**Figure 8**
**Facility report example**



*Source: NPRI Environment Canada, 1998.*

**Figure 9**
**Map of facility location**
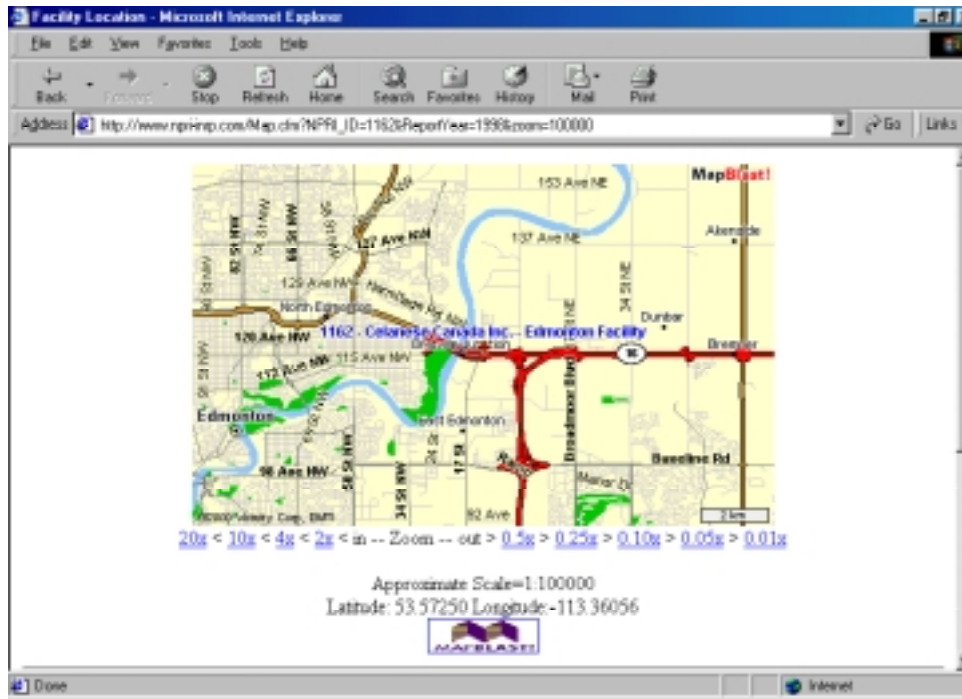


*Source: NPRI Environment Canada, 1998*

**Figure 10**
**Presentation method used for displaying a summary of substances released, transferred and for recycling, reuse or recovery (RRR)**
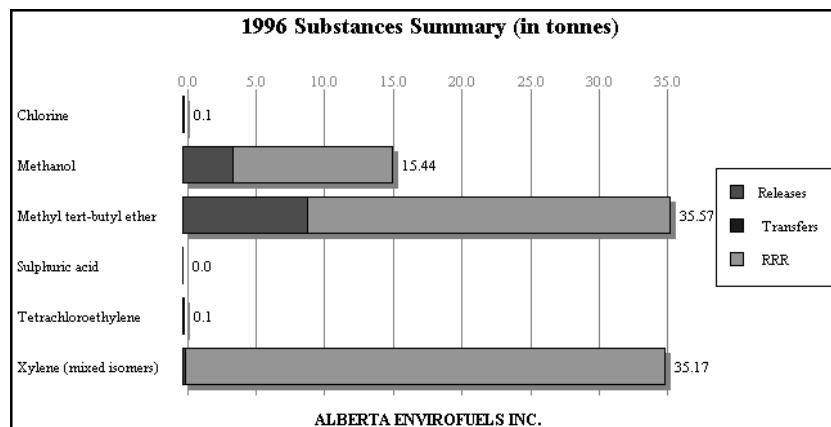


*Source: NPRI, Environment Canada, 1998*

The additional facility detail includes contact information, parent company information, geographic co-ordinates for mapping the facility's location, and a list of the other environmental programmes under which the facility reports—with the facility's identification numbers in those programmes. Few Web-based dissemination tools and prototypes presently available incorporate all of these details, particularly

geographic co-ordinates and facility IDs under other environmental programmes. Such data are invaluable for many purposes.

**Figure 11**
**Display page of facility-specific location and contact information**

| Contact | | |
|---|---|---|
| Ms. DEBRA WINDLE<br>Phone: (403) 449-7804<br>Facsimile: (403) 449-1702 | | |
| **Parent Companies** | | |
| NESTE CANADA INC.(50.0%)<br>CALGARY, AB<br>CANADA | | |
| CHEVRON CANADA LTD(50.0%)<br>VANCOUVER, BC<br>CANADA | | |
| **Geographical Coordinates** | | |
| Latitude: 53° 31' 55" | UTM zone: 12.0 | |
| Longitude: 113° 22' 02" | Northing: 5933843.0 | |
| | Easting: 343098.0 | |
| **Standard Industrial Classifications** | | |
| **Canadian** | 37 | Chemical and Chemical Products Ind. |
| | 3712 | Industrial Organic Chemical Inds., nec |
| **American** | 2869 | Industrial Organic Chemicals, nec |
| **Other Environmental Programs** | | |
| ALBERTA ENVIRONMENTAL PROTECTION APPROVAL<br>679-01-00 | | |

*Source: NPRI Canada*

The NPRI Web site makes clear one of the simultaneous benefit/limitation aspects of Web-based PRTR dissemination tools which is it lays out results clearly in a visually well-designed display. Where a great deal of information is available, this will entail more than one display. Users can print these results, but for Canada's NPRI, as an example, this will amount to printing five screens per facility for a single year's data. This type of limitation indicates the value of Environment Canada's decision to make NPRI data available for downloading from the Web in forms compatible with spreadsheet and relational database applications, as discussed later in this report.

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**Box 4**
**Chemical Groups of Concern**

One attribute of some searchable databases sets a limit on their utility for analyses focusing on particular groups of chemicals. Although a principal use of interactive on-line systems may be access to individual facility reports, there are many useful analyses at all geographic levels that focus on individual chemicals or groups of chemicals. Two characteristics are important:

- Can a user search the database for all reports on a specific chemical?—Most Web-based dissemination of PRTR data include this feature, but some do not.

- Does the Web site include pre-selected searches that return all chemicals in a particular group of concern, such as carcinogens or ozone depleters? If not, the user must search for each chemical, one at a time, and somehow accumulate the results (usually by printing out reports).

A critical issue can be identifying a definitive list of the chemicals in a group of concern. For ozone depleters, the Montreal Protocol establishes an authoritative list. For other groups, a list of chemicals may not have been authoritatively established (persistent bio-accumulating toxins or endocrine disrupters, for example). Similarly, more than one definitive list may exist for a particular group (for example, the International Agency for Research on Cancer and the U.S. National Toxicology Programme differ in their designation of known or suspect carcinogens).

Dissemination tools can be most helpful by identifying the chemicals in a group of particular concern, naming the source of the list, and offering pre-selected searches or supplying the results of analyses conducted by the agency producing the Web site.

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### 2.5.2    US Toxics Release Inventory (TRI)

Three Web sites make US TRI data publicly available on the Internet: RTK NET, EDF Scorecard, and US EPA's Envirofacts.

One of the earliest on-line access mechanisms for PRTR data was the **RTK NET** electronic bulletin board service, which *pre-dated* the World Wide Web.  RTK NET's bulletin board system, permitting both simple queries and downloading of complete data, helped establish a model for electronic data dissemination as the World Wide Web came into play.  RTK NET expanded its data delivery to the Web, but has also maintained the bulletin board service to facilitate downloading raw TRI data whether by complete year or for selected subsets.

A useful feature of RTK NET's Web site allows users to choose to receive their search results by E-mail rather than displayed in their Web browser.  This can facilitate use of the data for independent analyses.

From the opening screen in RTK NET (http://www.rtk.net/), a visitor to the site can initiate a quick search by location across numerous databases.  In addition to US Toxics Release Inventory data, RTK NET furnishes public access to nine other environmental databases as well as to three databases of information on housing issues such as government-sponsored mortgage loans for home purchases.  RTK NET users can conduct master searches of all databases at once, searching by geographic area, by facility, or by industry.

Many users will want to define their inquiry. RTK NET's Web site (updated with release of the 1997 US TRI data in May 1999) supplies the means to search US TRI data by geographic area (including postal code), by facility, by industry, by parent company, or—an important and often over-looked feature of PRTR data—by the locations which receive chemical waste shipped ("transferred") by reporting facilities.

RTK NET does not explicitly offer a chemical search, although users can perform one by initiating a geographic search, selecting the entire United States, and then identifying a specific chemical.

**Figure 12**
**Display page on the RTK NET**



*Source:  RTK NET, 1998.*

**Figure 13**
**Example of a data query page**



*Source:  RTK NET, 1998.*

**Figure 14**
**Company data page**

| | | | |
|---|---|---|---|
| Facility Name: | 3M TAPE MFG. DIV. | | |
| Address: | 6850 S. HARLEM AVE. | | |
| | BEDFORD PARK, IL 605011956 | | |
| County: | COOK | EPA Region: | 05 |
| Lat/Long: | 41.768100 / 87.804400 | (decimal degrees) | |
| Parent Company: | 3M | D&B #: | 006173082 |
| Public Contact: | M. D. SANFORD | Phone: | (708) 496-6742 |
| Technical Contact: | K. C. GROVER | Phone: | (708) 496-2342 |
| Year: | 1997 | EPA ID: | ILD006220123 |
| TRI ID: | 60501MCMPN6850S | D&B Number: | 006220123 |
| Primary SIC: | 2672 -- Coated And Laminated Paper, NEC | | |

*Source:  RTK NET, 1998.*

**Figure 15**
**Example of a display page of the breakdown of releases and waste**

Breakdown of releases and waste (by chemical) follows:

Chemical Name: CYCLOHEXANE
CAS Number: 000110827 (Name: 3M)
Maximum Amount On Site: 1,000 - 9,999 LBS (Year: 1997)

| Medium | Release (lbs) | Destination or Method Used |
|---|---|---|
| STACK AIR | 8,453 | |
| OFF-SITE | 80 | To: SAFETY-KLEEN CORP. , DOLTON, IL<br>Using: ENERGY RECOVERY |
| OFF-SITE | 561 | To: POLLUTION CONTROL INDUSTRIES OF INDIANA INC., EAST CHICAGO, IN<br>Using: ENERGY RECOVERY |
| Total: | 9,094 | |

Management of production-related waste-
Quantities for 1998 and 1999 years below are estimates for future years.

| Quantity | 1996 amount | 1997 amount | 1998 amount | 1999 amount |
|---|---|---|---|---|
| Release Onsite or Disposal Offsite | 4,300 | 8,453 | 10,000 | 10,000 |
| Recycling Offsite | 1 | 0 | 0 | 0 |
| Energy Recovery Onsite | 35,000 | 16,344 | 20,000 | 20,000 |
| Energy Recovery Offsite | 759 | 641 | 800 | 800 |
| Treatment Offsite | 77 | 0 | 0 | 0 |
| Total | 40,137 | 25,438 | 30,800 | 30,800 |

Non-production-related waste: 0 (accidental or remedial)
Total waste : 25,438 (Production & Non-Production)
Production Ratio: 0.63

Methods of source reduction used-
W49 OTHER RAW MATERIAL MODIFICATIONS

*Source:  RTK NET, 1998.*

The **Environmental Defense [Fund] Scorecard** Web site combines in its opening screen a preview of a top-10 facility ranking, a news story, a choice of five environmental issues each with its own overview map of the data, a postal code search facility, a site navigation pick list, and a site-wide search engine (http://www.scorecard.org/).

**Figure 16**
**Search display page**
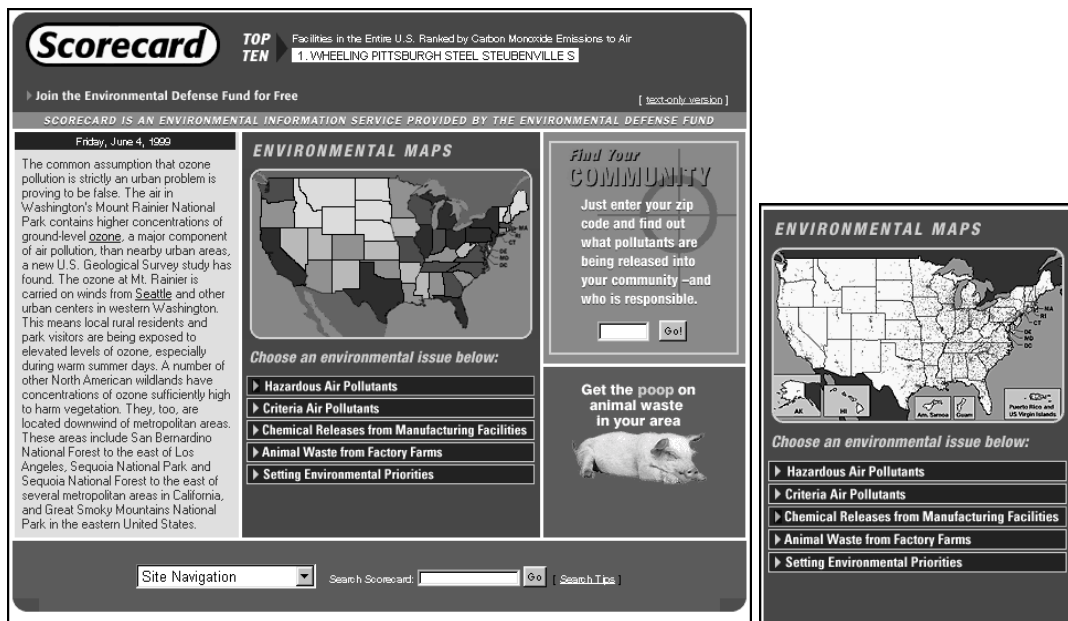


*Source: Environmental Defense [Fund] Scorecard, 1998.*

**Figure 17**
**Example of pollution locator display**
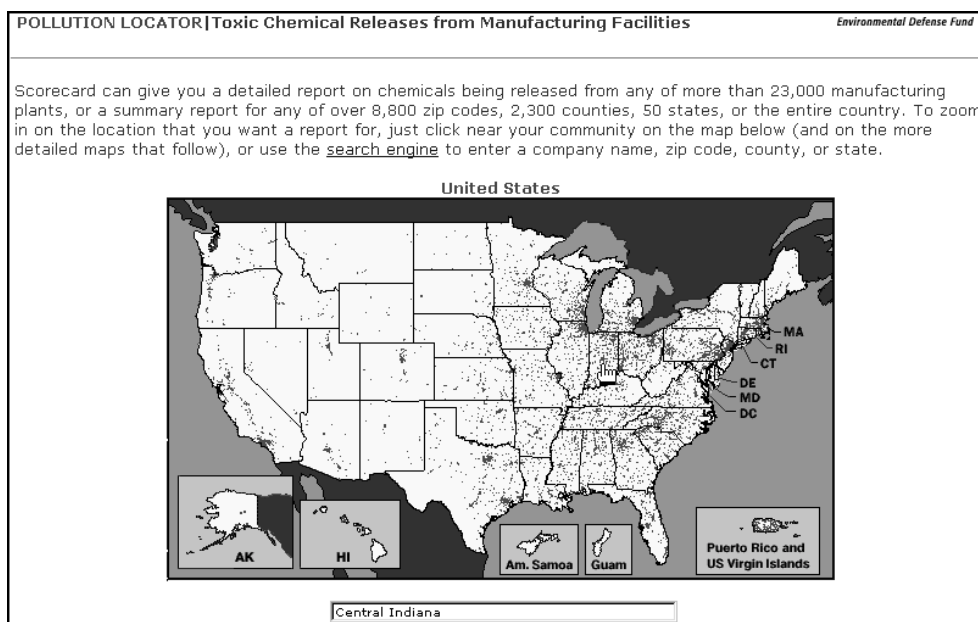


*Source: Environmental Defense [Fund] Scorecard, 1998.*

The Scorecard is quintessentially a community-focused tool. For locating data, the Scorecard is principally driven by "drilling" down through map layers to the local point of interest or by entering a postal code. A text-based alternative search mechanism supports searches by state, county, or by facility name. Users cannot initiate a search by chemical.

