GUIDANCE TO IMPLEMENTATION OF THE PROTOCOL ON POLLUTANT RELEASE AND TRANSFER REGISTERS

Part one General issues

Part two Data collection and management

Part one General issues

I. INTRODUCTION

1. This guide is first of all designed to assist Parties to the UNECE Protocol on Pollutant Release and Transfer Registers (PRTR Protocol) to interpret and fulfil their obligations. It also aims to assist officials in countries considering accession to the Protocol to evaluate and prepare for these obligations, as well as to aid potential users understand and take advantage of PRTR systems.

2. The PRTR Protocol was adopted at an extraordinary meeting of the Parties to the Aarhus Convention on 21 May 2003, in the framework of the fifth 'Environment for Europe' Ministerial Conference held in Kiev. It was signed by 36 countries and the European Community.

3. The Protocol is the first legally binding international instrument on pollutant release and transfer registers. Its objective is to enhance public access to information on the environment, to facilitate public participation, and to contribute to pollution prevention and reduction (see art. 1, below).

4. All States can sign up to the Protocol, including those that have not ratified the Aarhus Convention and those that are not members of the United Nations Economic Commission for Europe (UNECE). Thus, it is by design an 'open~~,~~', global protocol.

5. It addresses countries that can have very different economic situations. Parties and potential Parties will have very different starting points for developing their PRTR systems, in terms of their administrative structures, the availability and quality of information on emissions as well as the information requirements of different stakeholders. The PRTR Protocol aims at minimum requirements that can be achieved across different countries. At the same time, the Protocol views PRTRs as dynamic systems to be steadily improved, both on a national basis and in terms of international cooperation.

Article 1
OBJECTIVE

The objective of this Protocol is to enhance public access to information through the establishment of coherent, integrated, nationwide pollutant release and transfer registers (PRTRs) in accordance with the provisions of this Protocol, which could facilitate public participation in environmental decision-making as well as contribute to the prevention and reduction of pollution of the environment.

Box 1: Article 1

A. Origins and evolution of the PRTR mechanism

6. The idea of establishing a pollutant release and transfer register first emerged in the United States, following the tragic accident in Bhopal (India) in 1984. Shortly thereafter, the United States Congress approved the Emergency Planning and Community Right to Know Act, establishing a register called the Toxic Release Inventory (TRI), which tracks releases to all media (air, water and land) and off-site transfers of more than 600 chemicals. Other countries, including Australia and Canada, followed in developing national PRTR systems.

7. TRI provided unprecedented public information on pollution releases. It also created a powerful incentive for reporting facilities to take voluntary measures to reduce pollution. Although a PRTR does not directly regulate emissions, it creates pressure on companies to avoid being identified as major polluters and provides incentive for facilities to invest to reduce emissions. Public access to information is thus a central PRTR characteristic, and indeed contributes to the prevention and reduction of environmental pollution.

8. The 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (Brazil) recognized the importance of public access to information on environmental pollution, including emissions inventories, in its Agenda 21. First, principle 10 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."

9. Second, chapter 19 of Agenda 21 recommends that governments should collect sufficient data about various environmental media while providing public access to the information. Governments, with the cooperation of industry and the public, are to implement and improve databases about chemicals, including inventories of emissions. Chapter 19 further states that the broadest possible awareness of chemical risks is a prerequisite for chemical safety.

10. After UNCED, the Organisation for Economic Co-operation and Development (OECD) took the first steps to ensure the realization of this objective. In 1993, the member States of OECD and the United Nations gave a mandate to the OECD Secretary-General to prepare a guidance manual for national Governments interested in a pollutant release and transfer register, which was published in 1996.[1] A task force was created within OECD to deal with the most difficult aspects of the creation of PRTR systems. In line with the recommendation of UNCED, OECD undertook this work within the framework of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC).

[1] OECD, Pollutant Release and Transfer Registers (PRTRs): A Tool for Environmental Policy and Sustainable Development. Guidance Manual for Governments, Paris, 1996. (Available at: http://www.olis.oecd.org/olis/1996doc.nsf/LinkTo/ocde-gd(96)32)

11. The OECD guidance document defines a PRTR as a catalogue or register of potentially harmful pollutant releases or transfers to the environment from a variety of sources. A PRTR includes information on releases to air, water and soil as well as transfers of pollutants/waste to treatment and disposal sites. The register can include data on specific substances as well as broad categories of pollution. PRTRs are thus inventories of pollution from industrial sites and other sources. The development and implementation of a national PRTR system represents a means for Governments to track the generation and release as well as the fate of various pollutants over time.[2]

12. Following UNCED, other countries established national PRTR systems. In addition, the United Nations Institute for Training and Research (UNITAR) carried out pilot projects and capacity-building activities in several countries, including Croatia, Egypt, Mexico and Slovakia~~Egypt~~.

13. In the context of the "Environment for Europe" process and to further implement Agenda 21, UNECE began to work on a Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters in 1996. PRTRs are a tool for public access to environmental information and thus are closely tied to the Convention's goals. The Convention includes broad, flexible provisions calling on Parties to establish nationwide, publicly accessible "pollution inventories or registers" covering inputs, releases and transfers of substances and products (see its art. 5, para. 9 in the box below).

14. The Convention was signed by 39 UNECE member States and by the European Community in June 1998. It entered into force in October 2001.

Article 5, paragraph 9 (Aarhus Convention)

Each Party shall take steps to establish progressively, taking into account international processes where appropriate, a coherent, nationwide system of pollution inventories or registers on a structured, computerized and publicly accessible database compiled through standardized reporting. Such a system may include inputs, releases and transfers of a specified range of substances and products, including water, energy and resource use, from a specified range of activities to environmental media and to on-site and off-site treatment and disposal sites.

Box 2: Article 5, paragraph 9 (Aarhus Convention)

15. At the first meeting of the Signatories to the Aarhus Convention, a task force was created to prepare recommendations for future work on a PRTR. At the second meeting, the Task Force presented its findings and proposed the creation of an open-ended intergovernmental working group on PRTR.

16. Parallel to the international discussions about the creation of a protocol on PRTRs, the European Union (EU) adopted its own system, the European Pollutant Emission Register (EPER). EPER was created in the context of the Integrated Pollution Prevention

[2] OECD, op. cit.

and Control (IPPC) Directive, one of the cornerstones of the European environmental legislation which establishes an EU-wide integrated permitting system. EPER and the PRTR Protocol share many elements, reflecting their concurrent development. For example, the activities listed in annex I to the PRTR Protocol are largely based on annex I to the IPPC Directive, and include energy industries, metal industries, mineral industries, chemical industries, livestock farming and waste management.

17. The PRTR Protocol and EPER also have several important differences: EPER covers fewer pollutants and fewer polluting activities; moreover, it does not include provisions for off-site transfers of waste, for releases to land and for estimates of diffuse pollution. As the European Community had signed the PRTR Protocol, EPER was upgraded to a European PRTR (E-PRTR) which was published as Regulation (EC) No 166/2006 on 4 February 2006 (OJ L 33, 4.02.2006, p.1) and entered into force 20 days later. The European PRTR is designed to meet the provisions of the Protocol. The European Community, therefore, deposited its document for approval on 21 February 2006, the second signatory to do so(after Luxembourg). The first reporting year under the European PRTR will be the year 2007; the results will be disseminated on the Internet in October 2009.~~has signed the PRTR Protocol, EPER will be upgraded to a European PRTR (E-PRTR) that will meet the provisions of the Protocol~~.

B. Objectives and core elements of PRTRs

18. The Protocol's objective is to enhance public access to information and to facilitate public participation as well as to encourage pollution reduction (art. 1). Thus PRTRs are intended first to serve the general public. The preamble to the Protocol notes, however, that PRTRs can also assist governments in tracking pollution trends, setting priorities and monitoring compliance with international commitments, and they can benefit industry through improved environmental management.

19. Indeed, there are many potential users of PRTRs. These include, first of all, the general public and citizens' organizations interested in obtaining information on local, regional or national pollution. Health professionals can use the information in public health decisions. PRTRs can be a valuable tool for environmental education. Environmental authorities can use PRTRs to review both the permit compliance of local facilities as well as national progress towards international commitments. For polluting facilities, both the exercise of estimating pollution levels as well as their publication can encourage efforts to improve efficiency and reduce pollution levels.

20. The Protocol itself requires Parties to establish nationwide systems that report and collect pollution information, and it identifies a series of core elements for PRTRs (see box 4 – this should be box 3). As the first goal of the Protocol is to enhance public information, PRTR information should be available via direct electronic access, such as an open web site. Parties must provide "other effective means" for members of the public who do not have electronic access. PRTRs should provide information on individual facilities, on diffuse pollution and on aggregate pollution levels. The Protocol allows limited provision for polluters to request that their data remain confidential.

21. The Protocol calls for public participation in the development and modification of PRTRs. The negotiations for the Protocol itself provide an example, as they involved technical experts from governments, environmental NGOs, international organizations and industry. Participation of all interested parties was considered crucial to guarantee the transparency and acceptance of the Protocol.

22. Broad international cooperation will also be an important element for its implementation, in areas such as sharing information in border areas as well as providing technical assistance to Parties that are developing countries or countries with economies in transition. Moreover, the Protocol is designed as a dynamic instrument that can be revised based on users' needs as well as new technical developments.

23. Part one of this guidance document continues with chapter II, which presents the key issues that Parties should address in the institutional and legislative implementation of the Protocol. Chapter III reviews the scope of the Protocol, focusing on the specific types of activities and substances covered, including the different methods for determining facility and waste thresholds. Part two covers data issues: chapter ~~III~~ IV reviews the types of data covered, and chapter ~~I~~V describes the systems needed to handle data flows. Part three then reviews the Protocol's data dissemination requirements

(chapter VI), and capacity-building and public awareness, including areas for international cooperation (chapter VII).

24. The annexes provide background information, including a glossary, a table of analytical methods, indicative lists of pollutants and the references used in preparing this document.

Article 4
CORE ELEMENTS OF A POLLUTANT RELEASE AND TRANSFER REGISTER SYSTEM

In accordance with this Protocol, each Party shall establish and maintain a publicly accessible national pollutant release and transfer register that:

(a) Is facility-specific with respect to reporting on point sources;
(b) Accommodates reporting on diffuse sources;
(c) Is pollutant-specific or waste-specific, as appropriate;
(d) Is multimedia, distinguishing among releases to air, land and water;
(e) Includes information on transfers;
(f) Is based on mandatory reporting on a periodic basis;
(g) Includes standardized and timely data, a limited number of standardized reporting thresholds and limited provisions, if any, for confidentiality;
(h) Is coherent and designed to be user-friendly and publicly accessible, including in electronic form;
(i) Allows for public participation in its development and modification; and
(j) Is a structured, computerized database or several linked databases maintained by the competent authority.

Box 3: Article 4

II. INSTITUTIONAL AND LEGAL IMPLEMENTATION, INCLUDING PUBLIC PARTICIPATION AND ACCESS TO INFORMATION AND JUSTICE

1. Implementation of the obligations of the Protocol on Pollutant Release and Transfer Registers (PRTRs) will entail a number of decisions concerning PRTR design, structure and operations. These will range from choosing among various technical options for the design of a central, publicly accessibly register to determining the institutional framework required for ensuring a coordinated system of information flow to it.

Article 3, paragraph 1
Each Party shall take the necessary legislative, regulatory and other measures, and appropriate enforcement measures, to implement the provisions of this Protocol.

Box 1: Article 3, paragraph1

2. A legal framework will also be needed to set forth the rights and responsibilities of various key players, e.g., the obligation of pollutant-emitting facilities to report and the right of the general public to participate in decisions concerning PRTRs. This chapter focuses on some of the institutional and legal issues that will need to be considered in setting up a national PRTR. After reviewing some of the general issues, it looks more specifically at the institutional and legal structures needed to ensure a coordinated system of data collection and dissemination, and public participation/access.

A. Development of a PRTR

3. In developing a national PRTR, Parties are advised to tap the expertise of technical specialists in industrial pollution control, monitoring and analysis, as well as legal, institutional and information technology (IT) experts. Chapter II on scope and chapter III on PRTR data discuss some of the technical issues that will need to be considered. In addition, it will be important to consult broadly with the various stakeholders, including the reporting facilities and the public.

4. While each country's strategy and specific activities should reflect national conditions, the six-step process for PRTR development proposed by the United Nations Institute for Training and Development (UNITAR) and based on experience in several OECD member States, developing countries and countries with economies in transition, bears consideration (see box 2).

5. In particular, this approach includes a sub-national pilot PRTR trial to identify key difficulties and test implementation. Mexico started its PRTR development with pilot exercises and pilot PRTRs have been launched in at least five regions of the Russian Federation.

6. Another approach is to start with a limited number of pollutants and facilities, and then expand this over time. Still other countries have started with voluntary systems

before making reporting mandatory and comprehensive. The important step in any case is to begin the process.

Proposed steps for developing a national PRTR

1. A national workshop to identify PRTR goals

A well-prepared national workshop, with participation from a broad range of experts and stakeholders, can identify the main goals and key issues for national PRTR development. Participation can include: key officials at both national and sub-national authorities; representatives of major polluting facilities; experts from research institutes and universities; and representatives of key user groups, including public health groups, environmental NGOs and journalists. (The Protocol includes, as a core element of PRTRs, public participation in their development and modification.)

2. A feasibility study to assess existing capacity for a PRTR

The workshop's conclusions will provide the starting point for an in-depth study of capacity needs. The study should ensure that the goals identified are realistic. Study preparation should involve consultation with the key stakeholders involved in the workshop.

3. Design of the main PRTR characteristics

The feasibility study can be followed by the detailed design of technical, legal and institutional approaches.

4. A pilot trial

A trial, possibly in a specific region of the country, can test the proposed PRTR system and the mechanisms contemplated for reporting from key polluting facilities. The pilot area should include a representative sample of industrial sectors. Facilities might participate on a voluntary basis, reducing the legal preparations needed. The pilot project can test various PRTR issues, including data methods and their accuracy as well as mechanisms for communicating information between local and national levels. This pilot stage can also test methods for presenting PRTR data to the public and to interested stakeholders. The pilot trial should include capacity-building as well as efforts to raise public awareness.

5. Development of the national proposal

The lessons learned in the pilot trial can then be used to develop a full proposal, including any necessary legal instruments. It may be useful to compare this experience with lessons learned in other countries as well. The proposal should include a detailed review of capacity-building needs, as well as specific plans for raising public awareness.

6. A national PRTR workshop

The workshop, with broad participation (including at political level), will review the PRTR proposal and launch a final proposal for a national PRTR.

Based on UNITAR, 1997.

Box 2: Proposed steps for developing a national PRTR

7. It can be good practice to set up a national coordinating body to agree on inter-ministerial, multi-stakeholder issues related to PRTR creation and development. For example, in order to adapt and further develop its PRTR, the Netherlands has set up a special coordination group to reach agreement on new definitions, methods and emission factors.

B. The institutional framework

8. Setting up a national PRTR will require deciding on the most appropriate institutional structure for collecting and registering the data on pollutant releases and transfers, and ensuring that these data are publicly accessible.

9. The starting point may be a review of the obligations of the PRTR Protocol and determining whether existing institutions and systems are adequate for carrying out the various tasks and obligations. This will involve a review of existing systems to monitor and register polluting emissions, including how information on pollutant releases currently flows among the various institutions.

10. Some Parties may already have extensive systems in place for collecting and registering data on releases, e.g., through operating permits or monitoring systems, while others may be developing or reforming such structures. For example, some new EU member States, as well as Balkan and East European, Caucasian and Central Asian (EECCA) countries, are still restructuring their systems for controlling emissions from polluting facilities.

11. In carrying out the review, it is important to consider what is working well and what could be a problem. The lack of proper legal and institutional frameworks, and the existence of numerous non-compatible data collection obligations and thus different non-compatible databases maintained by a variety of State organizations may make it difficult to develop well-functioning PRTRs.

12. In most countries, the Environment ministry will hold overall responsibility for setting up the relevant structure. However, a number of other ministries are likely to also be involved in the collection and management of relevant data, i.e., ministries of agriculture, energy, health or transport. In such cases, structures for inter-ministerial coordination will be needed to determine whether the data currently collected meet the PRTR Protocol's requirements or whether adaptations are needed.

13. Even where the data on releases are collected largely by environmental authorities, there may be a number of different institutions involved. For example, collecting data on releases to water might be the responsibility of river basin management institutions, while collecting data on emissions to air might be carried out by environmental offices of local authorities.

14. In most EECCA countries, environmental monitoring is carried out by a range of ministries, State institutes and academic research centres. Efforts to improve monitoring have focused on strengthening coordination and cooperation among these bodies and on

establishing unified monitoring systems. For example, Ukraine created the Interdepartmental Commission on Environmental Monitoring Issues in 2001, to establish common standards and procedures for monitoring activities and to ensure data exchange. These efforts to develop nationally unified monitoring systems could provide a starting point for assembling PRTR data in those countries.

15. The checklists below identify a number of elements for a PRTR for which institutional structures ~~are~~ may be needed. These elements are either explicitly set forth in the PRTR Protocol or implicit in its requirements. The checklists are aimed at providing a quick guide for the institutional review.

Checklist of elements for which institutional structures ~~are~~ may be needed (1)

1. Institution to manage the national PRTR system (art. 2, para. 5)
2. Structure for inter-agency coordination
3. Appropriate systems for enforcement (art. 3, para. 1)

Collection, validation and management of data

4. Collection of data submitted by owners or operators of reporting facilities (art. 7, paras. 2 and 5)
5. Assessment of the quality of the data collected in terms of completeness, consistency and credibility (art. 10, para. 2)
6. Collection of information on releases of pollutants from diffuse sources
7. (art. 7, para. 4)
8. Development and management of a register comprising a structured, computerized database able to maintain data for ten reporting years (art. 4, para. (j) and art. 5, para. 3)
9. Dissemination of information and training (arts. 8, 11 and 15)

Box 3: Checklist of elements for which institutional structures ~~are~~ may be needed (1)

16. Owners or operators of facilities subject to reporting are required to to ensure the quality of the information they report and to use the "best available information". Best available information may include monitoring data, emission factors, mass balance equations, indirect monitoring or other calculations, engineering judgments and other methods. Where appropriate, this should be done in accordance with internationally approved methodologies.

~~Some Parties may decide to create a single institution responsible for the collection, validation and dissemination of PRTR data. In other cases, it may be possible to maintain existing institutional structures for instance for monitoring or enforcement, and to redefine certain tasks as well as unify the methodologies used for collecting and validating the data, in order to achieve a register.~~

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redefine certain tasks as well as unify the methodologies used for collecting and validating the data, in order to achieve a register.

18. Validation of the data submitted for the PRTR poses a different type of challenge than the creation and maintenance of a national PRTR. While the latter task will necessarily entail some degree of centralized collection and management of data, validation of data may be more easily achievable if responsibility is delegated to local or regional authorities or to the regional or local offices of national authorities, since they will be closer to the operators and are more likely to have an overview of their activities. One possible way of validating the data may be to use information from other controls of facilities, e.g., via regular or extraordinary environmental inspections.~~It may be particularly useful to link the validation of the data to other controls of facilities, e.g., via regular or extraordinary environmental inspections.~~

~~4.~~19. Another option might be to split the responsibilities for the validation of data among different competent authorities according to their competences, as in Spain, whose autonomous communities and river basin authorities validate the date within the area of their competence. However, in systems where these institutions are centralized, it might be wise to ensure that validation is still carried out regionally or locally.

~~5.~~20. Each country will need to decide the best way to enforce the reporting obligations, including the requirement for owners and operators to assure the quality of the information that they report. This could be done via existing systems of controlling polluting facilities, e.g., environmental inspectorates, or other administrative systems for enforcing environmental obligations.

Implementation in decentralized systems of governance

~~6.~~21. Some Parties may have regional or other decentralized structures. These may be accompanied by long-established systems of environmental management based on regionally determined requirements for monitoring and collecting environmental data. This can complicate the process of setting up a PRTR (which of course presupposes harmonized data).

~~7.~~22. Germany, for example, has a decentralized system of environmental management based on its Federal States (Länder). The legal and institutional structures for the collection of data vary, according to the environmental medium. Obligations to report data on emissions to water are set by these regional governments and data are managed regionally. Obligations to report emissions to air are set in national legislation, but again data collection and validation are managed regionally. A common regional data set on air and water emissions is compiled by the Federal States. Although legal competence is divided between regional and national levels, in practice only one institution – the Environment Agency (UBA) – is the national contact point and responsible for compiling the complete data set for Germany. Quality assessment is performed at all levels of the data flow and the results are communicated back to the operator along the data chain.

~~8.~~23. In decentralized systems, achieving a national register will require harmonization of data from various regions. This will involve harmonization of the quantification methods for each type of release across each region (see chapter ~~xxx~~IV, paragraphs 44-52~~section xxx~~), to enable nationwide comparison of the collected data. ~~Methods for the quantification of diffuse pollution should also be homogeneous at national level even if the data are collected regionally.~~

~~9.~~24. Centralized data collection and management will require transmission of the data collected regionally to one or more national institutions with responsibility for the registration and compilation of the data. This can be facilitated by enabling the regional institution to register the data in the PRTR directly by electronic means. Note that article 4, paragraph (j), of the Protocol suggests the possibility of a structured, computerized database or, alternatively, several linked databases maintained by a number of competent authorities, e.g., for different regions, in a federal system. Whether data collection, management and transfers are done in a centralized or decentralized manner, these tasks will be greatly simplified if all facilities and authorities involved use integrated compatible electronic systems.

Awareness raising, access to information and public participation

~~10.~~25. The PRTR Protocol also provides for the promotion of public awareness of the PRTR and for the provision of information to the public, along with opportunities for public participation (see checklists below).

~~11.~~26. Implementation of these provisions might require administrative structures different from those needed for establishing and managing the PRTR itself. Some of the responsibilities may be similar to tasks already carried out by officials in national, regional or local environmental administrations, e.g., public relations and environmental education. In order to ensure that these provisions under the PRTR Protocol are implemented, it could be useful to develop a plan that specifies each action and assigns responsibilities to specific units and officials.

Checklist of elements for which institutional structures ~~are~~ may be needed (2)

Awareness raising and capacity-building

1. Promotion of public awareness of the national PRTR and provision of assistance and guidance in accessing and using the information contained therein (art. 15, para. 1)
2. Capacity-building and guidance to responsible authorities for carrying out their duties under the Protocol (art. 15, para. 2)

Access to information; confidentiality; access to justice

3. Structures for provision of information to the public on request, in cases where the information is not easily accessed by the public by direct electronic means (art. 11, para. 2), optionally, charging a reasonable amount for this service (art. 11, para. 4)
4. Facilitation of electronic access to the register in publicly accessible locations where access is not available by direct electronic means (art. 11, para. 5)
5. Processing of requests for keeping certain information confidential, including taking decisions on when information can be excluded (art. 12, para. 1)
6. Processing of requests to disclose information that is considered confidential, including provision of generic chemical information and the reason the other information has been withheld (art. 12, para. 3)

Public participation

7. Provision of opportunities for public participation in the development of the national PRTR within the constraints of national law (art. 13, para. 1)
8. Provision of information to the public when a decision is taken to establish or significantly change the register (art. 13, para. 3)

Box 4: Checklist of elements for which institutional structures ~~are~~ may be needed (2)

~~12.~~27. Each Party setting up its national PRTR will need to establish a legal framework that clearly establishes the authorities and obligations of the bodies responsible for the PRTR as well as the obligations of the reporting facilities. Some countries will already have well-developed legal structures for collecting data on emissions from point and diffuse sources. Other countries, e.g. the Western Balkan countries, may still be establishing the necessary legal and institutional structures for collecting and managing emissions data.

C. The regulatory framework for data collection and dissemination

~~13.~~28. Again, the starting point for each Party should be a systematic assessment and review of its legislation, and identification of how its legal system will need to be brought into line with the obligations of the Protocol. The checklists below list most of the elements that will need to be in national legislation or secondary regulations. The first shows some of the general provisions required to ensure a workable national PRTR.

Checklist of legislative elements on data collection and dissemination

General provisions

1. Authority (or obligation) to establish and maintain a public register (art. ~~1~~4)
2. Designation of competent authority for managing the PRTR (art. 2, para. 5

and) – art. 3, para 1 in connection with Article 4 (j)) (Management of the PRTR, data collection, and enforcement of reporting obligations will not necessarily be carried out by the same authority.)(Enforcement will not necessarily be carried out by the Competent Authority designated for reporting purposes.)
3. Definitions, e.g., facility, pollutant, release, off-site transfer (compare art. 2 where necessary)
4. Designation of which point source facilities will be subject to mandatory reporting on a periodic basis (or, alternatively, authority to request the information from facilities needed for the PRTR)
5. What information needs to be reported and in what format (art. 7, paras. 5 and 6)
6. Reporting cycle and deadlines for reporting (art. 8)
7. Measures providing for the effective enforcement of the provisions of the Protocol, for example provisions making it an offence to submit information known to be false, and sanctions for so doing.

Obligations for owners and operators
1. To collect data and keep records for five years (art. 9, para. 1)
2. To use the best available information when reporting, and to use internationally approved methodologies where appropriate (art. 9, para. 2)
3. To assure the quality of information reported (art. 10, para. 1)

Obligations for Parties
1. Obligation to provide direct electronic access to the register through public telecom networks and, failing this, in publicly accessible locations (art. 11, para. 1 and
art. 11, para. 5)
2. Obligations to carry out quality assessments of the data in the register in particular assess whether & to ensure that the data are complete, consistent and credible (art. 10, para. 2)
3. Provisions on what information on the register may be kept confidential, as well as the procedure (criteria) for taking the determination and for providing information on what data have been withheld and why (art. 12, paras. 1, 2 and 3)
4. Measures to ensure that employees or members of the public who report a violation by a facility are not penalized, persecuted or harassed (art. 3, para. 3)
5.Technical measures for collection of information on diffuse pollution
(art. 7, paras. 4 and 7)

Box 5: Checklist of legislative elements on data collection and dissemination

14.29. The national legal framework will need to define the obligations of the administrative authorities who will be collecting, validating and managing the register, as well as dealing with accessibility to the data and confidentiality issues. In most cases a new legal instrument will be needed to ensure a comprehensive and workable system. In other cases it may be possible to amend existing legislation to cover the PRTR Protocol's requirements. This option is particularly important to consider where structures are already in place for gathering and managing information on polluting emissions.

15.30. In the United Kingdom, regulators have a duty to maintain public registers of specified information regarding pollution of the environment by "permitted activities ".

The modalities and requirements for public registers are set out in regulations. UK pollution control legislation also enables regulators to require operators to submit to them specified information and to compile information on releases~~emissions~~, waste and the destination of such waste, and to provide such information in the manner specified.

~~16.~~31. The Czech Republic similarly established its Integrated Pollution Register via provisions in the 2002 Act on Integrated Pollution Prevention and Control that oblige the Ministry of the Environment to establish and maintain such a register as well as the users of registered substances to report certain data to the Ministry. The Act also authorizes the Ministry to lay down implementing regulations stating the manner of determining and assessing the reported substances and the manner of keeping the integrated pollution register "so as to ensure the uniformity of the information system in the area of the environment."

~~17.~~32. In countries that already have systems, the two most common structures in use for collecting the data needed to establish central emissions registers are: (a) information requirements set in environmental permits; and (b) compulsory self-monitoring and reporting.

Procedures for reporting based on environmental permits

~~18.~~33. Many countries, especially in Western Europe, already have well-developed systems for permitting of large industrial installations, including mandatory self-monitoring and reporting of polluting emissions. To avoid duplication of effort, they have linked the collection of data required for their national PRTRs to requirements already in place in their permitting system. While this may avoid double reporting, it can also be limiting in that changes to the national PRTR to reflect any changes made in the PRTR Protocol could subsequently require amendments to the national permitting system.

~~19.~~34. For example, the European Community and its member States based their first-generation PRTR (the European Pollutant Emission Register (EPER)) on the integrated permitting system under the Integrated Pollution Prevention and Control (IPPC) Directive 96/61/EC.[3] Facilities covered under its annex I are obliged to report on their emissions of the substances covered under annex A1 to the EPER ~~d~~Decision 2000/479/EC.[4]

Article 3, paragraph 5
To reduce duplicative reporting, pollutant release and transfer register systems may be integrated to the degree practicable with existing information sources such as reporting mechanisms under licences or operating permits.

Box 6: Article 3, paragraph 5

[3] OJ L 257, 10.10.1996, p.26.

[4] OJ L 192, 28.7.2000, p.36.

Procedures for reporting based on compulsory reporting obligations

~~20.~~35. Another possibility is to base the data collection for the PRTR on a legal framework establishing specific obligations to report the relevant data. This framework could be linked to local or regional environmental monitoring systems. Australia's legislation for setting up a national pollutant inventory is a useful example of this approach to setting up compulsory reporting obligations.[5]

~~21.~~36. Countries contemplating accession to the PRTR Protocol but facing significant difficulties in establishing effective pollution monitoring and reporting may wish to consider a simple "pre-PRTR" system, such as the performance rating and disclosure systems in use in developing countries such as Indonesia and reviewed on a pilot basis in Ukraine. Such a system could then gradually be improved and extended to meet the Protocol's requirements over time.

Adapting PRTRs to national needs

~~22.~~37. The PRTR Protocol sets minimum requirements. Parties developing PRTRs in compliance with its obligations should keep in mind that they may go further, if appropriate in the light of national priorities and concerns. For example, if a local industrial facility emits significant amounts of a substance not yet covered under the PRTR Protocol, it may be important to include that substance in the reporting requirements. A country may also wish to increase the accessibility of the information maintained on the PRTR, e.g., by restricting the types of information that can be kept confidential for commercial reasons.

~~23.~~38. Moreover, countries may wish to add other elements to their national PRTRs, such as reporting obligations for small and medium-sized enterprises (SMEs). Bearing in mind the possibility of future developments of the PRTR Protocol and the need for flexibility, it could be interesting to introduce some of these additional elements on a voluntary or pilot basis. The Netherlands, for example, provides for individual provinces to require companies that are under the reporting thresholds to report information on their emissions, if these emissions are significant at local level.

~~24.~~39. Finally, countries will have to consider how to include data on diffuse sources of pollutants in their national PRTRs, where the data are already being collected by relevant authorities and can be practicably included. Indeed, under the PRTR Protocol, they are obliged to take measures to initiate such reporting, if they determine that no such data on diffuse sources exist.

Enforcement

~~25.~~40. The "appropriate enforcement measures" to implement the Protocol's provisions referred to in article 3, paragraph 1, will apply to operators as well as officials responsible

[5] See Australia's national database of pollutant emissions http://www.npi.gov.au.

for the registration acting in bad faith, fraudulently or negligently where this behaviour is apt to hamper the implementation of the Protocol. Parties could consider whether the enforcement measures should include sanctions and whether those could be administrative and/or penal. The introduction of both types of sanctions would create a gradual system in the use of sanctions. The same result would be achieved by providing for different levels of administrative sanctions depending on the gravity of the offence. Sanctions have to be proportionate. A repeated violation of the reporting obligation or the submission of false data may be considered a graver offence than the mere delay in delivering information.~~creates a gradual system in the use of sanctions. For a repeated violation of the reporting obligation or the submission of false data, the operator could be submitted to a criminal sanction. For the mere delay in delivering the information, an administrative sanction could suffice.~~

~~26.~~41. In addition, the Protocol requires Parties to take measures to protect employees of a facility and members of the public who report a violation by a facility of the national laws implementing the Protocol (art. 3, para. 3). One way to do this would be to oblige competent authorities to ensure anonymity of persons reporting violations, and to back this up with penalties. The United States, for example, has set in place stiff penalties for penalization, persecution or harassment in cases where the identity of the person has become known.