Action opportunities appear throughout the site, integrated with search results. Access to related facility and local/regional information is similarly integrated.

**Figure 18**
**Specific facility information and other queries on actions that can be taken**



*Source: Environmental Defense [Fund] Scorecard, 1998.*

Results for a single facility include rankings by percentile for numerous potential health effects (for example, in the top 20 percent of all reporting facilities for cancer hazards, non-cancer hazards, air releases of recognised carcinogens, air releases of recognised developmental toxicants, air releases of recognised reproductive toxicants, water releases of suspected carcinogens, air releases of suspected cardiovascular or blood toxicants, etc.) and for total releases (total environmental releases, air releases, surface water discharges, production-related waste, and off-site transfers to other locations for waste management or disposal). Amounts of releases are also associated with the various health-effect categories. In terms of presentation, health-effects and risk information are given precedence over the traditional presentations of reported amounts by release and transfer type.

**Figure 19**
**Display page for a facility search**



### Environmental Release Report: USS CLAIRTON WORKS

- Map(s) Locating the Manufacturing Facilities
- 1996 Rankings: Major Chemical Releases or Waste Generation at this Facility
- 1996 TRI Pollution Releases Ranked by Potential Human Health Risks
- 1996 TRI Pollution Releases Sorted by Health Effect
- What We Don't Know About Chemical Safety and Harm
- TRI Data Summary
- Take Action
- Facility Information
- Links

*Source: Environmental Defense [Fund] Scorecard, 1998.*

**Table 5**
**Releases sorted by health effects**

| · 1996 TRI Pollution Releases Sorted by Health Effect* | Air Releases (Pounds from TRI sources) | Water Releases (Pounds from TRI sources) |
|---|---|---|
| Recognized Carcinogens | 65,600 | 9 |
| Suspected Carcinogens | 1,700 | 2,760 |
| Suspected Cardiovascular or Blood Toxicants | 109,544 | 223,109 |
| Recognized Developmental Toxicants | 79,002 | 9 |
| Suspected Developmental Toxicants | 80,090 | 340 |
| Suspected Endocrine Toxicants | 69,312 | 9 |
| Suspected Immunotoxicants | 80,550 | 9 |
| Suspected Kidney Toxicants | 33,690 | 340 |
| Suspected Gastrointestinal or Liver Toxicants | 184,274 | 9,387 |
| Suspected Neurotoxicants | 197,124 | 23,154 |
| Recognized Reproductive Toxicants | 68,102 | 9 |
| Suspected Reproductive Toxicants | 14,950 | |
| Suspected Respiratory Toxicants | 197,322 | 23,154 |
| Suspected Skin or Sense Organ Toxicants | 195,194 | 9,514 |

*Note: Some chemicals are associated with more than one health effect, so their release may be counted multiple times in this table. Therefore, it is not appropriate to sum releases sorted by health effect. Total reported releases to air and water are provided in the data summary below.

*Source: Environmental Defense [Fund] Scorecard, 1998.*

**Table 6**
**Presentation of aggregated totals by year**

· TRI Data Summary

**Environmental Releases, Transfers, and Production-Related Waste** (Pounds from TRI sources)

| Year | Stack Air Releases | Fugitive Air Releases | Water Releases | Underground Injection | Land Releases | Total Environmental Releases | Total Off-Site Transfers | Total Production-Related Waste |
|------|------|------|------|------|------|------|------|------|
| 1988 | 7,521 | 5,413,330 | 42,537 | 0 | 0 | 5,463,388 | 1,126,000 | NA |
| 1989 | 2,315,000 | 613,990 | 59,012 | 0 | 0 | 2,988,002 | 4,696 | NA |
| 1990 | 2,081,000 | 484,410 | 4,086 | 0 | 0 | 2,569,496 | 3,516 | NA |
| 1991 | 911,929 | 139,840 | 27,148 | 0 | 0 | 1,078,917 | 11,765 | 6,009,544 |
| 1992 | 65,092 | 92,720 | 26,219 | 0 | 0 | 184,031 | 2,271 | 13,474,921 |
| 1993 | 73,626 | 34,740 | 25,214 | 0 | 0 | 133,580 | 6,367 | 19,567,090 |
| 1994 | 79,158 | 36,704 | 26,848 | 0 | 0 | 142,710 | 106,780 | 20,145,056 |
| 1995 | 113,020 | 211,461 | 244,724 | 0 | 0 | 569,205 | 2,123,656 | 20,302,173 |
| 1996 | 66,534 | 138,210 | 245,914 | 0 | 0 | 450,658 | 1,115,939 | 21,137,893 |

"NA" means that no data are available because "Total-Production Related Waste" was not reported until 1991.

top ]

· Take Action

- Join an online discussion about this facility
- Volunteer with environmental groups in your community
- Send an e-mail to the U.S. Environmental Protection Agency
- Network with environmental groups
- Learn how to prevent pollution
- Contribute to the Environmental Defense Fund
- Join the Scorecard Network

*Source:  Environmental Defense [Fund] Scorecard, 1998.*

The Environmental Defense Scorecard also includes results of an ongoing comparative risk project, intended to help in priority-setting processes.

**Figure 20**
**Display page for comparative risk information**



SETTING PRIORITIES | Comparative Risk Report

Project Name: Environmental Priorities Project

Ranking Results:

• Major Priority Areas for New Environmental Action (Risk-Based Environmental Priorities)
• Technical Advisory Committee's Air Team Rankings: Relative Risk
• Technical Advisory Committee's Air Team Rankings: Overall Priority for Action
• Technical Advisory Committee's Water Team Rankings: Relative Risk
• Technical Advisory Committee's Water Team Rankings: Overall Priority for Action
• Technical Advisory Committee's Land Team Rankings: Relative Risk
• Technical Advisory Committee's Land Team Rankings: Overall Priority for Action
• Technical Advisory Committee's Cross-Media Team Rankings: Relative Risk
• Technical Advisory Committee's Cross-Media Team Rankings: Overall Priority for Action

Project Description:

• Geographical Coverage
• Project Purpose
• Ranking Process
• Participants in the Ranking Process
• Project Reference
• Contact Information

More:

• Help with Interpreting these Rankings
• Suggest Links to Online Information
• Join an Online Discussion

*Source: Environmental Defense [Fund] Scorecard, 1998.*

Although other Web-based tools for access to US TRI data (RTK NET and Envirofacts) have made available the 1997 TRI data, released by US EPA in May 1999, the latest year available in EDF's Scorecard at the time of this report was 1996.

The US EPA's own Web-based tool, **Envirofacts**, covers seven major environmental databases including their Toxics Release Inventory (http://www.epa.gov/enviro/index_java.html).

**Figure 21**
**Display page for Envirofacts web site**
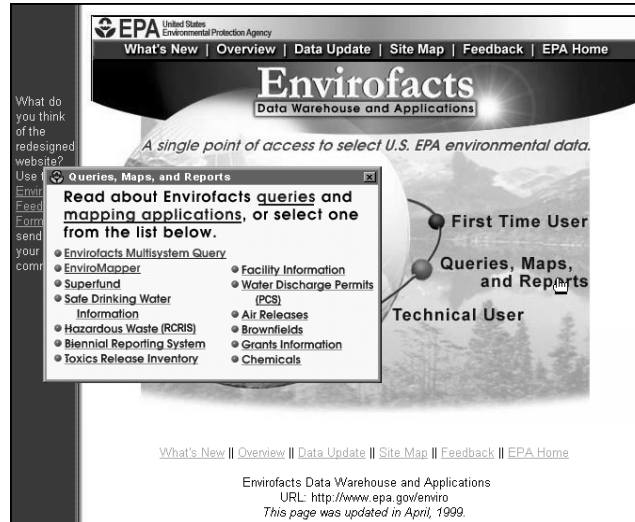


*Source:  Envirofacts, US EPA, 1998.*

Standard searches of US TRI data include facility, location, industrial classification, and chemical. Envirofacts includes a mapping tool, and users have the option of generating maps directly or of displaying the results of their searches and then requesting a map. Data can also be displayed in graphs. Links are offered to other Envirofacts databases that contain data for the selected facility.

**Figure 22**
**Display of results of a query**



*Source:  Envirofacts, US EPA, 1998.*

**Figure 23**
**Envirofacts search page example**



## Envirofacts TRI Report

Query executed on 04-JUN-1999
Results are based on data extracted on 20-APR-99

Click on the underlined EPA FACILITY ID value to view EPA Facility information for the facility.

| | | | |
|---|---|---|---|
| Facility Name: | ADELPHIA INC. | Mailing Name: | |
| Facility Name(2): | | Mailing Name(2): | |
| Address: | 15657 BROOKPARK RD. CLEVELAND OH 44142 | Mailing Address: | |
| County: | CUYAHOGA | Region: | 05 |
| EPA FACILITY ID: | OHD049386436 | TRI ID: | 44142DLPHN15657  DUNS Number: 049386436 |
| TRI Preferred Latitude: | 41.418333 | TRI Preferred Longitude: | 81.808333 |
| Public Contact: | DANE WARHOLIC | Phone: | 2162670570 |
| Parent Company: | NA | Parent DUNS: | NA |

**Primary SIC Codes for 1997**

| SIC CODE | SIC DESCRIPTION |
|---|---|
| 3479 | METAL COATING AND ALLIED SERVICES |

*The above information comes from 1997, which is the latest reporting year on file for this facility.*

Source:  Envirofacts, US EPA, 1998.

**Figure 24**
**Display page of total aggregate releases by environmental media**



Total Aggregate Releases of TRI Chemicals to the Environment:

*Please note that all release amounts are reported in pounds. For all releases estimated as a range, the mid-point of the range was used in these calculations. This table summarizes the releases reported by the facility. NR - signifies that there were no releases reporting for the corresponding media for the given reporting year.*

| Media | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 | 1989 | 1988 | 1987 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Air Emissions | 29602 | 24141 | 21032 | 51748 | 39554 | 8600 | 10000 | 14000 | 25600 | 51400 | NR |
| Surface Water Discharges | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NR |
| Releases to Land | 0 | 3594 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NR |
| Underground Injection | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NR |
| Total On-Site Releases | 29602 | 27735 | 21032 | 51748 | 39554 | 8600 | 10000 | 14000 | 25600 | 51400 | NR |
| Transfer Off-Site to Disposal | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Total Releases | 29602 | 27735 | 21032 | 51748 | 39554 | 8600 | 10000 | 14000 | 25600 | 51400 | NR |

Graphic Summary of this Table

TRI Chemical Reported on Form A:

*Please note that there were no chemicals reported on Form A for this facility*

Source:  Envirofacts, US EPA, 1998.

**Figure 25**
**Display of chemical releases by year**

Names and Amounts of Chemicals Released to the Environment by Year.

*Please note that all release amounts are reported in pounds. For all releases estimated as a range, the mid-point of the range was used in these calculations. NR - signifies that there were no releases reported for the corresponding media for the given reporting year. Rows with all "0" or "NR" values were not listed.*

| Chemical Name | Media | 1997 | 1996 | 1995 | 1994 | 1993 | 1992 | 1991 | 1990 | 1989 | 1988 | 1987 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-TRICHLOROETHANE (TRI Chemical ID: 000071556) | Air - Fugitive | NR | NR | NR | NR | NR | 4300 | 5000 | 7000 | 9000 | 14000 | NR |
| 1,1,1-TRICHLOROETHANE (TRI Chemical ID: 000071556) | Air - Stack | NR | NR | NR | NR | NR | 4300 | 5000 | 7000 | 9000 | 14000 | NR |
| DICHLOROMETHANE (TRI Chemical ID: 000075092) | Air - Fugitive | 6135 | 4854 | NR | 360 | NR | NR | NR | NR | NR | NR | NR |
| METHYL ETHYL KETONE (TRI Chemical ID: 000078933) | Air - Fugitive | NR | NR | NR | NR | NR | NR | NR | NR | NR | 1200 | NR |
| METHYL ETHYL KETONE (TRI Chemical ID: 000078933) | Air - Stack | NR | NR | NR | NR | NR | NR | NR | NR | NR | 11000 | NR |
| TOLUENE (TRI Chemical ID: 000108883) | Air - Fugitive | 0 | 0 | 0 | 25694 | 19777 | NR | NR | NR | 3800 | 5600 | NR |
| TOLUENE (TRI Chemical ID: 000108883) | Air - Stack | 23467 | 19287 | 21032 | 25694 | 19777 | NR | NR | NR | 3800 | 5600 | NR |
| TOLUENE (TRI Chemical ID: 000108883) | Other On-Site Land Releases | 0 | 3594 | 0 | 0 | 0 | NR | NR | NR | 0 | 0 | NR |

*Source: Envirofacts, US EPA, 1998.*

**Figure 26**
**Display page of chemicals discharged into streams or bodies of water**

Discharge of Chemicals into Streams or Bodies of Water:

*Please note that there were no discharge of chemicals into streams or bodies of water for this facility for the years 1987 to 1997*

Transfer of Chemicals to Off-Site Locations other than POTWs:

*Please note that transfer amounts are not included in release totals shown above. All transfer amounts are reported in pounds. For all releases estimated as a range, the mid-point of the range was used in these calculations.*

| Chemical Name | Year | Release Amount (Pounds) | Transfer Site Name and Address | Type Of Treatment |
|---|---|---|---|---|
| 1,1,1-TRICHLOROETHANE (TRI Chemical ID: 000071556) | 1992 | 4000 | PETRO CHEM PROCESSING 421 LYCASTE DETROIT, MI 48214 | INCINERATION/THERMAL TREATMENT |
| 1,1,1-TRICHLOROETHANE (TRI Chemical ID: 000071556) | 1991 | 900 | PETRO CHEM PROCESSING 421 LYCASTE DETROIT, MI 48214 | INCINERATION/THERMAL TREATMENT |
| 1,1,1-TRICHLOROETHANE (TRI Chemical ID: 000071556) | 1989 | 4800 | HUKILL CHEMICAL 7013 KRICK RD. BEDFORD, OH 44146 | INCINERATION/THERMAL TREATMENT |
| 1,1,1-TRICHLOROETHANE | | | HUKILL CHEMICAL 7013 KRICK RD. | |

*Source: Envirofacts, US EPA, 1998.*

The Envirofacts system offers both "EZ" and customised queries so that users may build data tables by selecting a primary focus (facility, chemical, release type) and then selecting specific data elements to be displayed as columns in that table. Users may obtain the results in a displayed table or as a "comma separated value" table that can be used in spreadsheet and other applications. Thus, Envirofacts readily enables users to obtain data for their own analysis. Even the "EZ" query functions are not, in fact, entirely easy for new users, but the query system permits users to select the data elements they wish to obtain.

Envirofacts users can search within TRI or make use of search by a facility identifier that crosses all the databases. Some users conducting detailed research have found that Envirofacts may not successfully locate data for facilities from one database to another because of inconsistencies in the way facilities report and the substantial differences from one reporting system to another in how facilities are identified. Nevertheless, this system provides a good example of an integrated database.

### 2.5.3    *The Netherlands—Datawarehouse-Pollutant Emission Register*

The Netherlands has developed a "Prototype Datawarehouse Viewer" distributed on CD-ROM and accessible on the Web at http://www.erc.geodan.nl. (Users of the Web prototype must register on-line and obtain a password.). The Datawarehouse prototype contains sampling of the PER data for 1994, selected to cover examples of the different source categories or sectors such as industry, public utilities, traffic, households, agriculture, and nature. Users can search by year, by chemical, by location, and by source category. (The Netherlands' Pollutant Emission Register (PER) collects air and water emissions data for large point sources and estimates emissions data for small and diffuse sources.) The Netherlands plans to make available by the end of 1999 a limited dataset for 1997 and possibly 1996 (previous years must be recalculated for consistency), also with limited GIS functionality.

The Netherlands has previously published printed reports summarising PER data, but has used its central databases principally for policy and research applications. Information at the level of industrial processes is restricted to regulatory authorities. National, regional, and local level governmental authorities have access to the PER data, and the public can obtain information—including facility-specific emissions data—on request from a central information office. (Research projects, often funded by government agencies, also made use of the PER data.) Thus, the Datawarehouse represents a tool that will greatly expand public access to the Netherlands' PER data—from making application to an information office to hands-on access via the Web. The Datawarehouse prototype on both the Web and CD-ROM also contains two recent PER annual reports (1994 and 1995) and supporting articles on PRTRs and the PER.

Datawarehouse users begin by choosing a source such as agriculture, industry, refineries, energy, traffic and transport, consumers, building, waste disposal, drinking water companies, sewage works, HDO, or nature. Users interested in large point emissions (large combustion sources) view a map of the facilities and a comprehensive data table. Clicking on a facility on the map displays that facility's ID, company name, location, year, chemicals, and amounts. The Datawarehouse contains air emissions data for some provinces, mapped and accessible in the same way. Water data are presented for 12 provinces and 95 water quality areas.

The example in Figure 27 shows air emissions by the energy sector by province. The table supplies data by chemical (or group) for each province. Clicking on the map with the "Information" pointer (white balloon with the letter "i") displays the data for the selected province (Gelderland, in the example below). Figure 28 below shows large point sources of water discharges. All screens in the Datawarehouse apply this model: a map (with shading or markers indicating relative amounts), the key or legend to the map, a complete data table, and a window which will display data for the user's selection of province, facility, or water quality area (as appropriate). Both the data table and the data window are scrollable to reveal all items. This consistent visual presentation of the various "slices" of data helps make the Datawarehouse an easy tool to learn and use.

**Figure 27**
**Display of a map of the energy sector**
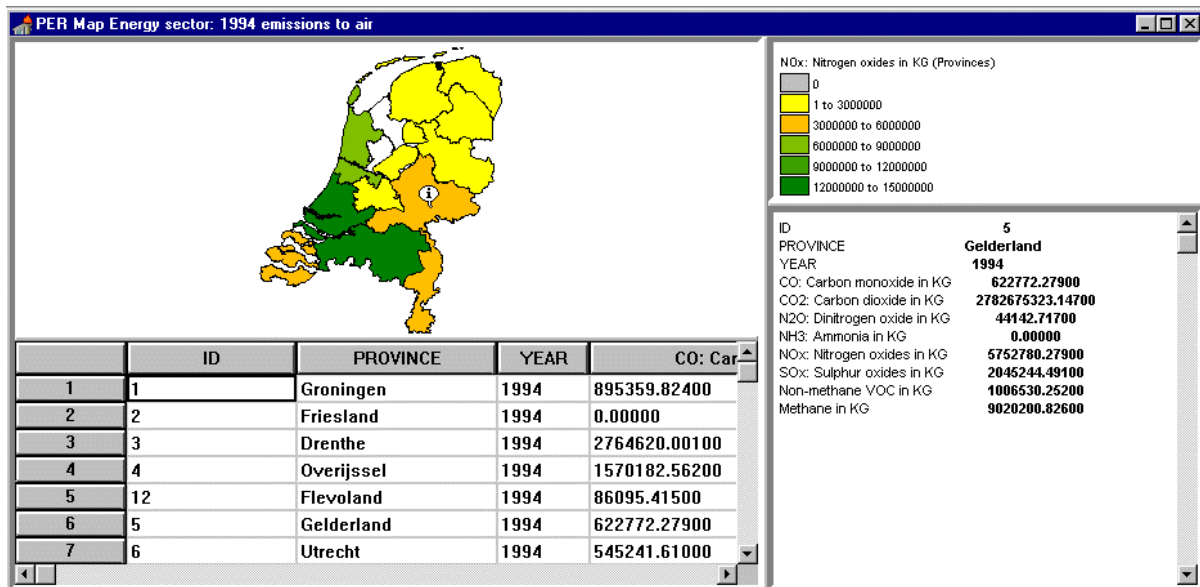


*Source: Prototype Datawarehouse Viewer, Netherlands, 1998.*

**Figure 28**
**Display of emissions to water**
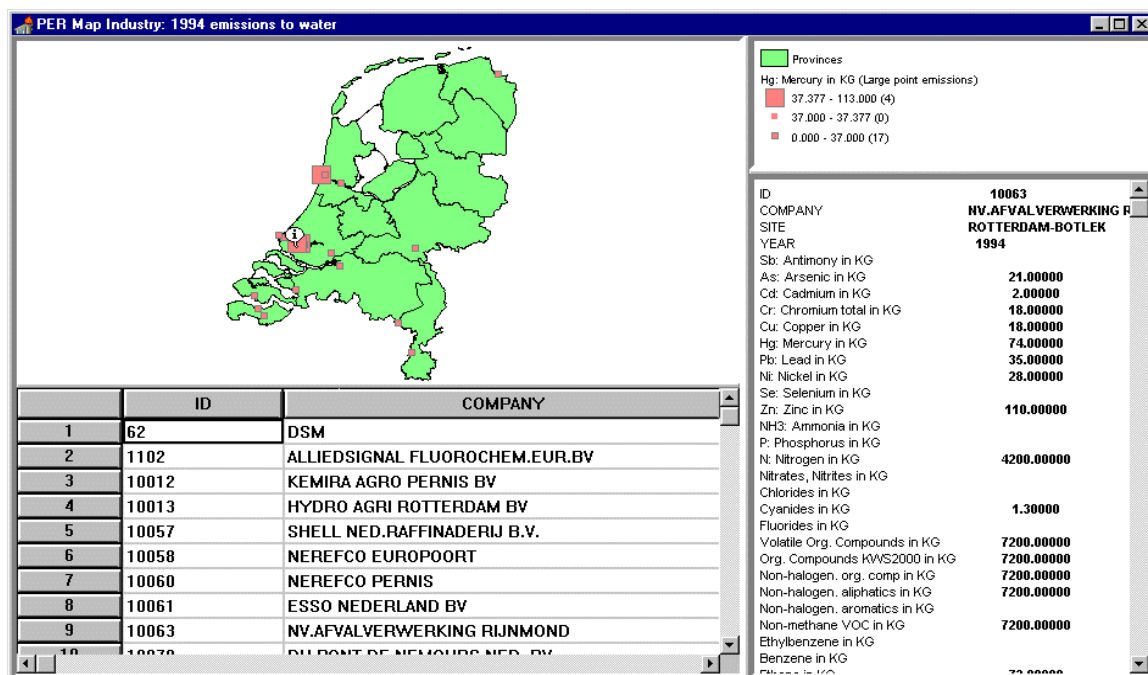


*Source: Prototype Datawarehouse Viewer, Netherlands, 1998.*

Users may print the PER Datawarehouse screens, but the prototype does not provide for exporting or extracting data. This effectively limits potential analyses that may reasonably be conducted using the Datawarehouse. Although the mapping facility indicates relative total emissions (by shading for provinces and by marker size for facilities), the PER Datawarehouse does not supply totals for geographic

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areas or facilities. Users who wish to prioritise on the basis of total emissions, for example, will have to depend on their ability to add entries displayed on the screen.

As noted earlier in this report, the chemical list covered by the Netherlands' PER is intended to support reporting and tracking of various chemical groups—those whose releases contribute to climate change, ozone depletion, acidification, and other aspects of potential environmental deterioration. However, the prototype Datawarehouse is not set up for searching by chemical (or by chemical group). This system refrains from supplying total releases per chemical at this time. Consequently, a user's ability to track such chemicals and chemical groups is limited.

### 2.5.4    Australia—National Pollutant Inventory

Australia's website makes the National Pollutant Inventory (NPI) data available to the public. This system is based on a pilot conducted in Southeast Queensland. Pilot data included voluntary reporting by about 70 industrial facilities, plus estimated emissions for smaller companies, domestic sources, and transport. Environment Australia's National Pollutant Inventory website, "Keeping an Eye on Pollution," can be found at http://www.environment.gov.au/epg/npi/.

**Figure 29**
**Example of display query page**
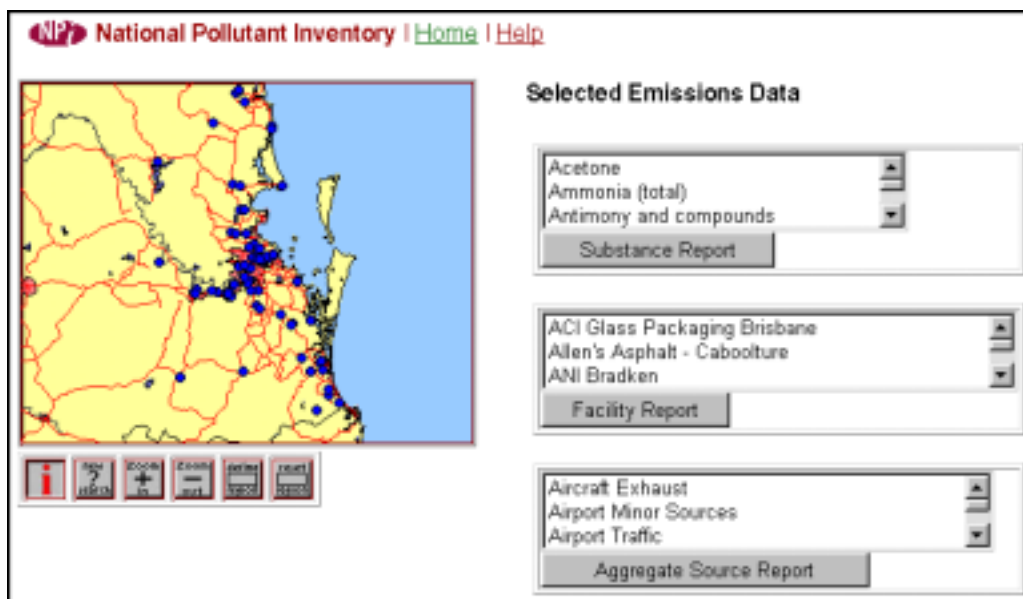


Source:  National Pollutant Inventory, Australia, 1998.

NPI data can be searched by substance, facility, or source, such as: airport exhaust, dry cleaning, or pulp and paper manufacturing. For chemical and facility searches, results are presented in summary form, followed by detailed data. A search by substance, for example, returns the number of facilities reporting the substance plus totals by source and by environmental medium, along with the facility-specific data.

**Figure 30**
**Example of chemical page**



*Source:  National Pollutant Inventory, Australia, 1998.*

**Table 7**
**Facility specific list**



*Source:  National Pollutant Inventory, Australia, 1998.*

Facility searches present facility identification and contact information, the number of employees, and descriptions of the entity's business activity and industry classification.   (Some PRTRs collect employment data as a rough indicator of economic activity or to generally compare facility size within a sector.)

**Figure 31**
**Example of a facility specific report**

**Facility Emission Report**

**Facility: Tubemakers Water**

| | |
|---|---|
| **Name:** | Tubemakers Water |
| **Address:** | 63 Currumbin Creek Road, Currumbin QLD 4223 |
| **Public Contact:** | Mr. Wayne Roberts (Technical Services Manager) |
| **Public Contact (Phone):** | 07 55 89 4456 |
| **Number of Employees:** | 175 |
| **Profile of Activities:** | a231 Ductile iron foundry manufacturing fittings and valves for the water industry Induction furnace melting using green sand and chemically bonded sand moulding systems |
| **ANZSIC Industry Classification:** | Metal Coating and Finishing Non-Building Construction n.e.c. Railway Equipment Manufacturing |

*Source:  National Pollutant Inventory, Australia, 1998.*

**Table 8**
**Example of emitted substance**

| Emitted Substance | Amount (tonnes/year) | | |
|---|---|---|---|
| | Air | Land | Water |
| Ammonia (total) | 0.059 | | |
| Benzene | 1.2 | | |
| Cyanide (inorganic) compounds | 0.15 | | |
| Formaldehyde (methyl aldehyde) | 0.015 | | |
| Oxides of nitrogen | 0.17 | | |
| Particulate Matter 10.0 micron | 12 | | |
| Phenol | 0.072 | | |
| Sulfur dioxide | 1.1 | | |
| Toluene (methylbenzene) | 1.7 | | |
| Xylenes (individual or mixed isomers) | 0.069 | | |

*Source:  National Pollutant Inventory, Australia, 1998.*

Aggregated source data does not include a breakdown by facility or source location, even for reported data submitted by industry.