D. The regulatory framework for public participation and access to information and justice

~~27.~~42. Much of the regulatory framework which is required to comply with the PRTR Protocol relating to access to information, public participation and access to justice will already be in place in countries that are Parties to the Aarhus Convention, although some adjustments may be required, due to the specificities of the PRTR Protocol.

~~28.~~43. The PRTR Protocol has specific articles dealing with public participation, access to information and access to justice. This insertion is important because the PRTR Protocol is open to non-Parties to the Aarhus Convention. The legislative framework for each of these pillars is addressed below.

Public participation

~~29.~~44. Public participation is among the core elements of the PRTR system. Experience among countries with a long tradition in PRTR systems shows that public involvement is very important for success in establishing a PRTR. Public involvement helps to raise public awareness, including of how to use the PRTR. Since the PRTR is intended to be a tool for the public, the public should be involved in its design and set-up.

~~30.~~45. The general obligation with respect to public participation is spelled out in article 4.

Article 4
In accordance with this Protocol, each Party shall establish and maintain a publicly accessible national pollutant release and transfer register that: (…) (i) allows for public participation in its development and modification…

Box 7: Article 4

~~31.~~46. Parties to the Aarhus Convention should have national legislation providing a general right to participate in decisions having an impact on the environment (art. 8). If the Party to the Protocol is not a Party to the Aarhus Convention and does not have such legislation, it will need to create a legal framework for the three pillars (i.e. articles 11, 13 and 14) under the PRTR Protocol. The elements required by the PRTR Protocol are set forth in box 8.

Check list of elements of national legislation on public participation

1. To ensure appropriate opportunities for public participation in the development of the PRTR (art. 13, para. 1);
2. To ensure that the public has access to information on the proposed measures in a timely manner (art. 13, para. 3);
3. To provide the opportunity for access to information on proposed measures concerning the development of the PRTR(art. 13, para. 2);
4. To take due account of any public input (art. 13, para. 4).

Box 8: Checklist of elements of national legislation on public participation

~~32.~~47. There is a legal right to participate granted to the general public. A legal instrument is recommended to secure these rights. If legislation is already in place, it may need to be adapted or further developed through communications, decisions or other secondary regulations sufficiently disseminated and made publicly available. Parties to the Aarhus Convention may also wish to provide specific rules for public participation in the establishment or modification of a PRTR, such as a coordinating body or longer deadlines.

~~33.~~48. The PRTR Protocol refers to two instances when public participation is relevant: (a) during the establishment of the PRTR; and (b) in the modification of the PRTR. In either instance, opportunities for public participation should be provided at an early stage when it can influence the decision-making process. Although the minimum requirements of the Protocol must always be met, any input from the public may influence how they are met and whether the national PRTR goes further.

Public participation in establishing a PRTR

~~34.~~49. A participatory process for establishing or developing a PRTR will be essential for the future success of the system. Involvement of all stakeholders, i.e., reporting facilities, NGOs and civic organizations, workers in the facilities, health officials, pollution control officials, local authorities, academia, is important. Those countries having to develop their PRTRs from the beginning will especially benefit from the experiences of other countries.

Involving stakeholders

~~35.~~50. The involvement of stakeholders could be possible by the creation of a national coordinating body (see chapter I, sect. A), which will facilitate the consultations at the very first stage. This initial working group or body can be useful to discuss the different options to develop PRTRs. Its conclusions can be proposed for broader consultation. This broader consultation process, e.g., Internet consultation, could have longer deadlines for the public to react in order to ensure the general public's participation in the establishment of the PRTR.

Informing the public

~~36.~~51. To ensure that the public is given sufficient opportunity to participate, some Parties may wish to set in place detailed rules. These can, for instance, specify how to inform the public, how the opportunity for consultation should be publicized, e.g., mass media or regional media, official journals or other appropriate means; information panels in city halls or other relevant buildings; or by post.

Ensuring public participation

~~37.~~52. The rules for public participation will also want to establish reasonable deadlines for the public to present its comments and opinions, e.g., one or two months. It is good practice in a specific consultation to note the deadline in terms of a clear date, e.g., 17 November, rather than as a period of time.

~~38.~~53. The rules for public participation may ensure that comments can be sent by both electronic and non-electronic means. In any case, it will be important to clearly identify the competent authority in charge of receiving these comments. This could include regional or local representatives that would in turn transmit the comments to the competent authority establishing or modifying the PRTR.

Taking into account the public's input

~~39.~~54. The PRTR Protocol specifies that the comments are to be taken into account by the authority taking the decision. Parties should therefore also set procedures for reporting how the public input has been considered in the final decision, e.g., how many comments were received, how these comments were addressed, why certain proposals were not retained and why others were finally adopted.

Consultation process in the United Kingdom

In the UK, the majority of legislative proposals are subject to public consultation in accordance with the Cabinet Office Code of Practice on public consultation. The Code sets out a series of points that must be taken into account during the consultation process. Criterion 4 is dedicated to feedback regarding the responses received and the way in which the consultation process influences policy. Each consultation is published on the internet, and hard copies are also sent to stakeholders and made available to the public. Generally, the consultation will be open for 12 weeks, after which time the responses will be considered.

Box 9: Consultation process of the United Kingdom's Department for Environment, Food and Rural Affairs

Public participation in modifying a PRTR

40.55. Public participation shall be allowed in the development and modification of the PRTR, (Article 4 (i)). Article 13 para. 1,which stipulates that each Party shall ensure appropriate opportunities for public participation in the development of its national registers, within the framework of its national law and Article 13 para. 3 which stipulates that each party shall ensure, when a decision to establish or significantly change the register has been taken, information on the decision and the considerations on which it is based are made publicly available in a timely manner, shall be interpreted in the light of the more general Article 4 (i).~~It would seem desirable to ensure public participation when any change is made to the PRTR system. However, it is not clear from article 13 whether public participation is also mandatory during modification of the PRTR Protocol itself, since paragraph 1 refers only to the development of the PRTR and paragraph 3 requires only that the Party ensure access to information relating to decisions to significantly change the PRTR system. Nonetheless, this article should be interpreted in to the light of the more general article 4, paragraph (i), which deals with the core elements of a PRTR Protocol and which states that public participation should be allowed in the development (meaning establishment) and modification (in the case of significant changes of the PRTR).~~

41.56. Significant changes to the PRTR system might be the inclusion of additional activities and pollutants or the lowering of thresholds.~~Significant changes to the PRTR system might include the adoption of a different approach to setting thresholds or reporting off-site transfers (waste-specific against pollutant-specific).~~

42.57. A Party may decide to call on the above-mentioned national coordinating body each time that a significant change is planned for the PRTR. For other changes, the Party may decide just to post the proposal on web sites and other relevant places (e.g., official journals) and apply the normal procedure for consultation.

43.58. Parties could also decide to allow the public to propose changes to the PRTR. In many cases, such proposals can improve the system and identify different users' needs. They could be sent to the web site or also by post to the identified competent authority for PRTRs.

Public participation and PRTRs – TRI Stakeholder Dialogue

~~TRI stakeholder dialogue:~~ When changes in the Toxics Release Inventory (TRI) are going to take place, the United States Environmental Protection Agency (USEPA) opens a stakeholder dialogue, consisting of different phases where interested stakeholders can participate. It includes background documents and online dialogue or a "virtual public meeting". The process is announced on the TRI portal web site but it is also published in the Federal Register and at EDOCKET. The proposal includes a summary, background information, an explanatory memorandum, the deadline to send comments (specific date) and instructions on how to send comments, including addresses and allowing for electronic submission, e.g., via e-mail or to the eRulemaking Portal, as well as post and hand delivery. A national TRI conference is also organized every year to discuss TRI issues.

Box 10: Public participation and PRTRs – TRI stakeholder dialogue

Access to information and access to justice

~~44.~~59. An important aspect concerning the legal framework on access to information is that Parties should have in place relevant legislation dealing with the dissemination of and access to information on environmental matters, and specific provisions on confidentiality. Parties to the Aarhus Convention would in many cases already have such general rules in place.

Checklist of legislative elements on access to information and access to justice

1. To ensure that data are easily publicly accessible through electronic means without an interest having to be stated (art. 11, para. 1)
2. Where electronic access is not available, to provide data upon request within one month by other effective means and to facilitate electronic access in public locations (when data are not easily publicly accessible by electronic means) (art. 11, paras. 2 and 5)
3. To ensure that access is free of charge or that any charges do not exceed a reasonable amount (art. 11, paras. 3 and 4)
4. To ensure access to justice, including reviews (art. 14)

Box 11: Checklist of legislative elements on access to information and access to justice

~~45.~~60. The legislation dealing with access to information can be a framework instrument dealing with access to information and access to justice in general or a specific instrument created to deal with the establishment of a PRTR. In any case, it should ensure that the PRTR data are easily publicly accessible by electronic access, such as through telecommunications networks. If they are not easily publicly accessible by electronic means, then the legislation should specify how the PRTR will be made publicly accessible by other effective means including upon request or by facilitating electronic access in public locations.

~~46.~~61. Parties should first analyse their legislation on access to information to assess whether it needs to be amended to align with the PRTR Protocol's requirements. Non-Parties to the Aarhus Convention should pay particular attention to the grounds for confidentiality, as these are more limited than those of the Aarhus Convention and amendments to national legislation may be required (for a more detailed explanation, see chap. V, sect. G).

~~47.~~62. Concerning access to justice, article 14 of the PRTR Protocol basically reproduces the beginning of article 9 of the Aarhus Convention. It does not override the Aarhus Convention's provisions, which are broader and cover more cases. Parties to the Aarhus Convention should therefore take this aspect into account as legal implementation may already be in place. Others will however have to create the legal framework required by this article. The guidance documents on the Aarhus Convention could prove useful to this end.

E. Implementation by regional economic integration organizations

~~48.~~63. The PRTR Protocol allows regional economic integration organisation, such as the European Community, to be Parties (art. 24) and refers to regional economic integration organization in four more articles:

- Article 8, paragraph 3, reporting cycle (for more details see chap. IV);
- Article 17, paragraph 4, allowing regional economic integration organizations which are not Party to participate as observers in the sessions of the Meeting of the Parties;
- Article 18, paragraph 2: right to vote in matters within its competence (number of votes equal to number of member States which are Parties);
- Article 26, paragraphs 3 and 4: instruments for accession.

~~49.~~64. One of the issues for such organizations is defining the ~~the~~ extent of its competence with respect to the matters governed by this Protocol. In fact, a regional economic integration organisation has to declare in its document of accession the extent of its competence with respect to the matters governed by this Protocol and also inform the Depositary of any substantial modification to the extent of this competence (art. 26, para. 4).

~~50.~~65. The regional economic integration organization has an international responsibility to comply with the Protocol within the area of its competence.

~~51.~~66. Implementation of the PRTR Protocol by a regional economic integration organization can have many advantages in bringing about convergence in the efforts from member States and in saving costs on the establishment of a PRTR (see chap. VI for more details). However, member States of a regional economic integration organization, which are themselves Parties to the PRTR Protocol, are, in addition, obliged to implement the Protocol nationally

III. SCOPE OF THE PROTOCOL

1. The PRTR Protocol covers 64 activities and 86 substances and categories of substances. Although it follows closely the European Union's system under the Integrated Pollution Prevention and Control (IPPC) Directive, the Protocol covers more activities and substances. This chapter reviews the scope of the Protocol in terms of activities, substances and types of releases. It then describes in further detail the reporting of releases and transfers.

2. Article 6 of the Protocol, on the scope of the register, provides that its Parties shall review reporting requirements on the basis of the experience gained in implementation and revise the lists of activities, pollutants and thresholds in its annexes.

A. Activities

3. The PRTR Protocol covers 64 activities grouped by sectors (energy, metal production and processing, mineral industry, chemical industry, waste and waste-water management, paper/wood processing industries, intensive livestock and aquaculture, animal and vegetable products and others). Table 1 below lists the key activities.

4. Annex I to the PRTR Protocol lists the activities covered. The list is based largely on annex I to the IPPC Directive and incorporates its capacity thresholds.[6] However, annex I to the PRTR Protocol contains some additional activities, including mining, municipal waste-water treatment, aquaculture and shipbuilding.

No.	Activity
1.	**Energy sector**
(a)	Mineral oil and gas refineries
(b)	Installations for gasification and liquefaction
(c)	Thermal power stations and other combustion installations
(d)	Coke ovens
(e)	Coal rolling mills
(f)	Installations for the manufacture of coal products and solid smokeless fuel
2.	**Production and processing of metals**
(a)	Metal ore (including sulphide ore) roasting or sintering installations

[6] The IPPC Directive is also the basis of annex I to the Aarhus Convention.

No.	Activity
(b)	Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting
(c)	Installations for the processing of ferrous metals: (i) Hot-rolling mills (ii) Smitheries with hammers (iii) Application of protective fused metal coats
(d)	Ferrous metal foundries
(e)	Installations: (i) For the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes (ii) For the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)
(f)	Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process
3.	**Mineral industry**
(a)	Underground mining and related operations
(b)	Opencast mining
(c)	Installations for the production of: (i) Cement clinker in rotary kilns (ii) Lime in rotary kilns (iii) Cement clinker or lime in other furnaces
(d)	Installations for the production of asbestos and the manufacture of asbestos-based products
(e)	Installations for the manufacture of glass, including glass fibre
(f)	Installations for melting mineral substances, including the production of mineral fibres
(g)	Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain
4.	**Chemical industry**

No.	Activity
(a)	Chemical installations for the production on an industrial scale of basic organic chemicals, such as: (i) Simple hydrocarbons (liner or cyclic, saturated or unsaturated, aliphatic or aromatic (ii) Oxygen-containg hydropcarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters, acetates, ethers, peroxides, epoxy resins (iii) Sulphurous hydrocarbons (iv) Nitrogenous hydrocarbons such as amines, amides, nitrous compounds, nitro compounds or nitrate compounds, nitriles, cyanates, isocyanates (v) Phosphorus-containing hydrocarbons (vi) Halogenic hydrocarbons (vii) Organometallic compounds (viii) Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres) (ix) Synthetic rubbers (x) Dyes and pigments (xi) Surface-active agents and surfactants
	Chemical installations for the production on an industrial scale of basic inorganic chemicals, such as: (i) Gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride (ii) Acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid, oleum, sulphurous acids (iii) Bases, such as ammonium hydroxide, potassium hydroxide, sodium hydroxide (iv) Salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate (v) Non-metals, metal oxides or other inorganic compounds such as calcium carbide, silicon, silicon carbide
(c)	Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilizers (simple or compound fertilizers)
(d)	Chemical installations for the production on an industrial scale of basic plant health products and of biocides
(e)	Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products
(f)	Installations for the production on an industrial scale of explosives and pyrotechnic products
5.	**Waste and waste-water management**
(a)	Installations for the incineration, pyrolysis, recovery, chemical treatment or landfilling of hazardous waste
(b)	Installations for the incineration of municipal waste

No.	Activity
(c)	Installations for the disposal of non-hazardous waste
(d)	Landfills (excluding landfills of inert waste)
(e)	Installations for the disposal or recycling of animal carcasses and animal waste
(f)	Municipal waste-water treatment plants
(g)	Independently operated industrial waste-water treatment plants which serve one or more activities of this annex
6.	**Paper and wood production and processing**
(a)	Industrial plants for the production of pulp from timber or similar fibrous materials
(b)	Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood)
(c)	Industrial plants for the preservation of wood and wood products with chemicals
7.	**Intensive livestock production and aquaculture**
(a)	Installations for the intensive rearing of poultry or pigs
(b)	Intensive aquaculture
8.	**Animal and vegetable products from the food and beverage sector**
(a)	Slaughterhouses
(b)	Treatment and processing intended for the production of food and beverage products from:
(a)	(i) Animal raw materials (other than milk)
(b)	(ii) Vegetable raw materials
(c)	(iii) Treatment and processing of milk
9.	**Other activities**
(a)	Plants for the pretreatment (operations such as washing, bleaching, mercerization) or dyeing of fibres or textiles
(b)	Plants for the tanning of hides and skins
(c)	Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating
(d)	Installations for the production of carbon (hard-burnt coal) or electrographite by means of incineration or graphitization
(e)	Installations for the building of, and painting or removal of paint from ships

~~Oil and gas refineries~~ ~~Power stations~~	~~Paper and board plants~~ ~~Wood preservation plants~~

~~Metal and steel works~~ ~~Underground and opencast mining~~ ~~Cement and lime clinker~~ ~~Asbestos works~~ ~~Glass and ceramic works~~ ~~Chemicals production~~ ~~Fertilizer production~~ ~~Pesticides production~~ ~~Pharmaceuticals production~~ ~~Explosives and pyrotechnics~~ ~~Incinerators and landfills~~ ~~Large municipal waste-water treatment plants~~	~~Intensive pig and sow rearing~~ ~~Intensive aquaculture facilities~~ ~~Slaughterhouses~~ ~~Food and beverage processing~~ ~~Textile treatment~~ ~~Tanneries~~ ~~Surface treatment facilities using organic solvents~~ ~~Carbon and electrographite production~~ ~~Large shipyards~~

Table 1: ~~Key~~ Annex I activities ~~included in annex I~~

5. The IPPC Directive's list was used for the Protocol, first of all for the practical reason that many UNECE countries already were or were to become members of the European Union, and thus already had systems in place to control polluting emissions from the facilities carrying out these activities. A second reason was that these activities, together with the additional ones in the Protocol, were responsible for about 90% of industrial pollution. Thus information on releases from the facilities carrying out annex I activities should provide ~~a country's citizens~~the public with a good overall picture of the level of pollution from its industrial installations. Other activities can be added at national level if the Party considers it appropriate. Information on diffuse sources, also required under the Protocol, completes the information on releases (pollution) for a targeted area.

6. In deciding which facilities carrying out activities listed in annex I to the PRTR Protocol will be subject to reporting requirements, it will be necessary to choose between the EU and the North American systems for establishing reporting thresholds. Both systems are aimed at focusing reporting requirements on the larger facilities that are responsible for most polluting emissions, but each system uses a different reporting threshold for determining which facilities must report. The EU uses reporting thresholds are based on the capacity of the facility, for example, its energy input, production or receiving capacity (annex I, column 1, to the PRTR Protocol) and releases (annex II, column 1). Canada and the United States use reporting thresholds based on number of employees (annex I, column 2) and manufacture, process or use (MPU) thresholds (annex II, column 3), these last named being pollutants measured in kilograms per year. Both systems have advantages and disadvantages.

7. Under the MPU system, facilities that meet the threshold will have to report even the smallest releases, whereas under the capacity threshold system releases will have to be reported only when they are above a specific threshold for a specific substance. Facilities that do not meet the MPU threshold do not have to report any releases. In practice, the results from selecting either of the systems are assumed to be quite similar.

B. Substances

8. Annex II to the PRTR Protocol lists 86 polluting substances and categories of substances. Lists of substances regulated by a number of international instruments were used to develop annex II, including:

(a) The IPPC/European Pollutant Emission Register (EPER) list of substances;
(b) The EU Water Framework Directive list of priority substances;
(c) The principal substances regulated under the United Nations Framework Convention on Climate Change; and
(d) Substances regulated under the Stockholm Convention on Persistent Organic Pollutants (POPs), the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Convention for the Protection of the Marine Environment of the North-East Atlantic, the International Convention for the Prevention of Pollution from Ships and the UNECE Convention on Long-Range Transboundary Air Pollution.[7]

9. These lists were considered to cover key pollutants. The negotiators also aimed to avoid overlaps and duplication of reporting among these instruments. In the end, 86 substances and categories of substances were agreed upon, including greenhouse gases, ozone-depleting substances, heavy metals, pesticides, acidification precursors and persistent organic pollutants (see table 2).

10. The emphasis of the Protocol is on the amount of pollution. The Protocol tries to find a balance between the reporting burden and the relevance of the information provided. Instead of covering a broad number of pollutants, the Protocol concentrates on releases of a limited number of specific pollutants and pollutant categories in order to present an overall picture of the amount of pollution. This is one of the differences between the PRTR and the Toxics Release Inventory (TRI) system, which is mainly based on chemical safety concerns and which specifies hundreds of individual pollutants.

11. The PRTR Protocol instead identifies a number of important groups of substances, such as COD, AOX, phenols, PM_{10}, dioxins, PAHs, cyanides, fluorides, NMVOCs, PFCs and HCFCs, as well as key individual pollutants. These groups cover potentially thousands of single substances.

Methane (CH4)	1,2,3,4,5,6-hexachlorocyclohexane (HCH)
Carbon monoxide (CO)	Lindane
Carbon dioxide (CO_2)	Mirex
Hydrofluorocarbons (HFCs)	PCDD +PCDF (dioxins +furans) (as Teq)
Nitrous oxide (N_2O)	Pentachlorobenzene
Ammonia (NH_3)	Pentachlorophenol
Non-methane volatile organic compounds (NMVOC)	Polychlorinated biphenyls (PCBs)
	Simazine
Nitrogen oxides (NO_x/NO_2)	Tetrachloroethylene (PER)
Perfluorocarbons (PFCs)	Tetrachloromethane (TCM)

[7] See CEP/WG.5/AC.2/2001/7.

Sulphur hexafluoride (SF_6)	Trichlorobenzenes (TCBs)
Sulphur oxides (SO_x/SO_2)	1,1,1-trichloroethane
Total nitrogen	1,1,2,2-tetrachloroethane
Total phosphorus	Trichloroethylene
Hydrochlorofluorocarbons (HCFCs)	Trichloromethane
Chlorofluorocarbons (CFCs)	Toxaphene
Halons	Vinyl chloride
Arsenic and compounds (as As)	Anthracene
Cadmium and compounds (as Cd)	Benzene
Chromium and compounds (as Cr)	Brominated diphenylethers (PBDE)
Copper and compounds (as Cu)	Nonylphenol ethoxylates (NP/NPEs) and
Mercury and compounds (as Hg)	related substances
Nickel and compounds (as Ni)	Ethyl benzene
Lead and compounds (as Pb)	Ethylene oxide
Zinc and compounds (as Zn)	Isoproturon
Alachlor	Naphthalene
Aldrin	Organotin compounds (as total Sn)
Atrazine	Di-(2-ethyl hexyl) phthalate (DEHP)
Chlordane	Phenols (as total C)
Chlordecone	Polycyclic aromatic hydrocarbons (PAHs)
Chlorfenvinphos	Toluene
Chloro-alkanes, C_{10}-C_{13}	Tributyltin and compounds
Chlorpyrifos	Triphenyltin and compounds
DDT	Total organic carbon (TOC) (as total C or
1,2-dichloroethane (EDC)	COD/3)
Dichloromethane (DCM)	Trifluralin
Dieldrin	Xylenes
Diuron	Chlorides (as total Cl)
Endosulphan	Chlorine and inorganic compounds (as HCl)
Endrin	Asbestos
Halogenated organic compounds (as AOX)	Cyanides (as total CN)
Heptachlor	Fluorides (as total F)
Hexachlorobenzene (HCB)	Fluorine and inorganic compounds (as HF)
Hexachlorobutadiene (HCBD)	Hydrogen cyanide (HCN)
	Particulate matter (PM_{10})

Table 2: Substances listed in annex I to the PRTR Protocol

12. Many of the substances included in annex I are severely restricted, banned or being phased out under international agreements. They are included in the PRTR Protocol for the sake of completeness, even though in most cases their use and thus their reporting will be limited.

13. Parties may include additional substances in their national PRTRs if considered appropriate.

C. Releases

Article 2, paragraph 7
"Release" means any introduction of pollutants into the environment as a result of any human activity, whether deliberate or accidental, routine or not routine, including spilling, emitting,

discharging, injecting, disposing or dumping, or through sewer systems without final waste-water treatment.

Box 1: Article 2, paragraph 7

14. The term "releases" used in the PRTR Protocol covers a number of terms used in different countries to refer to the introduction of pollutants into the environment, such as:

(a) Emissions (often used to refer to the introduction of pollutants into the environment from point sources); and
(b) Discharges (used to refer to the introduction of pollutants into water).

15. The PRTR Protocol's definition is broad in that it covers both routine releases and non-routine ones, such as accidental releases. The definition itself has three main elements.

(a) Introduction of pollutants: the Protocol does not link the definition of releases to the specific pollutants listed in annex I, thereby providing a dynamic approach that does not limit which pollutants can be included in PRTRs;
(b) Into the environment: the PRTR Protocol refers to the environment in general but nonetheless takes a medium-specific approach in requiring reporting of releases to air, water and land;
(c) As a result of a human activity: only releases that are directly (point sources) or indirectly (diffuse sources, including agriculture and traffic) the result of a human activity have to be reported.

16. Releases that are the result of natural phenomena, such as a volcanic eruption, do not have to be reported. Accidental releases from facilities due to a natural phenomenon, such as flooding, should be reported as the pollutants arise from human activity.

Categories of releases

Article 7, paragraph 6
The information referred to in paragraph 5 (c) to (e) shall include information on releases and transfers resulting from routine and from extraordinary events.

Box 2: Article 7, paragraph 6

17. The PRTR Protocol refers to releases that are both "routine and non-routine" and either "deliberate or accidental" (art. 2). Article 7, paragraph 6 emphasizes the obligation for operators to report releases in all cases. It refers to non-routine and accidental releases as "extraordinary events". For example, releases resulting from an accidental explosion should be reported. In conclusion, operators have to report all releases. [The suggestion to change "deliberate" to "expected" in line 2 is not accepted, as the phrase is a direct quotation from article 2, paragraph 7.]

Diffuse sources

18. Reporting on diffuse sources is a core element of PRTRs under the Protocol (art. 4, para. (b)) and will be discussed in chapter IV of the guidance.

Diffuse sources

- Reporting on diffuse sources is a core element of PRTRs under the Protocol (Article 4(b)).
- "Each Party shall present on its register, in an adequate spatial disaggregation, information on releases of pollutants from diffuse sources for which that Party determines that data are being collected by the relevant authorities and can be practicably included. Where the Party determines that no such data exist, it shall take measures to initiate reporting on releases of relevant pollutants from one or more diffuse sources in accordance with its national priorities" (art. 7, para. 7)
- "The information referred to in paragraph 7 shall include information on the type of methodology used to derive the information." (art. 7, para. 8).

Box 3: Article 7, paragraphs 7 and 8

D. Off-site transfers

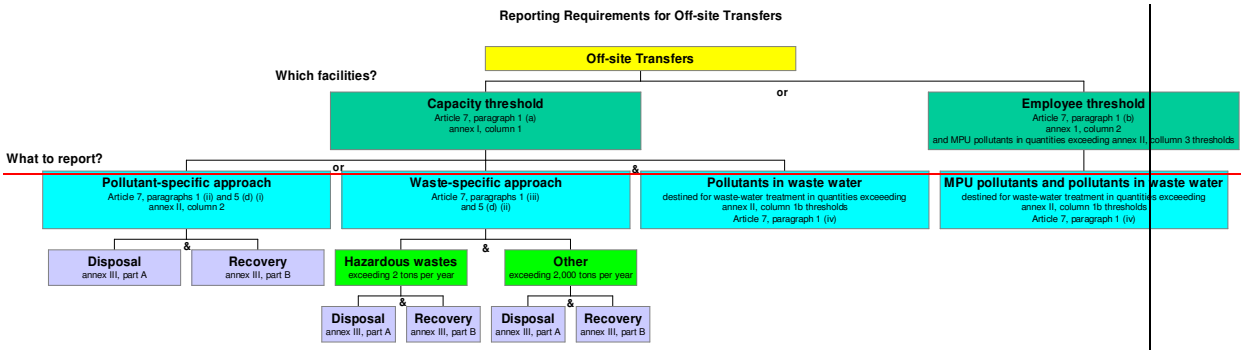
Article 2, paragraph 8
"Off-site transfer" means the movement beyond the boundaries of the facility of either pollutants or waste destined for disposal or recovery and of pollutants in waste water destined for waste-water treatment

Box 3: Article 2, paragraph 8

19. Whereas the concept of "releases" is generally understood to cover situations where pollutants are emitted or introduced into the environment from a facility or other sources, the concept of "transfers" applies instead to movement of pollutants within or between facilities.

20. The PRTR Protocol covers only "off-site" transfers. Figure 1 illustrates the reporting requirements for off-site transfers. Under the Protocol, each Party has to choose between the pollutant-specific approach and the waste-specific approach for reporting off-site transfers of waste. These alternatives are sometimes referred to as the 'two-track approach' to reporting. Figures I, II and III give three variants of off-site reporting of waste. Actually reporting requirements will depend on which of the two-tracks each Party or regional economic integration organization selects and additionally on whether a capacity or employee threshold is chosen. Whichever combination of track and threshold are selected, facilities in any case will report on transfers of pollutants in waste water. ~~20.~~

Figures ~~1~~I, II and III. Reporting Requirements for Off-site Transfers

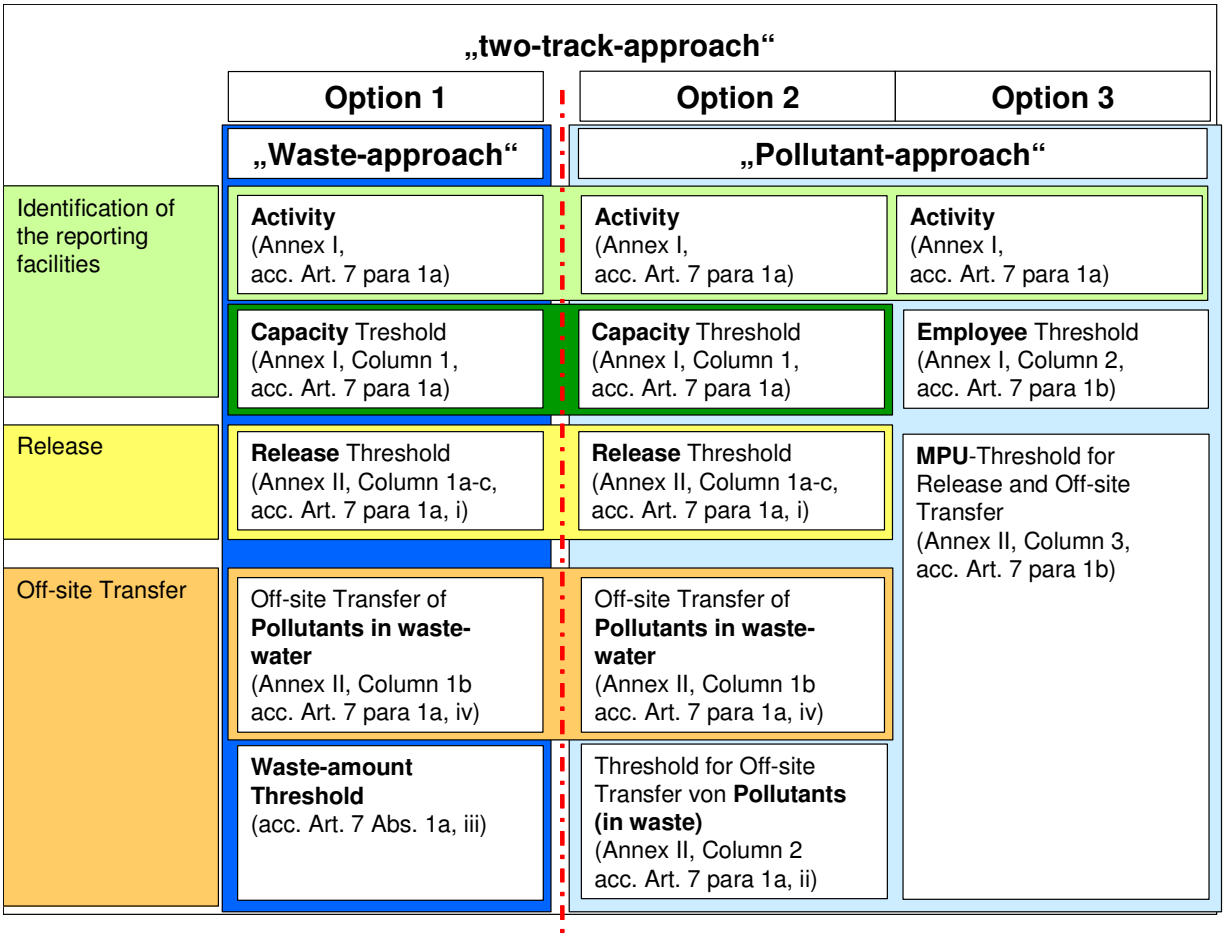


[Above figure is deleted. See figures in attached powerpoint.]