**Table 9**
**Example of aggregate source emission report**

**Aggregate Source Emission Report**

**Aggregate Source: Paint and Ink Manufacturing**

| Emitted Substance | Amount (tonnes/year) | | |
|---|---|---|---|
| | Air | Land | Water |
| Acetone | 2.4 | | |
| Ammonia (total) | 0.48 | | |
| Ethanol | 1.7 | | |
| Methyl ethyl ketone | 3.5 | | |
| Methyl isobutyl ketone | 2.4 | | |
| Particulate Matter 10.0 micron | 0.54 | | |
| Styrene (ethenylbenzene) | 0.95 | | |
| Toluene (methylbenzene) | 12 | | |
| Total VOCs | 29 | | |
| Xylenes (individual or mixed isomers) | 5.2 | | |

*Source:  National Pollutant Inventory, Australia, 1998.*

**Table 10**
**Example of aggregate source emission report**



Aggregate Source Emission Report

Aggregate Source: Solvents - Commercial and Domestic

| Emitted Substance | Amount (tonnes/year) | | |
|---|---|---|---|
| | Air | Land | Water |
| Benzene | 0.0008839 | | |
| Fluoride compounds | 0.012 | | |
| Formaldehyde (methyl aldehyde) | 1 | | |
| Hydrochloric acid | 0.0015 | | |
| Methyl ethyl ketone | 42 | | |
| Methyl isobutyl ketone | 6.3 | | |
| n-Hexane | 72 | | |
| Polychlorinated dioxins and furans | 0.0363 | | |
| Toluene (methylbenzene) | 360 | | |
| Total VOCs | 6500 | | |
| Xylenes (individual or mixed isomers) | 170 | | |

*Source:  National Pollutant Inventory, Australia, 1998.*

The map feature of the NPI main window is also interactive.  A user can search the entire database by place, company, or substance and the relevant locations (facilities) on the map will be highlighted. Clicking on any facility on the NPI map identifies the facility and the substances it reported to NPI; these appear in the appropriate report windows.

**Figure 32**
**Example of a query page**



*Source:  National Pollutant Inventory, Australia, 1998.*

Probably the most advanced example of contextual data provided with PRTR data appears in Australia's Web site. Australia is "road testing" a revised contextual information service to accompany the NPI database.  Information provided to help put NPI data in context includes: chemical/physical properties, uses, environmental and health impacts, emissions sources (natural and from human activity), environmental fate, data on concentrations found in the environment (for example, concentrations in rural and in urban areas), exposure limits set or recommended by various regulatory bodies, health effects, and likely exposures of the general population.  This contextual database is also searchable.

**Table 11**
**Example of keyword searches**

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**Keyword Searches in**
**Australia's "Road Test" of Contextual Information for NPI**

Affects animals/birds
Affects fish/amphibians/reptiles
Affects plants/trees
Environment - Bio-accumulation
Environment - Contributes to smog
Environment - Contributes to water pollution
Environment - Persistent Health - Allergies/asthma
Health - Cancer/carcinogenic
Health - Circulatory disorder
Health - Growth suppression
Health – Headache
Health - Immune suppression

Health - Liver/kidney
Health – Lungs
Health - Mutations/reproductive effects
Health – Skin
Source – Air
Source - Domestic use
Source - Industrial processes
Source - Natural processes
Source – Transport
Source - Water/food
State – Gas
State - Liquid or in solution
State - Solid/dust/particles

---

Australia also provides background information to explain the content and concepts of the contextual data, a glossary, and references to sources of information used.

## 2.5.5    United Kingdom

Among Web site vehicles using PRTR data, **Friends of the Earth UK** (England, Wales, and Northern Ireland) takes the most environmentally activist approach in its Factory Watch (http://www.foe.co.uk/campaigns/industry_and_pollution/factorywatch/).   FOE's Web site was first to supply the UK's Chemical Release Inventory data to the public.

**Figure 33**
**Example of the Factory Watch home page**



*Source:  Friends of the Earth, United Kingdom, 1998.*

Facility data can be retrieved by facility name or location.   A geographic search generates a map of facility sites—pointing at a site displays the factory name, clicking on it retrieves its CRI data.

**Figure 34**
**Example of a Factory Watch query page**



*Source:  Friends of the Earth, United Kingdom, 1998.*

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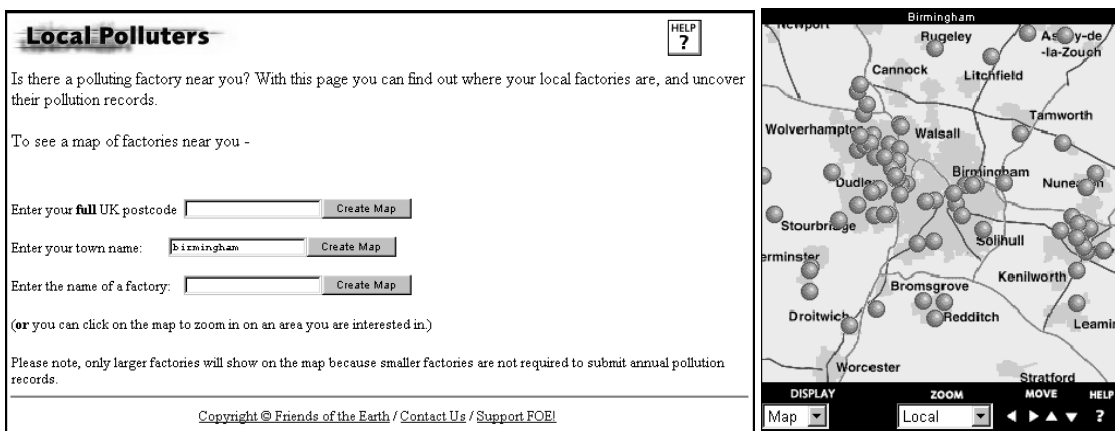
Friends of the Earth has linked many of the chemical substances in its Factory Watch site to the contextual information supplied in the Environmental Defense Scorecard for US TRI chemicals.

**Figure 35**
**Example of contextual data and information available on Factory Watch**
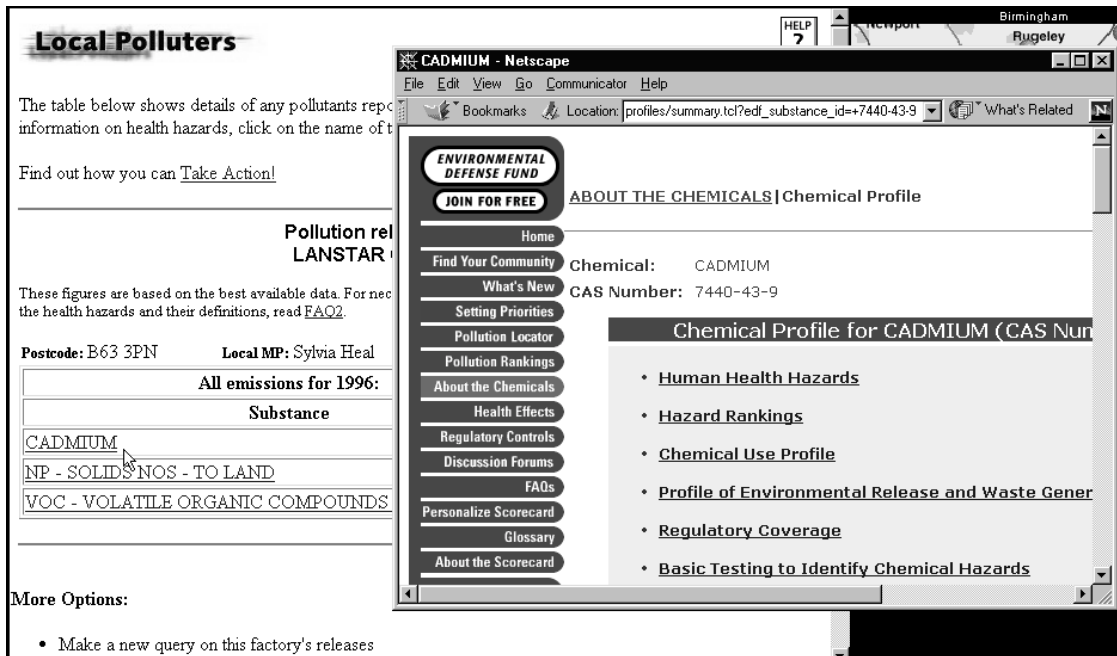


*Source: Friends of the Earth, United Kingdom, 1998.*

FOE's Factory Watch also supports searches by chemical, by health effect, by industrial process, and by parent company.

**Figure 36**
**League table example from Factory Watch**
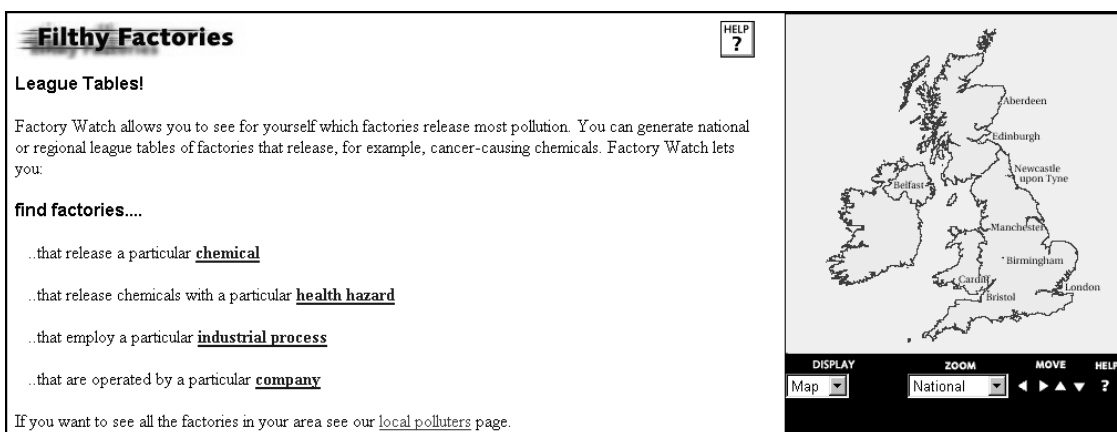


*Source: Friends of the Earth, United Kingdom, 1998.*

**Figure 37**
**Specific industry query page from Factory Watch**



*Source: Friends of the Earth, United Kingdom, 1998.*

Following the UK Environment Agency's release of the 1998 data, FOE published tables of the top 100 factory sources of carcinogens, dioxins, toxic waste, and acid rain gases. For the top 25 facilities in each category, FOE also supplied the average household income data in the facility's postcode sector.

The UK **Environment Agency**'s Web site previously incorporated a link to the FOE site for public access to the Chemical Release Inventory data. More recently, the UK has revised its PRTR (now the Pollution Inventory) to require all facilities to report on a "core" set of approximately 150 chemicals, and—as this report was being prepared—the Environment Agency posted the 1998 data on the Web at http://www.environment-agency.gov.uk/ (click on "Your Environment").

**Figure 38**
**Example of the UK Environment Agency Internet page**



*Source: United Kingdom Environment Agency, 1998.*

One feature of the UK Environment Agency's "What's in Your Backyard" site is likely to appeal particularly to public audiences not previously attuned to environmental data: the opportunity to check the water quality of area bathing beaches (http://146.101.4.38/wiyby/html/introduction.htm).

**Figure 39**
**Example of bathing water quality**
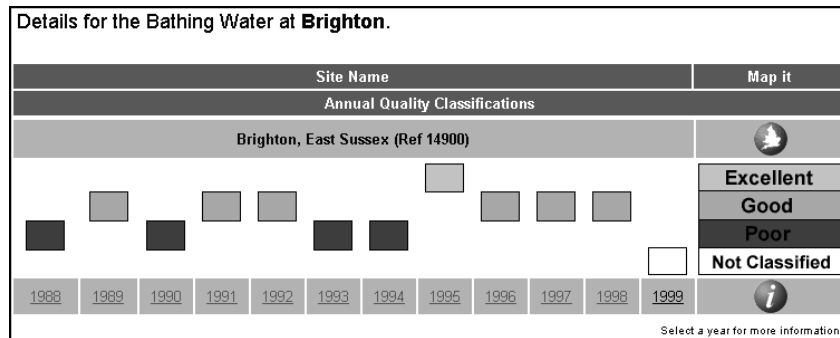


*Source: United Kingdom Environment Agency, 1998.*

**Figure 40**
**Example of a presentation of water quality samples**

| 1999 Bathing Water Quality Samples for **Brighton** (Site Reference 14900) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date | Time | Total Coliforms (colonies / 100ml) | Faecal Coliforms (colonies / 100ml) | Faecal Streptococci (colonies / 100ml) | Salmonella | Enteroviruses (plaque forming units / 10 ltrs) | Water Quality |
| 5/4/99 | 09:10 | 18 | <10 | 30 | - | - | Excellent |
| 5/10/99 | 09:35 | 182 | 18 | <10 | - | - | Excellent |

*Source: United Kingdom Environment Agency, 1998.*

The UK Pollution Inventory Web site relies in the first instance on mapping for users to "Find Your Environment", beginning with a map of the whole country, a map centred on a place name, postal code or co-ordinate reference. One or more additional steps may be needed to arrive at sufficient detail to make facilities visible on this map. The main public register may also be accessed from "What's in Your Backyard".

**Figure 41**
**Example of map on UK background website**



*Source: United Kingdom Environment Agency, 1998.*

By "asking" questions, users may also search by other criteria, including industry process or chemical. Pick lists enhance the utility of the typical questions.

**Figure 42**
**Query page – What's in Your Backyard, UK Environment Agency**



*Source: United Kingdom Environment Agency, 1998.*

**Figure 43**
**Example of reported releases – What's in Your Backyard, UK Environment Agency**

| Sites Which Had Reportable Releases of 1,1,1-Trichloroethane (Methyl Chloroform) During 1998, Ordered by Total Site Amount | | | | |
|---|---|---|---|---|
| **Company Name** | **Address** | | | **Map It !** |
| **Authorisation Number** | **Substance** | **Route** | **Amount** | **More Details** |
| ICI CHEMICALS AND POLYMERS LTD | MERSEYSIDE OPERATIONS PO BOX 9 , WA7 4JE | | | |
| AL7243 | 1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM) | Controlled Waters | 1.83kg | |
| AL7421 | 1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM) | Air | 1.8t | |
| SOLREC LTD | MIDDLETON ROAD , LA3 3JW | | | |
| AG9248 | 1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM) | Controlled Waters | 600kg | |
| ARJO WIGGINS LTD | DARTFORD PAPER MILL PRIORY ROAD NORTH , DA1 2BW | | | |
| AU7206 | 1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM) | Air | 410kg | |

*Source:  United Kingdom Environment Agency, 1998.*

Whether from a map, from a list of sources of a chemical, or by other avenues, users may retrieve facility-specific details, including authorisation/permit number and industrial sector and process.

**Figure 44**
**Example of facility specific details – What's in Your Backyard, UK Environment Agency**

| Company Name | Address | | Grid Reference | | |
|---|---|---|---|---|---|
| ICI CHEMICALS AND POLYMERS LTD | MERSEYSIDE OPERATIONS PO BOX 9, WA7 4JE | | X: 351300 Y: 379900 | | |
| | **Authorisation** | **Industry** | **Process** | | |
| | AL7243 | THE CHEMICAL INDUSTRY | PROCESSES INVOLVING HALOGENS | | |

| Year | Medium | Substance | Limit of Release | Notifiable Release | Total Release |
|---|---|---|---|---|---|
| | Air | VOC - VOLATILE ORGANIC COMPOUNDS - CLASS B | 2950000 kg | - | 133900 kg |
| | | TRICHLOROETHYLENE | 1200 kg | - | 80 kg |
| | | HFCS(HYDROFLUOROCARBONS) | 11000 kg | - | - |
| | | HYDROGEN CHLORIDE | - | - | - |
| | | CARBON DIOXIDE | - | - | 4.6 kg |
| | | VOC - VOLATILE ORGANIC COMPOUNDS - CLASS A | 325000 kg | - | 17300 kg |
| | | HYDROGEN BROMIDE | - | - | - |
| | | HCFCS(HYDROCHLOROFLUOROCARBONS) | 11000 kg | - | 900 kg |
| | | CHLOROFORM (TRICHLOROMETHANE) | 50000 kg | - | 500 kg |
| | | MERCURY | 11.2 kg | - | - |
| | | HYDROGEN FLUORIDE | - | - | - |
| | | CARBON MONOXIDE | - | - | 60 kg |

*Source:  United Kingdom Environment Agency, 1998.*

Wherever search results display a chemical, the user may click on the chemical name to obtain additional information.  The UK Environmental Agency's approach puts total releases literally in the middle of selected contextual information, with links to health effects and other supplementary data (a sampling of the information appears in the screen capture).

**Figure 45**
**Example of additional information about a specific chemical – What's in Your Backyard,**
**UK Environment Agency**



**Further Information About 1,1,1-trichloroethane (methyl chloroform)**

**What is it ?**

1,1,1-trichloroethane is a chlorinated aliphatic hydrocarbon, is soluble in water and highly volatile. It is a colourless liquid at room temperature with sweet odour similar to chloroform.

**Where is it Found in the Environment ?**

There are no natural sources of 1,1,1-trichloroethane. Man-made sources include releases at points of manufacture and industrial use, as well as from dispersed domestic and commercial use, in household cleaning products, and in dry cleaning and from landfilled wastes (primarily by volatilisation).

**How is it Used or Produced by Industry ?**

1,1,1-trichloroethane is mostly used as a solvent for metal degreasing, cleaning precision instruments, and in the production of pesticides and textiles.

**How Much Was Released in 1998 ?**

| Air | Sewer | Controlled Waters | Land |
|---|---|---|---|
| 3337.419921875 kg | 16 kg | 706.588989257813 kg | - |

Remember, this does not necessarily represent all the emmisions for England and Wales as there are many other sources of pollution. For further information on sources of pollution try the National Atmospheric Emission Inventory.

**What About Health Effects ?**

For further information on this we have provided an Environmental and Health Effects Page.

**What Substances Make up This Group?**

Not Applicable

*Source:  United Kingdom Environment Agency, 1998.*

## 2.6    Complete Data Files on the Web

The one way a Web site may avoid imposing the assumptions of a user interface is to make available complete data files that a Web visitor can download and use independently.  Files can be made available in a database format such as dBASE®, in spreadsheet form such as Lotus© or Microsoft® Excel, or in plain text (ASCII).

The great value of this approach is that it allows interested persons to conduct the full range of potential analyses of PRTR data.  Other users can similarly obtain the data to verify or build on existing analyses. For most PRTRs, a whole year of data in a database format can be conveniently compressed into a self-extracting file for any Web visitor to download, extract, and analyse.  Many persons with interests in specific PRTR information—submissions by a local facility, trends for a particular chemical—may not have extensive experience in handling and analysing databases of full sets of reported data, and these users benefit from the Web-based interfaces that give them access to selected data.  More sophisticated users, however, will need complete data to conduct many more specialised types of analyses that PRTR data support. The principal responsibility of the disseminator in this regard is to clearly describe the contents of the data files—the field structure and contents and any limitations in the data themselves.

Environment Canada's Web page makes these choices clear. In addition to the summary document, supplementary tables, and the interactive query mechanism in the NPRI Web site, users can download a year's data as a simple flat-file (which can be read by database or spreadsheet software) or as complete relational databases.

**Figure 46**
**On-line query example – NPRI, Environment Canada**



## On-line Search of the 1996 database
http://www.npri-inrp.com/queryform.cfm

You can search the entire 1996 NPRI with our on-line database. With our simple query form and its many helpful pick-lists, you can quickly and easily obtain detailed information on a single facility or informative summaries based upon substance, location or industrial sector. And if your browser supports Java™ a graph of the summary data will be generated.

## 1996 Flat-file Database
Download the 1996 Flat-file Database (npri96.exe 347 KB)

The 1996 NPRI is provided as a simple flat-file for people who need to analyse the NPRI data in greater detail, but who do not have access to a relational database. The NPRI flat-file is provided in a dBase ™ format which is widely recognized by a variety of spreadsheet and database programs. The flat-file and a description of the database are in the self-extracting archive.

## 1996 NPRI Databases
1996 Databases

The databases are intended for individuals who want more information than is available from the Summary Report, the on-line query or in the flat-file. All publicly available information reported to the NPRI is contained in the database files. A number of commercial relational database programs can be used to view and analyze the data.

*Source: NPRI, Environment Canada, 1998.*

Although the complete US TRI database is too large and complex for distribution in this manner, US EPA makes state-by-state subsets of the TRI database available for downloading from the Web.


## 2.7    PRTR Summary Data and Data Analyses on the Web

Some PRTRs and non-integrated systems publish only summary data (specifically, they do not make facility-level information public). Web sites for these systems similarly publish summary or selected data. Where complete PRTR data, including facility-specific detail, are made available, Web sites are likely to allow users to retrieve data at several levels of aggregation—national totals, industry totals, geographic totals, and so forth. Summary data are thus generally widely available via Web site dissemination tools. (An exception might be the Netherlands' prototype Datawarehouse, which does not supply totals for the data it presents.)

Government agencies that collate PRTR agencies usually post their primary printed publications—the annual reports—on the Web for viewing or downloading. (Adobe Acrobat® PDF files are the tool of choice for this application.) More in-depth analyses—tracking performance of various facility or industry groups, examining chemical trends by various cross-sections of business activity—will most likely be found in these printed publications. Government Web sites also typically offer reporting software or forms, instructions, and other guidance for those preparing PRTR submissions. Non-governmental sites may offer materials—press releases and issue papers or background documents—that highlight their major findings from the data. Non-government organisations may also issue on the Web rankings of facilities based on total releases or other data, especially where official PRTR dissemination has avoided this approach.

Generally, however, Web sites have not been used to offer additional analyses of PRTR data. That is, Web sites most frequently offer data in visual display, and they may or may not offer data in forms that permit users to conduct analyses. A few include pre-formulated questions that can serve as a vehicle for delivering particular subsets of data with accompanying explanatory information. This feature could be expanded to offer more sophisticated analyses to Web visitors. The Friends of the Earth site, Factory Watch, in the UK takes this approach. The Environmental Defense Scorecard also offers clearly distinguished summaries and analyses of the US TRI data.

**Figure 47**
**EDF Scorecard information page**



**Environmental Release Report: Entire United States**

- Map(s) Locating the Manufacturing Facilities
- 1996 Rankings: Major Chemical Releases or Waste Generation in the Entire United States
- 1996 TRI Pollution Releases Ranked by Ozone Depleting Potential
- 1996 TRI Pollution Releases Ranked by Potential Human Health Risks
- 1996 TRI Pollution Releases Sorted by Health Effect
- What We Don't Know About Chemical Safety and Harm
- TRI Data Summary
- Take Action

*Source:  Environmental Defense, 1998.*

**Figure 48**
**Query page example – Scorecard**



- 1996 TRI Pollution Releases Ranked by Ozone Depleting Potential
  Top Ranked Ozone Depleting Chemical: METHYL BROMIDE

[top ]

- 1996 TRI Pollution Releases Ranked by Potential Human Health Risks
  Top Ranked Cancer Risk: CARBON TETRACHLORIDE
  Top Ranked Noncancer Risk: COPPER

[top ]

- 1996 TRI Pollution Releases Sorted by Health Effect*

| | Air Releases (Pounds from TRI sources) | Water Releases (Pounds from TRI sources) |
|---|---|---|
| Recognized Carcinogens | 140,923,223 | 1,425,966 |
| Suspected Carcinogens | 32,412,948 | 1,037,225 |
| Suspected Cardiovascular or Blood Toxicants | 793,831,752 | 124,501,740 |
| Recognized Developmental Toxicants | 211,985,627 | 244,351 |
| Suspected Developmental Toxicants | 675,803,055 | 12,225,464 |

*Source:  Environmental Defense, 1998.*

**Table 13**
**Example of how data is summarised – Scorecard**

| · TRI Data Summary | | | | | | | |
|---|---|---|---|---|---|---|---|
| Environmental Releases, Transfers, and Production-Related Waste (Pounds from TRI sources) | | | | | | | |
| Year | Stack Air Releases | Fugitive Air Releases | Water Releases | Underground Injection | Land Releases | Total Environmental Releases | Total Off-Site Transfers | Total Production-Related Waste |
| 1988 | 1,946,043,422 | 873,711,521 | 336,496,996 | 1,371,505,444 | 1,141,058,409 | 5,668,815,792 | 2,634,381,146 | NA |
| 1989 | 1,805,201,575 | 809,777,240 | 191,186,075 | 1,175,501,011 | 457,342,346 | 4,439,008,247 | 1,534,995,317 | NA |
| 1990 | 1,615,935,002 | 725,078,674 | 201,301,399 | 755,904,668 | 436,898,040 | 3,735,117,783 | 1,341,480,430 | NA |
| 1991 | 1,432,938,779 | 643,664,430 | 245,496,334 | 709,314,242 | 420,472,948 | 3,451,886,733 | 3,851,862,271 | 28,857,198,563 |
| 1992 | 1,351,405,027 | 559,851,175 | 276,619,065 | 725,922,422 | 340,919,891 | 3,254,717,580 | 5,198,052,816 | 29,033,899,234 |
| 1993 | 1,198,201,099 | 497,994,998 | 271,788,047 | 579,168,396 | 287,542,875 | 2,834,695,415 | 4,786,830,485 | 29,057,500,950 |
| 1994 | 1,148,492,031 | 407,515,054 | 66,083,288 | 348,968,226 | 289,151,126 | 2,260,209,725 | 3,795,029,488 | 26,545,372,789 |
| 1995 | 1,177,227,504 | 385,094,609 | 136,315,624 | 234,979,709 | 275,131,965 | 2,208,749,411 | 3,534,827,951 | 35,027,058,218 |
| 1996 | 1,096,585,765 | 348,974,021 | 173,263,553 | 204,329,109 | 309,063,206 | 2,132,215,654 | 3,443,782,241 | 23,405,070,639 |
| "NA" means that no data are available because "Total-Production Related Waste" was not reported until 1991. | | | | | | | |

*Source: Environmental Defense, 1998.*

Aside from reproducing published reports and press releases, however, many Web sites do not share results of further data analysis with their visitors. In particular, PRTR analyses tend to concentrate around the periodic public release of the data. To enhance the utility of the data and to draw attention throughout the year to the value of PRTR data, governmental agencies could use their Web sites to publicise in-depth studies conducted between reporting cycles.

**Table 14**
**Characteristics of Selected PRTR-Related Web Sites**

| Table 14 **Note:** As Web sites evolve, their features change and new options are added. Characteristics indicated here were current in mid-1999. | 1. Canada NPRI | 2. RTK NET | 3. EDF Scorecard | 4. Envirofacts | 5. NL Datawarehouse | 6. FOE Factory Watch | 7. UK PI | 8. Australia NPI | 9. CORINAIR |
|---|---|---|---|---|---|---|---|---|---|
| **Form of data** | | | | | | | | | |
| Complete data downloadable | X | | | 1 | | | | 2 | |
| Complete data searchable | X | X | X | X | | X | | X | |
| Selected but facility-specific data | | | | | X | | X | | |
| Selected but no facility data | | | | | | | | | X |
| Data for all years | X | X | X | X | 3 | 4 | | X | X |
| Pre-selected data (to answer specific questions) | | | X | X | | | | | |
| Summary data only | | | | | | | | | |

| Table 14<br><br>**Note:** As Web sites evolve, their features change and new options are added. Characteristics indicated here were current in mid-1999. | 1. Canada NPRI | 2. RTK NET | 3. EDF Scorecard | 4. Envirofacts | 5. NL Datawarehouse | 6. FOE Factory Watch | 7. UK PI | 8. Australia NPI | 9. CORINAIR |
|---|---|---|---|---|---|---|---|---|---|
| **Opportunity for interaction** | | | | | 5 | | | | |
| Searchable | X | X | X | X | X | X | X | X | X |
| Mapping | | | X | X | X | X | X | X | |
| e-Mail/off-line contacts for sources of pollution | X | X | X | X | | X | X | X | |
| e-Mail/off-line contacts for policymakers | | | X | | | X | | X | |
| e-Mail/off-line contacts for sources of data | X | X | X | | | X | X | X | |
| **Timing** | | | | | | | | | |
| Frequency (annual, biennial, less often) | A | A | A | A | | | | A | 4 yrs |
| Timeliness (within 1 year of submission, more than 1 year) | >1 | >1 6 | >1 | >1 6 | | >2 | | <1 | |
| **Contextual Data** | | | | | | | | | |
| Geography | | | 7 | | | | | X | |
| Ecology | | | | | | | | | |
| Health effects, toxicity (Integrated, Links to other sites) | L | | I | L | | L 8 | L | I | |
| Demographics | | | 9 | | | | | | |
| Economic (Uses, Other) | | | U O 10 | | | O 11 | U | U | |
| Other | | | | | | | | 12 | |
| **Integration with other resource/pollution data** (collected by other systems) | | | | | | | | | |
| Non-point sources | 13 | | | | X | | | X | |
| Permitted air emissions | | | X | X | | | | | |
| Permitted water discharges | | X | | X | | | | | |
| Hazardous waste transfers | | X 14 | X | X 14 | | | | | |

| Table 14<br><br>**Note:** As Web sites evolve, their features change and new options are added. Characteristics indicated here were current in mid-1999. | 1. Canada NPRI | 2. RTK NET | 3. EDF Scorecard | 4. Envirofacts | 5. NL Datawarehouse | 6. FOE Factory Watch | 7. UK PI | 8. Australia NPI | 9. CORINAIR |
|---|---|---|---|---|---|---|---|---|---|
| On-site recycling (non-chemical) | | | | | | | | | |
| Air, water, or soil quality data | | | | | | | | | |
| Upstream (raw materials extraction and processing) | | | | | | | | | |
| Downstream (use, reuse, recycling of products, stock) | | | | | | | | | |
| Water use | | | | | | | | | |
| Energy use | | | | | | | | | |
| Other | | 15 | 16 | 17 | | | 18 | | |
| **Publicity and marketing** | | | | | | | | | |
| Outreach programme | | | | | | X | | X | |
| Press conferences, press releases | X | X | X | | | X | X | X | |
| User group/ listserv | | X | | | | X | | | |
| Advertising | | | X | | | | | X | |
| **Training and education in dissemination and presentation** | | | | | | | | | |
| Conferences | | X | | | | | | X | |
| Hard copy guides | 19 | | | | | | | X | |
| Web site links to resources | | | | | | | | X | |
| Mapping tools (downloadable for local use) | | | | | | | | | |
| Other | | | | | | | | 20 | |

1  Available for sophisticated users via a "Batch Query Option", but could be limited for large data files.
2  Not available for prototype, but will be available with first-year data.
3  The Netherlands plans to release 1997 and possibly 1996 data by the end of 1999.
4  1992-1996.
5  Web visitors must register to obtain access to the prototype Web site.
6  Simultaneous with U.S. EPA release of TRI data.
7  Forthcoming.