21. The facility is the point of reference when deciding whether the movement has to be reported for being an "off-site transfer", and the boundaries of a facility have to be clearly defined. The PRTR Protocol's definition of facility is therefore essential: it can include one or more "installations" on the same or adjoining "sites" (see annex I). Thus, movements of pollutants/waste between two installations of the same facility on the same site or adjoining sites will be an on-site transfer, and therefore not subject to reporting. For example, if one installation disposes of waste in another installation, such as an incinerator that is part of the same facility, then the disposal of waste need not be reported, as it is considered to be an "on-site transfer". However, releases of emissions from the incineration will need to be reported as releases to air and any solid or liquid waste remaining from combustion and air pollution control sent off-site for disposal will need to be reported.

The pollutant-specific and the waste-specific approaches

Figure ~~2~~IV. "Two-track approach"



~~23.~~22. ~~Under the Protocol, each Party has to choose between the pollutant-specific approach and the waste-specific approach for reporting off-site transfers of waste. These alternatives are sometimes referred to as the 'two-track approach' to reporting.~~ Figure 2 represents the 'two-track approach' as three 'options' ~~[Developed by Umwelt Bundes Amt fur Mensch und Umweit.]~~.

~~24.~~23. If the pollutant-specific approach is chosen, each facility in the country will need to report the quantities of specific pollutants transferred off-site. The applicable thresholds are those set forth in annex II, column 2, to the PRTR Protocol (art. 7, para. 1 (a) (ii)). This will require the facility to indicate the amount of each pollutant contained in the waste, distinguishing between the amounts destined for recovery and the amounts destined for disposal (annex III to the Protocol identifies the specific operations for recovery and for disposal), as well as the name and address of the facility receiving the transfer (art. 7, para. 5 (d) (i)).

~~25.~~24. If the waste-specific approach is chosen, then each facility has to indicate the amount of waste transferred (without specifying the pollutants), whether the transferred waste is "hazardous" or "other" waste, and whether it is destined for recovery or disposal.

The thresholds are set in article 7, paragraph 1 (a) (iii). If the transferred waste is hazardous, within the meaning of the Protocol, the threshold is 2 tons per year. If it is other waste (waste that is not hazardous), the threshold is 2,000 tons per year. Chapter III provides further detail on the determination of hazardous versus other waste.

~~26.~~25. In addition, for movement of hazardous waste to another country (transboundary movement of hazardous waste), the facility will, under the waste-specific approach, have to indicate the name and address of the recovery or disposal operator and the actual recovery or disposal site receiving the transfer (art. 7, para. 5 (d) (ii)).

Comparing the pollutant- and waste-specific approaches

~~27.~~26. Each approach has its advantages and disadvantages. In the European Union, reporting obligations for transfers of waste refer to the amount of waste disposed of or recovered, differentiating between hazardous or non hazardous waste.[8] The Basel Convention on the Control of Transboundary Movements of Wastes and their Disposal also follows this approach. Thus, adopting the waste-specific approach will in many cases be less onerous on companies, as they should already have in place systems to carry out the reporting. This approach will enhance convergence with EU systems. In some~~many~~ cases the identification of waste transferred as hazardous indicates the dangerous nature of the pollutants contained and thus ~~gives a clear picture~~ of the hazardous potential of the transferred load.

~~28.~~27. The disadvantage of the waste-specific approach is that it does not provide the same pollutant-specific detail as the reporting on releases. The public~~Citizens~~ and other PRTR users will not have information on the specific pollutants contained in the waste (e.g., if the waste is hazardous because it contains x tons of heavy metals or y tons of PCBs). Furthermore, since pollutant concentrations in the waste stream may vary, reporting only the total amounts of waste could lead to a misleading impression of the total quantity of the pollutant transferred.

~~29.~~28. The pollutant-specific approach can provide better information about the content of the waste and a more accurate vision of facility activities and their environmental impact. However, this approach has the disadvantage of potentially increasing the reporting burden and, therefore, the costs for facilities.~~ There is no straightforward analytical method to qualify estimated data for the content of pollutants in waste. Thus data validation is difficult to perform (see also III C). In addition, no information on the hazardous nature of a pollutant in the waste is given, e. g. copper as metal has a significantly lower hazardous potential compared to copper salts~~.

[8] The EU legislation setting out this approach includes the Waste Framework Directive and the Waste Statistics Regulation~~Directive~~.

Off-site transfers of waste water

~~30.~~29. The Protocol sets forth a specific regime for waste water. An off-site transfer of pollutants in waste water means the movement beyond the boundaries of a facility of pollutants in waste water destined for waste-water treatment. The off-side transfer may be carried out via a sewer or any other means such as containers or tank trucks. Transfers of waste water will always be reported following the pollutant-specific approach (art. 7, paras. 1 (a) (iv) and 5 (e)). The applicable thresholds are set in annex II, column 1b. Facilities that release waste water directly to a water body, whether first treated at a facility waste-water plant or not, will report the release as a release to water, using the pollutant-specific approach.

Releases to land or off-site transfers?

~~31.~~30. Disposal and recovery operations can be considered releases to land instead of off-site transfers of waste when a landfill is lacking suitable technical measures to prevent polluting of soil and/or ground water. In fact, the term "disposal" appears in the definitions of both "release" and "off-site transfers". The reference to disposal via transfer covers situations where the pollutant is transferred to an intermediary body which then carries out the disposal, whereas when the facility directly disposes of waste to the environment, this would be a release.

~~32.~~31. This difference will be important for Parties adopting the waste-specific approach for reporting off-site transfers of waste, since the resulting releases to land must be reported following the pollutant-specific approach, with reporting thresholds that are different from those for off-site transfers.

~~33.~~32. In the case of underground injection of waste, the PRTR Protocol clarifies in article 7, paragraph 5 (c), that these are always to be reported as a release to land, using, therefore, the pollutant-specific approach.

~~34.~~33. The issue is important also because there could be a double counting in some cases and for certain activities, as pollutants transferred might later become releases which have an impact on the environment and health. As an example, a landfill complying with modern technical standards will report releases to air and water as a result of this activity, but will not report "release to land". It is possible to interpret the Protocol to require that the operator of a landfill report, as a release to land, waste received and then deposited in the landfill. However, this would lead to a duplication of reporting, as the facilities transferring waste to the landfill would already have to report the movement as an off-site transfer. In the absence of an agreement among the Parties for this type of activity, each Party should clarify this issue at national level to avoid overlap and duplicate reporting.[9] Concerning the European PRTR (E-PRTR) only the two

[9] The landfill operator should in any case report any air emissions or leachate to surface waters, as well as any off-site transfers of waste water that result from landfill activities.

disposal-operations "land treatment" and "deep injection" are supposed to be releases to land as other operations do not lead to an introduction of pollutants into the environment and are therefore no releases to land.

E. Working towards convergence

~~35.~~34. Article 17, paragraph 3, of the PRTR Protocol calls for convergence between the pollutant- and waste-specific types of PRTR. During negotiations, different countries indicated their interest in ensuring that reporting of off-site transfers included both the amount of waste transferred, indicating whether hazardous or non-hazardous and whether for recovery or disposal, as well as the amount of each specific pollutant. As mentioned above, the PRTR Protocol reached convergence in the reporting of waste water and underground injection.

~~36.~~35. A Party may want to reach convergence between the two systems for certain cases where the pollutant-specific approach is feasible for reporting off-site transfers of waste. This could be, as was already mentioned during the negotiations, the adoption, together with the waste-specific approach, of a pollutant-specific approach for those substances for which quantification in waste streams is feasible and important because of their persistence or relevance. These could include heavy metals as well as substances that are banned or severely restricted and being phased out or strictly controlled, such as PCB/Polychlorinated terphenyls (PCTs) and other POPs. On the other hand, a Party executing the pollutant specific approach may decide to add the amount of waste, its destination whether for recovery and/or disposal and if the waste is hazardous or non-hazardous. Adopting aspects of the other approach is merely an option and does not alter the reporting requirements of the system the Party has selected.

Part two Data collection and management

IV PRTR data

1. Pollutant release and transfer registers (PRTRs) implementing the PRTR Protocol will contain in the long run two types of data: facility-level data and data for so-called diffuse sources. The data for these different types of sources must be integrated into an overall picture of the releases and transfers of pollutants in waste water and pollutants in waste or waste amounts. This structure is shown in figure I

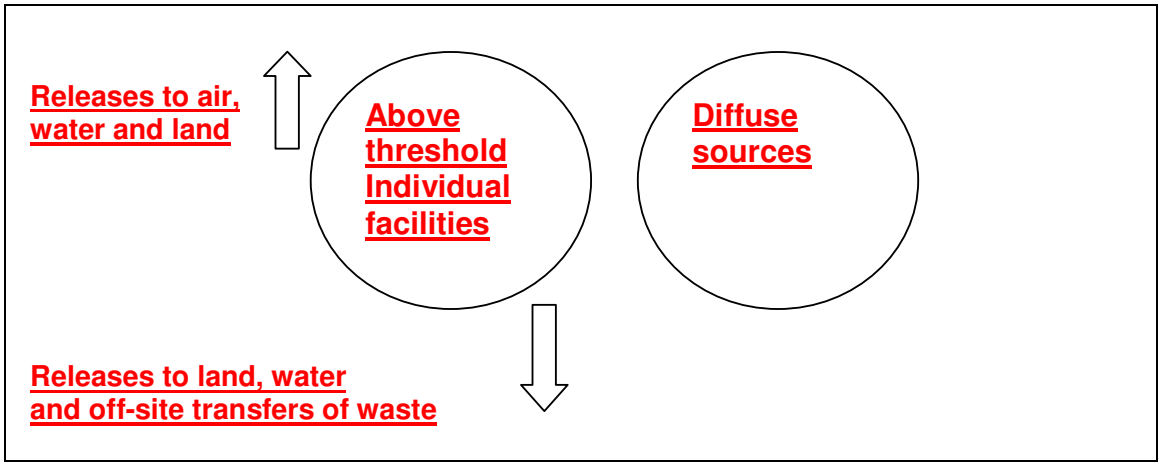


Figure I: Structure of releases and transfers from facilities and diffuse sources ~~(* are below threshold facilities)~~ ~~(Germany: redo graphic without intersecting circles)~~

2. The core of the system is data collected by individual facilities that have in operation one or more activities as listed in annex I to the PRTR Protocol, taking into account the thresholds for installed capacity or the number of employees.

3. The PRTR Protocol also requires diffuse sources to be reported. Examples of these sources are road transport, shipping, aviation, agriculture, small and medium-size enterprises (some of these might be listed in annex I, but are below the capacity thresholds), fuel distribution and domestic heating.

Diffuse sources
1. Reporting on diffuse sources is a core element of PRTRs under the Protocol (Article 4(b)).
2. "Each Party shall present on its register, in an adequate spatial disaggregation, information on releases of pollutants from diffuse sources for which that Party determines that data are being collected by the relevant authorities and can be practicably included. Where the Party determines that no such data exist, it shall take measures to initiate reporting on releases of relevant pollutants from one or more diffuse sources in accordance with its national priorities" (art. 7, para. 7)
3. "The information referred to in paragraph 7 shall include information on the type of methodology used to derive the information." (art. 7, para. 8).

Box 1: Article 7, paragraphs 7 and 8

4. Thresholds are applied to two different levels of data generation: once for identification of the individual facilities obliged to report to the PRTR and once to determine which pollutants to report.

A. Facility-level data

5. The facility is the reporting unit for the PRTR Protocol. The efforts to be undertaken by Parties to identify the facilities with annex I activities and to meet the reporting obligations in the framework of the PRTR Protocol are set out in article 7, paragraph 1.

Article 7, paragraph 1

Each Party shall either:

(a) Require the owner or the operator of each individual facility within its jurisdiction that undertakes one or more of the activities specified in annex I above the applicable capacity threshold specified in annex I, column 1, and:

(i) Releases any pollutant specified in annex II in quantities exceeding the applicable thresholds specified in annex II, column 1;

(ii) Transfers off-site any pollutant specified in annex II in quantities exceeding the applicable threshold specified in annex II, column 2, where the Party has opted for pollutant-specific reporting of transfers pursuant to paragraph 5 (d);

(iii) Transfers off-site hazardous waste exceeding 2 tons per year or other waste exceeding 2,000 tons per year, where the Party has opted for waste-specific reporting of transfers pursuant to paragraph 5 (d); or

(iv) Transfers off-site any pollutant specified in annex II in waste water destined for waste-water treatment in quantities exceeding the applicable threshold specified in annex II, column 1b;

to undertake the obligation imposed on that owner or operator pursuant to paragraph 2; or

(b) Require the owner or the operator of each individual facility within its jurisdiction that undertakes one or more of the activities specified in annex I at or above the employee threshold specified in annex I, column 2, and manufactures, processes or uses any pollutant specified in annex II in quantities exceeding the applicable threshold specified in annex II, column 3, to undertake the obligation imposed on that owner or operation pursuant to paragraph 2.

Box 2: Article 7, paragraph 1

Defining facilities

(a) What are facilities?

6. The PRTR Protocol (art. 2, para. 4) defines a facility as: "one or more installations on the same site, or on adjoining sites, that are owned or operated by the same natural or legal person."

7. Operators with a permit for annex I activities are usually already obliged to report the releases and transfers of pollutants to the authorities. If an operator has various activities in one or more installations on a given site this cluster is in the PRTR Protocol defined as one facility. In many countries the environmental permitting is based on the owner as a natural or legal person. A facility can include however both annex I activities and non-annex I activities. Only the annex-I-related releases and transfers of pollutants are subject to reporting under the PRTR Protocol. The reporting obligation concerns all sources of a facility, including non-point or diffuse sources.

8. The facility is the reporting unit for the PRTR Protocol, similar to the reporting approach in the national inventories of industrial emissions in the European Pollutant Emission Register (EPER) and Canada and the United States. The advantage of this

choice is that industry is allowed to report the total emission of each pollutant released by a facility and exceeding its threshold, and, hence, the reporting burden will be minimized by omitting detailed data per activity. To simplify the reporting obligations, it is required to report only the total industrial emissions of the facility, which can consist of a number of installations, for all pollutants for which the thresholds are exceeded.

9. If a facility operates several installations falling under the same annex I activity on the same site, the production capacities / number of employees of the individual installations should be summed for the annex I activity. The sum of the capacities / number of employees is then compared with the minimum production capacity/employee threshold for the specific activity as listed in annex I to the PRTR Protocol.

10. In general, national experts and competent authorities will be able to identify the reporting unit. Multi-operator situations may occur where several operators share certain activities or installations at the same industrial location (site). Such a jointly operated complex may include a common waste-water treatment plant or a common energy production facility.

Example: industrial refining site and reporting units

An industrial site for oil refining is operated by two companies, A and B. Company A owns a facility with several refining installations such as a catalytic cracker for the actual refining of crude oil. Company B takes care of the further downstream processing. The installations of both facilities are interconnected and dependent on each other for throughput and storage ~~(see figure II)~~.

According to the PRTR Protocol, both companies (different owners) are considered as separate facilities and each facility is required to determine whether it is required to report according to annex I: company A as a facility according to activity 1a (mineral oil and gas refineries) and company B as chemical industry (see figure II on page 45).

Box 3: Industrial refining site and reporting units

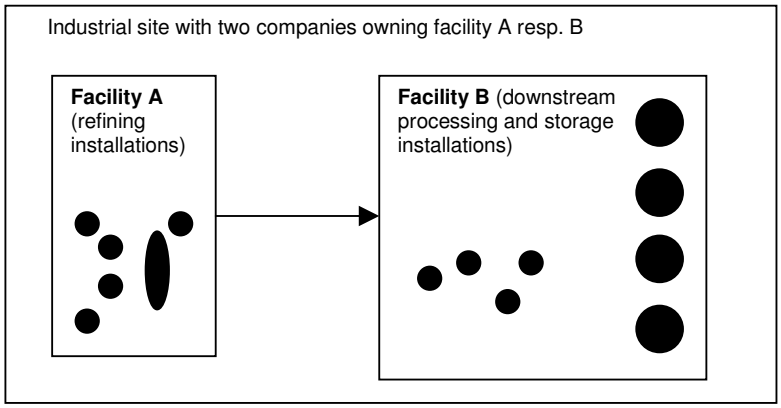


Figure II: Two facilities with different installations on one site

Choosing a threshold system for the selection of facilities

11. Annex I to the PRTR Protocol lists the activities that are covered by it (see also Table 1 on pages 27-30 above). Article 7 allows for two alternative sets of selection criteria: capacity and pollutant release thresholds, on the one hand, or number of employees and pollutant manufacture, use or process thresholds, on the other.

12. Parties must choose either to employ exclusively capacity thresholds or pollutant release thresholds for all reporting activities. They may not mix them. Experiences with current PRTRs show that the two approaches do not cause large differences in the selection. The number and character of facilities in both types of PRTR selections are similar and the expectation is that with either approach the majority of releases and transfers of pollutants will be reported.

~~12.A Party can thus select the facilities covered by annex I using:~~
13. ~~(a)~~ T~~t~~he capacity thresholds for the given activity are shown in ~~(~~column -1 of ~~,~~ Table 1 below~~)~~.
~~;~~
~~(b) the employee thresholds for the given activity (column 2, Table 1) .~~

(a) Identification of facilities

~~13.~~14. A Party may have information on operators of facilities based on an economic classification and could start the identification and selection of the facilities based on this information. Table 1 reproduces annex I and indicates in which economic sectors each of the activities could occur.

~~14.~~15. Parties have information available enabling them to assign International Standard Industrial Classification (ISIC) or Nomenclature générale des activités économiques dans les Communautés Européennes (NACE) codes (Official Journal of the European Communities, OJ L 6, 10.01.2002, page 3) to the economic sectors. The ISIC code is a standard classification of economic activities arranged so that facilities (entities) can be

classified according to the activity they carry out.

~~15.~~16. If Parties wish to establish a link between, on the one hand, the source categories of annex I activities with corresponding nomenclature for reporting (NFR) or common reporting format (CRF) codes and, on the other hand, the economic sectors and subsectors with ISIC codes of 4 digits or more, they can consult national statistical agencies and national experts.

No.	ISIC 3.1	Activity	Capacity threshold (column 1)
1	E	Energy sector	
(a)	D232	Mineral oil and gas refineries *	*
(b)	E402	Installations for gasification and liquefaction	*
(c)	E401	Thermal power stations and other combustion installations	With a heat input of50 megawatts (MW)
(d)	D2310	Coke ovens	*
(e)	C101	Coal rolling mills	With a capacity of 1 ton per hour
(f)	C101	Installations for the manufacture of coal products and solid smokeless fuel	*
2.		Production and processing of metals	
(a)	D721	Metal ore (including sulphide ore) roasting or sintering installations	*
(b)	D723	Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting	With a capacity of 2.5 tons per hour
(c)	D28	Installations for the processing of ferrous metals: (i) Hot-rolling mills (ii) Smitheries with hammers (iii) Application of protective fused metal coats	With a capacity of 20 tons of crude steel per hour With an energy of 50 kilojoules per hammer, where the calorific power used exceeds 20 MW With an input of 2 tons of crude steel per hour
(d)	D2731	Ferrous metal foundries	With a production capacity of 20 tons per day
(e)	D2732	Installations: (i) For the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes (ii) For the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)	* With a melting capacity of 4 tons per day for lead and cadmium or 20 tons per day for all other metals
(f)	various ISIC codes	Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process	Where the volume of the treatment vats equals 30 m^3

3.		Mineral industry	
(a)	C	Underground mining and related operations	*
(b)	D141	Opencast mining	Where the surface of the area being mined equals 25 hectares
(c)	D269	Installations for the production of: Cement clinker in rotary kilns Lime in rotary kilns Cement clinker or lime in other furnaces	With a production capacity of 500 tons per day With a production capacity exceeding 50 tons per day With a production capacity of 50 tons per day
(d)	D269	Installations for the production of asbestos and the manufacture of asbestos-based products	*
(e)	D261	Installations for the manufacture of glass, including glass fibre	With a melting capacity of 20 tons per day
(f)	D269	Installations for melting mineral substances, including the production of mineral fibres	With a melting capacity of 20 tons per day
(g)	D269	Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain	With a production capacity of 75 tons per day, or with a kiln capacity of 4 m^3 and with a setting density per kiln of 300 kg/m^3
4.	D24	Chemical industry	
(a)	B241	Chemical installations for the production on an industrial scale of basic organic chemicals, such as: (i) Simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic) (ii) Oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters, acetates, ethers, peroxides, epoxy resins (iii) Sulphurous hydrocarbons (iv) Nitrogenous hydrocarbons such as amines, amides, nitrous compounds, nitro compounds or nitrate compounds, nitrile s, cyanates, isocyanates (v) Phosphorus-containing hydrocarbons (vi) Halogenic hydrocarbons (vii) Organometallic compounds (viii) Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres) (ix) Synthetic rubbers (x) Dyes and pigments (xi) Surface-active agents and surfactants	*

4.	D24	Chemical industry (cont.)	
(b)	B241	Chemical installations for the production on an industrial scale of basic inorganic chemicals, such as: (i) Gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride (ii) Acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid, oleum, sulphurous acids (iii) Bases, such as ammonium hydroxide, potassium hydroxide, sodium hydroxide (iv) Salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate (v) Non-metals, metal oxides or other inorganic compounds such as calc ium carbide, silicon, silicon carbide	*
(c)	B2412	Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilizers (simple or compound fertilizers)	*
(d)	B2421	Chemical installations for the production on an industrial scale of basic plant health products and of biocides	*
(e)	B2423	Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products	*
(f)	B2429	Installations for the production on an industrial scale of explosives and pyrotechnic products	*
5.		Waste and waste-water management	
(a)	O90	Installations for the incineration, pyrolysis, recovery, chemical treatment or landfilling of hazardous waste	Receiving 10 tons per day
(b)	O90	Installations for the incineration of municipal waste	With a capacity of 3 tons per hour
(c)	O90	Installations for the disposal of non-hazardous waste	With a capacity of 50 tons per day
(d)	O90	Landfills (excluding landfills of inert waste)	Receiving 10 tons per day or with a total capacity of 25,000 tons
(e)		Installations for the disposal or recycling of animal carcasses and animal waste	With a treatment capacity of 10 tons per day
(f)	O90	Municipal waste-water treatment plants	With a capacity of 100,000 population equivalents
(g)	O90	Independently operated industrial waste-water treatment plants which serve one or more activities of this annex	With a capacity of 10,000 m^3 per day

6.	D210	Paper and wood production and processing	
(a)	D2101	Industrial plants for the production of pulp from timber or similar fibrous materials	*
(b)	D2102 /D2103	Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood)	With a production capacity of 20 tons per day
(c)	D202	Industrial plants for the preservation of wood and wood products with chemicals	With a production capacity of 50 m3 per day
7.	A012	Intensive livestock production and aquaculture	
(a)	A0122	Installations for the intensive rearing of poultry or pigs	(i) With 40,000 places for poultry (ii) With 2,000 places for production pigs (over 30 kg) (iii) With 750 places for sows
(b)	B0502	Intensive aquaculture	1,000 tons of fish and shellfish per year
8.	D15	Animal and vegetable products from the food and beverage sector	
(a)	D151	Slaughterhouses	With a carcass production capacity of 50 tons per day
(b)	D151	Treatment and processing intended for the production of food and beverage products from: Animal raw materials (other than milk) Vegetable raw materials	With a finished product production capacity of 75 tons per day With a finished product production capacity of 300 tons per day (average value on a quarterly basis)
(c)	D152	Treatment and processing of milk	With a capacity to receive 200 tons of milk per day (average value on an annual basis)
9.		Other activities	
(a)	D171	Plants for the pretreatment (operations such as washing, bleaching, mercerization) or dyeing of fibres or textiles	With a treatment capacity of 10 tons per day
(b)	D19	Plants for the tanning of hides and skins	With a treatment capacity of 12 tons of finished product per day
(c)	various ISIC codes	Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating	With a consumption capacity of 150 kg per hour or 200 tons per year
(d)	D242	Installations for the production of carbon (hard-burnt coal) or electrographite by means of incineration or graphitization	*

(e)	D3511	Installations for the building of, and painting or removal of paint from ships	With a capacity for ships 100 m long	

Table 1: Source categories of activities in economic sectors of annex I to the PRTR Protocol. Where possible the ISIC code is referenced.

Explanatory notes:

Column 1 contains the capacity thresholds referred to article 7, paragraph 1 (a).

An asterisk (*) indicates that no capacity threshold is applicable (all facilities are subject to reporting).

No.	ISIC 3.1	Activity	Capacity threshold (column 1)	Employee threshold (column 2)
1	E	Energy sector		
(a)	D232	Mineral oil and gas refineries *	*	10 employees
(b)	E402	Installations for gasification and liquefaction	*	
(c)	E401	Thermal power stations and other combustion installations	With a heat input of50 megawatts (MW)	
(d)	D2310	Coke ovens	*	
(e)	C101	Coal rolling mills	With a capacity of 1 ton per hour	
(f)	C101	Installations for the manufacture of coal products and solid smokeless fuel	*	
2.		Production and processing of metals		
(a)	D721	Metal ore (including sulphide ore) roasting or sintering installations	*	10 employees
(b)	D723	Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting	With a capacity of 2.5 tons per hour	
(c)	D28	Installations for the processing of ferrous metals: (i) Hot-rolling mills (ii) Smitheries with hammers (iii) Application of protective fused metal coats	With a capacity of 20 tons of crude steel per hour With an energy of 50 kilojoules per hammer, where the calorific power used exceeds 20 MW With an input of 2 tons of crude steel per hour	
(d)	D2731	Ferrous metal foundries	With a production capacity of 20 tons per day	
(e)	D2732	Installations: (i) For the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes (ii) For the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)	* With a melting capacity of 4 tons per day for lead and cadmium or 20 tons per day for all other metals	

~~No.~~	~~ISIC 3.1~~	~~Activity~~	~~Capacity threshold (column 1)~~	~~Employee threshold (column 2)~~
~~(f)~~	~~various ISIC codes~~	~~Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process~~	~~Where the volume of the treatment vats equals 30 m^3~~	

~~3.~~		~~Mineral industry~~		
~~(a)~~	~~C~~	~~Underground mining and related operations~~	~~*~~	
~~(b)~~	~~D141~~	~~Opencast mining~~	~~Where the surface of the area being mined equals 25 hectares~~	
~~(c)~~	~~D269~~	~~Installations for the production of:~~ ~~Cement clinker in rotary kilns~~ ~~Lime in rotary kilns~~ ~~Cement clinker or lime in other furnaces~~	~~With a production capacity of 500 tons per day~~ ~~With a production capacity exceeding 50 tons per day~~ ~~With a production capacity of 50 tons per day~~	
~~(d)~~	~~D269~~	~~Installations for the production of asbestos and the manufacture of asbestos-based products~~	~~*~~	
~~(e)~~	~~D261~~	~~Installations for the manufacture of glass, including glass fibre~~	~~With a melting capacity of 20 tons per day~~	
~~(f)~~	~~D269~~	~~Installations for melting mineral substances, including the production of mineral fibres~~	~~With a melting capacity of 20 tons per day~~	
~~(g)~~	~~D269~~	~~Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain~~	~~With a production capacity of 75 tons per day, or with a kiln capacity of 4 m^3 and with a setting density per kiln of 300 kg/m^3~~	
~~4.~~	~~D24~~	~~Chemical industry~~		
~~(a)~~	~~B241~~	~~Chemical installations for the production on an industrial scale of basic organic chemicals, such as:~~ ~~(i) Simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic)~~ ~~(ii) Oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters, acetates, ethers, peroxides, epoxy resins~~ ~~(iii) Sulphurous hydrocarbons~~ ~~(iv) Nitrogenous hydrocarbons such as amines, amides, nitrous compounds, nitro compounds or nitrate compounds, nitrile s, cyanates, isocyanates~~ ~~(v) Phosphorus-containing hydrocarbons~~ ~~(vi) Halogenic hydrocarbons~~ ~~(vii) Organometallic compounds~~ ~~(viii) Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres)~~ ~~(ix) Synthetic rubbers~~ ~~(x) Dyes and pigments~~ ~~(xi) Surface-active agents and surfactants~~	~~*~~	~~10 employees~~

~~4.~~	~~D24~~	~~Chemical industry (cont.)~~		
~~(b)~~	~~B241~~	~~Chemical installations for the production on an industrial scale of basic inorganic chemicals, such as:~~ ~~(i) Gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride~~ ~~(ii) Acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid, oleum, sulphurous acids~~ ~~(iii) Bases, such as ammonium hydroxide, potassium hydroxide, sodium hydroxide~~ ~~(iv) Salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate~~ ~~(v) Non-metals, metal oxides or other inorganic compounds such as calc ium carbide, silicon, silicon carbide~~	~~*~~	
~~(c)~~	~~B2412~~	~~Chemical installations for the production on an industrial scale of phosphorous -, nitrogen- or potassium-based fertilizers (simple or compound fertilizers)~~	~~*~~	
~~(d)~~	~~B2421~~	~~Chemical installations for the production on an industrial scale of basic plant health products and of biocides~~	~~*~~	
~~(e)~~	~~B2423~~	~~Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products~~	~~*~~	
~~(f)~~	~~B2429~~	~~Installations for the production on an industrial scale of explosives and pyrotechnic products~~	~~*~~	
~~5.~~		~~Waste and waste-water management~~		
~~(a)~~	~~O90~~	~~Installations for the incineration, pyrolysis, recovery, chemical treatment or landfilling of hazardous waste~~	~~Receiving 10 tons per day~~	~~10 employees~~
~~(b)~~	~~O90~~	~~Installations for the incineration of municipal waste~~	~~With a capacity of 3 tons per hour~~	
~~(c)~~	~~O90~~	~~Installations for the disposal of non-hazardous waste~~	~~With a capacity of 50 tons per day~~	
~~(d)~~	~~O90~~	~~Landfills (excluding landfills of inert waste)~~	~~Receiving 10 tons per day or with a total capacity of 25,000 tons~~	
~~(e)~~		~~Installations for the disposal or recycling of animal carcasses and animal waste~~	~~With a treatment capacity of 10 tons per day~~	
~~(f)~~	~~O90~~	~~Municipal waste water treatment plants~~	~~With a capacity of 100,000 population equivalents~~	

~~(g)~~	~~O90~~	~~Independently operated industrial waste-water treatment plants which serve one or more activities of this annex~~	~~With a capacity of 10,000 m^3 per day~~	
~~6.~~	~~D210~~	~~Paper and wood production and processing~~		
~~(a)~~	~~D2101~~	~~Industrial plants for the production of pulp from timber or similar fibrous materials~~	~~*~~	~~10 employees~~
~~(b)~~	~~D2102 /D2103~~	~~Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood)~~	~~With a production capacity of 20 tons per day~~	
~~(c)~~	~~D202~~	~~Industrial plants for the preservation of wood and wood products with chemicals~~	~~With a production capacity of 50 m3 per day~~	
~~7.~~	~~A012~~	~~Intensive livestock production and aquaculture~~		
~~(a)~~	~~A0122~~	~~Installations for the intensive rearing of poultry or pigs~~	~~(i) With 40,000 places for poultry~~ ~~(ii) With 2,000 places for production pigs (over 30 kg)~~ ~~(iii) With 750 places for sows~~	~~10 employees~~
~~(b)~~	~~B0502~~	~~Intensive aquaculture~~	~~1,000 tons of fish and shellfish per year~~	
~~8.~~	~~D15~~	~~Animal and vegetable products from the food and beverage sector~~		
~~(a)~~	~~D151~~	~~Slaughterhouses~~	~~With a carcass production capacity of 50 tons per day~~	~~10 employees~~
~~(b)~~	~~D151~~	~~Treatment and processing intended for the production of food and beverage products from:~~ ~~Animal raw materials (other than milk)~~ ~~Vegetable raw materials~~	~~With a finished product production capacity of 75 tons per day~~ ~~With a finished product production capacity of 300 tons per day (average value on a quarterly basis)~~	
~~(c)~~	~~D152~~	~~Treatment and processing of milk~~	~~With a capacity to receive 200 tons of milk per day (average value on an annual basis)~~	
~~9.~~		~~Other activities~~		
~~(a)~~	~~D171~~	~~Plants for the pretreatment (operations such as washing, bleaching, mercerization) or dyeing of fibres or textiles~~	~~With a treatment capacity of 10 tons per day~~	~~10 employees~~
~~(b)~~	~~D19~~	~~Plants for the tanning of hides and skins~~	~~With a treatment capacity of 12 tons of finished product per day~~	
~~(c)~~	~~various ISIC codes~~	~~Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating~~	~~With a consumption capacity of 150 kg per hour or 200 tons per year~~	

~~(d)~~	~~D242~~	~~Installations for the production of carbon (hard-burnt coal) or electrographite by means of incineration or graphitization~~	~~*~~	
~~(e)~~	~~D3511~~	~~Installations for the building of, and painting or removal of paint from ships~~	~~With a capacity for ships 100 m long~~	

~~Table 1: Source categories of activities in economic sectors of annex I to the PRTR Protocol. Where possible the ISIC code is referenced.~~

~~Explanatory notes:~~

~~Column 1 contains the capacity thresholds referred to article 7, paragraph 1 (a).~~

~~An asterisk (*) indicates that no capacity threshold is applicable (all facilities are subject to reporting).~~

~~Column 2 contains the employee threshold referred to in article 7, paragraph 1 (b).~~

~~"10 employees" means the equivalent of 10 full-time employees.~~

(b) Selecting facilities using capacity thresholds

~~16.~~17. Parties that have opted for a "capacity approach" to selecting facilities should use column 1 of annex I, which sets out the thresholds for the production capacity for the activities required to report to the PRTR. The PRTR Protocol does not cover facilities with a production capacity below these thresholds.

~~17.~~18. For some activities column 1 lists an asterisk "*". No threshold is given for these categories because all facilities belonging to these categories are required to report.

~~18.~~19. The European Community uses mainly production capacity as threshold.

Dairy plant
A dairy plant with 40 employees has an average annual capacity to process 500 tons of milk per day into different products, such as cottage cheese and various desserts. According to annex I (~~main~~ activity 8.c treatment and processing of milk), the facility is required to report to the PRTR because the capacity threshold of 200 tons is exceeded.
Brewery
A brewery with a production capacity of 3.2 million hectolitres per year has 600 employees. According to annex I (~~main~~ activity 8.b treatment and processing intended for the production of food and beverage products from vegetable raw materials), it is required to report to the PRTR, ~~-~~because its yearly capacity of 3.2 million hectolitres equals a daily production capacity of 870 tons, which exceeds the 300-ton threshold.

Box 4: Examples of production capacity as threshold

(c) Selecting facilities using employee thresholds

20. The employee thresholds for the given activity are shown in column 1 of Table 2 below. For every activity, the employee threshold is 10 employees. "10 employees" means the equivalent of 10 full-time employees.

No.	**ISIC 3.1**	**Activity**		**Employee threshold**
1	E	Energy sector		
				10 employees
2.		Production and processing of metals		
				10 employees

3.		Mineral industry		
				10 employees
4.	D24	Chemical industry		
				10 employees

5.		Waste and waste-water management	
			10 employees
6.		Paper and wood production and processing	
			10 employees
7.	A012	Intensive livestock production and aquaculture	
			10 employees
8.	D15	Animal and vegetable products from the food and beverage sector	
			10 employees
9.		Other activities	
			10 employees

Table 2: Employee thresholds for activities in economic sectors of annex I referred to in article 7, paragraph 1 (b).

19.21. Parties that have opted for an "employee approach" to selecting facilities should use column 2 of annex I, which sets the thresholds for the number of employees for the activities required to report to the PRTR. The choice of using employee-threshold is strictly combined with the so-called MPU-thresholds (see above figure 2 "Two-track approach", option 3).

20.22. The employee threshold refers to the equivalent of a full-time employee and can be defined as 2,000 hours per year. The employee threshold for all annex I activities is set at 10 employees. In other words, if the total number of hours worked by all employees (including contractors) is 20,000 hours or more, the facility meets the employee threshold. All contractor and employee hours, with the exception of minor on-site intermittent service vendors such as vending-machine servicers, must be considered. Also the hours worked by employees directly in support of the activities of a facility must be counted towards the 20,000-hour threshold, regardless of the location of the employees (i.e., at the facility or off-site) [Toxics Release Inventory (TRI)].

21.23. Canada and the United States currently use an employee threshold in their PRTRs with a few exceptions, for instance waste incineration.

1. Dairy plant
A dairy plant with 40 employees has an average annual capacity to process 500 tons of milk per day into different products, such as cottage cheese and various desserts. According to annex I (main activity 8.c treatment and processing of milk), the facility is required to report to the PRTR because the employee threshold of 10 employees is exceeded.
2. Brewery
A brewery with a production capacity of 3.2 million hectolitres per year has 600 employees. According to annex I (main activity 8.b treatment and processing intended for the production of

food and beverage products from vegetable raw materials), it is required to report to the PRTR because the employee threshold of 10 employees is exceeded.

Box 5: Examples of employee capacity as threshold

Selection of pollutants to report for facilities

~~22.~~24. Releases of any pollutant specified in annex II in quantities exceeding the applicable thresholds must be reported per facility. The general guidelines in the PRTR Protocol for reporting emission data are set out in article 7, paragraph 1.

(a) Applying thresholds for reporting (how to use annex II)

~~23.~~25. The thresholds values in annex II for triggering a report are essential parameters. The purpose of applying them is to avoid the need for facilities to report insignificant releases while, at the same time, ensuring that the reporting will cover most of the industrial releases. The thresholds are meant for reporting purposes only: a facility must report all releases of each pollutant exceeding the threshold.

~~24.~~26. "Releases" means any introduction of pollutants into the environment as a result of any human activity, whether deliberate or accidental, routine or non-routine, including spilling, emitting, discharging, injecting, disposing or dumping, or through sewer systems without final waste-water treatment.

~~25.~~27. "Off-site transfers" means the movement beyond the boundaries of the facility of either pollutants or waste destined for disposal or recovery and of pollutants in waste water destined for waste-water treatment. Waste water means used water containing substances or objects that is subject to regulation by national law.

(i) Capacity approach and thresholds for releases and off-site transfers

~~26.~~28. Parties selecting the capacity approach must use the thresholds for reporting releases and off-site transfers referred to in article 7, paragraph 1 (a), and set in columns 1 and 2 of annex II. The selected thresholds will depend on whether a Party has opted for a "capacity approach" or an "employee approach" for selecting facilities.

~~27.~~29. Parties must require the owners or operators of facilities to report the pollutants from annex II for routine activities (and also from extraordinary events) on:

(a) Releases to air (thresholds in column 1a of annex II)

(b) Releases to water (thresholds in column 1b of annex II)

(c) Releases to land, including by underground injection (thresholds in column 1c of annex II)

(d) Off-site transfers of pollutants (thresholds in column 2 of annex II) (option 2 and 3 according to figure 2 above),

(e) off-site transfer of hazardous waste and other waste (according to Art. 7 para. 1 a (iii)) (only option 1 according to figure2), or

(f): off-site transfer of pollutants in waste-water (according to Art. 7 para 1 a (iv) (option 1 and 2 according to figure 2).

(ii) Employee approach and threshold for manufacture, process or use

~~28.~~30. Parties using an employee approach should base the reporting of a facility to the PRTR on the amount of manufacture, process or use in the calendar year. If the facility manufactures, processes or uses a substance on the annex II list of pollutants and exceeds that threshold, all releases and transfers must be reported.

~~29.~~31. The actual annual amount of a pollutant released by manufacturing, processing or use is to be calculated by:

Amount of substance in inventory at the beginning of the year	+	amount of substance brought on the site during the year	+	amount of substance produced on the site during the year	–	amount of substance in inventory at the end of the year

Releases by manufacturing, processing or use can also be calculated from other process information:

Amount of substance shipped as or in product during the year	+	amount of substance consumed on the site during the year	+	amount of substance newly generated as waste during the year

A Party can make exemptions on the use of the thresholds. The TRI, for example, makes an exemption known as the de minimis exemption. It allows facilities to disregard certain minimal concentrations of toxic chemicals in mixtures or other trade-name products that they process or otherwise use from calculations to determine whether reporting thresholds have been exceeded, as well as from release and other waste management calculations.

(iii) How to use annex II

~~30.~~32. The application of thresholds can be further illustrated by explaining annex II (see excerpt below).

Box 6: Explaining annex II

The abbreviation "No." is the numerical identifier of the pollutant in the PRTR Protocol.
The "CAS number" is the precise identifier of the pollutants in the Chemical Abstracts Service.
"Pollutant" is the common name of the pollutant used in the PRTR Protocol
The "Threshold for releases (column 1)" and "Threshold for off-site transfers of pollutants

(column 2)" are the thresholds to be used for Parties opting for a capacity approach.
The "Manufacture, process or use threshold (column 3)" is the threshold to be used by Parties that have opted for an employee approach.
A hyphen (-) indicates that the parameter in question does not trigger a reporting requirement.
An asterisk (*) indicates that, for this pollutant, the release threshold is to be used rather than a manufacture, process or use threshold.
A double asterisk (**) indicates that, for this pollutant, the release threshold in column (1)(b) is to be used rather than a manufacture, process or use threshold.
For PCDD + PCDF (dioxins + furans), the unit Teq in ng / dscm at 7% O_2 is used. Teq stands for "Toxicity Equivalents, the emission of 17 isomers of PCDD and PCDF related to the most toxic isomer 2,3,7,8-TCDD"[10].

(a) Releases to air

~~31.~~33. Table ~~2~~ 3 below reproduces the list of pollutants for emissions to air from annex II of the PRTR Protocol. ~~Table 3~~ Box 7 provides examples of releases to air from a public power plant and spray coating facility.

No.	CAS number	Pollutant	Threshold for releases to air (column 1a)
			kg/year
1	74-82-8	Methane (CH4)	100 000
2	630-08-0	Carbon monoxide (CO)	500 000
3	124-38-9	Carbon dioxide (CO2)	100 million
4		Hydro-fluorocarbons (HFCs)	100
5	10024-97-2	Nitrous oxide (N2O)	10 000
6	7664-41-7	Ammonia (NH3)	10 000

10 RAPPE, C. & KJELLER, L.-O. (1987) PCDDs and PCDFs in environmental samples, air, particulates, sediments and soil. Chemosphere, 16:1775-1780.
2,3,4,8-tetraCDF
1,2,3,4,8-pentaCDF
1,2,3,4,7,9-hexaCDF
2,3,7,8-tetraCDF
2,3,7,8-tetraCDD
1,2,3,7,8-pentaCDF
2,3,4,7,8-pentaCDF
1,2,3,7,8-pentaCDD
1,2,3,4,7,8-hexaCDF
1,2,3,6,7,8-hexaCDF
1,2,3,7,8,9-hexaCDF
2,3,4,6,7,8-hexaCDF
1,2,3,4,7,8-hexaCDD
1,2,3,6,7,8-hexaCDD0
1,2,3,7,8,9-hexaCDD
OctaCDF
OctaCDD

No.	CAS number	Pollutant	Threshold for releases to air (column 1a)
7		Non-methane volatile organic compounds (NMVOC)	100 000
8		Nitrogen oxides (NOx/NO2)	100 000
9		Perfluorocarbons (PFCs)	100
10	2551-62-4	Sulphur hexafluoride (SF6)	50
11		Sulphur oxides (SOx/SO2)	150 000
12		Total nitrogen	-
13		Total phosphorus	-
14		Hydrochlorofluorocarbons (HCFCs)	1
15		Chlorofluorocarbons (CFCs)	1
16		Halons	1
17	7440-38-2	Arsenic and compounds (as As)	20
18	7440-43-9	Cadmium and compounds (as Cd)	10
19	7440-47-3	Chromium and compounds (as Cr)	100
20	7440-50-8	Copper and compounds (as Cu)	100
21	7439-97-6	Mercury and compounds (as Hg)	10
22	7440-02-0	Nickel and compounds (as Ni)	50
23	7439-92-1	Lead and compounds (as Pb)	200
24	7440-66-6	Zinc and compounds (as Zn)	200
25	15972-60-8	Alachlor	-
26	309-00-2	Aldrin	1
27	1912-24-9	Atrazine	-
28	57-74-9	Chlordane	1
29	143-50-0	Chlordecone	1
30	470-90-6	Chlorfenvinphos	-
31	85535-84-8	Chloro -alkanes, C10-C13	-
32	2921-88-2	Chlorpyrifos	-
33	50-29-3	DDT	1
34	107-06-2	1,2-dichloroethane	1 000
35	75-09-2	Dichloromethane	1 000
36	60-57-1	Dieldrin	1
37	330-54-1	Diuron	-
38	115-29-7	Endosulphan	-
39	72-20-8	Endrin	1
40		Halogenated organic compounds (as AOX)	-
41	76-44-8	Heptachlor	1
42	118-74-1	Hexachlorobenzene (HCB)	10
43	87-68-3	Hexachlorobutadiene (HCBD)	-
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	10
45	58-89-9	Lindane	1
46	2385-85-5	Mirex	1
47		PCDD + PCDF (dioxins + furans) as Teq	0,001
48	608-93-5	Pentachlorobenzene	1
49	87-86-5	Pentachlorophenol (PCP)	10

No.	CAS number	Pollutant	Threshold for releases to air (column 1a)
50	1336-36-3	Polychlorinated biphenyls (PCBs)	0,1
51	122-34-9	Simazine	-
52	127-18-4	Tetrachloroethylene (PER)	2 000
53	56-23-5	Tetrachloromethane (TCM)	100
54	12002-48-1	Trichlorobenzenes (TCBs)	10
55	71-55-6	1,1,1-trichloroethane	100
56	79-34-5	1,1,2,2-tetrachloroethane	50
57	79-01-6	Trichloroethylene	2 000
58	67-66-3	Trichloromethane	500
59	8001-35-2	Toxaphene	1
60	75-01-4	Vinyl chloride	1 000
61	120-12-7	Anthracene	50
62	71-43-2	Benzene	1 000
63		Brominated diphenylethers (PBDE)	-
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	-
65	100-41-4	Ethyl benzene	-
66	75-21-8	Ethylene oxide	1 000
67	34123-59-6	Isoproturon	-
68	91-20-3	Naphthalene	100
69		Organotin compounds (as total Sn)	-
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	10
71	108-95-2	Phenols (as total C)	-
72		Polycyclic aromatic hydrocarbons (PAHs) b/	50
73	108-88-3	Toluene	-
74		Tributyltin and compounds	-
75		Triphenyltin and compounds	-
76		Total organic carbon (TOC) (as total C or COD/3)	-
77	1582-09-8	Trifluralin	-
78	1330-20-7	Xylenes	-
79		Chlorides (as total Cl)	-
80		Chlorine and inorganic compounds (as HCl)	10 000
81	1332-21-4	Asbestos	1
82		Cyanides (as total CN)	-
83		Fluorides (as total F)	-
84		Fluorine and inorganic compounds (as HF)	5 000
85	74-90-8	Hydrogencyanide (HCN)	200
86		Particulate matter (PM10)	50 000

Table 4. Threshold for release to air from annex II, column 1a of the Protocol

An asterisk (*) indicates that for this pollutant, the release threshold in column 1 (a) is to be used rather than a manufacture, process or use threshold.

Examples:
1. Public power plant
A large coal fired public power plant (630 MW) reports releases to air for a reporting year. The table below illustrates how the threshold values for release to air can be used to determine which releases are required to report, following a capacity approach on selecting facilities.

Pollutant	**Thresholds (kg) Release / MPU**	**Actual release (kg)**	**Report?**
Carbon monoxide (CO)	500 000 /*	4 200 000	yes
Carbon dioxide, (CO2):	100 million /*	1 930 million	Yes
Nitrous oxide (N2O):	10 000 /*	24 400	Yes
Nitrogen oxides (NOx):	100 000 /*	807 000	yes
Sulphur oxides (SOx):	150 000 /*	1 720 000	yes
Chlorine and inorganic compounds (as HCl)	10 000 / 10 000	35 600	yes
Fluorine and inorganic compounds (as HF)	5 000 / 10 000	8 010	yes
Non methane volatile organic compounds (NMVOC)	100 000 /*	10 320 000	yes
Mercury	10 / 5	14 100	yes
Cadmium	10 / 5	566	yes
Lead	200 / 50	707	yes
Copper	100 / 10 000	1 410	yes
Zinc	200 / 10 000	4 240	yes
Arsenic	20 / 50	5 660	yes
Chromium	100 / 10 000	707	yes
Nickel	50 / 10 000	7 070	yes

Since all releases to air are above the threshold values they must all be reported when using the capacity approach.

In case the employee approach is used on selecting facilities the selection of releases and transfers is a little more complex:

- for a number of pollutants no MPU threshold is given in Annex I (*), these 'pollutants must be assessed with the release threshold
- the MPU thresholds on the trace metals can be applied on the results of calculations on elements composition and fuel use (see remark on annual mass flow on page 76, paragraph 40 [check]).

2. Spray coating facility
A spray coating facility has an annual release of 180 000 kg Non-methane volatile organic compounds (NMVOC) to the air. Annex II gives for NMVOC no manufacturing, process or use threshold but refers (with the *) to the release threshold to air of 100 000 kg/year. The facility is thus required to report the annual release of 180 000 kg NMVOC, independent the selection approach of the Party.

Box 7. Examples of reporting of releases to air

Table ~~2~~4: Emissions to air from annex II for MPU threshold reporting

No.	CAS number	Pollutant	~~Threshold for releases to air (column 1a)~~	Manufacture, process or use threshold (column 3)
			~~kg/year~~	kg/year
1	74-82-8	Methane (CH4)	~~100 000~~	*
2	630-08-0	Carbon monoxide (CO)	~~500 000~~	*
3	124-38-9	Carbon dioxide (CO2)	~~100 million~~	*
4		Hydro-fluorocarbons (HFCs)	~~100~~	*
5	10024-97-2	Nitrous oxide (N2O)	~~10 000~~	*
6	7664-41-7	Ammonia (NH3)	~~10 000~~	10 000
7		Non-methane volatile organic compounds (NMVOC)	~~100 000~~	*
8		Nitrogen oxides (NOx/NO2)	~~100 000~~	*
9		Perfluorocarbons (PFCs)	~~100~~	*
10	2551-62-4	Sulphur hexafluoride (SF6)	~~50~~	*
11		Sulphur oxides (SOx/SO2)	~~150 000~~	*
12		Total nitrogen	~~-~~	10 000
13		Total phosphorus	~~-~~	10 000
14		Hydrochlorofluorocarbons (HCFCs)	~~1~~	10 000
15		Chlorofluorocarbons (CFCs)	~~1~~	10 000
16		Halons	~~1~~	10 000
17	7440-38-2	Arsenic and compounds (as As)	~~20~~	50
18	7440-43-9	Cadmium and compounds (as Cd)	~~10~~	5
19	7440-47-3	Chromium and compounds (as Cr)	~~100~~	10 000
20	7440-50-8	Copper and compounds (as Cu)	~~100~~	10 000
21	7439-97-6	Mercury and compounds (as Hg)	~~10~~	5
22	7440-02-0	Nickel and compounds (as Ni)	~~50~~	10 000
23	7439-92-1	Lead and compounds (as Pb)	~~200~~	50
24	7440-66-6	Zinc and compounds (as Zn)	~~200~~	10 000
25	15972-60-8	Alachlor	~~-~~	10 000
26	309-00-2	Aldrin	~~1~~	1
27	1912-24-9	Atrazine	~~-~~	10 000
28	57-74-9	Chlordane	~~1~~	1
29	143-50-0	Chlordecone	~~1~~	1
30	470-90-6	Chlorfenvinphos	~~-~~	10 000
31	85535-84-8	Chloro -alkanes, C10-C13	~~-~~	10 000
32	2921-88-2	Chlorpyrifos	~~-~~	10 000
33	50-29-3	DDT	~~1~~	1
34	107-06-2	1,2-dichloroethane	~~1 000~~	10 000
35	75-09-2	Dichloromethane	~~1 000~~	10 000
36	60-57-1	Dieldrin	~~1~~	1
37	330-54-1	Diuron	~~-~~	10 000
38	115-29-7	Endosulphan	~~-~~	10 000

No.	CAS number	Pollutant	~~Threshold for releases to air (column 1a)~~	Manufacture, process or use threshold (column 3)
39	72-20-8	Endrin	~~1~~	1
40		Halogenated organic compounds (as AOX)	~~-~~	10 000
41	76-44-8	Heptachlor	~~1~~	1
42	118-74-1	Hexachlorobenzene (HCB)	~~10~~	5
43	87-68-3	Hexachlorobutadiene (HCBD)	~~-~~	10 000
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	~~10~~	10
45	58-89-9	Lindane	~~1~~	1
46	2385-85-5	Mirex	~~1~~	1
47		PCDD + PCDF (dioxins + furans) as Teq	~~0,001~~	0,001
48	608-93-5	Pentachlorobenzene	~~1~~	50
49	87-86-5	Pentachlorophenol (PCP)	~~10~~	10 000
50	1336-36-3	Polychlorinated biphenyls (PCBs)	~~0,1~~	50
51	122-34-9	Simazine	~~-~~	10 000
52	127-18-4	Tetrachloroethylene (PER)	~~2 000~~	10 000
53	56-23-5	Tetrachloromethane (TCM)	~~100~~	10 000
54	12002-48-1	Trichlorobenzenes (TCBs)	~~10~~	10 000
55	71-55-6	1,1,1-trichloroethane	~~100~~	10 000
56	79-34-5	1,1,2,2-tetrachloroethane	~~50~~	10 000
57	79-01-6	Trichloroethylene	~~2 000~~	10 000
58	67-66-3	Trichloromethane	~~500~~	10 000
59	8001-35-2	Toxaphene	~~1~~	1
60	75-01-4	Vinyl chloride	~~1 000~~	10 000
61	120-12-7	Anthracene	~~50~~	50
62	71-43-2	Benzene	~~1 000~~	10 000
63		Brominated diphenylethers (PBDE)	~~-~~	10 000
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	~~-~~	10 000
65	100-41-4	Ethyl benzene	~~-~~	10 000
66	75-21-8	Ethylene oxide	~~1 000~~	10 000
67	34123-59-6	Isoproturon	~~-~~	10 000
68	91-20-3	Naphthalene	~~100~~	10 000
69		Organotin compounds (as total Sn)	~~-~~	10 000
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	~~10~~	10 000
71	108-95-2	Phenols (as total C)	~~-~~	10 000
72		Polycyclic aromatic hydrocarbons (PAHs) b/	~~50~~	50
73	108-88-3	Toluene	~~-~~	10 000
74		Tributyltin and compounds	~~-~~	10 000
75		Triphenyltin and compounds	~~-~~	10 000
76		Total organic carbon (TOC) (as total C or COD/3)	~~-~~	**
77	1582-09-8	Trifluralin	~~-~~	10 000

No.	CAS number	Pollutant	~~Threshold for releases to air (column 1a)~~	Manufacture, process or use threshold (column 3)
78	1330-20-7	Xylenes	~~-~~	10 000
79		Chlorides (as total Cl)	~~-~~	10 000 c/
80		Chlorine and inorganic compounds (as HCl)	~~10 000~~	10 000
81	1332-21-4	Asbestos	~~1~~	10 000
82		Cyanides (as total CN)	~~-~~	10 000
83		Fluorides (as total F)	~~-~~	10 000 c/
84		Fluorine and inorganic compounds (as HF)	~~5 000~~	10 000
85	74-90-8	Hydrogencyanide (HCN)	~~200~~	10 000
86		Particulate matter (PM10)	~~50 000~~	*

Footnotes:
a/ Single pollutants are to be reported if the threshold for BTEX (the sum parameter of benzene, toluene, ethyl benzene, xylene) is exceeded.
b/ Polycyclic aromatic hydrocarbons (PAHs) are to be measured as benzo(a)pyrene (50-32-8), benzo(b)fluoranthene (205-99-2), benzo(k)fluoranthene (207-08-9), indeno(1,2,3-cd)pyrene (193-39-5) (derived from the Protocol on Persistent Organic Pollutants to the Convention on Long-range Transboundary Air Pollution).
c/ As inorganic compounds.

An asterisk (*) indicates that for this pollutant, the release threshold in column 1 (a) is to be used rather than a manufacture, process or use threshold.~~An asterisk (*) indicates …~~

~~Table 3: Examples of releases to air from a public power plant and a spray coating facility~~

(b) Releases to water

~~32.~~34. Two types of releases to water must be reported for a facility, namely:

(a) Releases to surface water and releases to sewers without a final waste-water treatment plant: they must be indicated as releases to water;

(b) Releases to an off-site waste-water treatment plant: they must be indicated as off-site transfers.

If there is a background load of a certain pollutant in water, this can be taken into account. For example, if water is collected from a river for use as process or cooling water which is then released again into the same river, the "release" caused by the background load of that pollutant can be subtracted from the total release of the facility. If the additional load results from the use of extracted groundwater it should not be subtracted since this load is increasing the load of the pollutant in the river and should be reported.

~~33.~~35. Table ~~4~~ 5 reproduces the list of pollutants for direct releases to water from annex II, column 1b of the PRTR Protocol.

Table ~~4~~5: Identification of direct release of pollutants to water from annex II of the UNECE PRTR Protocol

No.	CAS number	Pollutant	Threshold for releases to water (column 1b)	Manufacture, process or use threshold (column 3)
			kg/year	kg/year
1	74-82-8	Methane (CH4)	-	*
2	630-08-0	Carbon monoxide (CO)	-	*
3	124-38-9	Carbon dioxide (CO2)	-	*
4		Hydro-fluorocarbons (HFCs)	-	*
5	10024-97-2	Nitrous oxide (N2O)	-	*
6	7664-41-7	Ammonia (NH3)	-	10 000
7		Non-methane volatile organic compounds (NMVOC)	-	*
8		Nitrogen oxides (NOx/NO2)	-	*
9		Perfluorocarbons (PFCs)	-	*
10	2551-62-4	Sulphur hexafluoride (SF6)	-	*
11		Sulphur oxides (SOx/SO2)	-	*
12		Total nitrogen	50 000	10 000
13		Total phosphorus	5 000	10 000
14		Hydrochlorofluorocarbons (HCFCs)	-	10 000
15		Chlorofluorocarbons (CFCs)	-	10 000
16		Halons	-	10 000
17	7440-38-	Arsenic and compounds (as As)	5	50

No.	CAS number	Pollutant	Threshold for releases to water (column 1b)	Manufacture, process or use threshold (column 3)
	2			
18	7440-43-9	Cadmium and compounds (as Cd)	5	5
19	7440-47-3	Chromium and compounds (as Cr)	50	10 000
20	7440-50-8	Copper and compounds (as Cu)	50	10 000
21	7439-97-6	Mercury and compounds (as Hg)	1	5
22	7440-02-0	Nickel and compounds (as Ni)	20	10 000
23	7439-92-1	Lead and compounds (as Pb)	20	50
24	7440-66-6	Zinc and compounds (as Zn)	100	10 000
25	15972-60-8	Alachlor	-	10 000
26	309-00-2	Aldrin	1	1
27	1912-24-9	Atrazine	1	10 000
28	57-74-9	Chlordane	1	1
29	143-50-0	Chlordecone	1	1
30	470-90-6	Chlorfenvinphos	1	10 000
31	85535-84-8	Chloro -alkanes, C10-C13	1	10 000
32	2921-88-2	Chlorpyrifos	1	10 000
33	50-29-3	DDT	1	1
34	107-06-2	1,2-dichloroethane	10	10 000
35	75-09-2	Dichloromethane	10	10 000
36	60-57-1	Dieldrin	1	1
37	330-54-1	Diuron	1	10 000
38	115-29-7	Endosulphan	1	10 000
39	72-20-8	Endrin	1	1
40		Halogenated organic compounds (as AOX)	1 000	10 000
41	76-44-8	Heptachlor	1	1
42	118-74-1	Hexachlorobenzene (HCB)	1	5
43	87-68-3	Hexachlorobutadiene (HCBD)	1	10 000
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	1	10
45	58-89-9	Lindane	1	1
46	2385-85-5	Mirex	1	1
47		PCDD + PCDF (dioxins + furans) as Teq	0,001	0,001
48	608-93-5	Pentachlorobenzene	1	50

No.	CAS number	Pollutant	Threshold for releases to water (column 1b)	Manufacture, process or use threshold (column 3)
49	87-86-5	Pentachlorophenol (PCP)	1	10 000
50	1336-36-3	Polychlorinated biphenyls (PCBs)	0,1	50
51	122-34-9	Simazine	1	10 000
52	127-18-4	Tetrachloroethylene (PER)	-	10 000
53	56-23-5	Tetrachloromethane (TCM)	-	10 000
54	12002-48-1	Trichlorobenzenes (TCBs)	-	10 000
55	71-55-6	1,1,1-trichloroethane	-	10 000
56	79-34-5	1,1,2,2-tetrachloroethane	-	10 000
57	79-01-6	Trichloroethylene	-	10 000
58	67-66-3	Trichloromethane	-	10 000
59	8001-35-2	Toxaphene	1	1
60	75-01-4	Vinyl chloride	10	10 000
61	120-12-7	Anthracene	1	50
62	71-43-2	Benzene	200 (as BTEX) a/	10 000
63		Brominated diphenylethers (PBDE)	1	10 000
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	1	10 000
65	100-41-4	Ethyl benzene	200 (as BTEX)	10 000
66	75-21-8	Ethylene oxide	10	10 000
67	34123-59-6	Isoproturon	1	10 000
68	91-20-3	Naphthalene	10	10 000
69		Organotin compounds (as total Sn)	50	10 000
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	1	10 000
71	108-95-2	Phenols (as total C)	20	10 000
72		Polycyclic aromatic hydrocarbons (PAHs) b/	5	50
73	108-88-3	Toluene	200 (as BTEX) a/	10 000
74		Tributyltin and compounds	1	10 000
75		Triphenyltin and compounds	1	10 000
76		Total organic carbon (TOC) (as total C or COD/3)	50 000	**
77	1582-09-8	Trifluralin	1	10 000
78	1330-20-7	Xylenes	200 (as BTEX) a/	10 000
79		Chlorides (as total Cl)	2 million	10 000 c/
80		Chlorine and inorganic compounds (as	-	10 000