8  Individual chemicals linked to EDF Scorecard, where applicable.
9  Forthcoming.
10  Industries that use the chemical; high-volume chemicals identified.
11  Average income and location of major industries.
12  Physical characteristics.
13  In downloadable summary report.
14  BRS, RCRIS, Superfund.
15  Emergency notifications (ERNS), accidental releases (ARIP), chemical testing (TSCATS), civil cases.
16  Animal waste.
17  Brownfields, drinking water.
18  Bathing beaches water quality.
19  Forthcoming.
20  Newsletters.

## 2.8  Option:  Other On-Line Access

User-friendly advances in Web data-retrieval techniques have tended to leave behind other forms of on-line access to databases. As noted, however, user-friendly Web sites are not necessarily a complete data delivery tool. Thus, while developing and marketing its Web-based access to databases, RTK NET has maintained its electronic bulletin board service, which allows users to conduct searches and also to download more extensive data files.

Although most Internet users interact with Web sites (HTML pages), File Transfer Protocol can be used to allow transfers of large files directly from Web hosting computers to the user's computer.  Little use seems to be made of this approach, which retains some of the "user-friendless" character of on-line communications before the advent of the Web.

## 2.9  Electronic Media: CD-ROM, Diskettes

Because CD-ROMs can carry such large amounts of data, they are useful for distributing larger databases. US TRI data for 1987-1996 are available on a single CD-ROM (1987-1997 data are forthcoming in this format).

Among other benefits, CD-ROMs can also offer the advantages of the Web without the Web. Databases supplied on CD-ROM often resemble Web-based systems or in fact replicate them. The Netherlands' prototype PER Datawarehouse exemplifies this use—the same prototype is available on CD or on the Web. Both distribution formats include the same supporting materials (reports and articles) as well.

More explicitly, many CDs rely on the data user's World Wide Web browser, used off-line. Thus, the European Environment Agency distributed CORINAIR's *Atmospheric Emission Inventory Guidebook* as HTML files which the user views using either Netscape or Internet Explorer, the common Web browsers. A principal advantage for users of this mode is that they avoid the communications problems and delays that sometimes interfere with productive use of the Web. Similarly, the agency disseminating the data does not have to maintain the data in a Web site. Users without access to the Web can still make use of the CD so long as they have a Web browser installed.

## 2.10    Complementary Use of Dissemination Methods

To enhance use of both published reports and Web access (and other electronic media), established PRTRs generally included their published (printed) reports on the Web, usually as Acrobat® PDF files available for downloading. In parallel to this, the published reports include information on obtaining electronic access to the data.

One example of a more complementary use of print and electronic dissemination occurs with the US TRI data at the state level.  The annual report is issued in two volumes (publication of the 1996 data included extensive analyses by industry sector and totalled three volumes).  The main volume (*Toxics Release Inventory: Public Data Release*) consists of a national report, which includes summary data by state and territory. Published simultaneously, the second volume (*State Fact Sheets*) supplies considerably more detail with a two-page spread for each state and territory.  At the same time, persons especially interested in state-level information can visit the Web site and download complete TRI data for individual states and territories by clicking on the appropriate state on a US map.

As an example, Environment Canada's Executive Summary from its published annual report appears on the Web in its entirety (http://www.ec.gc.ca/pdb/npri/1996/index.html, see Annex 3, Box 1). The rest of the printed report can be downloaded from the Web site, which also provides supplementary tables that do not appear in print.

Print and Web publication of PRTR data could offer more complementary features.  The Commission for Environmental Co-operation, for example, plans to give Web users the opportunity to download tables from the annual published report as spreadsheets for further analysis.  This kind of complementarity could be further enhanced for the special analyses that appear in many PRTR publications if the relevant Web site gave Web visitors access to the corresponding data aggregation—for example, data files for chemical groupings such as metals, carcinogens, or ozone-depleting chemicals.

Reproducing printed publications on microfiche for use in public libraries represents another complementary technique for expanding public access to an existing presentation and dissemination tool. Microfiche offers substantial cost savings compared to printing and shipping larger quantities of printed publications.

ANNEX 3

SELECTED NATIONAL PRTR REPORTS

3.1

The Tables of Contents found in Table 1 and 2 on the following pages illustrate the wide range of publicly useful analyses that are possible with PRTR data. They are taken from the national report on the first year of US TRI data (the 1987 data report) and the North American Commission for Environmental Co-operation's report PRTR data for 1996.

The third entry in this Annex, Box 1, presents an example of complementary distribution of a published report. Environment Canada's Executive Summary from its published annual report appears on the Web in its entirety (http://www.ec.gc.ca/pdb/npri/1996/index.html). The rest of the report is downloadable from the Web, and supplementary tables are available only on the Web.

---

**Table 1**
**Example of a summary report table of contents**

**(First National Summary Report on US TRI)**

*The Toxics Release Inventory: A National Perspective,* US EPA, June 1989
**Table of Contents**

**The 1987 Toxics Release Inventory: A National Summary**

**Chapter 2. Introduction to the Toxics Release Inventory**

**Table 2**
**Example of the table of contents of the First U.S. TRI summary report:**
**The Toxics Release Inventory: A National Perspective, U.S. EPA, June 1989**

**Table 3**

**Selected Contents of Taking Stock: North American Pollutant Releases and Transfers, 1995**

Commission for Environmental Co-operation, 1998

**[All other figures and tables in Chapter 3, listed below, based on Matched Data, 1995]**

## Selected Contents of Taking Stock: 1995 (cont.)
(Remainder of Chapter 3 based on Matched Data 1995)

**Box 1**
**Excerpts from the NPRI, Canada, Summary Report**

| 1996 NPRI Summary Report: Executive Summary |
| --- |

The 1996 Summary Report is the fourth annual report published under the National Pollutant Release Inventory (NPRI) program. The report provides information on 176 listed substances, specifically on their on-site releases to air, water, land and underground injection; off-site transfers in waste; and off-site transfers for recovery, re-use and recycling (3Rs), and energy recovery.

The NPRI is the only legislated, nation-wide, publicly accessible inventory of its type in Canada. One of the fundamental aspects of the NPRI is to provide Canadians with access to pollutant release information for facilities located in their communities. In addition, the NPRI continues to support a number of environmental initiatives by providing information that assists governments and others to identify priorities for action, encourages industry to take voluntary measures to reduce releases, allows tracking of progress in reducing releases, and supports a number of regulatory initiatives across Canada.

The 1996 Summary Report includes data from the National Pollutant Release Inventory for the calendar years 1995 and 1996 as it appeared in the NPRI database on January 10, 1998. Non-confidential NPRI information and data are also accessible on the Internet at the Environment Canada National NPRI website at http://www.ec.gc.ca/pdb/npri/. Readers should note that the NPRI data on the Internet site are updated regularly as a result of new or revised reports submitted by facilities. As a result of revisions submitted after January 10, the quantities identified in this report may at times differ from those listed on the national database.

The report highlights 1996 release and transfer information, and this year, for the first time, includes a section on national, provincial and territorial analysis for NPRI-listed CEPA-toxic and carcinogenic pollutants listed on the inventory from 1995 to 1996.

Environment Canada and the NPRI program encourage industrial associations, community groups, and the public to participate actively in all aspects of the NPRI program.

| Highlights of the 1996 NPRI Summary Report |
| --- |

- A total of 1,818 Canadian facilities filed reports with the NPRI in 1996. The number of reporting facilities increased by 39 (+2.2%) over 1995.

- There were 6,635 pollutant reports filed in 1996 (one report is filed for each substance released or transferred); 271 (+4.3%) more reports than in 1995.

- In 1996, facilities across Canada reported:
  – on-site releases totalling 142,613 tonnes; **a decrease of 25,001 tonnes or -14.9% compared with 1995.**
  – off-site transfers in waste totalling 64,626 tonnes; **an increase of 12,500 tonnes or +24.0%.**

- on-site releases of NPRI-listed **CEPA-toxic and carcinogenic** pollutants totalling 13,252 tonnes; **a decrease of 865 tonnes or -6.1%**.

- off-site transfers of NPRI-listed **CEPA-toxic and carcinogenic** pollutants in waste totalling 9,427 tonnes; **a decrease of 621 tonnes or -6.2% since 1995.**

- **97,884 tonnes** as off-site transfers for 3Rs and **4,262** tonnes as off-site transfers for energy recovery.

- In 1996, the following five industrial sectors, based on two-digit Canadian Standard Industrial Classification (SIC) codes, reported the largest on-site releases of NPRI-listed pollutants:

    1. **Chemical and Chemical Products Industries:** 41,965 tonnes

    2. **Primary Metal Industries:** 20,372 tonnes

    3. **Paper and Allied Products Industries:** 20,251 tonnes

    4. **Refined Petroleum and Coal Products Industries:** 10,496 tonnes

    5. **Crude Petroleum and Natural Gas Industries:** 8,019 tonnes

Furthermore, the following two industrial sectors reported the largest decrease in on-site releases of NPRI-listed pollutants **from 1995 to 1996**:

- The **Mining Industries Sector** showed the largest decrease in on-site releases between 1995 and 1996. In 1995, this industrial sector reported total on-site releases of 20,400 tonnes, compared to 6,540 tonnes in 1996 (**a decrease of 13,860 tonnes or -67.9%**). The primary factor for this decrease was the 1995 closure of the **BHP Minerals Canada Ltd. - Island Copper Mine** (NPRI #1127), in Port Hardy, BC. This facility reported 12,000 tonnes of copper (and its compounds) released to surface water in 1995.

- The **Paper and Allied Products Industries Sector** showed the **second largest decrease** in on-site releases in Canada from 1995 to 1996. This **decrease of 9,649 tonnes (-32.3%)** was primarily due to the effluent treatment requirements of the federal pulp and paper regulations.

- In 1996, the following five industrial sectors, based on two-digit Canadian SIC codes, reported the largest on-site releases of NPRI-listed **CEPA-toxic and carcinogenic** pollutants:

  1. **Primary Metal Industries:** 3,436 tonnes

  2. **Mining Industries:** 3,272 tonnes

  3. **Plastic Products Industries:** 1,482 tonnes

  4. **Chemical and Chemical Products Industries:** 1,369 tonnes

  5. **Wood Industries:** 853 tonnes

- In 1996, the following five industrial sectors, based on two-digit Canadian SIC codes, reported the largest off-site transfers of NPRI-listed pollutants in waste:

  1. **Primary Metal Industries:** 22,504 tonnes

  2. **Chemical and Chemical Products Industries:** 20,813 tonnes

  3. **Fabricated Metal Products Industries (Except Machinery and Transportation Equipment Industries)**: 3,260 tonnes

  4. **Transportation Equipment Industries**: 2,604 tonnes

  5. **Non-metallic Mineral Industries**: 2,412 tonnes

- In 1996, the following five industrial sectors, based on two-digit Canadian SIC codes, reported the largest off-site transfers of NPRI-listed **CEPA-toxic and carcinogenic pollutants** in waste:

  1. **Primary Metal Industries:** 3,627 tonnes

  2. **Non-metallic Mineral Products Industries:** 2,328 tonnes

  3. **Chemical and Chemical Products Industries:** 1,069 tonnes

  4. **Fabricated Metal Products Industries (Except Machinery and Transportation Equipment):** 451 tonnes

  5. **Transportation Equipment Industries**: 319 tonnes

**The report contains two main appendices:**

Appendix 1 ranks facilities based on the largest total on-site releases per pollutant and lists releases by environmental medium.

Appendix 2 compares facilities that reported NPRI-listed CEPA-toxic or carcinogenic pollutant releases by province and territory in 1996. Both on-site releases and off-site transfers in waste were provided for every facility. This analysis compares facilities in a given industrial sector and their management of CEPA-toxic and carcinogenic NPRI pollutants during 1995 and 1996.

The NPRI program continues to evolve in response to the needs and concerns of both governments and the public in Canada. Environment Canada has engaged stakeholders on proposed changes to the program since 1997 and consultations are still under way. As one of its highest priorities, Environment Canada is undertaking a review of the NPRI list of substances and the list of facilities currently exempt from reporting to the NPRI

# ANNEX 4

## STATE-LEVEL PRTR DATA

US Toxics Release Inventory annual publications include a volume of State Fact Sheets that cover all US states and territories. These are laid out on two-page spreads to facilitate photocopying of just the state(s) of particular interest to a user. (The following example is from *1996 Toxics Release Inventory: Public Data Release — 10 Years of Right-to-Know. State Fact Sheets*.) It provides an example of how state data are presented in the US.

**1996 TOXICS RELEASE INVENTORY**

# MISSISSIPPI

## State/TRI Data

| | |
|---|---|
| Population | 2,710,750 |
| | |
| Total Facilities | 322 |
| Total Forms | 1,047 |
| Form As | 128 |
| | |
| National Rank for | |
| On- and Off-site Releases | 17 |
| On-site Releases | 16 |
| | |
| Transfers into State | |
| National Rank | 38 |
| Pounds | 3,292,752 |
| | |
| Transfers out of State | |
| National Rank | 25 |
| Pounds | 22,871,434 |
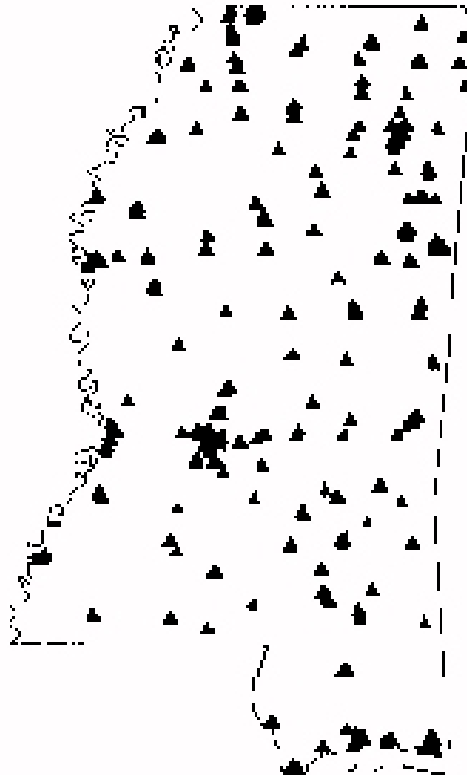
## Reported Releases and Waste Management Activities

| | (pounds) |
|---|---|
| **On- and Off-site Releases** | 54,846,362 |
| Air Emissions | 52,820,669 |
| Surface Water Discharges | 7,566,642 |
| Underground Injection | |
| Class I Wells | 83,315 |
| Class II-V Wells | 0 |
| Releases to land | |
| RCRA Subtitle C Landfills | 1,924 |
| Other On-site Land Releases | 5,665,772 |
| Transfers Off-site to Disposal | 2,025,693 |
| | |
| **On-site Waste Management** | 338,644,569 |
| Recycling | 215,890,406 |
| Energy Recovery | 28,567,578 |
| Treatment | 104,186,585 |
| | |
| **Off-site Transfers for Further Waste Management** | 27,012,462 |
| Recycling | 21,598,058 |
| Energy Recovery | 2,654,505 |
| Treatment | 2,122,333 |
| Publicly Owned Treatment Works (POTWs) | 628,934 |
| Other Off-site Transfers | 8,632 |

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**For More Information . .**

**State Contact:**
John David Burns
(601) 960-9000
Fax (601) 105352-8314

**EPA Regional Contact:**
Ezequiel Velez
(404) 562-9191
Fax (404) 562-9163(202) 260-1531

**To obtain TRI data use assistance
call TRI User Support Service (TRI-US):**

Fax (202) 401-2347

## Top Ten Chemicals for On- and Off-site Releases

| CAS Number | Chemical | Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Class I Wells Pounds | Class II-V Wells Pounds | On-site Releases to Land RCRA Subtitle C Landfills Pounds | Other On-site Land Releases Pounds | Total On-site Releases Pounds | Total Transfers Off-site to Disposal Pounds | On-and Off-site Releases Pounds |
|---|---|---|---|---|---|---|---|---|---|---|
| 67-56-1 | Methanol | 8,773,102 | 142,890 | 61,845 | 0 | 0 | 5,400 | 8,983,237 | 31,000 | 9,014,237 |
| — | Nitrate compounds | 0 | 6,948,605 | 0 | 0 | 0 | 5 | 6,948,610 | 0 | 6,948,610 |
| — | Manganese compounds | 9,393 | 24,044 | 0 | 0 | 0 | 5,105,200 | 5,138,637 | 34,172 | 5,172,809 |
| 108-88-3 | Toluene | 4,624,141 | 8,487 | 7,998 | 0 | 212 | 19 | 4,640,857 | 251 | 4,641,108 |
| 78-93-3 | Methyl ethyl ketone | 4,462,837 | 1,104 | 4,615 | 0 | 0 | 10 | 4,468,566 | 2,200 | 4,470,766 |
| 75-09-2 | Dichloromethane | 4,103,921 | 0 | 0 | 0 | 0 | 0 | 4,103,921 | 0 | 4,103,921 |
| 7664-41-7 | Ammonia | 2,892,734 | 276,788 | 0 | 0 | 0 | 126,035 | 3,295,547 | 10,680 | 3,306,227 |
| 1330-20-7 | Xylene (mixed isomers) | 2,193,660 | 72 | 0 | 0 | 0 | 0 | 2,193,732 | 820 | 2,194,552 |
| 110-54-3 | n-Hexane | 2,081,427 | 42,022 | 0 | 0 | 0 | 2 | 2,123,451 | 1,150 | 2,124,601 |
| 7647-01-0 | Hydrochloric acid | 1,507,038 | 0 | 0 | 0 | 0 | 0 | 1,507,038 | 0 | 1,507,038 |

## Top Ten Facilities for On- and Off-site Releases

| Facility / City, County | Air Emissions Pounds | Surface Water Discharges Pounds | Underground Injection Class I Wells Pounds | Class II-V Wells Pounds | On-site Releases to Land RCRA Subtitle C Landfills Pounds | Other On-site Land Releases Pounds | Total On-site Releases Pounds | Total Transfers Off-site to Disposal Pounds | On-and Off-site Releases Pounds |
|---|---|---|---|---|---|---|---|---|---|
| Vicksburg Chemical Co., Vicksburg, Warren | 93,282 | 6,046,178 | 0 | 0 | 0 | 0 | 6,139,460 | 0 | 6,139,460 |
| Kerr-McGee Chemical Corp., Hamilton, Monroe | 203,003 | 28,520 | 0 | 0 | 0 | 5,245,400 | 5,476,923 | 0 | 5,476,923 |
| Gencorp, Columbus, Lowndes | 3,930,015 | 5 | 0 | 0 | 0 | 0 | 3,930,020 | 51,450 | 3,981,470 |
| Chevron Products Co., Pascagoula, Jackson | 3,529,786 | 249,634 | 0 | 0 | 0 | 1,771 | 3,781,191 | 2,647 | 3,783,838 |
| Georgia-Pacific Corp., Monticello, Lawrence | 2,986,090 | 110,666 | 0 | 0 | 0 | 96,139 | 3,192,895 | 0 | 3,192,895 |
| International paper, Natchez, Adams | 2,055,664 | 57,101 | 0 | 0 | 0 | 5,475 | 2,118,240 | 0 | 2,118,240 |
| Du Pont, Pass Christian, Harrison | 2,000,360 | 0 | 0 | 0 | 0 | 4 | 2,000,364 | 0 | 2,000,364 |
| Carpenter Co., Verona, Lee | 1,520,124 | 0 | 0 | 0 | 0 | 0 | 1,520,124 | 0 | 1,520,124 |
| International Paper, Redwood, Warren | 1,511,685 | 7,110 | 0 | 0 | 0 | 0 | 1,518,795 | 0 | 1,518,795 |
| World Color, Corinth, Alcorn | 1,384,320 | 0 | 0 | 0 | 0 | 0 | 1,384,320 | 0 | 1,384,320 |

# ANNEX 5

# A BRIEF PUBLICITY TOOL

Print resources to promote PRTR data access, such as the two-page draft brochure in this Annex, can be simple, short, and effective.  Such a tool could be used to promote other means of access, as well, such as the availability of PRTR data on computer diskettes.  This Annex also contains examples of a Fact Sheet distributed by Environment Canada.

### How to Get U.S. Environmental Toxics Data from the World Wide Web[15]

This booklet is designed for those who want information about toxic substances in the U.S. environment, and who may have some familiarity with the basic terms used, but who aren't sure where to start. It's more like a guide to part of a library than anything else. It focuses on ways of getting free information through the World Wide Web, so you'll need a Web connection for it to be of much use. If you want very detailed information about a particular issue or facility, using the Freedom of Information Act (FOIA) at the Federal level or with your state environmental agency can produce much more information. But that is better done if you've already looked through the Web and haven't found the information you need.

Keep in mind that the first thing you should know when looking for information is which question you're trying to answer. A broad investigation of a particular area, chemical, or company can turn up additional information for as long as you care to look for it, making this research an essentially open-ended process. You can find things you wouldn't have thought of beforehand, but it requires a large time commitment. If you don't have a lot of time, you're better off deciding on a focussed question before you start. Examples might be: what chemicals does this facility release, and what are their well-known health effects? How smoggy is the air in my county? Who has permits to release chromium into the water nation-wide? Being clear about what you need at the beginning can save you a lot of time later.

Almost all of the data that's easily available can be found through eight major sources (four, if you consider everything on the U.S. EPA Web site to be one source). The exact URLs for these sources are listed in a table at the end of this booklet; the rest of the booklet refers only to the names of the sources. Having the URLs in one place will allow you to update the booklet easily if the URLs change. The Web changes quickly, so if you are reading this booklet more than a year after its publication date, much of the information

about the data provided by different sources may have changed as well. You should know that different sources of data on the Web will often use the same databases of EPA information. This booklet will refer to the commonly used names of databases, so that you'll know whether two different sources are really presenting the same data or not.

The rest of the booklet is divided into major areas of inquiry. Once you've decided what you're looking for, find the area of inquiry that seems closest and try the sources listed there. Good luck!

### Accidents

Accidents involving toxic chemicals can occur at fixed sites or during transport by road, rail, or sea. EPA's major database for tracking these accidents is a database called ERNS, which holds records of phone calls to a nation-wide response centre. ERNS can be downloaded as a full dataset from the EPA Web site, but to search it the best source is currently RTK NET. Be sure to look for the accident descriptions.

### Air quality (smog)

This information, which is mostly from EPA's AQS/AIRS database, is best found through EPA's AIRSData site. EPA's CEIS also has simple air quality profiles for each county in the U.S. If you want to analyse data yourself, the EPA Web site provides a downloadable program called "AIRS Executive."

### Compliance and enforcement

Sometimes you want to find out if a particular entity has been complying with environmental laws. Compliance with air pollution, water pollution, and hazardous waste laws is tracked in the three main permit databases (see **Permits** below), with some additional information available about Superfund sites and drinking water sources (see **Contaminated Sites** and **Water quality**). In addition, there is a database called DOCKET that tracks enforcement actions by EPA. It is available through RTK NET.

### Contaminated sites (including "Superfund")

Some sites have been contaminated by past releases of toxics to the land, and remain dangerous (usually as threats to groundwater, or to people in nearby buildings). "Superfund" sites are major sites that are known to the government. Basic Superfund information is held in a database called CERCLIS, though there are many other related factsheets and smaller databases. The best source for this is EPA's Envirofacts. The most common other hazard of this type is old underground storage tanks. There is generally no national database of these tanks; the only way to find them is to FOIA for information at the state level or to pay a company to do a real estate search around a particular point.

### Factories

Factories make pollution in addition to products. Major categories of information about factories are **Toxic Releases**, **Hazardous Waste**, and **Permits** (see sections below). If you are interested specifically in factories in the petroleum refining, iron and steel production, primary non-ferrous metals, pulp manufacturing, or automobile assembly industries, then you may be best off with EPA's SFIP.

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[15]      Draft **Data Access** flyer, by Rich Puchalsky, Grassroots Connections, project for U.S. PIRG

**Geographic areas (states, counties, and Zip codes)**

Sometimes you want a summary of the status of a geographic area or a list of sites within it. Quick summaries can be found through EPA's CEIS. The EDF Scorecard has a good ranking system that ranks facilities by health hazards within an area, and a comparative risk feature that will sometimes have expert opinion on the worst risks in an area. EPA's Surf Your Watershed is very good for an overall look at water issues within an area; EPA's AIRSdata site is best for air quality. Both EPA's Envirofacts and RTK NET will provide detailed data about facilities within areas.

**Health and regulatory information (on chemicals)**

Often you will want to know what health effects a chemical can cause, which chemicals can produce a certain health effect, or which chemicals are regulated under a particular law. The EDF Scorecard is the best site for that type of information, and it will provide links to other sites.

**Hazardous waste (generation, shipment, treatment and disposal)**

EPA's data on quantities and types of hazardous waste -- its generation, and its destinations, such as incinerators and landfills -- is mainly in the BRS database, available through RTK NET and EPA's Envirofacts. The TRI database also has information on generation of waste and transfers of waste from factories. The best source for this is RTK NET, since it lets you search for the destinations as well as the sources of the waste.

**Mapping**

EPA's Envirofacts has extensive real-time mapping capabilities. The EDF Scorecard also has real-time maps that have less information but are easier to use. EPA's Surf Your Watershed provides watershed maps,

and most of the other sites have some kind of static maps available. If you want to produce detailed maps on your own computer, you can download the free EPA Landview program from RTK NET.

**Permits (for air releases, water releases, or hazardous waste)**

Most pollution in the U.S. is permitted by law. Generally, each facility must have a one or more permits (to release to the air, to the water, or to handle hazardous waste). Information about these permits, and compliance with them, is kept in the AFS/AIRS, PCS, and RCRIS databases (for air, water, and hazwaste respectively). The best source for air permit data is EPA's AIRSData site. For water permits, the best source is EPA's Envirofacts. Both Envirofacts and RTK NET are good sources for hazwaste permit information from RCRIS.

**Pesticides**

EPA has many fragmented pesticide databases available for download through the EPA Web page. The most useful searchable site is EWG's Foodnews site, which will show which pesticides are in which foods.

**Toxic releases (to air, water, and land)**

The TRI database is the best and mostly widely used source for this information. It provides estimates of actual release amounts, rather than permit levels. For complete TRI data, the best source is RTK NET. If you want TRI data linked with other EPA data, the best source is EPA's Envirofacts. For TRI data linked with information on health effects of chemicals, the best source is the EDF Scorecard.

**Water quality (drinking water and surface water)**

Data on sources of drinking waters is kept in EPA's SDWIS database, available through EPA's Envirofacts and EWG's "Where You Live." Data on quality of surface water (rivers, lakes, etc.) is best accessed through EPA's Surf Your Watershed site.

**Sources**

EDF Scorecard http://www.scorecard.org/
Has subset of latest toxic release information, with very extensive health effect and regulatory info.
EPA's AIRSData http://www.epa.gov/airsweb/
Run by EPA's air pollution office; has info on general air quality and air pollution from individual sites.
EPA's CEIS http://www.epa.gov/ceis/
Environmental statistics; look under "Environmental Profiler" for county data summaries.
EPA's Database page
http://www.epa.gov/epahome/Data.html
Source for a large number of downloadable data files.
EPA's Envirofacts http://www.epa.gov/enviro/
Info from seven major EPA databases, with very good linkage between databases.
EPA's SFIP http://es.epa.gov/oeca/sfi/access.htm
Conjoined pollution, compliance, and production data for facilities in 5 major industries.
EPA's Surf Your Watershed http://www.epa.gov/surf/
Has wide variety of water quality and ecological information on surface waters.
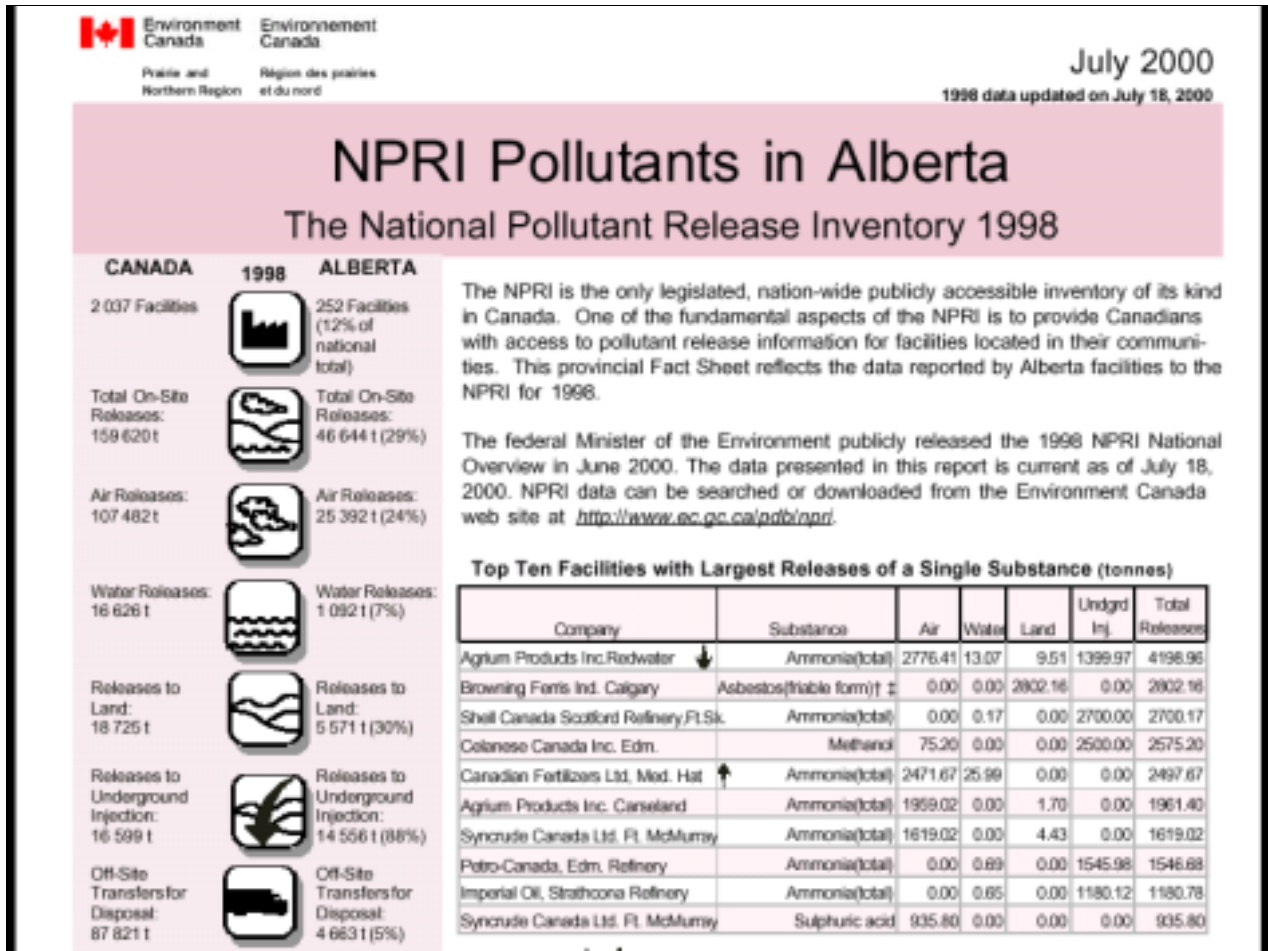EWG http://www.ewg.org/
Has "Where You Live" source for environmental and other data; "Foodnews" for pesticides in foods.
RTK NET http://www.rtk.net/
Has detailed information from EPA toxic release and many other databases.