No.	CAS number	Pollutant	Threshold for releases to water (column 1b)	Manufacture, process or use threshold (column 3)
		HCl)		
81	1332-21-4	Asbestos	1	10 000
82		Cyanides (as total CN)	50	10 000
83		Fluorides (as total F)	2 000	10 000 c/
84		Fluorine and inorganic compounds (as HF)	-	10 000
85	74-90-8	Hydrogencyanide (HCN)	-	10 000
86		Particulate matter (PM10)	-	*

36. Table 6 reproduces the list of pollutants for direct releases to water from annex II, column 3 of the PRTR Protocol.

Table 6: Identification of direct release of pollutants to water from annex II, column 3

No.	CAS number	Pollutant		Manufacture, process or use threshold (column 3)
				kg/year
1	74-82-8	Methane (CH4)		*
2	630-08-0	Carbon monoxide (CO)		*
3	124-38-9	Carbon dioxide (CO2)		*
4		Hydro-fluorocarbons (HFCs)		*
5	10024-97-2	Nitrous oxide (N2O)		*
6	7664-41-7	Ammonia (NH3)		10 000
7		Non-methane volatile organic compounds (NMVOC)		*
8		Nitrogen oxides (NOx/NO2)		*
9		Perfluorocarbons (PFCs)		*
10	2551-62-4	Sulphur hexafluoride (SF6)		*
11		Sulphur oxides (SOx/SO2)		*
12		Total nitrogen		10 000
13		Total phosphorus		10 000
14		Hydrochlorofluorocarbons (HCFCs)		10 000
15		Chlorofluorocarbons (CFCs)		10 000
16		Halons		10 000
17	7440-38-2	Arsenic and compounds (as As)		50
18	7440-43-	Cadmium and compounds (as Cd)		5

No.	CAS number	Pollutant		Manufacture, process or use threshold (column 3)
	9			
19	7440-47-3	Chromium and compounds (as Cr)		10 000
20	7440-50-8	Copper and compounds (as Cu)		10 000
21	7439-97-6	Mercury and compounds (as Hg)		5
22	7440-02-0	Nickel and compounds (as Ni)		10 000
23	7439-92-1	Lead and compounds (as Pb)		50
24	7440-66-6	Zinc and compounds (as Zn)		10 000
25	15972-60-8	Alachlor		10 000
26	309-00-2	Aldrin		1
27	1912-24-9	Atrazine		10 000
28	57-74-9	Chlordane		1
29	143-50-0	Chlordecone		1
30	470-90-6	Chlorfenvinphos		10 000
31	85535-84-8	Chloro -alkanes, C10-C13		10 000
32	2921-88-2	Chlorpyrifos		10 000
33	50-29-3	DDT		1
34	107-06-2	1,2-dichloroethane		10 000
35	75-09-2	Dichloromethane		10 000
36	60-57-1	Dieldrin		1
37	330-54-1	Diuron		10 000
38	115-29-7	Endosulphan		10 000
39	72-20-8	Endrin		1
40		Halogenated organic compounds (as AOX)		10 000
41	76-44-8	Heptachlor		1
42	118-74-1	Hexachlorobenzene (HCB)		5
43	87-68-3	Hexachlorobutadiene (HCBD)		10 000
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)		10
45	58-89-9	Lindane		1
46	2385-85-5	Mirex		1
47		PCDD + PCDF (dioxins + furans) as Teq		0,001
48	608-93-5	Pentachlorobenzene		50
49	87-86-5	Pentachlorophenol (PCP)		10 000
50	1336-36-	Polychlorinated biphenyls (PCBs)		50

No.	CAS number	Pollutant		Manufacture, process or use threshold (column 3)
	3			
51	122-34-9	Simazine		10 000
52	127-18-4	Tetrachloroethylene (PER)		10 000
53	56-23-5	Tetrachloromethane (TCM)		10 000
54	12002-48-1	Trichlorobenzenes (TCBs)		10 000
55	71-55-6	1,1,1-trichloroethane		10 000
56	79-34-5	1,1,2,2-tetrachloroethane		10 000
57	79-01-6	Trichloroethylene		10 000
58	67-66-3	Trichloromethane		10 000
59	8001-35-2	Toxaphene		1
60	75-01-4	Vinyl chloride		10 000
61	120-12-7	Anthracene		50
62	71-43-2	Benzene		10 000
63		Brominated diphenylethers (PBDE)		10 000
64		Nonylphenol ethoxylates (NP/NPEs) and related substances		10 000
65	100-41-4	Ethyl benzene		10 000
66	75-21-8	Ethylene oxide		10 000
67	34123-59-6	Isoproturon		10 000
68	91-20-3	Naphthalene		10 000
69		Organotin compounds (as total Sn)		10 000
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)		10 000
71	108-95-2	Phenols (as total C)		10 000
72		Polycyclic aromatic hydrocarbons (PAHs) b/		50
73	108-88-3	Toluene		10 000
74		Tributyltin and compounds		10 000
75		Triphenyltin and compounds		10 000
76		Total organic carbon (TOC) (as total C or COD/3)		**
77	1582-09-8	Trifluralin		10 000
78	1330-20-7	Xylenes		10 000
79		Chlorides (as total Cl)		10 000 c/
80		Chlorine and inorganic compounds (as HCl)		10 000
81	1332-21-4	Asbestos		10 000
82		Cyanides (as total CN)		10 000
83		Fluorides (as total F)		10 000 c/

No.	CAS number	Pollutant		Manufacture, process or use threshold (column 3)
84		Fluorine and inorganic compounds (as HF)		10 000
85	74-90-8	Hydrogencyanide (HCN)		10 000
86		Particulate matter (PM10)		*

(c) Releases to land

34.37. Releases to land of any pollutant specified in annex II in quantities exceeding the applicable threshold are specified in annex II, column 1c for Parties that have opted for pollutant-specific reporting of transfers pursuant to paragraph 5 (d)(i). (Germany: The last part of the sentence must be deleted because it refers to waste-specific Reporting as well, but does not include the "option 3" of the above figure (Employee threshold and MPU threshold).)

35.38. Table 5 7 reproduces the list of pollutants and thresholds for releases to land from annex II of the PRTR Protocol, column 1c.

No.	CAS number	Pollutant	Threshold for releases to land (column 1c)	Manufacture, process or use threshold (column 3)
			kg/year	kg/year
1	74-82-8	Methane (CH_4)	-	*
2	630-08-0	Carbon monoxide (CO)	-	*
3	124-38-9	Carbon dioxide (CO_2)	-	*
4		Hydro-fluorocarbons (HFCs)	-	*
5	10024-97-2	Nitrous oxide (N_2O)	-	*
6	7664-41-7	Ammonia (NH_3)	-	10 000
7		Non-methane volatile organic compounds (NMVOC)	-	*
8		Nitrogen oxides (NOx/NO_2)	-	*
9		Perfluorocarbons (PFCs)	-	*
10	2551-62-4	Sulphur hexafluoride (SF_6)	-	*
11		Sulphur oxides (SOx/SO_2)	-	*
12		Total nitrogen	50 000	10 000
13		Total phosphorus	5 000	10 000
14		Hydrochlorofluorocarbons (HCFCs)	-	10 000
15		Chlorofluorocarbons (CFCs)	-	10 000
16		Halons	-	10 000
17	7440-38-2	Arsenic and compounds (as As)	5	50
18	7440-43-9	Cadmium and compounds (as Cd)	5	5
19	7440-47-3	Chromium and compounds (as Cr)	50	10 000

No.	CAS number	Pollutant	Threshold for releases to land (column 1c)	~~Manufacture, process or use threshold (column 3)~~
20	7440-50-8	Copper and compounds (as Cu)	50	~~10 000~~
21	7439-97-6	Mercury and compounds (as Hg)	1	~~5~~
22	7440-02-0	Nickel and compounds (as Ni)	20	~~10 000~~
23	7439-92-1	Lead and compounds (as Pb)	20	~~50~~
24	7440-66-6	Zinc and compounds (as Zn)	100	~~10 000~~
25	15972-60-8	Alachlor	-	~~10 000~~
26	309-00-2	Aldrin	1	~~1~~
27	1912-24-9	Atrazine	1	~~10 000~~
28	57-74-9	Chlordane	1	~~1~~
29	143-50-0	Chlordecone	1	~~1~~
30	470-90-6	Chlorfenvinphos	1	~~10 000~~
31	85535-84-8	Chloro-alkanes, C_{10}-C_{13}	1	~~10 000~~
32	2921-88-2	Chlorpyrifos	1	~~10 000~~
33	50-29-3	DDT	1	~~1~~
34	107-06-2	1,2-dichloroethane	10	~~10 000~~
35	75-09-2	Dichloromethane	10	~~10 000~~
36	60-57-1	Dieldrin	1	~~1~~
37	330-54-1	Diuron	1	~~10 000~~
38	115-29-7	Endosulphan	1	~~10 000~~
39	72-20-8	Endrin	1	~~1~~
40		Halogenated organic compounds (as AOX)	1 000	~~10 000~~
41	76-44-8	Heptachlor	1	~~1~~
42	118-74-1	Hexachlorobenzene (HCB)	1	~~5~~
43	87-68-3	Hexachlorobutadiene (HCBD)	1	~~10 000~~
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	1	~~10~~
45	58-89-9	Lindane	1	~~1~~
46	2385-85-5	Mirex	1	~~1~~
47		PCDD + PCDF (dioxins + furans) as Teq	0.001	~~0.001~~
48	608-93-5	Pentachlorobenzene	1	~~50~~
49	87-86-5	Pentachlorophenol (PCP)	1	~~10 000~~
50	1336-36-3	Polychlorinated biphenyls (PCBs)	0.1	~~50~~
51	122-34-9	Simazine	1	~~10 000~~
52	127-18-4	Tetrachloroethylene (PER)	-	~~10 000~~
53	56-23-5	Tetrachloromethane (TCM)	-	~~10 000~~
54	12002-48-1	Trichlorobenzenes (TCBs)	-	~~10 000~~
55	71-55-6	1,1,1-trichloroethane	-	~~10 000~~
56	79-34-5	1,1,2,2-tetrachloroethane	-	~~10 000~~
57	79-01-6	Trichloroethylene	-	~~10 000~~
58	67-66-3	Trichloromethane	-	~~10 000~~
59	8001-35-2	Toxaphene	1	~~1~~
60	75-01-4	Vinyl chloride	10	~~10 000~~
61	120-12-7	Anthracene	1	~~50~~
62	71-43-2	Benzene	200 (as BTEX) [a/]	~~10 000~~

No.	CAS number	Pollutant	Threshold for releases to land (column 1c)	~~Manufacture, process or use threshold (column 3)~~
63		Brominated diphenylethers (PBDE)	1	~~10 000~~
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	1	~~10 000~~
65	100-41-4	Ethyl benzene	200 (as BTEX)	~~10 000~~
66	75-21-8	Ethylene oxide	10	~~10 000~~
67	34123-59-6	Isoproturon	1	~~10 000~~
68	91-20-3	Naphthalene	10	~~10 000~~
69		Organotin compounds (as total Sn)	50	~~10 000~~
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	1	~~10 000~~
71	108-95-2	Phenols (as total C)	20	~~10 000~~
72		Polycyclic aromatic hydrocarbons (PAHs) b/	5	~~50~~
73	108-88-3	Toluene	200 (as BTEX) a/	~~10 000~~
74		Tributyltin and compounds	1	~~10 000~~
75		Triphenyltin and compounds	1	~~10 000~~
76		Total organic carbon (TOC) (as total C or COD/3)	-	~~**~~
77	1582-09-8	Trifluralin	1	~~10 000~~
78	1330-20-7	Xylenes	200 (as BTEX) a/	~~10 000~~
79		Chlorides (as total Cl)	2 million	~~10 000 c/~~
80		Chlorine and inorganic compounds (as HCl)	-	~~10 000~~
81	1332-21-4	Asbestos	1	~~10 000~~
82		Cyanides (as total CN)	50	~~10 000~~
83		Fluorides (as total F)	2 000	~~10 000 c/~~
84		Fluorine and inorganic compounds (as HF)	-	~~10 000~~
85	74-90-8	Hydrogencyanide (HCN)	-	~~10 000~~
86		Particulate matter (PM_{10})	-	~~*~~

Table ~~5~~7: Identification and thresholds of releases to land from annex II of the PRTR Protocol, column 1c

Footnotes:
a/ Single pollutants are to be reported if the threshold for BTEX (the sum parameter of benzene, toluene, ethyl benzene, xylene) is exceeded.
b/ Polycyclic aromatic hydrocarbons (PAHs) are to be measured as benzo(a)pyrene (50-32-8), benzo(b)fluoranthene (205-99-2), benzo(k)fluoranthene (207-08-9), indeno(1,2,3-cd)pyrene (193-39-5) (derived from the Protocol on Persistent Organic Pollutants to the Convention on Long-range Transboundary Air Pollution).
c/ As inorganic compounds.

No.	CAS number	Pollutant	Manufacture, process or use threshold (column 3)
			kg/year
1	74-82-8	Methane (CH_4)	*
2	630-08-0	Carbon monoxide (CO)	*
3	124-38-9	Carbon dioxide (CO_2)	*
4		Hydro-fluorocarbons (HFCs)	*
5	10024-97-2	Nitrous oxide (N_2O)	*
6	7664-41-7	Ammonia (NH_3)	10 000
7		Non-methane volatile organic compounds (NMVOC)	*
8		Nitrogen oxides (NOx/NO_2)	*
9		Perfluorocarbons (PFCs)	*
10	2551-62-4	Sulphur hexafluoride (SF_6)	*
11		Sulphur oxides (SOx/SO_2)	*
12		Total nitrogen	10 000
13		Total phosphorus	10 000
14		Hydrochlorofluorocarbons (HCFCs)	10 000
15		Chlorofluorocarbons (CFCs)	10 000
16		Halons	10 000
17	7440-38-2	Arsenic and compounds (as As)	50
18	7440-43-9	Cadmium and compounds (as Cd)	5
19	7440-47-3	Chromium and compounds (as Cr)	10 000
20	7440-50-8	Copper and compounds (as Cu)	10 000
21	7439-97-6	Mercury and compounds (as Hg)	5
22	7440-02-0	Nickel and compounds (as Ni)	10 000
23	7439-92-1	Lead and compounds (as Pb)	50
24	7440-66-6	Zinc and compounds (as Zn)	10 000
25	15972-60-8	Alachlor	10 000
26	309-00-2	Aldrin	1
27	1912-24-9	Atrazine	10 000
28	57-74-9	Chlordane	1
29	143-50-0	Chlordecone	1
30	470-90-6	Chlorfenvinphos	10 000
31	85535-84-8	Chloro-alkanes, C_{10}-C_{13}	10 000
32	2921-88-2	Chlorpyrifos	10 000
33	50-29-3	DDT	1
34	107-06-2	1,2-dichloroethane	10 000
35	75-09-2	Dichloromethane	10 000
36	60-57-1	Dieldrin	1
37	330-54-1	Diuron	10 000
38	115-29-7	Endosulphan	10 000
39	72-20-8	Endrin	1
40		Halogenated organic compounds (as AOX)	10 000
41	76-44-8	Heptachlor	1
42	118-74-1	Hexachlorobenzene (HCB)	5

No.	CAS number	Pollutant	Manufacture, process or use threshold (column 3)
43	87-68-3	Hexachlorobutadiene (HCBD)	10 000
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	10
45	58-89-9	Lindane	1
46	2385-85-5	Mirex	1
47		PCDD + PCDF (dioxins + furans) as Teq	0.001
48	608-93-5	Pentachlorobenzene	50
49	87-86-5	Pentachlorophenol (PCP)	10 000
50	1336-36-3	Polychlorinated biphenyls (PCBs)	50
51	122-34-9	Simazine	10 000
52	127-18-4	Tetrachloroethylene (PER)	10 000
53	56-23-5	Tetrachloromethane (TCM)	10 000
54	12002-48-1	Trichlorobenzenes (TCBs)	10 000
55	71-55-6	1,1,1-trichloroethane	10 000
56	79-34-5	1,1,2,2-tetrachloroethane	10 000
57	79-01-6	Trichloroethylene	10 000
58	67-66-3	Trichloromethane	10 000
59	8001-35-2	Toxaphene	1
60	75-01-4	Vinyl chloride	10 000
61	120-12-7	Anthracene	50
62	71-43-2	Benzene	10 000
63		Brominated diphenylethers (PBDE)	10 000
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	10 000
65	100-41-4	Ethyl benzene	10 000
66	75-21-8	Ethylene oxide	10 000
67	34123-59-6	Isoproturon	10 000
68	91-20-3	Naphthalene	10 000
69		Organotin compounds (as total Sn)	10 000
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	10 000
71	108-95-2	Phenols (as total C)	10 000
72		Polycyclic aromatic hydrocarbons (PAHs) [b/]	50
73	108-88-3	Toluene	10 000
74		Tributyltin and compounds	10 000
75		Triphenyltin and compounds	10 000
76		Total organic carbon (TOC) (as total C or COD/3)	**
77	1582-09-8	Trifluralin	10 000
78	1330-20-7	Xylenes	10 000

No.	CAS number	Pollutant	Manufacture, process or use threshold (column 3)
79		Chlorides (as total Cl)	10 000 c/
80		Chlorine and inorganic compounds (as HCl)	10 000
81	1332-21-4	Asbestos	10 000
82		Cyanides (as total CN)	10 000
83		Fluorides (as total F)	10 000 c/
84		Fluorine and inorganic compounds (as HF)	10 000
85	74-90-8	Hydrogencyanide (HCN)	10 000
86		Particulate matter (PM_{10})	*

Table 8. Releases to land, column 3 MPU thresholds

Off-site transfers

36.39. Off-site transfers of pollutants can either be waste or waste water fed into a (public) sewer system. The PRTR Protocol text allows for waste two possibilities:

(a) pollutant specific reporting; and
(b) waste specific reporting.

37.40. Off-site transfers could be waste-specific (option 1 of figure 2) or pollutant-specific (option 2 and 3 of figure 2)

Off-site transfers of hazardous waste and other waste

38.41. For waste-specific reporting Parties should define by means of national law what waste is designated as hazardous waste. The threshold is 2 tons for hazardous waste and 2000 tons for other waste.

39.42. Hazardous wastes and other wastes destined for recovery or disposal transferred off site including transboundary movements shall be indicated respectively with the 'R' or 'D' operation pursuant to annex III.

Off-site transfers of pollutants

40.43. Pollutant specific reporting can be generated by analyzing the various wastes on their chemical composition. With the chemical composition the annual mass flow for each pollutant can be calculated. Table 6 9 reproduces the list of pollutants for off site transfers from annex II of the PRTR Protocol using a pollutant-specific approach.

Table 69: Thresholds for off-site transfers of pollutants in waste from annex II of the PRTR Protocol using a pollutant specific approach

No.	CAS number	Pollutant	Threshold for off-site transfers of pollutants (column 2)	Manufacture, process or use threshold (column 3)
			kg/year	kg/year
1	74-82-8	Methane (CH_4)	-	*
2	630-08-0	Carbon monoxide (CO)	-	*
3	124-38-9	Carbon dioxide (CO_2)	-	*
4		Hydro-fluorocarbons (HFCs)	-	*
5	10024-97-2	Nitrous oxide (N_2O)	-	*
6	7664-41-7	Ammonia (NH_3)	-	10 000
7		Non-methane volatile organic compounds (NMVOC)	-	*
8		Nitrogen oxides (NOx/NO_2)	-	*
9		Perfluorocarbons (PFCs)	-	*
10	2551-62-4	Sulphur hexafluoride (SF_6)	-	*
11		Sulphur oxides (SOx/SO_2)	-	*
12		Total nitrogen	10 000	10 000
13		Total phosphorus	10 000	10 000
14		Hydrochlorofluorocarbons (HCFCs)	100	10 000
15		Chlorofluorocarbons (CFCs)	100	10 000
16		Halons	100	10 000
17	7440-38-2	Arsenic and compounds (as As)	50	50
18	7440-43-9	Cadmium and compounds (as Cd)	5	5
19	7440-47-3	Chromium and compounds (as Cr)	200	10 000
20	7440-50-8	Copper and compounds (as Cu)	500	10 000
21	7439-97-6	Mercury and compounds (as Hg)	5	5
22	7440-02-0	Nickel and compounds (as Ni)	500	10 000
23	7439-92-1	Lead and compounds (as Pb)	50	50
24	7440-66-6	Zinc and compounds (as Zn)	1 000	10 000
25	15972-60-8	Alachlor	5	10 000
26	309-00-2	Aldrin	1	1
27	1912-24-9	Atrazine	5	10 000
28	57-74-9	Chlordane	1	1
29	143-50-0	Chlordecone	1	1
30	470-90-6	Chlorfenvinphos	5	10 000
31	85535-84-8	Chloro -alkanes, C_{10}-C_{13}	10	10 000
32	2921-88-2	Chlorpyrifos	5	10 000
33	50-29-3	DDT	1	1
34	107-06-2	1,2-dichloroethane	100	10 000
35	75-09-2	Dichloromethane	100	10 000
36	60-57-1	Dieldrin	1	1
37	330-54-1	Diuron	5	10 000
38	115-29-7	Endosulphan	5	10 000
39	72-20-8	Endrin	1	1
40		Halogenated organic compounds (as AOX)	1 000	10 000
41	76-44-8	Heptachlor	1	1
42	118-74-1	Hexachlorobenzene (HCB)	1	5
43	87-68-3	Hexachlorobutadiene (HCBD)	5	10 000

No.	CAS number	Pollutant	Threshold for off-site transfers of pollutants (column 2)	Manufacture, process or use threshold (column 3)
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	1	10
45	58-89-9	Lindane	1	1
46	2385-85-5	Mirex	1	1
47		PCDD + PCDF (dioxins + furans) as Teq	0.001	0.001
48	608-93-5	Pentachlorobenzene	5	50
49	87-86-5	Pentachlorophenol (PCP)	5	10 000
50	1336-36-3	Polychlorinated biphenyls (PCBs)	1	50
51	122-34-9	Simazine	5	10 000
52	127-18-4	Tetrachloroethylene (PER)	1 000	10 000
53	56-23-5	Tetrachloromethane (TCM)	1 000	10 000
54	12002-48-1	Trichlorobenzenes (TCBs)	1 000	10 000
55	71-55-6	1,1,1-trichloroethane	1 000	10 000
56	79-34-5	1,1,2,2-tetrachloroethane	1 000	10 000
57	79-01-6	Trichloroethylene	1 000	10 000
58	67-66-3	Trichloromethane	1 000	10 000
59	8001-35-2	Toxaphene	1	1
60	75-01-4	Vinyl chloride	100	10 000
61	120-12-7	Anthracene	50	50
62	71-43-2	Benzene	2000 (as BTEX) [a/]	10 000
63		Brominated diphenylethers (PBDE)	5	10 000
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	5	10 000
65	100-41-4	Ethyl benzene	2000 (as BTEX)	10 000
66	75-21-8	Ethylene oxide	100	10 000
67	34123-59-6	Isoproturon	5	10 000
68	91-20-3	Naphthalene	100	10 000
69		Organotin compounds (as total Sn)	50	10 000
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	100	10 000
71	108-95-2	Phenols (as total C)	200	10 000
72		Polycyclic aromatic hydrocarbons (PAHs) [b/]	50	50
73	108-88-3	Toluene	2000 (as BTEX) [a/]	10 000
74		Tributyltin and compounds	5	10 000
75		Triphenyltin and compounds	5	10 000
76		Total organic carbon (TOC) (as total C or COD/3)	-	**

[a/] Single pollutants are to be reported if the threshold for BTEX (the sum parameter of benzene, toluene, ethyl benzene, xylene) is exceeded.

[b/] Polycyclic aromatic hydrocarbons (PAHs) are to be measured as benzo(a)pyrene (50-32-8), benzo(b)fluoranthene (205-99-2), benzo(k)fluoranthene (207-08-9), indeno(1,2,3-cd)pyrene (193-39-5) (derived from the Protocol on Persistent Organic Pollutants to the Convention on Long-range Transboundary Air Pollution).

No.	CAS number	Pollutant	Threshold for off-site transfers of pollutants (column 2)	Manufacture, process or use threshold (column 3)
77	1582-09-8	Trifluralin	5	10 000
78	1330-20-7	Xylenes	2000 (as BTEX) [a/]	10 000
79		Chlorides (as total Cl)	2 million	10 000 [c/]
80		Chlorine and inorganic compounds (as HCl)		10 000
81	1332-21-4	Asbestos	10	10 000
82		Cyanides (as total CN)	500	10 000
83		Fluorides (as total F)	10 000	10 000 [c/]
84		Fluorine and inorganic compounds (as HF)		10 000
85	74-90-8	Hydrogencyanide (HCN)		10 000
86		Particulate matter (PM_{10})		*

Off-site transfers of pollutants in waste water

~~41.~~44. Concerning waste water, pollutant-specific reporting is obligatory. Parties that have decided for a capacity approach have to report pollutants in waste water according to article. 7 para.1(iv) (option 1 and 2 of figure 2). Parties that have decided for an employee approach have to report pollutants in waste water according to article 7 paragraph 1b (option 3 of figure 2). ~~Table x reproduces the list of pollutants for the off-site transfer of pollutants in waste water from annex II of the PRTR Protocol.~~

~~[Table x including column 1b and column 3 to be included]~~

[c/] As inorganic compounds.

Annex III
PART A DISPOSAL OPERATIONS ('D')

- Deposit into or onto land (e.g. landfill)
- Land treatment (e.g. biodegradation of liquid or sludgy discards in soils)
- Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories)
- Surface impoundment (e.g. placement of liquid or sludge discards into pits, ponds or lagoons)
- Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment)
- Release into a water body except seas/oceans
- Release into seas/oceans including sea-bed insertion
- Biological treatment not specified elsewhere in this annex which results in final compounds or mixtures which are discarded by means of any of the operations specified in this part
- Physico-chemical treatment not specified elsewhere in this annex which results in final compounds or mixtures which are discarded by means of any of the operations specified in this part (e.g. evaporation, drying, calcination, neutralization, precipitation)
- Incineration on land
- Incineration at sea
- Permanent storage (e.g. emplacement of containers in a mine)
- Blending or mixing prior to submission to any of the operations specified in this part
- Repackaging prior to submission to any of the operations specified in this part
- Storage pending any of the operations specified in this part

PART B RECOVERY OPERATIONS ('R')

- Use as a fuel (other than in direct incineration) or other means to generate energy
- Solvent reclamation/regeneration
- Recycling/reclamation of organic substances which are not used as solvents
- Recycling/reclamation of metals and metal compounds
- Recycling/reclamation of other inorganic materials
- Regeneration of acids or bases
- Recovery of components used for pollution abatement
- Recovery of components from catalysts
- Used oil re-refining or other reuses of previously used oil
- Land treatment resulting in benefit to agriculture or ecological improvement
- Uses of residual materials obtained from any of the recovery operations specified above in this part
- Exchange of wastes for submission to any of the recovery operations specified above in this part
- Accumulation of material intended for any operation specified in this part

Box ~~1~~8: Annex III

Expected releases and transfers

~~42.~~45. Each individual source category as listed in annex I releases or transfers a different set of pollutants. In table ~~7~~ 10 an indicative list is given of the pollutants for which releases or transfers can be expected that might be above the reporting thresholds for each of the annex I activities.

~~43.~~46. The pollutants are indicated in release to air (a) and water (w) and for off-site transfer (o), respectively. This indicative list is presented to assist Parties in identifying the pollutants that are likely to be emitted by a specific source category of annex I of the PRTR Protocol and can be used as a checklist for reporting. Whether or not a pollutant is

released or transferred above the threshold value depends on the specific characteristics of the facility.

Table ~~7~~10: Sector-specific checklist for pollutants likely to be released or transferred by source categories of annex 1activities (a = release to air, w = release to water, o = off-site transfer). ~~[Note: this table to be updated and corrected with assistance of UoT]~~

No.		Activity	1	2.	3.	4.	5.	6.	7.	8.
		Pollutant	Energy sector	Production and processing of metals	Mineral industry	Chemical industry	Waste and waste -water management	Paper and wood production and processing	Intensive livestock production and aquaculture	Animal and vegetable products from the food and beverage sector
1	74-82-8	Methane (CH_4)	A			a	a		a	a
2	630-08-0	Carbon monoxide (CO)	A	a	a	a				
3	124-38-9	Carbon dioxide (CO_2)	a	a	a	a	a	a	a	a
4		Hydro-fluorocarbons (HFCs)		a	a		a			
5	10024-97-2	Nitrous oxide (N_2O)	a			a				
6	7664-41-7	Ammonia (NH_3)		a		a	a		awo	w
7		Non-methane volatile organic compounds (NMVOC)	a	a	a	a	a	a		
8		Nitrogen oxides (NOx/NO_2)	a	a	a	a	a	a	a	a
9		Perfluorocarbons (PFCs)		a		a	a			
10	2551-62-4	Sulphur hexafluoride (SF_6)								
11		Sulphur oxides (SOx/SO_2)	a	a	a	a	a	a	a	
12		Total nitrogen			wo	wo	wo	wo	wo	wo
13		Total phosphorus			wo	wo	wo	wo	wo	wo
14		Hydrochlorofluorocarbons (HCFCs)		a	a	a	a	a	a	a
15		Chlorofluorocarbons (CFCs)								
16		Halons		a	a	a	a	a	a	a
17	7440-38-2	Arsenic and compounds (as As)	aw	awo	awo	awo	awo			
18	7440-43-9	Cadmium and compounds (as Cd)	aw	awo	awo	awo	awo			
19	7440-47-3	Chromium and compounds (as Cr)	aw	awo	awo	awo	awo			
20	7440-50-8	Copper and compounds (as Cu)	aw	awo	awo	awo	awo			
21	7439-97-6	Mercury and compounds (as Hg)	aw	awo	awo	awo	awo			
22	7440-02-0	Nickel and compounds (as Ni)	aw	awo	awo	awo	awo			
23	7439-92-1	Lead and compounds (as Pb)	aw	awo	awo	awo	awo			

No.		Activity	1	2.	3.	4.	5.	6.	7.	8.
		Pollutant	Energy sector	Production and processing of metals	Mineral industry	Chemical industry	Waste and waste -water management	Paper and wood production and processing	Intensive livestock production and aquaculture	Animal and vegetable products from the food and beverage sector
24	7440-66-6	Zinc and compounds (as Zn)	aw	awo	awo	awo	awo			
25	15972-60-8	Alachlor				awo	awo			
26	309-00-2	Aldrin				awo	awo			
27	1912-24-9	Atrazine				awo	awo			
28	57-74-9	Chlordane				awo	awo			
29	143-50-0	Chlordecone				awo	awo			
30	470-90-6	Chlorfenvinphos				awo	awo			
31	85535-84-8	Chloro-alkanes, C_{10}-C_{13}				awo	awo			
32	2921-88-2	Chlorpyrifos				awo	awo			
33	50-29-3	DDT				awo	awo			
34	107-06-2	1,2-dichloroethane				awo	awo			
35	75-09-2	Dichloromethane				awo	awo			
36	60-57-1	Dieldrin				awo	awo			
37	330-54-1	Diuron				awo	awo			
38	115-29-7	Endosulphan				awo	awo			
39	72-20-8	Endrin				awo	awo			
40		Halogenated organic compounds (as AOX)		w		awo	awo	w		
41	76-44-8	Heptachlor				awo	awo			
42	118-74-1	Hexachlorobenzene (HCB)				awo	awo			
43	87-68-3	Hexachlorobutadiene (HCBD)				awo	awo			
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)				awo	awo			
45	58-89-9	Lindane				awo	awo			
46	2385-85-5	Mirex				awo	awo			
47		PCDD + PCDF (dioxins + furans) as Teq	a	a	a	awo	awo	a		
48	608-93-5	Pentachlorobenzene				awo	awo			

No.		Activity	1	2.	3.	4.	5.	6.	7.	8.
		Pollutant	Energy sector	Production and processing of metals	Mineral industry	Chemical industry	Waste and waste -water management	Paper and wood production and processing	Intensive livestock production and aquaculture	Animal and vegetable products from the food and beverage sector
49	87-86-5	Pentachlorophenol (PCP)				awo	awo			
50	1336-36-3	Polychlorinated biphenyls (PCBs)				awo	awo			
51	122-34-9	Simazine				awo	awo			
52	127-18-4	Tetrachloroethylene (PER)				awo	awo			
53	56-23-5	Tetrachloromethane (TCM)				awo	awo			
54	12002-48-1	Trichlorobenzenes (TCBs)				awo	awo			
55	71-55-6	1,1,1-trichloroethane				awo	awo			
56	79-34-5	1,1,2,2-tetrachloroethane				awo	awo			
57	79-01-6	Trichloroethylene				awo	awo			
58	67-66-3	Trichloromethane				awo	awo			
59	8001-35-2	Toxaphene				awo	awo			
60	75-01-4	Vinyl chloride				awo	awo			
61	120-12-7	Anthracene				awo	awo			
62	71-43-2	Benzene				awo	awo			
63		Brominated diphenylethers (PBDE)				awo	awo			
64		Nonylphenol ethoxylates (NP/NPEs) and related substances				awo	awo			
65	100-41-4	Ethyl benzene				awo	awo			
66	75-21-8	Ethylene oxide				awo	awo			
67	34123-59-6	Isoproturon				awo	awo			
68	91-20-3	Naphthalene				awo	awo			
69		Organotin compounds (as total Sn)				awo	awo			
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)				awo	awo			
71	108-95-2	Phenols (as total C)				awo	awo			
72		Polycyclic aromatic hydrocarbons (PAHs) b/				awo	awo			
73	108-88-3	Toluene				awo	awo			

No.		Activity	1	2.	3.	4.	5.	6.	7.	8.
		Pollutant	Energy sector	Production and processing of metals	Mineral industry	Chemical industry	Waste and waste -water management	Paper and wood production and processing	Intensive livestock production and aquaculture	Animal and vegetable products from the food and beverage sector
74		Tributyltin and compounds				awo	awo			
75		Triphenyltin and compounds				awo	awo			
76		Total organic carbon (TOC) (as total C or COD/3)	wo	wo	wo	awo	awo	wo	wo	wo
77	1582-09-8	Trifluralin				awo	Awo			
78	1330-20-7	Xylenes				awo	awo			
79		Chlorides (as total Cl)				awo	awo			
80		Chlorine and inorganic compounds (as HCl)				awo	awo			
81	1332-21-4	Asbestos				awo	awo			
82		Cyanides (as total CN)				awo	awo			
83		Fluorides (as total F)				awo	awo			
84		Fluorine and inorganic compounds (as HF)				awo	awo			
85	74-90-8	Hydrogencyanide (HCN)				a	a			
86		Particulate matter (PM_{10})	a	a	a	a	a	a	a	a

Reporting

~~44.~~47. The requirements for facility-specific reporting are shown in Box ~~2~~ 9 (art. 7, para. 5).