**Figure 1**

**Example of a Fact Sheet**



Environment Canada — Environnement Canada
Prairie and Northern Region — Région des prairies et du nord

July 2000
1998 data updated on July 18, 2000

# NPRI Pollutants in Alberta
## The National Pollutant Release Inventory 1998

**CANADA** — 1998 — **ALBERTA**

2 037 Facilities — 252 Facilities (12% of national total)

Total On-Site Releases: 159 620 t — Total On-Site Releases: 46 644 t (29%)

Air Releases: 107 482 t — Air Releases: 25 392 t (24%)

Water Releases: 16 626 t — Water Releases: 1 092 t (7%)

Releases to Land: 18 725 t — Releases to Land: 5 571 t (30%)

Releases to Underground Injection: 16 599 t — Releases to Underground Injection: 14 556 t (88%)

Off-Site Transfers for Disposal: 87 821 t — Off-Site Transfers for Disposal: 4 663 t (5%)

The NPRI is the only legislated, nation-wide publicly accessible inventory of its kind in Canada. One of the fundamental aspects of the NPRI is to provide Canadians with access to pollutant release information for facilities located in their communities. This provincial Fact Sheet reflects the data reported by Alberta facilities to the NPRI for 1998.

The federal Minister of the Environment publicly released the 1998 NPRI National Overview in June 2000. The data presented in this report is current as of July 18, 2000. NPRI data can be searched or downloaded from the Environment Canada web site at http://www.ec.gc.ca/pdb/npri.

**Top Ten Facilities with Largest Releases of a Single Substance** (tonnes)

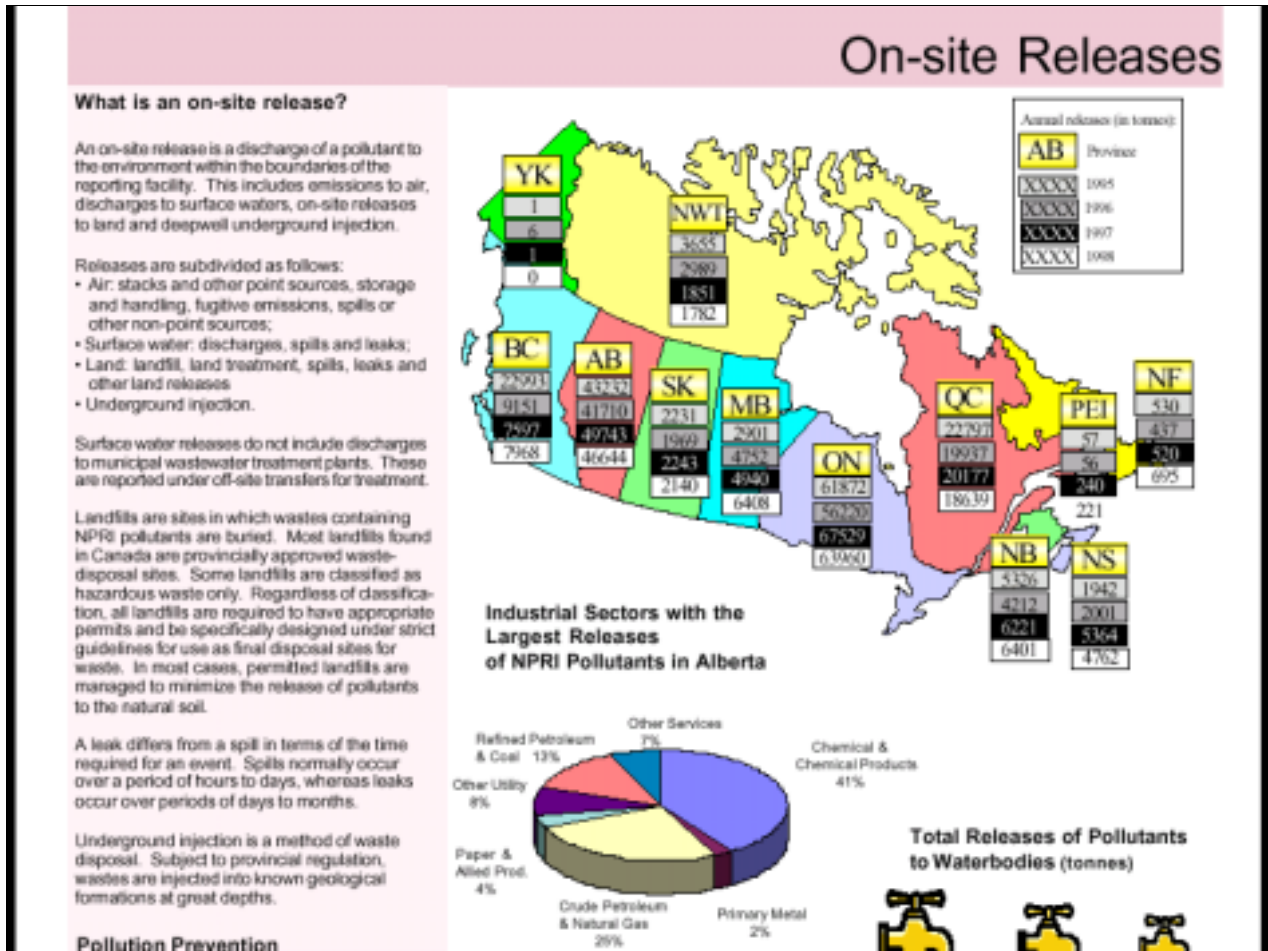| Company | Substance | Air | Water | Land | Undgrd Inj. | Total Releases |
|---|---|---|---|---|---|---|
| Agrium Products Inc. Redwater | Ammonia(total) | 2776.41 | 13.07 | 9.51 | 1399.97 | 4198.96 |
| Browning Ferris Ind. Calgary | Asbestos(friable form)† ‡ | 0.00 | 0.00 | 2802.16 | 0.00 | 2802.16 |
| Shell Canada Scotford Refinery. Ft. Sk. | Ammonia(total) | 0.00 | 0.17 | 0.00 | 2700.00 | 2700.17 |
| Celanese Canada Inc. Edm. | Methanol | 75.20 | 0.00 | 0.00 | 2500.00 | 2575.20 |
| Canadian Fertilizers Ltd. Med. Hat | Ammonia(total) | 2471.67 | 25.99 | 0.00 | 0.00 | 2497.67 |
| Agrium Products Inc. Carseland | Ammonia(total) | 1959.02 | 0.00 | 1.70 | 0.00 | 1961.40 |
| Syncrude Canada Ltd. Ft. McMurray | Ammonia(total) | 1619.02 | 0.00 | 4.43 | 0.00 | 1619.02 |
| Petro-Canada, Edm. Refinery | Ammonia(total) | 0.00 | 0.69 | 0.00 | 1545.98 | 1546.68 |
| Imperial Oil, Strathcona Refinery | Ammonia(total) | 0.00 | 0.65 | 0.00 | 1180.12 | 1180.78 |
| Syncrude Canada Ltd. Ft. McMurray | Sulphuric acid | 935.80 | 0.00 | 0.00 | 0.00 | 935.80 |

*Source: Environment Canada, 1998*

**Figure 2**

**Example of a Fact Sheet**



*Source:  Environment Canada, 1998*

**ANNEX 6**

**WEB SITES IDENTIFIED IN THIS REPORT**

**Australia**

- National Pollutant Inventory (NPI): http://www.environment.gov.au/epg/npi/

- http://www.environment.gov.au/epg/npi/database/index.html?Ok=OK

- http://www.environment.gov.au/cgi-bin/epg/npi/database/npi3/npiquery.pl

**Canada**

- National Pollutant Release Inventory (NPRI):
- http://www.npri-inrp.com/queryform.cfm
- http://www.ec.gc.ca/pdb/npri/
- 1996 Executive Summary: http://www.ec.gc.ca/pdb/npri/1996/index.html
- Citizens' Environmental Alliance of Southwestern Ontario, Toxic Tracker Report: http://www.mnsi.net/~cea/news/npri1996.html

**Corporate Environmental Reporting**

- Canadian Chemical Producers Association's "Reducing Emissions Report" 1998 Emissions Inventory and Five-Year Projections: http://www.ccpa.ca/english/sitemap/index.html

- Coalition for Environmentally Responsible Economies (CERES): http://www.ceres.org/

- Global Reporting Initiative (also by CERES): http://www.globalreporting.org/

- ICI (Imperial Chemical Industries): http://www.ici.com/iciportal/ (Safety, Health and Environment section)

- International Corporate Environmental Reporting Site: http://www.enviroreporting.com/

- International Institute for Sustainable Development: http://iisd.ca/business/corpreport.htm, http://iisd.ca/measure/default.htm

- Rockwool (Green Account): http://www.rockwool.com/environment/default.htm.

- Solvay: http://www.solvay.com/sowe/sowe/envir.htm

- Semiconductor Industry Association: http://www.semichips.org/

- SustainAbility: http://www.sustainability.co.uk/

**Denmark**

- Green Accounts (Evaluation): http://www.mst.dk/activi/11000000.htm
  (see also: Corporations—Rockwool and useful information on Danish Green Accounts in the Czech Right-to-Know Web site)

**European Community**

- CORINAIR: http://www.aeat.co.uk/netcen/corinair/94/

- European Environment Agency: http://www.eea.eu.int/

**Geneva, Switzerland**

- l'Etat de Genève (République et canton de Genève), Environnement, énergie et territoire: http://www.geneve.ch/environnement/welcome.html

**Government and Environmental Non-Governmental Organisations:**

- CIELAP: "A Citizen's Guide to the National Pollutant Release Inventory": http://www.cielap.org/infocent/index.html

**Great Lakes (Canada and United States):**

- Great Lakes Commission's Regional Air Pollutant Inventory Development System (RAPIDS):
- http://www.glc.org/air/air3.html
  http://www.glc.org/air/final1993/1993.html

**Indonesia**

- PROPER (in World Bank's Web site): http://www.worldbank.org/nipr/comrole.htm

**The Netherlands**

- Pollutant Emissions Register Datawarehouse: http://erc.geodan.nl/

**Trade Associations**

- American Petroleum Institute: http://www.api.org/step/piep.htm.

- Semiconductor Industry Association: http://www.semichips.org/index2.htm

- American Forest and Paper Association: http://www.afandpa.org/

**United Kingdom (England and Wales)**

- Environment Agency, Pollutant Inventory:
  http://www.environment-agency.gov.uk/your_env/;
  http://www.environment-agency.gov.uk/aboutus/how_to_get_info/public_registers.htm;
  http://146.101.4.38/wiyby/html/introduction.htm.

- Friends of the Earth UK, Factory Watch:
  http://www.foe.co.uk/campaigns/industry_and_pollution/factorywatch/

## United States

- U.S. Environmental Protection Agency, Envirofacts, Toxics Release Inventory (TRI):
  http://www.epa.gov/enviro/index_java.html

- Environmental Defense Fund's Scorecard: http://www.scorecard.org/

- RTK NET: http://www.rtk.net/

- Louisiana: http://www.deq.state.la.us/

- New Jersey Release and Pollution Prevention Report data (supplied by the Hampshire Research Institute): http://www.hampshire.org/njdeq/home.htm

- Silicon Valley Toxics Coalition (mapped by Clary-Meuser and Associates):
  http://www.mapcruzin.com/svtc_ecomaps/
  http://www.mapcruzin.com/projects/proj_ei.htm
  Right-to-know resources:  http://www.mapcruzin.com/globalchem.htm
  Environmental risk map network:  http://www.mapcruzin.com/global_toxmaps.htm
  Environmental justice resources:  http://www.mapcruzin.com/environmental_justice.htm
  Community-based research:  http://www.mapcruzin.com/part_research.htm
  Data sources:  http://www.mapcruzin.com/data.htm
  Other WebMap Projects:  http://www.mapcruzin.com/other_projects.htm
  GIS data and map layers:  http://www.mapcruzin.com/download_mapcruz.htm
  Personal GIS:  http://www.mapcruzin.com/free_gis.htm

## World Bank

- New Ideas in Pollution Regulation: http://www.worldbank.org/nipr/

- Tom Tietenberg and David Wheeler, "Empowering the Community: Information Strategies for Pollution Control", presented at Frontiers of Environmental Economics Conference, Airlie House, Virginia, USA, 23-25 October 1998, http://www.worldbank.org/nipr/work_paper/ecoenv/index.htm.

- (see also Indonesia)

## Mapping Tool (downloadable)

- MapCruzin: http://www.mapcruzin.com/

## Other Reports

- Nancy Olewiler and Kelli Dawson, "Analysis of NPRI Data on Toxic Emissions by Industry", prepared for the Technical Committee on Business Taxation, Department of Finance, Working Paper 97-16, March 1998: http://www.fin.gc.ca/taxstudy/WP97-16e.html

- Cornell University, "Pollution drops when workers get involved, Cornell study finds", Cornell University Science News Release, announcing study by Cornell's Work and Environment

Initiative and the Center for Advanced Human Resource Studies, May 1995:
http://www.news.cornell.edu/science/May95/st.emissions.html

**Other Useful Websites**

- http://www.enfo.ie/

- Korean Ministry of Environment:
  http://www.me.go.kr; http://www.me.go.kr/english/eindex.html