Box ~~29~~: Article 7, paragraph 5

Article 7, paragraph 5
Each Party shall require the owners or operators of the facilities required to report under paragraph 2 to complete and submit to its competent authority, the following inf ormation on a facility-specific basis:
(a) The name, street address, geographical location and the activity or activities of the reporting facility, and the name of the owner or operator, and, as appropriate, company;
(b) The name and numerical identifier of each pollutant required to be reported pursuant to paragraph 2;
(c) The amount of each pollutant required to be reported pursuant to paragraph 2 released from the facility to the environment in the reporting year, both in aggregate and according to whether the release is to air, to water or to land, including by underground injection;
(d) Either:
(i) The amount of each pollutant required to be reported pursuant to paragraph 2 that is transferred off-site in the reporting year, distinguishing between the amounts transferred for disposal and for recovery, and the name and address of the facility receiving the transfer; or
(ii) The amount of waste required to be reported pursuant to paragraph 2 transferred off-site in the reporting year, distinguishing between hazardous waste and other waste, for any operations of recovery or disposal, indicating respectively with 'R' or 'D' whether the waste is destined for recovery or disposal pursuant to annex III and, for transboundary movements of hazardous waste, the name and address of the recoverer or disposer of the waste and the actual recovery or disposal site receiving the transfer;
(e) The amount of each pollutant in waste water required to be reported pursuant to paragraph 2 transferred off-site in t he reporting year; and
(f) The type of methodology used to derive the information referred to in subparagraphs (c) to (e), according to article 9, paragraph 2, indicating whether the information is based on measurement, calculation or estimation.

(a) Release determination methods

~~45.~~48. Many facilities already collect data suitable for determining releases and transfers to air, water and land. The release and transfer data on pollutants reported per facility can be based on three different principal determination methods:

(a) Measurements using standardized or accepted methods; often additional calculations are needed to convert the results of measurements into annual emission data.

(b) Calculations using nationally or internationally agreed estimation methods and emission factors, which are representative for the industrial sectors.

(c) Estimations (non-standardized) derived from best assumptions or expert guesses.

~~46.~~49. Measurements are derived from the direct monitoring of the releases and transfers of pollutants for specific processes at the facility, based on actual measurements of pollutant concentrations for its media. The term "measurements" refers to the results of standardized or accepted measurement methods (see appendix 3 of the guidance).

~~46.~~50. Types of measurements that can be used are compliance monitoring by authorities or prescribed self monitoring by facilities, process control measurements, worker exposure measurements or government permit or compliance measurements. These measurements can often directly be used to determine releases. Monitoring data needs to be taken frequently enough to account for normal variations in operating conditions

throughout the year. An average concentration can be used with an average flow rate to calculate the yearly emission.

~~47.~~51. Calculations determine releases and transfers of pollutants based on activity data (fuel used, production rate, etc.) and emission factors. In some cases more complicated calculation methods can be applied, using variables like temperature, global radiance etc. These cases should also be marked as calculations. Also, calculations based on a mass balance approach should be marked as calculations. Furthermore, the indication "calculation" is used whenever the emission calculation method is obtained from published references.

~~48.~~52. Estimations refer to releases and transfers of pollutants that are determined by expert judgment and not based on publicly available references. The indication "estimation" applies also for guesses of the emissions wherever internationally approved emission determination methodologies or good practice guidelines are lacking.

~~49.~~53. An overview of different types of determination methods for estimating releases and transfers of pollutants from facilities is given in table ~~4~~11 as an example.

Table ~~8~~11. Different types of determination methods for estimating releases and transfers of pollutants from facilities and classification as measurement (M), calculation (C) or estimation (E) [Unitar 1997]

Type of measurtement	Classification for PRTR
I. Direct Measurement	M
- Fugitive Air Emissions	M
- Measuring Point Source Air Emissions	M
- Measuring Surface Water Discharges	M
- Measuring Releases to Land	M
II. Materials Accounting and Mass Balance	C
- Estimating Fugitive Air Emissions by Materials Accounting	C
- Estimating Point Source Air Emissions by Materials Accounting	C
- Estimating Surface Water Discharges by Materials Accounting	C
- Estimating Releases to Land by Materials Accounting	C
III - Emission Factors	C
- Estimating Fugitive Air Emissions with Emission Factors	C
- Estimating Point Source Air Emissions with Emission Factors	C
- Estimating Surface Water Discharges and Releases to Land with Emission Factors	C
IV. Engineering Calculation	C / E
- Estimating Fugitive Air Emissions by Engineering Calculation	C / E
- Estimating Point Source Air Emissions by Engineering Calculation	C / E
- Estimating Surface Water Discharges by Engineering Calculation	C / E
- Estimating Releases to Land by Engineering Calculation	C / E

~~50.~~54. Measurements are not always considered as more reliable or accurate than calculations. For example, when determining the amount of CO_2 from fuel use released to the atmosphere from a point-source, the direct measurement of the CO_2 emission load

from stacks relies on the determination of a set of parameters as CO_2 concentration and the total flow off flue gas. Each of these introduces a new uncertainty and adds to the total uncertainty of the measurement.

~~51.~~55. A more thorough and extensive overview and description of methods can be found in the following documents:

(a) "Estimating Environmental Releases for Facility PRTR Reporting, Introduction and Guide to Methods" (United Nations Institute for Training and Research (UNITAR), January 1997);[11]

(b) IPPC Bref Monitoring.[12]

~~52.~~56. In annex III of the guidance, "Analytical Procedures for 86 Substances," an indicative list is given of:

(a) Release determination techniques;

(b) Measurement methods for relevant pollutants covered by CEN or ISO standards. This list is presented as guidance to the Parties regarding the availability of existing standardised measurement methods. Note that the use of other measurement methods is not precluded, but Parties should ensure that the analytical performance of alternatives is at least as good as that of the standardized methods.

Box 10~~3~~: Organisation for Economic Co-operation and Development (OECD) Resource Centre for PRTR Release Estimation Techniques

Resource Centre for PRTR Release Estimation Techniques (RETs)
The Resource Centre is an Internet site that has been developed by the Task Force on PRTRs (Pollutant Release and Transfer Registers) of the OECD's Environment, Health and Safety Programme under the lead of Environment Canada. The purpose of the site is to provide a clearinghouse of guidance manuals/documents of release estimation techniques for the principal pollutant release and transfer registries developed by OECD member countries. The manuals and documents include descriptive information on the sources of pollution and the pollutants that are released, as well as information on emission factors, mass balance methods, engineering calculations, and monitoring information. The Resource Centre will be updated on a regular basis to include additional and new documents available.
See http://206.191.48.253/

Example for a reporting form for facilities

[11] See http://www.unitar.org/cwm/prtr/pdf/cat5/estimating_rels.pdf

[12] See http://eippcb.jrc.es/cgi-bin/locatemr?ref_final_0203.pdf. The Integrated Pollution Prevention and Control (IPPC) Directive reference document on the general principles of monitoring is intended to provide information to guide IPPC permit writers and operators of IPPC installations in meeting their obligations under the IPPC Directive with regards to the monitoring requirements of industrial emissions.

53.57. Table 9 12 gives an example format for reporting of releases and off-site transfers of individual facilities. (EC recommends replacement of table with examples such as given in E-PRTR guidance)

Table 12. Format for the reporting of release and transfer data

Format for the reporting of release and transfer data

Reference year
Identification of the facility
Name of the parent company
Name of the facility
Identification number of facility
Street address
Town/village
Postal code
Country
Coordinates of the location
River basin district
NACE-code (4 digits)
Main economic activity
Production volume (optional)
Number of installations (optional)
Number of operating hours in year (optional)
Number of employees (optional)
Text field for textual information or website address delivered by facility or parent company (optional)
All Annex I activities of the facility (according to the coding system given in Annex I and the IPPC code where available)
Activity 1 (main Annex I activity)
Activity 2
Activity N
Release data to air for the facility for each pollutant exceeding threshold value (according to Annex II) (Releases to air)
Pollutant 1
Pollutant 2
Pollutant N
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated
T: Total in kg/year
A: accidental in kg/year
Release data to water for the facility for each pollutant exceeding threshold value (according to Annex II) (Releases to water)
Pollutant 1

Pollutant 2
Pollutant N
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated
T: Total in kg/year
A: accidental in kg/year
Release data to land for the facility for each pollutant exceeding threshold value (according to Annex II) (Releases to land)
Pollutant 1
Pollutant 2
Pollutant N
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated
T: Total in kg/year
A: accidental in kg/year
Off-site transfer of each pollutant destined for waste-water treatment in quantities exceeding threshold value (according to Annex II)
Pollutant 1
Pollutant 2
Pollutant N
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in kg/year
Off-site transfers of hazardous waste for the facility exceeding threshold value (according to Article 5)
Within the country: For Recovery (R)
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in tonnes/year
Within the country: For Disposal (D)
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in tonnes/year
To other countries: For Recovery (R)
Name of the recoverer
Address of the recoverer
Address of actual recovery site receiving the transfer
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in tonnes/year
To other countries: For Disposal (D)
Name of the disposer
Address of the disposer
Address of actual disposal site receiving the transfer

M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in tonnes/year
Off-site transfer of non-hazardous waste for the facility exceeding threshold value (according to Article 5)
For Recovery (R)
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in tonnes/year
For Disposal (D)
M: measured; Analytical Method used
C: calculated; Calculation Method used
E: estimated in tonnes/year
Competent authority for requests of the public:
Name
Street address
Town/village
Telephone No
Fax No
E-mail address

~~Identification of the facility~~			
~~Name of parent company~~ ~~Name of the facility~~ ~~Address / City of the facility~~ ~~ZIP Code / Country~~ ~~Co-ordinates of the location~~ ~~NACE-code (4 digits)~~ ~~Capacity / production volume (for capacity selection approach)~~ ~~Number of employees (for employee selection approach)~~ ~~Regulatory bodies (optional)~~ ~~Number of installations (optional)~~ ~~Number of operating hours in year (optional)~~			
~~Annex I activities/processes (according to annex I)~~		~~Activity codes (according to annex I)~~	
~~Activity 1 (main annex I activity)~~ ~~"~~ ~~Activity N~~		~~Code 1~~ ~~"~~ ~~Code N~~	
~~Air~~			
~~Releases to AIR for the facility for |each pollutant exceeding threshold value (according to annex II, column 1a or column 3)~~			
~~Pollutant 1, name and numerical identifier~~ ~~"~~ ~~Pollutant N~~	~~M: measured~~ ~~C : calculated~~ ~~E : estimated~~	~~in kg/year~~	
~~Water~~			
~~Emission data to WATER for the facility for each pollutant exceeding threshold value (according to annex II, column 1b or column 3)~~			
~~Pollutant 1, name and numerical identifier~~ ~~"~~ ~~Pollutant N~~	~~M: measured~~ ~~C : calculated~~ ~~E : estimated~~	~~in kg/year~~	
~~Land~~			
~~Releases of pollutant for the facility for each pollutant or waste exceeding threshold value (according to annex II, column 1c or column 3)~~			
~~Pollutant 1 name and numerical identifier~~ ~~"~~ ~~Pollutant N~~	~~M: measured~~ ~~C : calculated~~ ~~E : estimated~~	~~in kg/year~~	
~~Off-site transfer of pollutants in waste wate~~			
~~Transfers for wastewater treatment of pollutants exceeding threshold value (according to annex II, column 1b)~~			
~~Pollutant 1, name and numerical identifier~~ ~~"~~ ~~Pollutant N~~	~~M: measured~~ ~~C : calculated~~ ~~E : estimated~~	~~in kg/year~~	
~~Off-site transfers (non waster water)~~			
~~Off-site transfers of pollutant / waste for the facility for each pollutant or waste exceeding threshold value (according to annex II, column 2 or column 3)~~			
~~Pollutant 1 / waste1 name and numerical identifier~~ ~~"~~ ~~Pollutant N/ waste N~~	~~M: measured~~ ~~C : calculated~~ ~~E : estimated~~	~~Indication of: hazardous waste (hw) or other waste (ow), recovery (R) or disposal (D) and transboundary movements hazardous waste.~~	~~in kg/year~~
	~~Name and address of recoverer or disposer of each pollutant of transboundary and hazardous waste~~		

	Name and address of the actual recovery or disposal site of each transboundary and hazardous pollutant / waste

Table 9: Example format for reporting of releases and transfers of individual facilities (Germany: it seems to be much easier and clearer to prepare 3 different example reporting forms for the three different options.

B. Diffuse sources

54.58. The PRTR Protocol defines "diffuse sources" as the "many smaller or scattered sources from which pollutants may be released to land, air or water, whose combined impact on those media may be significant and for which it is impractical to collect reports from each individual source" (Article 2.9). This definition is so broad that it covers essentially all sources of pollution that are not point sources.

55.59. Each Party is to ensure that data on diffuse sources can be searched by each diffuse source category that has been included in the register.

56.The inclusion of diffuse sources is a core element of a PRTR, since the Protocol accommodates reporting on diffuse sources, given that emissions data in many countries show these can constitute the most important sources of releases for key 60. Ppollutants. For example, the 2000 Convention on Long-Range Transboundary Air Pollution (CLRTAP) air emission inventory[13] showed that across Europe, 25% of CO_2, 55% of NOx, 58% of CO and 27% of NMVOC originate from transport. Agriculture emits 49% of all methane (CH_4) and 65% of nitrous oxide (N_2O). In the Netherlands, nearly all releases to soil of nitrogen, phosphorus and heavy metals are attributed to agriculture.[14] In addition, agriculture in the Netherlands is responsible for a large share of releases of phosphorus (45%) and nitrogen (65%) to surface waters, while transport is responsible for a large part of releases of some organic pollutants, such as PAHs, to surface waters.

Obligation to report or take measures to initiate reporting of diffuse sources
Each Party shall present on its register, in an adequate spatial disaggregation, the information on releases of pollutants from diffuse sources for which that Party determines that data are being collected by the relevant authorities and can be practicably included. Where the Party determines that no such data exist, it shall take measures to initiate reporting on releases of relevant pollutants from one or more diffuse sources in accordance with its national priorities.

Box 211: Article 7, paragraph 7, Diffuse sources

[13] EEA, technical report 91, Annual European Community CLRTAP emission inventory, Copenhagen 2002.

[14] CCDM, Emissiemonitor, jaarcijfers 2000 en ramingen 2001 voor emissies en afval, Den Haag, 2002

Definition of diffuse source categories

~~57.~~61. The United Nations Institute for Training and Research (UNITAR) Guidance on Estimating Non-point Source Emissions[15] (1998) provides an overview and definitions of other (non-point or diffuse) sources from, e.g., domestic activities and consumer product use, transportation and traffic, agriculture and small- and medium-sized enterprises. Since many of the Parties to the Aarhus Convention already have signed other conventions and protocols, including the United Nations Framework Convention on Climate Change (UNFCCC) and United Nations Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution (LRTAP), the use of a standardized sectoral classification for sources is recommended. The Nomenclature For Reporting[16] (NFR) is a reporting structure that is used for submitting data to UNECE and the Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air pollutants in Europe (EMEP). The NFR is closely linked to the Common Reporting Format[17] (CRF) used for submitting data to UNFCCC. With adoption of these source categories a close correspondence can be brought into the PRTR system with activities that many of the parties already apply. The PRTR Protocol excludes non-anthropogenic (natural) sources.

62. Diffuse source pollution from agricultural activities is mainly associated with fertilizer and pesticide use and contributes to such water quality problems as eutrophication in surface water, nitrate accumulation in ground water and the leaching of nitrate to both. Releases arising from agriculture-related activities are often treated as diffuse sources because they are caused by a collection of individual events which are impractical to identify and measure as separate point sources. They may represent important contributions to total national pollutant release loads. Rough estimates of pollutant emissions from agriculture-related activities can often be obtained from primary production and use data. These include information on the types and quantities of crops produced, the formulation and volumes of pesticides and fertilizer used, animal censuses, etc. Computer models may be required to go beyond localized estimates to aggregate estimates for watershed or national level water bodies.[18]

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[15] UNITAR Guidance on Estimating Non-point Source Emissions~~-~~, 1998, http://www.unitar.org/cwg/publications/cw/prtr/prtr_en/prtr_tech_support_3_nov2003.pdf~~http://www.unitar.org/cwm/publications/prtr_tech_support_3.pdf~~

[16] Guidelines for Estimating and Reporting Emission Data under the Convention on Long-range Transboundary Air Pollution. See http://www.unece.org/env/documents/2003/eb/air/ece.eb.air.15.E.pdf

[17] Common Reporting Format (CRF). See http://unfccc.int/national)reports/annex_1_ghg_inventories/reporting_requirements/items/2759.php

[18] For a fuller discussion, see UNITAR op cit (1998).

~~A list of diffuse sources according the NFR and CRF structure is presented in table 10 below. [UK suggested to replace table 1 with text which includes information regarding emissions to water]~~

~~Table 10. list of diffuse source categories according NFR / CRF structure and proxy for determination of releases and transfers, using energy (Es), production (Pr) or population (Pp) statistics with extrapolation (X); see Determination of diffuse source data below.~~

~~CRF/NFR Code~~	~~CRF/NFR category~~	~~Above threshold facilities might occur?~~	~~Proxy for diffuse source estimation~~
~~1~~	~~Energy~~		
~~1.A~~	~~fuel combustion activities (sectoral approach)~~		~~Es~~
~~1.A.1~~	~~energy industries~~	~~+~~	~~Es / X~~
~~1.A.2~~	~~manufacturing industries and construction~~	~~+~~	~~Es / X~~
~~1.A.3~~	~~transport~~		~~Es~~
~~1.A.4~~	~~other sectors~~		~~Es~~
~~1.A.4.a~~	~~commercial / institutional~~		~~Es~~
~~1.A.4.b~~	~~residential~~		~~Es~~
~~1.A.4.b.i~~	~~residential plants~~	~~+~~	~~Es / X~~
~~1.A.4.b.ii~~	~~household and gardening (mobile)~~		~~Es~~
~~1.A.4.c~~	~~agriculture / forestry / fishing~~		~~Es~~
~~1.A.4.c.i~~	~~stationary~~		~~Es~~
~~1.A.4.c.ii~~	~~off-road vehicles and other machinery~~		~~Es~~
~~1.A.4.c.iii~~	~~national fishing~~		~~Es~~
~~1.A.5~~	~~other~~		~~Es~~
~~1.B~~	~~fugitive emissions from fuels~~	~~+~~	~~Es / X~~
~~1.B.1~~	~~fugitive emissions from solid fuels~~	~~+~~	~~Es / X~~
~~1.B.2~~	~~oil and natural gas~~	~~+~~	~~Es / X~~
~~2~~	~~Industrial processes~~		
~~2.A~~	~~mineral products~~	~~+~~	~~Pr / pp /X~~
~~2.A.1~~	~~cement production~~	~~+~~	~~Pr / pp /X~~
~~2.A.2~~	~~lime production~~	~~+~~	~~Pr / pp /X~~
~~2.A.3~~	~~limestone and dolomite use~~	~~+~~	~~Pr / pp /X~~
~~2.A.4~~	~~soda ash production and use~~	~~+~~	~~Pr / pp /X~~
~~2.A.5~~	~~asphalt roofing~~		~~Pr / pp~~
~~2.A.6~~	~~road paving with asphalt~~		~~Pr / pp~~
~~2.A.7~~	~~other including non fuel mining & construction~~	~~+~~	~~Pr / pp /X~~
~~2.A.7.1~~	~~glass production~~	~~+~~	~~Pr / pp /X~~
~~2.B~~	~~chemical industry~~	~~+~~	~~Pr / pp /X~~
~~2.C~~	~~metal production~~	~~+~~	~~Pr / pp /X~~
~~2.D~~	~~other production~~	~~+~~	~~Pr / pp /X~~
~~2.E~~	~~production of halocarbons and sf6~~	~~+~~	~~Pr / pp /X~~
~~2.F~~	~~consumption of halocarbons and sf6~~	~~+~~	~~Pr / pp /X~~
~~2.G~~	~~other~~	~~+~~	~~Pr / pp /X~~
~~3~~	~~Solvent and other product use~~		
~~3.A~~	~~paint application~~		~~Pr / pp~~
~~3.B~~	~~degreasing and dry cleaning~~		~~Pr / pp~~
~~3.C~~	~~chemical products, manufacture and processing~~	~~+~~	~~Pr / pp /X~~

~~CRF/NFR Code~~	~~CRF/NFR category~~	~~Above threshold facilities might occur?~~	~~Proxy for diffuse source estimation~~
~~3.D~~	~~other including products containing heavy metals and persistent organic pollutants~~	~~+~~	~~Pr / pp /X~~
~~4~~	~~Agriculture~~		~~Pr / pp~~
~~4.A~~	~~enteric fermentation~~	~~+~~	~~Pr / pp /X~~
~~4.B~~	~~manure management~~	~~+~~	~~Pr / pp /X~~
~~4.C~~	~~rice cultivation~~		~~Pr / pp~~
~~4.D~~	~~agricultural soils~~		~~Pr / pp~~
~~4.E~~	~~prescribed burning of savannas~~		~~Pr / pp~~
~~4.F~~	~~field burning of agricultural wastes~~		~~Pr / pp~~
~~4.G~~	~~other~~		~~Pr / pp~~
~~5~~	~~Land-use change and forestry~~		~~Pp~~
~~6~~	~~Waste~~		~~Pp~~
~~6.A~~	~~solid waste disposal on land~~	~~+~~	~~Pr / pp /X~~
~~6.B~~	~~waste-water handling~~	~~+~~	~~Pr / pp /X~~
~~6.C~~	~~waste incineration~~	~~+~~	~~Pr / pp /X~~
~~6.D~~	~~other waste~~	~~+~~	~~Pr / pp /X~~
~~7~~	~~Other~~		~~Pr / pp~~

Determination of diffuse source data

~~58.~~63. Releases from diffuse sources occur in two different types: below-threshold facilities for activities listed in annex 1 to the Protocol and releases and transfers from activities not listed in the annex I.

(a) Below-threshold facilities

~~59.~~64. A facility performing annex I activities may fall below the capacity or employee threshold and for that reason be excluded from the obligation to report (art. 7, para. 1, subsection b). In some sectors, e.g., the chemical industry, all facilities are obliged to report. A statistical extrapolation should be used to estimate the releases and transfers of pollutants of below-threshold facilities. This extrapolation may use economic or statistical data on production volumes, number of employees or added value to determine the releases and transfers in below-threshold facilities under the assumption of equal production efficiency.

~~60.As a starting point for this estimation data from individual facilities is necessary. Also the activity data of both threshold- and below-threshold facilities is needed. Extrapolation based on this activity data can then be performed to collectively estimate the release and transfer of pollutants from below-threshold facilities, dependant on industrial source category:~~

~~Releases and transfers of pollutants from below threshold facilities from = Releases and transfer of pollutants from annex I x (1-F)~~

annex I facilities

Box 3: Estimating below-threshold releases

61. Where, dependant of the basis used for extrapolation and in order of decreasing preference, F can be:

(a) (Total production of annex I category – production of annex I facilities)/ total production of Annex I category;
(b) (Total number of employees of annex I category – number of employees of annex I facilities) / Total number of employees of annex I category;
(c) (Total added value of annex I category – added value of annex I facilities) / Total added value of an Annex I category.

63. With this method the individual reporting of above-threshold facilities for annex I activities can be used to generate emission factors or other statistically based calculation methods to estimate releases and transfers.

(b).(a). Activities not listed in annex 1 of the Protocol

64.65. To estimate the contribution of other diffuse sources, appropriate emission factors which are linked to source parameters that are known or which can be easily obtained ("proxies") can be constructed. These source parameters could be, for example, the average number of vehicle miles traveled in the case of road traffic, or the size and composition of cultivated area, the tonnage of pesticide or fertilizer use and the locations where these chemicals are applied, in the case of agriculture. In this manner a reasonable estimate of aggregate emissions arising from other diffuse sources of certain pollutants can be constructed starting from simple parameters that are readily measured or obtained for each source type.

65.66. In order to determine diffuse source data, the Parties will need to obtain data about such variables as population density, traffic intensity, employees per enterprise in various economic sectors, land use, manufacturing value added, emissions per vehicle-km traveled by vehicle type (on and off-road), number of farm animals etc. Then statistical estimates of releases of items on the PRTR list can be made by means of computer models. One result can be spatially resolved emissions maps; another can be total releases of pesticides by the agricultural community or total NO_x from transport activities.

(c).(b). Designating an authority for diffuse source reporting

66.67. Each Party must ensure that its competent authority collects, or shall designate one or more public authorities or competent bodies to collect, the information on releases of pollutants from diffuse sources specified in paragraphs 7 and 8, for inclusion in its register.

Release determination techniques

~~67.~~68. A review of documents available from various countries and organizations (World Health Organization) shows several basic estimation methods which are commonly "repackaged" by various organizations for their own use. Often the basic methods are supplemented with additional new data and methods; however, the basic concept remains the same.

~~68.~~69. The most common method of estimating emissions, especially from point sources, is the use of emission factors. The emissions are estimated based on the production or activity level of the source, from which an emission level is calculated using existing emission factors. This method is widespread because it is both cost effective and provides good figures. The accuracy of the estimate can be increased as more agencies and organizations conduct measurements to validate the published emission factors.

(a) Release determination guidance documents

~~69.~~70. The United States Environmental Protection Agency (USEPA) maintains an extensive database of emission (release) factors. This database is widely distributed, and undergoes regular updates and refinements. Because of this USEPA emission (release) factors can often be found at the root of other emission (release) factor listings. The European Commission, with the CORINAIR project, has undertaken a considerable effort to develop emission (release) factors which are based on release measurements from European industries. There is frequent cross referencing between the two collections.[19]

~~70.~~71. The UNITAR Guidance on Estimating Non-point Source Emissions (1998) provides an introduction to non-point source release determination and outlines key issues with regard to their inclusion in national or regional pollutant inventories. It aims to inform PRTR designers on what methods and data requirements are entailed for the inclusion of non-point source releases in a national or regional PRTR system. The UNITAR Guidance also lists methods for determining releases from non-point and diffuse sources including: domestic activities and consumer product use; transportation and traffic; agriculture; small- and medium-sized enterprises; and natural sources. For each category, information is provided on the types of activities and pollutants typically involved, followed by an overview of the data needed and explanations of the available methods for determining the releases. Examples and simple calculations are provided throughout to illustrate the basic principles behind thedetermination methods used and the types of data needed.

[19] EMEP/CORINAIR Emission Inventory Guidebook - 3rd edition (September 2004). See http://reports.eea.eu.int/EMEPCORINAIR4/en.

71.72. The UNFCCC has issued the (revised) 1996 IPCC Guidelines to provide assistance in the preparation of national greenhouse gas inventories.[20] The Guidelines consists of a three-volume series:

(α)• The Reporting Instructions (Volume 1) which provides directions for assembling, documenting and transmitting completed national inventory data consistently, regardless of the method used to produce the determinations. The instructions provide the primary means of ensuring that all reports are consistent and comparable.

(β)• The Workbook (Volume 2) contains suggestions about planning and getting started on a national inventory and also contains instructions for calculating releases of carbon dioxide (CO_2) and methane (CH_4), as well as some other trace gases, from six major release source categories.

(χ)• The Reference Manual (Volume 3) provides a compendium of information on methods for determination of releases for a broader range of greenhouse gases and a complete list of source types for each. It also provides summaries of the scientific basis for the inventory methods recommended and gives references to literature.

V. DATA MANAGEMENT

1. This chapter gives guidance on how Parties could organise the PRTR data flows.

2. The operator assures the quality of the information they report (art. 10 (1)) that data quality objectives were met, ensure that the inventory represents the best possible measurements, calculation or estimations of releases and transfers of pollutants given the current state of best available information. The competent authority ensures the quality assessment according completeness, consistency and credibility (art. 10 (2)). Informal public feedback facilitates the exchange between public and operator. The public can address the operator or the competent authority to give feedback. The operator or the competent authority can give a response.

2.3.Figure 1 illustrates the different data flows.

[20] See http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm

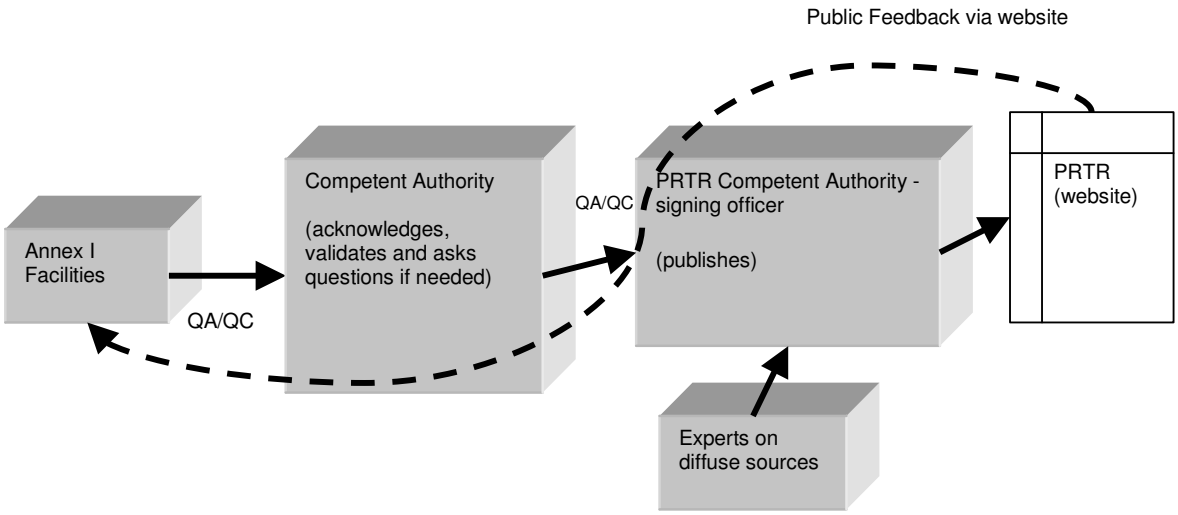


Figure 1: Data flows of PRTR data

~~3.~~4.The PRTR Protocol assumes that public access to the PRTR data and feedback from the public will result in improvement of the quality of the reported PRTR data. The data review, therefore, occurs after reporting. Contrary to other international protocols and conventions as the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution (LRTAP), the quality assessment requirements of the PRTR Protocol do not include independent review as part of the reporting process. This chapter on data management and quality assessment, therefore, does not intend to give guidance on data verification but focuses on data validation.

A. Data transfer

~~4.~~5.A Party implementing a PRTR should design the data transfer system to allow a smooth and possibly automated data flow from individual facilities to the competent authorities and to a publicly accessible web site.

~~5.~~6.The PRTR should be expandable. The PRTR should be designed in such a way that inclusion of other substances than the 86 annex II pollutants is possible. The PRTR should also be designed in a way that makes it possible to add other sources, categories etc. A relational database structure allows for this.

Article 9. Data collection and record-keeping
1. Each Party shall require the owners or operators of the facilities subject to the reporting requirements of article 7 to collect the data needed to determine, in accordance with paragraph 2 below and with appropriate frequency, the facility's releases and off-site transfers subject to reporting under article 7 and to keep available for the competent authorities the records of the data from which the reported information was derived for a period of five years, starting from the end of the reporting year concerned. These records shall also describe the methodology used for data gathering.
2. Each Party shall require the owners or operators of the facilities subject to reporting under article 7 to use the best available information, which may include monitoring data, emission factors, mass balance equations, indirect monitoring or other calculations, engineering judgments and other methods. Where appropriate, this should be done in accordance with internationally approved methodologies.

Box 1: Article 9 – Data collection and record-keeping

Responsibility

(a). Responsibility for data flows

~~6.~~7. Each Party is responsible for organizing its national PRTR activities, taking into account the requirements of the PRTR Protocol.

~~7.~~8. The Parties will collect and register the data on releases and transfers of pollutants per facility in the PRTR on a national level. The transfer of PRTR data should be properly organized to ensure that all quality aspects are met. This means that the allocation of responsibilities to the involved organizations should be based on a transparent framework of agreements. Streamlining the data transfer can be encouraged in several ways and on different levels of aggregation. In general three levels can be distinguished: the facility level, the competent authority level and the national government level of the Party.

~~8.~~9. Many Parties have already different authorities responsible for the collection of data on releases and transfers from facilities. For small facilities municipal and regional authorities are often the competent bodies, whereas the national authorities can be competent for the larger facilities. Either way a Party should assign one competent authority for the PRTR and arrange the data flows between the different authorities involved.

(b).Responsibility of facilities

~~9.~~10. The owners or operators of annex I facilities that are subject to reporting to the PRTR are responsible for:

(a) The collection of the data needed to determine the facility's releases and off-site transfers (art. 9, para. 1) using the best available information, which may

include monitoring data, emission factors, mass balance equations, indirect monitoring or other calculations, engineering judgments and other methods. Where appropriate, this should be done in accordance with internationally approved methodologies (art. 9, para. 2);

(b) Keeping records which describe the methodology used for determining the facility's releases and off-site transfers (art. 9, para. 1);

(c) Storing the records of the data from which the reported information was derived available for the competent authorities for a period of five years, starting from the end of the reporting year concerned (art. 9, para. 1);

(d) Assuring the quality of the information that is reported (art. 10, para. 1); and

(e) Reporting to the competent authority.

(c) Responsibility of competent authority

The competent authority is responsible for

(a) Collecting the reports on releases and transfers of pollutants of the annex I facilities under their area of authority;

~~(b)~~1. Performing quality assessment, validation (and if possible verification) with regard to the collected PRTR data of the annex I facilities on releases and transfers of pollutants;

~~(c)~~2. Determining the releases and transfers of pollutants of the below threshold facilities of annex I; ~~and~~

3. Collecting the data related to diffuse sources as e.g. ~~Determining~~ the releases and transfers of pollutants of other sources; and

~~(d)~~

~~(e)~~4. Publishing the PRTR data on a publicly assessable web site~~;~~. ~~and~~

~~(f)~~5. ~~Response on public feedback. [Examples to be added.]~~

Methods of reporting and transmitting data and software solutions

(a). Submitting facility data

~~10.~~11. Parties can use software tools to facilitate and streamline the data collection. Facility data on releases and transfers of pollutants can be submitted by:

- electronic submission, eg. over the Internet;
- magnetic or optic media like floppy disks or CD-ROMs; and
- paper forms.

~~11.~~12. Submission of the facility data to the competent authorities in an electronic form is most preferable and allows for an automated data flow. An electronic tool can also be

enhanced with checks on consistency. Letting facilities submit paper forms to the PRTR is the least preferred way as it is most costly to process and automate and is most prone to errors.

~~12.~~13. Parties can choose to provide an electronic tool for submitting the facility level data or letting software vendors develop commercial solutions that deliver the data in the required format. The recent reporting to European Pollutant Emission Register (EPER) is an example of this. All facilities in Austria have submitted their data by using electronic means. Also the data transfer used in Finland, Italy and Portugal was mainly electronic. The United States Environmental Protection Agency (EPA), responsible for the Toxics Release Inventory (TRI) also gives guidance on table and data formats to software vendors to develop third party solutions.

(b).Relational databases for PRTRs

~~13.~~14. A PRTR could be stored in an integrated relational database with data on releases and transfers of pollutants. A relational database consists of a collection of tables, each having a unique name. A table includes relationships with other tables forming a relational database.

~~14.~~15. A relational database structure could support quality assessment and quality control issues and prevent a broad range of copying and typing errors by screening data during its input. Exchange of data should be in open formats, like XML. XML (Extensible markup language) is a simple, flexible text format derived from SGML (ISO 8879). XML plays an important role in the exchange of a wide variety of data on the Internet and elsewhere.

~~15.~~16. A relatively simple relational database could be built around the structure as given below. Each emission record contains:

~~(a)~~a. A link to a list of pollutants, containing all properties and attributes of each pollutant such as:

- Thresholds;
- CAS numbers;
- Global warming potential; or
- Associated types of release

~~(b)~~b. A link to a list of emission types (emissions to air, emissions to water, offsite transfers of waste water, offsite transfers of waste, ...)

(c) A link to a list of locations, that either are

- Facilities for above threshold annex 1 facilities; facility properties and attributes are stored in a table "facilities"; or
- Administrative units (competent authorities: municipalities, provinces, etc.); administrative unit properties and attributes are stored in a table "Administrative Units"

(d) Each facility and administrative unit contains a link to a list of source-categories.

An example of such a structure is illustrated in figure 2.

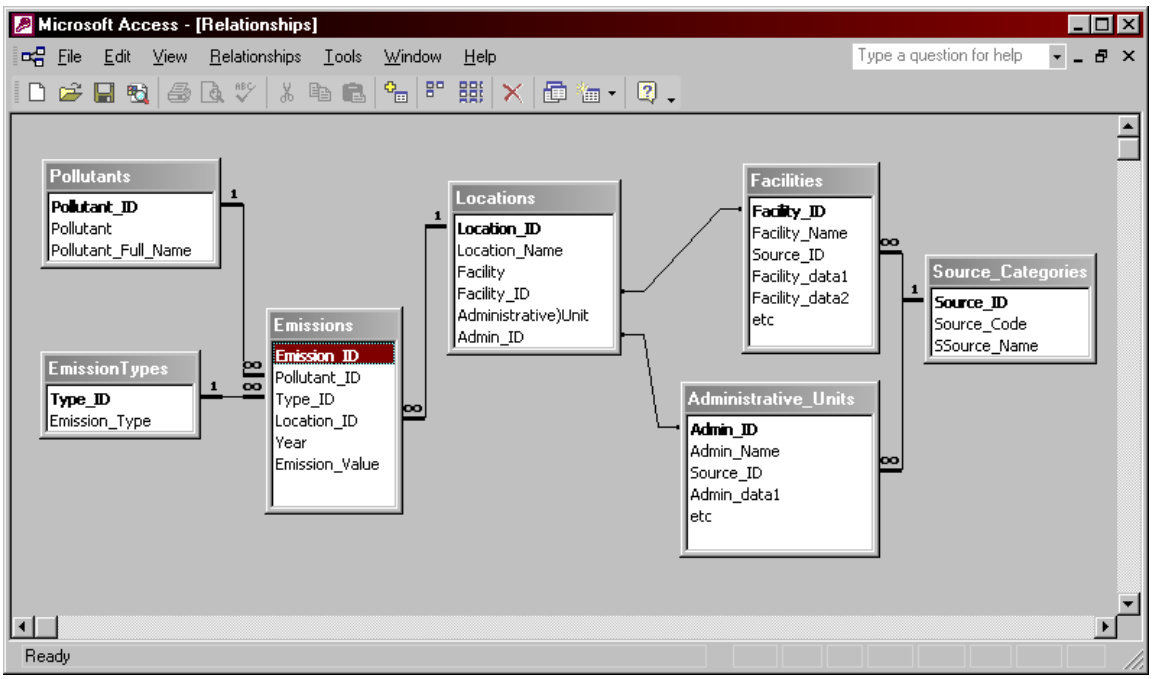


Figure 2: Relationships in a relatively simple PRTR relational database (screenshot of MS Access)

~~16.~~17. In developing a PRTR special attention has to be paid to data security. The data in the PRTR web site is to be marked as read- only and is only to be modified by an authorized senior officer of the publishing authority

~~17.~~18. Linking of PRTR data with geographical information enables the spatial representation of emission data and loads, either in administrative sectors (provinces, municipalities, water boards), in a grid structure or in a catchment area.

B. Quality assessment

Box 2: Article 10 – Quality assessment

Each Party shall require the owners or operators of the facilities subject to the reporting requirements of article 7, paragraph 1, to assure the quality of the information that they report. Each Party shall ensure that the data contained in its register are subject to quality assessment by the competent authority, in particular as to their completeness, consistency and credibility, taking into account any guidelines that may be developed by the Meeting of the Parties.
Each Party shall require the owners or operators of the facilities subject to the reporting requirements of article 7, paragraph 1, to assure the quality of the information that they report. Each Party shall ensure that the data contained in its register are subject to quality assessment by the competent authority, in particular as to their completeness, consistency and credibility, taking into account any guidelines that may be developed by the Meeting of the Parties.

Data validation

~~18.~~19. Validation is an important part of quality assessment, or quality assurance and quality control (QA/QC). Quality assessment is a system of routine activities, to measure and control the quality of the PRTR data as it is being developed. The QA/QC system should be designed to provide routine and consistent checks to ensure data integrity, correctness, and completeness, identify and address errors and omissions and to document and archive PRTR data and to record all QA/QC activities.

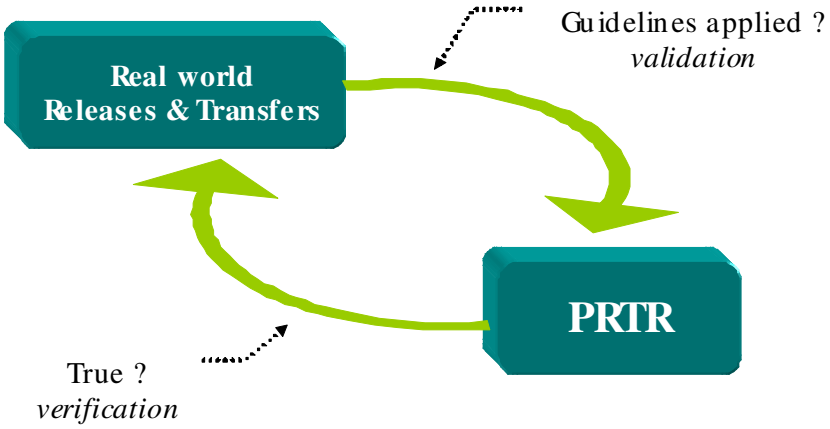
~~19.The Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories defines validation as follows: "Validation is the establishment of sound approach and foundation. In the context of emission inventories, validation involves checking to ensure that the inventory has been compiled correctly in line with reporting instructions and guidelines. It checks the internal consistency of the inventory. The legal use of validation is to give an official confirmation or approval of an act or product."~~

20. Validation activities include general methods such as accuracy checks on data acquisition and calculations and the use of approved standardized procedures for emission calculations, measurements, estimating uncertainties, archiving information and reporting. Also validation could include planned systems of review procedures conducted by personnel not directly involved in the PRTR compilation/development process. ~~Reviews verify that data quality objectives were met, ensure that the inventory represents the best possible estimates of releases and transfers of pollutants given the current state of scientific knowledge and data available and support the effectiveness of the validation. In a PRTR this review is happening by means of public feedback.~~

21. The data validation is the responsibility of the Parties. Before publishing the data in the PRTR, the Parties should ensure that the data is complete, consistent and reported according to the requirements of the PRTR Protocol and its guidance document.

22. Validation by the Party focuses on whether or not guidance has been applied correctly. This does not exclude that further sources of information (such as "ground truthing"), while important, are not part of a data collection and dissemination process of

a PRTR (see Figure 3) but can be used for an error-management procedure.



23. Figure 3 Quality assessment of PRTR data on releases and transfer of pollutants and public feedback [‘validation’ and ‘verification’ are to be deleted from figure 3]

24. Issues related to QA/QC and data validation and quality assessment are completeness, consistency and credibility of the data on the releases and transfers of pollutants. Completeness can be defined on two aspects:

(a) information on all (expected) emissions; and

(b) all information that is material to users for assessing the reported data on releases and transfers of pollutants. This information should appear in the report in a manner consistent with the declared boundaries, scope and time period.

25. Consistency is the unambiguous and uniform use of definitions, source identification and methodologies for the estimation of emissions over several years to allow trend analysis. By using standardized formats, Parties will be able to compare the data with previous data. As facilities might be bought and sold, owners might differ from year to year. Parties are recommended to use a facility identifier that will be consistent over time despite such changes in ownership.

26. Credibility refers to the trustworthiness, authenticity or reliability of the data. In the context of PRTRs consistency and credibility are closely linked. If the approaches and data sources used in an inventory development project are considered consistent, then users will have an acceptable degree of confidence in the emissions data developed from those techniques.

27. Another important issue is transparency. Transparency supports credibility and consistency and is used to represent the condition of being clear and free from pretence. For the interpretation of the data on releases and transfers of pollutants, it is important to know how the data collection was performed, how the releases and transfers of pollutants were measured or estimated, which methodology and emission factors were used to

estimate emissions, what the units of the reported data are and confirmation that validation was done by the competent authorities. It is the responsibility of the member States to establish the reporting requirements for industry and the methodologies to be used.

Techniques for data validation

Techniques for data validation that can be used are:
- format checks
- completeness checks
- reasonableness checks and limits

Format checks are to ensure that correct formats are used throughout the process of collecting the data of the releases and transfer of pollutants. These checks can be used in the submission of facility level data and also in establishing data of other and diffuse sources.

Completeness checks are to confirm that 1) estimates are reported for all source categories and to check that known data gaps that result in incomplete source category emissions estimates are documented and 2) that all information for assessing the reported data on releases and transfers of pollutants is available and consistent with the declared boundaries, scope, and time period.

Box 3: Techniques for data validation

Data presentation

28. The PRTR offer an aggregated overview with the national totals of all reported releases and transfers. Presentation of ~~this~~ these data must be in both aggregated and non-aggregated form~~s~~ (art 5, paragraph 1) along two~~hree~~ dimensions as:

~~(α)~~• Pollutants;

~~(β)~~• **activities**~~sources or sectors~~.

The reports with aggregated national totals can be used for other international protocols and will reduce duplication of efforts.

29. The PRTR register must present the information on releases of pollutants from diffuse sources in an adequate spatial disaggregation (art. 7, para. 7). For this geographic information systems (GIS) can be used. GIS is a powerful tool which presents layers of information in a geographical way. This implies that the releases and transfers of pollutants of annex I facilities ~~are~~ connected with their geographical co-ordinates are shown on the maps, e.g. England and Wales' In Your Backyard and the U. S. Toxics Release Inventory, but not all national systems have done so.

30. In the relational database structure of figure 2 such geographical co-ordinates could be stored as properties of the locations (facility or administrative unit).

What's in Your Backyard?
Environment Agency's web site "What's in Your Backyard" is an example a PRTR with spatial disaggregation. The web site gives on-line access to a range of environmental information for England and Wales, including the Pollution Inventory, which is a PRTR of facilities.~~the Environment Agency's data for England and Wales and access to the Pollution Inventory~~. Information on pollution hazards of waste facilities, water quality, discharges to sea, floodplains

and landfill sites can also be accessed~~Further ratings of pollution hazards of local waste facilities and data on water quality discharges to sea, floodplains and landfill sites can be accessed~~. [http://www.environment-agency.gov.uk/maps]~~[http://216.31.193.171/asp/1_introduction.asp]~~

Box 4: What's In Your Backyard? Online access to spatially disaggregated information

Timetable

Article 8

1. Each Party shall ensure that the information required to be incorporated in its register is publicly available, compiled and presented on the register by calendar year. The reporting year is the calendar year to which that information relates. For each Party, the first reporting year is the calendar year after the Protocol enters into force for that Party. The reporting required under Article 7 shall be annual. However, the second reporting year may be the second calendar year following the first reporting year.

Box 5: Article 8

31. The PRTR Protocol sets forth an annual reporting cycle obligation for Parties. However, in consideration of the problems that some Parties may have in setting up a PRTR, including compiling and validating the necessary information, the PRTR Protocol establishes flexibility in incorporation and publication of PRTR data. Parties that are economic integration organizations, such as the European Community, report according to a different timetable.

32. Box ~~5~~ 6 gives the reporting timetable for the Pollution Inventory of England and Wales.

Reporting timetable for Pollution Inventory of England & Wales
(competent authority: the Environment Agency of England & Wales (EA))

Legal notice valid for 3 years issued to operators of permitted facilities requiring annual mass emissions to be reported against a standard substance list. Issued by 31st March 2005 and 2008.
Reminder letters sent annually to operators by 20th December.
Data submitted by operators (either electronically or on paper forms) between 1st Jan and 28th Feb each year following the reporting year in question.
Data on paper forms entered into database by EA staff by 31st March.
Data validated by EA staff by 5th April.
Overview data reviewed and outstanding problems resolved by 30th April.
Data extract prepared for 'What's in your backyard' and published annually by 31st July.

Box ~~5~~6: Example of national reporting timetable

One year gap between the first reporting year and the second reporting year

33. Article 8 establishes an annual reporting cycle. Nevertheless, for the second cycle, the PRTR allows that the second reporting year may be the second calendar year following the first reporting year. This option is initially conceived for Parties that would have to put in place a PRTR for the first time and build up the organizational structure from scratch.

Exception for the regional economic integration organizations

2. Each Party that is not a regional economic integration organization shall ensure that the information is incorporated into its register within fifteen months from the end of each reporting year. However, the information for the first reporting year shall be incorporated into its register within two years from the end of that reporting year.

3. Each Party that is a regional economic integration organization shall ensure that the information for a particular reporting year is incorporated into its register six months after the Parties that are not regional economic integration organizations are required to do so.

Box ~~6~~7: Article 8, paragraphs 2 and 3 – Reporting time table continued

34. As in the case of the reporting cycle, the two-year option is thought to be useful for Parties that would have to put in place this type of register for the first time.

~~35.According to the calendar proposed by the PRTR Protocol, the public may not have access to data for the reporting year until 15 months or more[21] after the reporting year, a long delay to achieve the goals of a PRTR. Some countries have succeeded in reducing the time to collect, validate and publish the data to 12 months.~~
~~An example is given below:~~

~~Country X ratifies the PRTR Protocol and it enters into force for that Country X in 2006. The first reporting year is therefore 2007. Country X, as a Party, has then the option of:~~
~~(a)publishing the report in 2008; or~~
~~(b)publishing the report in 2009~~

~~Country X can then base the second report on data from 2009. For the remaining years, the annual cycle should be respected.~~

~~**Proposed time table**~~

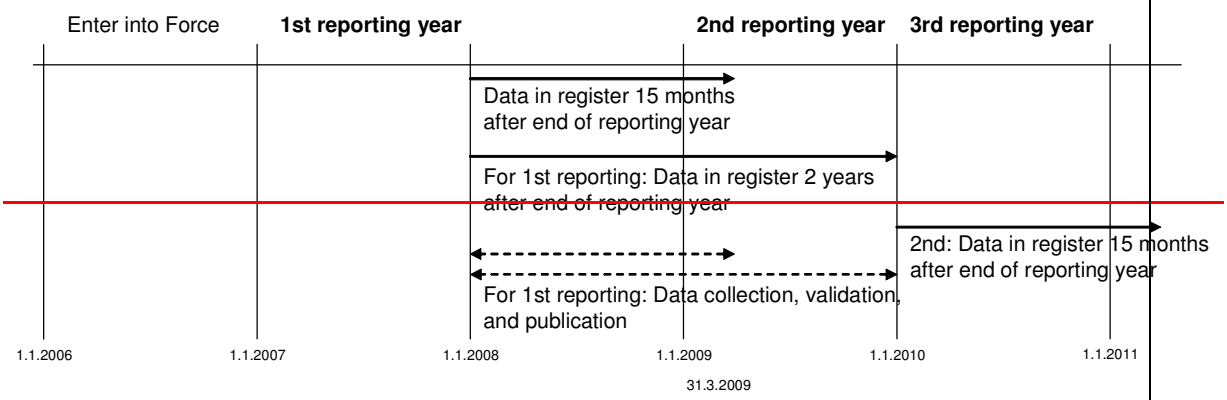
~~Phase~~	~~J~~	~~F~~	~~M~~	~~A~~	~~M~~	~~J~~	~~J~~	~~A~~	~~S~~	~~O~~	~~N~~	~~D~~	~~J~~	~~F~~	~~M~~
~~Collection /notification~~															
~~Validation/ notification~~															
~~Publication/ dissemination~~															

~~Box 7: Proposed time table for collection, validation/notification and publication/dissemination~~

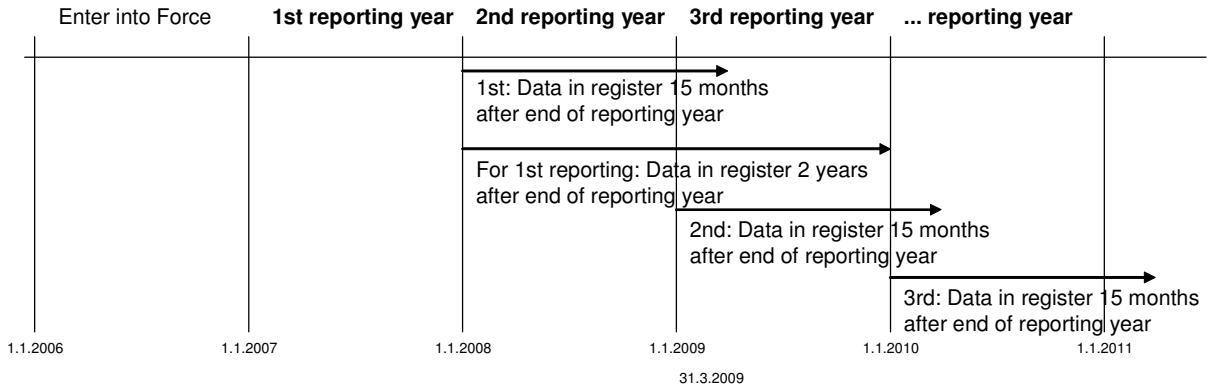
~~(Germany proposedsdeleting the above paragraph and substituting the following:~~

35. Concerning the first reporting year an example is given below (presuming that the ~~protocol~~ Protocol enters into force for the Party in 2006):

[21] or for regional economic integration organization, until 21 (or 30, if the option of two years is adopted).



36. If a Party does not need the ~~2~~ two years to publish its data, the following example shows the "Reporting Cycle" according to ~~A~~article~~.~~ 8 of the PRTR-Protocol in this case:



~~36.~~37. The publication and dissemination of PRTR data is the end of a long process which starts with the collection of data from the reporting facilities, the validation of data from the competent authorities and the final publication in the register. Each party should clearly establish a calendar for data collection, validation and publication. The validation of data may take time so Parties should make realistic calendars and make them publicly available.

~~37.~~38. Data compilation could take place during the first six months of the year following the reporting year, i.e. from January until June. Companies will the have to collect data on their releases and transfers and communicate them to the competent authority.

~~38.~~39. Data validation could take place during next six months of the year following the reporting year. This validation ~~will~~ may entail in many cases going back to companies and asking for clarifications or new data.

~~39.~~40. Data publication could take place in the first three months of the year after the next reporting year. For decentralized systems, the central competent authority may first have to gather all national information from the regional authorities.

~~40.~~41. Countries making use of the options of skipping one year can develop other calendars, e.g., data could be collected during the year after the ~~whole~~ reporting year, nine months can be used for the validation of data and publication can take place the during last three months.

Part three Data dissemination and public access

VI. DATA DISSEMINATION

A. Making PRTR data accessible

1. The PRTR Protocol's main objective is to enhance public access to information (art 1). The Protocol was created on the basis of article 5, paragraph 9 of the Aarhus Convention and is part of the Convention's pillar on access to information and in particular the dissemination of environmental data. Data accessibility is therefore one of the crucial issues for proper implementation of the Protocol.

2. The obligations set forth in the Protocol can be summarized as follows:

(a) The information is easily publicly accessible by electronic means, and when this is not possible, by effective non-electronic means;

(b) The information contained in the register is accessible without having to state an interest; and

(c) Access to the information contained in the register is free of charge.

3. Different parts of the Protocol affirm that the register is meant to be an electronic database and it should therefore be accessible by electronic means. Alternatives are to be provided where this is not possible. This obligation, however, does not refer to the dissemination as such of the data contained in the register but to the accessibility of the register.

4. Accessibility is a broad term that implies not only physical access to the information but also presentation of that information in a form that is easy to use and understand. Accessibility entails that the Register (as an electronic database) is easy to find; that the ~~citizen~~ public can easily locate specific information he or she is interested in within the register; and that such information is presented in a way that is comprehensible (i.e. not presented in an obscure fashion). This applies both to registers accessible through electronic means and registers accessible by other effective means.

5. It is clear that the Parties should aim at establishing a system where the PRTR information is disseminated through an easily accessible user-friendly website. However, this will not always be possible due to economic and technical constraints. From the wording of the Protocol it also seems clear that Parties should ~~should (Germany: may)~~ always leave open the possibility for access upon request. This interpretation is also in line with the Aarhus Convention.

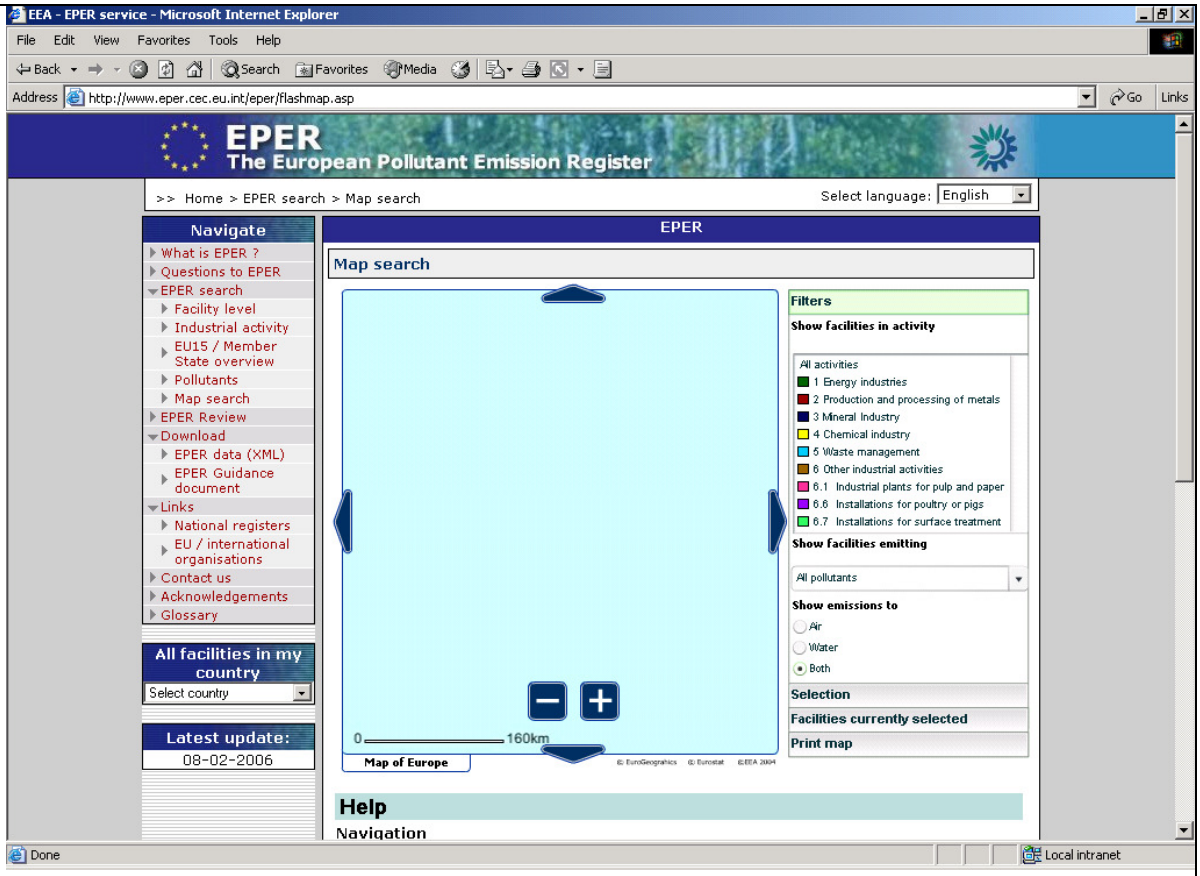
Electronic means

6. Article 11, paragraph 1 of the Protocol provides that Parties should ensure that the Register is publicly accessible, primarily via direct electronic access through public

communication networks. The goal behind this article is a computerized register, the information of which is available through the Internet (or in the future other more developed public communication networks). In fact, the Internet is specifically mentioned in article 5, paragraph 4. This implies the creation of a web site which provides access to all the PRTR information. Furthermore, an electronic database available through Internet is the most suitable form to ensure that the information is "continuously and immediately available" (as the Protocol intends).

7. According to article 4, subsection (h), the design of the Register, and therefore the web site, should be user-friendly and ensure accessibility. The way the information is presented should be a reflection of the structure of the register, allowing for individual searches by pollutant, media, facility and geographic area. The EPER web site pictured below provides an example. The most user-friendly formats are probably interactive electronic maps or geographic information systems (GIS) where the user can identify his/her neighborhood and the locations of reporting facilities (as colored spots) close to that area. Further links with information about the facility, pollutants and so on could be then accessed through this first identification.

8. In order to ensure that the accessibility is effective, the Party should inform potential users of the existence of the web site and the register along with the places where it can be consulted, for example, via mass media.



Welcome to EPER !

EPER is the **European Pollutant Emission Register** - the first European-wide register of industrial emissions into air and water.

It gives you access to information on the annual emissions of approx. 10000 industrial facilities in the 15 Member States of the EU as well as Norway and Hungary – mostly from the year 2001.

It lets you group information easily, by pollutant, activity (sector), air and water (direct or via a sewerage system) or by country.

It is also possible to see detailed data on individual facilities.

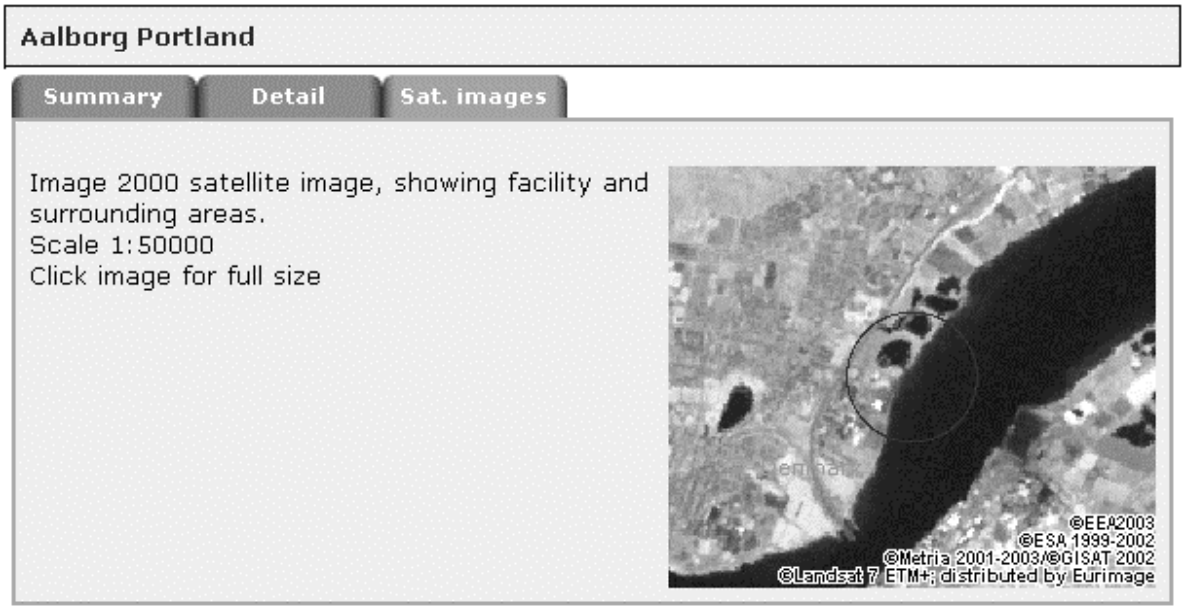
You can search by name or by clicking on a map. Alternatively you can look for the sources of a particular pollutant.

We hope you enjoy this website and we welcome your questions and comments!

~~The EPER web site was the result of the joint efforts of the European Commission, the European Environment Agency and the European Union (EU) member States. This web site allows research by map, media (for the moment only air and/or water), facility and industrial activity. Information on the facility includes satellite photographs of facility locations. Users can download reports by country from the site,~~

~~data in XML, and background information. It includes description of key substances, their impacts on human health and the environment as well as the relevant EPER reporting thresholds. For the time being the website is only available in English, but it is under revision for improvement.~~

Box 1: European Pollutant Emissions Register digital map (Map to be added)



Box 2: Satellite image of PRTR facility and environ

9. The national PRTR web site should be in the national language or languages. In addition, at least basic information of interest to the international community could be provided in an internationally more widespread language such as English.[22]

10. Article 11, paragraphs 2 and 3 introduce the obligation to provide this information without an interest to be stated and free of charge. This obligation will probably be addressed mainly when dealing with individual requests to access to PRTR data, but it is pertinent to mention it in cases of access to direct electronic means as well.

11. When a PRTR website has been developed and is accessible through the Internet, the Party should not ask ~~citizens~~ the public seeking information, as a condition for access

[22] This is proposed in the "Recommendation on the more effective use of electronic information tools to provide public access to environmental information" (ECE.MP.PP.2005.7 annex), to be considered for adoption by the Second Meeting of the Parties in Almaty, Kazakhstan. See http://www.unece.org/env/pp/mop2/mop2.docI/htm

to the website, to state why that they want access to the information. While such information cannot used to control access, it can be useful feedback to be obtained on a voluntary basis.

Non-electronic means

~~12.As mentioned, an Internet-based register will not always be easily publicly accessible. In many countries, only a limited number of citizens may have ready access to a computer and the internet. Where this is the case, if the register is available only via electronic means, large sections of the public would not have access to PRTR data. The PRTR Protocol has foreseen these cases and has provided for alternatives. **[Note: This section is rather short and seems rather pointless as it simply introduces section C]**~~

Facilitating electronic access

Article 11, paragraph 5
Where the information contained in its register is not easily public accessible by direct electronic means, each Party shall facilitate electronic access to its register in publicly accessible locations, for example in public libraries, offices of local authorities or other appropriate places.

Box. 3: Article 11, paragraph 5 - Publicly accessible locations

~~The wording of the article clearly refers to "facilitat[ing] electronic access".~~
12. ~~The Protocol foresees here situations where the general public does not have electronic tools, such as computers, or where access to Internet is not easy.~~ The wording of the article clearly refers to cases where a register is "facilitat[ing] electronic access". The Protocol foresees here situations where it is not easy to access electronic tools, such as computers, or where connection to the Internet is not easy. This could be the case in many countries, including many high-income countries, where only a limited sector of the population has access to Internet at reasonable price or knows how to use it, especially among certain age groups.

~~14.~~13. In these cases, the Parties must facilitate electronic access in publicly accessible locations. The Protocol provides two examples: public libraries and offices of local authorities. ~~This of course assumes that libraries and local authorities have computers linked to the Internet, which may not be the case.~~ Such access~~, however (and this is the case for accessibility in any appropriate location)~~ has to be made publicly known, for example by posting on the portal web site of the library (computer desk-top) the link to the PRTR.

Public locations for environmental information
The Organization for Security and Co-operation in Europe (OSCE) Centres: On 26 February 2004 OSCE made a call for the creation of a network of environmental centres to be set up in five Central Asian States (at the Third Regional Seminar on the Implementation of the Aarhus Convention in Central Asia, held in Dushanbe, Tajikistan). These centres could also provide information on PRTRs as well as access to PRTR web sites. The Ireland ENFO Centre: ENFO is a national service that disseminates information on environmental matters. Information materials produced by ENFO are available in many public

offices throughout the country, including local authority offices, public libraries, motor tax offices and some university and school libraries. ENFO also prepares teacher resource packs. Its web site provides a searchable library database, environmental tips for the home, thematic materials, and links to the web sites of environmental agencies, businesses and NGOs. This web site is in both English and Gaelic.

Box 4: Public locations for environmental information

~~15.~~14. Opportunity for using other public locations may differ from one country to another. These public locations can include the offices of regional authorities (in particular those in charge of environmental issues), regional ministries of environment, regional and national environmental agencies and authorities, universities or even at city halls. The location should be in a place where the public would logically and naturally go to obtain environmental information. This possibility could also be expanded to places where health information can be obtained.

Accessibility upon request

~~16.~~15. The second possibility foreseen by the PRTR Protocol, in cases where PRTR information is not easily publicly accessible by direct electronic means, is accessibility upon request. In this case, the person wishing the information must ask for it. This is the case not only where there is no accessibility through electronic means because the register is not available as an electronic database on the Internet, but also where the Internet is not easily accessible by the public~~the public does not have broad access to Internet. It can also be the case if there is information that has been kept confidential by the competent authority~~.

Article 11, paragraph 2
Where the information contained in its register is not easily publicly accessible by direct electronic means, each Party shall ensure that its competent authority upon request provides that the information by any other effective means, as soon as possible and at the latest within one month after the request has been submitted.

Box 5 : Article 11, paragraph 2 - Accessibility upon request

~~17.~~16. The procedure is very similar to that under the Aarhus Convention in that~~.~~ a~~A~~ny person wanting to obtain information contained in the PRTR will have access without having to explain why he/she wants to have access to that information. It is important that there is a clear competent authority to whom the person can address his/her request. The authority that is responsible for managing the PRTR may be designated to be responsible for handling the requests for information. Accessibility of the competent authority has to be ensured, for example by making its name and email, address or telephone number available.~~This competent authority has to be easy to identify, for example, by designating at all levels of government and in all regions, a person whose email, address and telephone number are available.~~ Another possibility is to create hotlines or information points where the public can obtain information about the person responsible or even PRTR data.

REQUESTING INFORMATION
The Environment Agency of England and Wales includes on its web site a section on "Your right to know" with specific information on the "How to make a request for

information" toolkit. This includes a telephone number, links to make a request for information online or to find the local office, an enquiry form and the address of the nearest Environment Agency office.The Environment Agency of England and Wales includes on its website a section on "Your Right to Know" with specific information on the "How to make a request for information" toolkit, including a telephone number, links to make a request for information online or find the local office, an enquiry form and the address of the nearest Environment Agency office to address a query [http://www.environment-agency.gov.uk/aboutus/1105530/310151](www.environment-agency.gov.uk)

Box 6: Requesting information in the UK

18.17. Once the information has been requested, the competent authority is obliged to answer within one month. The objective is to ensure that the public is informed in a prompt manner. In many cases, this will depend on the means used to transfer the information, which will have to be adapted to the necessities of the person requesting the information.

19.18. If the information requested is already available and does not require any preparation from the public authority, the time-limit should considerably be reduced. If some elaboration is required or the authority addressed does not hold the information, the time-limit of one month may be reasonable.

Other means

20.19. Although the PRTR is, or aims to be, an electronic database, electronic means will not always be effective to disseminate and make accessible PRTR data. Thus Parties should consider other means to disseminate PRTR information. , other means will be needed to effectively disseminate and makes accessible PRTR information.

21.20. Most countries that have PRTRs or similar systems publish annual PRTR-based reports (including the USA, UK, Netherlands, Canada and now the EU under its EPER system). These reports summarize the information at national level and also include analyses and describe trends, as well as provide some comparison of facilities and regions, identifying the largest pollutant or the most polluted regions. These reports can reach specific sectors of the public, provide overview information, and can also reduce the costs of having to deal with particular requests for information.

22.21. In countries where computers are scarce or access to Internet is difficult, paper versions are even more important for dissemination of the PRTR data. Such reports will also facilitate the authorities' task of fulfilling requests for information. When the person requesting access to PRTR data has a computer but not access to internet, for example, a CD Rom containing the PRTR information and maps can be a solution.

23.22. When such electronic supports do not exist, the Party should prepare paper versions of national information or more specific information affecting an area. In many cases the paper versions cannot be as comprehensive or detailed, or if they are, not as

easy to read as the Internet or electronic versions. Electronic versions provide multiple tools for research and allow for compilation of information in ways not always be possible in paper versions. Annual reports (at national, regional and/or local level) that compile PRTR data and address issues that could be of importance for the general public may ease dealing with requests for information.

~~24.~~23. Other means of dissemination include the provision of PRTR information and analyses based thereon to the media or via television teletexts.

Making PRTR information available through reports:

The CEC's "**Taking Stock**". The North American Commission for Environmental Cooperation (CEC) is an international organization created by the North American Agreement on Environmental Cooperation, the environmental side agreement to the North American Free Trade Agreement (NAFTA), signed by Canada, Mexico and the US. The CEC publishes Taking Stock, an annual trinational report on chemical pollution from industrial facilities.

Taking Stock 2001 is the eighth in the CEC's Taking Stock series on sources and management of industrial pollutants in North America. Its analyses are based on 1995–2001 data from the US Toxics Release Inventory (TRI) and the Canadian National Pollutant Release Inventory (NPRI). Results from 2001, trends over the seven years from 1995 to 2001 and from 1998 to 2001 are presented. (In English, French and Spanish)

EPER Review Report: According to the EPER decision, the European Commission reviews the reporting process and its results after each reporting cycle. The first EPER Review Report evaluates 2001 reporting and data delivered in the then 15 member States as well as Norway and Hungary, and compares EPER data with national data for selected greenhouse gases and air pollutants.

Spanish regional reports: Spain has so far not developed a GIS system for PRTR information, but each Autonomous Community has developed reports with facility information, similar to what could be obtained from a PRTR website. These reports provide an example of a first step for a system where a web site is not fully operative or where Internet access is not widely spread.

Box 7: Making PRTR information available through reports

Costs to Users

Article 11, paragraph 3: Subject to paragraph 4, each Party shall ensure access to information contained in this register is free of charge.
Article 11, paragraph 4: Each Party may allow its competent authority to make a charge for reproducing and mailing the specific information referred to in paragraph 2, but such charge shall not exceed a reasonable amount.

Box 8: Article 11, paragraphs 3 and 4 - Charges to users

~~25.~~24. In principle, and according to article 11, paragraph 3, access to PRTR information is free of charge. However, article 11, paragraph 4 allows the Parties to charge up to a reasonable amount for reproduction of and mailing the specific information requested. This could be the case for example, when the competent authority has to develop a specific report or CD Rom or has to mail the requested information to the concerned person.

~~26.~~25. The PRTR Protocol does not specify the maximum amount that could be charged. It only says that it has to be reasonable. Many countries consider that the charge should not exceed the costs of producing or reproducing the documents. Therefore, if the documents already exist, the only chargeable cost may be the cost of copying and mailing the report. [add waiver]

B. Confidentiality

~~27.~~26. The objective of the PRTR Protocol is to make information on polluting emission accessible. Although in principle all information available will be disseminated, Article 12 sets forth the conditions under which certain information on the register may be withheld from public view. The article is not mandatory. Each Party can decide whether to apply confidentiality criteria or, on the contrary, to make all emissions data accessible. ~~This is, for example, the case for EPER data.~~

Article 12

1. Each Party may authorize the competent authority to keep information held on the register confidential where the public disclosure of that information would adversely affect:
(a) International relations, national defense or public security;
(b) The course of justice, the ability of a person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;
(c) The confidentiality of commercial and industrial information, where such confidentiality is protected by law in order to protect a legitimate economic interest;
(d) Intellectual property rights; or
(e) The confidentiality of personal data and/or files relating to a natural person if that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for in national law.

The aforementioned grounds for confidentiality shall be interpreted in a restrictive way, taking into account the public interest served by disclosure and whether the information relates to releases into the environment.

Box 9: Article 12 - Confidentiality

~~28.~~27. The structure of article 12 is very similar to that of the Aarhus Convention's provisions on confidentiality. However, the grounds for confidentiality retained by the PRTR Protocol are more limited than those of the Aarhus Convention, which contains three additional grounds for confidentiality compared to the PRTR Protocol. The additional grounds were considered during the negotiations of the PRTR Protocol but in the end were discarded as being irrelevant or inappropriate in the context of a PRTR.

~~29.~~28. Article 12's wording has other differences from its parallel in the Aarhus Convention, especially in relation to the protection of economic interests as a specific ground for confidentiality. As a consequence of these differences, although the Protocol contains fewer grounds for confidentiality, its article 12 provides greater scope for confidentiality than its homologue in the Aarhus Convention.

~~30.~~29. Article 12 of the Protocol contains five exceptions for confidentiality. These are presented in the table, along with an overview of their use in practice in existing PRTR systems.

GROUND FOR EXCEPTION	USE IN PRACTICE
(a) international relations, national defense or public security;	• Used infrequently
(b) the course of justice, the ability of a person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;	• Used infrequently
(c) The confidentiality of commercial and industrial information, where such confidentiality is protected by law in order to protect a legitimate economic interest;	• Used by companies when information on chemicals substances could give advantage to competitors concerning production process and efficiency: mostly used in pollutant specific systems in reporting transfers
(d) Intellectual property rights; or	• Used by companies when information on chemicals could give advantage to competitors concerning the composition of certain preparations and products
(e) The confidentiality of personal data and/or files relating to a natural person if that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for in national law.	• Used by individual farmers operating pig and poultry farms

Table 1: Grounds for exception for confidentiality

~~31.~~30. The two grounds that are more likely to be claimed by companies or individuals are: confidentiality of commercial and industrial information (art. 12, para.1, subsection (c)); and confidentiality of personal data (art. 12, para..1, subsection (e)). These grounds will be dealt with in more detail below.

~~32.~~31. In order for certain information reported by a company or individual to be kept confidential and not disseminated in the PRTR system, the reporting company or individual may be asked to~~must~~ make a specific request with regard to confidentiality ground c), d) and e). When a request for confidentiality is made by a facility on one of the article 12, paragraph 1 grounds, the competent authority must take a decision on that request that strikes a balance between the private interest to keep the information confidential and the public interest to know that particular information. The last paragraph of article 12, paragraph 1, requires that the grounds for keeping data confidential must be interpreted restrictively~~strictly~~.

32. T
~~33.T~~wo aspects should be taken into account by a competent authority when dealing with confidentiality claims:

~~c)~~• The public interest served by disclosure; and
~~c)~~• Whether the information relates to releases into the environment.

The basic presumption under the PRTR Protocol is that all the information is public. This presumption places the burden of proving the existence of a real threat to the commercial or other interest on the company or person alleging the threat. Where a company or an

individual invokes a confidentiality ground, the company or individual may be asked to provide reasons to substantiate his/her claim, so that the competent authority can then verify whether there are genuine concerns. If there is no real danger for the private interest in disseminating the information, the competent authority should refuse the claim and allow the public access to the data.
~~In these cases, the company or individual should provide reasons to substantiate his/her claim, so that the competent authority can then verify whether there are genuine concerns. If there is no real danger for the private interest in disseminating the information, the competent authority should refuse the claim and allow the public access to the data.~~

~~34.~~33. If the assessment indicates that there is a genuine threat to the commercial or private interest, the competent authority must decide whether the public interest to know the information overcomes the private interest to keep the information confidential. If the information has already been made legally publicly available, e.g., under other programs, permits or reporting requirements, the confidentiality claim should be refused. This will imply an effort of coordination among different authorities.

~~35.~~34. In any case, those countries where PRTRs or similar systems are in place report only a few cases per year where it has been decided to keep some information confidential. For example, for the 2000 reporting year in the United States Toxics Release Inventory (TRI), only three out of 91,513 reports were listed as trade secrets reports. For the 1999 reporting year in Canada's National Pollutant Release Inventory (NPRI), only 6 out of 8,595 reports were kept confidential.

~~36.~~35. If a Party decides to allow withholding of information on the basis of one of the article 12, paragraph 1, grounds for confidentiality, it can be helpful to develop specific guidelines on how to apply the exceptions. The guidelines would include: the cases where each ground could apply; how to strike a balance between the public interest for disclosure (in this case, to make the information publicly available in the PRTR website) and the private interest to keep the information confidential; what type of information can be kept confidential, e.g., only the chemical name or only the name/address of the company; and how to present the reasons for the information being kept confidential. However, even with the help of guidelines, the exceptions cannot be automatically applied. In each case, there should be an analysis of each of the claims presented, keeping in mind that the exceptions have to be strictly applied. The Guidance Document for the implementation of the European PRTR includes in its chapter 1.2.4 several examples how to report in the case of confidentiality. [23]

~~37.~~36. In many cases, the facility requesting confidentiality will have a right to appeal a negative decision. The public, however, can also challenge the decision of the competent authority to grant confidentiality under article 14 of the PRTR Protocol, if, for example, a request for access to data kept confidential is wrongfully refused. More generally, for Parties to the Aarhus Convention, there should be no doubt about the existence of a right to access to justice in these cases.

[23] see http://www.prtr.europa.eu

Confidentiality of commercial or industrial information

~~38.~~37. Economic interests are the most likely ground for confidentiality that will be claimed by industrial facilities. In fact, this has been almost the only reason for granting confidentiality in countries with PRTRs or similar systems.[24]

~~39.~~38. The wording of this provision in the PRTR Protocol is slightly different than the wording of the Aarhus Convention and it provides broader ground for confidentiality. The Aarhus Convention states that:

> "A request for environmental information may be refused if the disclosure would adversely affect (…) (d) the confidentiality of commercial or industrial information, where such confidentiality is protected by law in order to protect a legitimate economic interest.
>
> Within this framework, information on emissions which is relevant for the protection of the environment shall be disclosed".

Article 12 of the PRTR Protocol states:

> "1. (c) The confidentiality of commercial and industrial information, where such confidentiality is protected by law in order to protect a legitimate economic interest;"
>
> "2. Within the framework of paragraph 1(c), any information on releases which is relevant for the protection of the environment shall be considered for disclosure according to national law." (Emphasis added)

~~40.~~39. In the Aarhus Convention context, once proved that the information is relevant to the protection of the environment (and in the case of PRTR this is obvious), the information has to be disclosed. In the context of the PRTR Protocol, once proved that the information is relevant for the protection of the environment, the information shall be considered for disclosure, and thus submitted to an evaluation in order to consider whether it should be disclosed or not. This provides greater potential for granting confidentiality.

~~41.~~40. The difference is related to the different contexts of the Convention and the Protocol. The Aarhus Convention refers to confidentiality in terms of passive dissemination (access to information upon request), whereas the PRTR Protocol does so in terms of active dissemination. Therefore, as a prior step, it is up to the competent authority responsible for PRTR data to decide whether the data concerned should be made publicly available or not. At the same time, in the context of the Protocol, all

[24] The importance of this ground of confidentiality is clear. For instance, the Commission for Environmental Cooperation (CEC) of North America, in the framework of its North American Pollutant Release and Transfer Register (PRTR) Project, issued a paper on Confidential Business Information comparing USA, Canada and Mexico systems (Issue paper #2: "Confidential Business Information", December 2002).

information included in the Register will intrinsically be relevant for the protection of the environment, due to the purposes and functioning of this type of register. This could explain the difference in the wording, as application of the same wording as in the Aarhus Convention will mean that the exception would be virtually inapplicable in practice.

42.41. In the case of off-site transfers, confidentiality on the ground of commercial and industrial interest would only be relevant when the information could serve to deduce by chemical inversion the production process and efficiency of the facility, and this could only happen in pollutant-specific reporting.

43.42. The competent authority should in any case bear in mind the obligation to restrictively interpret the grounds for confidentiality. As shown earlier in this section, cases where data has been kept confidential on the ground of trade secret are few.

Forms for Claiming Trade Secrecy

The US EPA has developed a five-page form for claiming trade secrecy of information to be submitted to the TRI. If t The US EPA determines that the claim is frivolous, it may assess a penalty of up to $25,000 per claim. If the information provided is false or misleading, the claimant can be punishable with a fine and/or imprisonment.

Presentation of information kept confidential

Article 12, paragraph 3

Whenever the information is kept confidential according to paragraph 1, the register shall indicate what type of information has been withheld through, for example, providing generic chemical information if possible, and for what reason it has been withheld."

44.43. The presentation of information that has been kept confidential may vary depending on the type of information. Where the name of the chemical is kept confidential, the chemical family or similar generic information should be provided. For example, one proposal to group the 86 pollutants into broad categories would list: heavy metals (no. 17-24), gaseous substances (no. 1-11, 14-16), pesticides (no. 25-30), chlorinated organic substances/parameters (AOX, Trichloromethane, dioxins, etc), other organic substances/parameters (Anthracene, Benzene, PAH, etc.) and other inorganic substances/parameters (hydrogen cyanide, total nitrogen, PM_{10}, chlorides, etc.).

45.44. Where personal data is kept confidential, all information except the name, address of the operator/owner and the geographical location of the facility should be given. Geographical information might be presented at a broader scale than in other cases (e.g., 10km instead of 1km), or at least the region where the facility operates.– However, restrictions should only be foreseen where this is necessary to protect the personal data.

46.45. In any case, the register should clearly mention, maybe in the portal of each search, the number of cases where confidentiality has been applied and the reasons for which the information has been withheld. The explanation should not be limited to indicate the ground that has served to withheld the information i.e., protection of economic interest. Rather, it should explain the reasons for which it was considered that disclosing the information will negatively affect the economic interest of the facility and the inexistence of an overriding public interest. For example, one legitimate ground could

be that disclosure of the name of the chemical plus the quantities released will allow competitors to deduce by chemical inversion the production process and efficiency of the facility.

Limiting confidentiality

In some countries, a form has been created for confidentiality claims, and only some specific data can be kept confidential.

For example, in USA only the chemical name can be kept confidential on the basis of commercial and industrial interest. All other information, such as the facility name and address and the amounts of releases and transfers, is included in the database. A generic name for the chemical is substituted.

The proposal for a Regulation to establish a European PRTR refers to Directive 2004/3/EC on Access to Environmental Information when dealing with confidentiality. It seems that the intention is to broadly interpret "information relating to emissions" and therefore not to allow confidentiality claims based on commercial and industrial information or protection of personal data. (However some concerns exist on the way Directive 2004/3/EC will work once combined with Directive 95/46/EC on protection of personal data).

C. Using PRTR information

~~47.~~46. PRTR data are useful for all sectors of society, including government, enterprises, NGOs, other stakeholders, workers or the general public.

- General public: PRTR data will help the public to be better informed and therefore to better participate in the decision making process for environmental issues. This will enhance democracy in general and environmental democracy in particular. The public may also pressure poorly performing companies to improve contributing to pollution reduction. PRTR data will help the public have information about pollution in their neighborhood and thus to gain knowledge of local health issues.
- Governments: PRTR data are useful to monitor facility compliance with permit requirements as well as national implementation of international commitments, such as plans for the reduction of greenhouse gas emissions. For example, PRTR systems could be linked to data needed for national and international emissions trading schemes. PRTR data help to identify activities that contribute to a specific environmental problem and consequently adopt more efficient regulatory action.
- Enterprises: reporting and estimation models will help companies to gain a better idea of their performance and efficiency thereby stimulating the introduction of more efficient processes which will in turn increase competitiveness. Furthermore, as information is provided for all facilities, PRTRs will help companies to better compare their performance with that of their direct competitors, creating an incentive for action (investment in more efficient technologies and processes). Making releases and transfers information publicly available will help to increase company accountability.

Showing how PRTR data can be used:

USEPA prepared in May 2003 a paper on "How are the Toxic Inventory Release Data Used" containing success stories from governments, academia, business and citizens on the use of PRTR information. See http://www.epa.gov/tri/guide_docs/2003_datausepaper.pdf

Putting PRTR information into context

48.47. The PRTR Protocol is mainly a tool for citizensthe public. PRTR data can only be useful if properly explained and put into context. Lay persons have to be able to approach PRTRs and the data in order to make analyses and draw conclusions. If those to whom it is addressed are unable to understand it, they will not be able to use it. A clear and attractive presentation of the data is essential to give incentives to citizens the public to approach and use PRTRs

49.48. As mentioned before, accessibility also entails that the information is understandable for all who consult a PRTR. This is especially important for information in PRTRs, as many pollutants are not well-known to lay persons. Putting PRTR information into context is implicit in the obligation to make PRTR information accessible. As mentioned before, co-operation with NGOs, civil organizations and the industrial sector will enhance the accessibility of the PRTR system by identifying the users' needs.

- Explanations of pollutants: Explanations should be geared to the general public. For example, clicking on a pollutant name, a box or a link to another website could provide users with the information to understand the type of substance and its properties
- Pollutant effects on health (environmental quality and impacts): No direct health risk information can be given by a PRTR, but iInformation on a pollutant should be supplemented by a clear explanation of its relationship to health effects. Many countries already have experience providing information on levels of ozone and other local air pollutants. Similar information can be provided for each pollutant including also the levels at which the pollutant is considered a health risk.
- E

Economic sectors and permit requirements: Descriptions of the weight of an economic sector in contributing to total emissions of certain pollutants can be also useful for the general public, especially for pollutants that are of general concern. Inclusion of information about permit requirements, e.g., the amount of a pollutant a company is authorized to release, will help the public interpret the information and identifying well-performing companies.

Putting PRTR information into context
The Environment Agency of England and Wales and Friends of the Earth (an NGO) worked together to improve the official inventory of industrial emissions, adding a Geographical Information System (GIS) for users to locate polluting facilities as well as other features. This

cooperation was a success, and with the improvements Friends of the Earth closed its own Factory Watch web site.

The Environment Agency for England and Wales and Friends of the Earth worked together to improve the official Pollutant Emission Inventory, adding a Geographical Information Systems (GIS) for users to locate polluting facilities as well as other features. This cooperation was a success, and with the improvements Friends of Earth closed its own Factory Watch web site.

The resulting Pollution Inventory provides fact sheets on pollutants in the "What's in Your Backyard" glossary. The information includes:

symbols indicating the potential hazards of each substance (eg health effects, local effects, global effects)
sources
chemical classification
the scientific name, alternative and trade names
CAS number
why the substance was selected for the Pollution Inventory
physical properties
potential uses
standard risk phrases
links to further information
controlling legislation and international agreements

The England and Wales pollution inventory provides fact sheets on pollutants under its "What's in your backyard" glossary. The information includes symbols indicating the potential hazards of each substance (e.g., health problems, local effects, global effects), sources of its releases to the environment, its Pollution Inventory Classification, links to explain terms used, the scientific name, other names, including trade names, CAS number, why the substance was selected for the Pollution Inventory, properties, potential uses, standard risk phrases for substances, possible local environmental impacts, possible global environmental impacts, possible health concerns, controlling legislation and international agreements and links for further information.

Linking PRTRs to supporting information

Article 5, paragraph. 5:

"Each Party should provide links, in its register to its relevant existing publicly accessible databases on subject matters related to environmental protection"

50.49. Since PRTRs are intended to be electronic databases, PRTR websites have the potential to become portals to environmental information, linking not only different PRTR data but also other relevant environmental and ancillary information that may be spread over different databases whose existence is not well known to the public. The PRTR Protocol has foreseen this and suggests (though this is not an obligation) that Parties link their PRTR systems to other accessible data bases on subject matters related to environmental protection.

51.50. Links to supporting websites dealing with health and pollutants issues could

include (see more details in Chapter 7):

- International organizations dealing with PRTRs or other pollutant emissions or release data and methods: in addition to UNECE website, other links can go to OECD, UNITAR, IOMC, North American Commission for Economic Co-operation and WHO.

~~o~~Issues of direct interest for the purposes of a PRTR: for example, to registers of chemicals covered by international conventions, such as the POPs Convention and to international health and environment guidelines. ~~These registers could furthermore be a first step in convergence of the waste-specific and pollutant-specific PRTR systems.~~

Links to Companies and Civil Society

~~52.~~51. While it is important to put PRTR data into context, sometimes it is difficult to provide all the information in a single website. Links to company and NGO websites can provide further information.

~~53.~~52. This can help to address concerns expressed by some companies that presentation of isolated PRTR data can create misleading impressions of their environmental performance. Links could be provided to company websites that put the information into context. Each company's site could describe, for example, the conditions of its permit or whether it is releasing pollutants within or below the permit requirements.

~~54.~~53. Other links could be provided to NGOs and other associations that use PRTR data: their sites could provide more information about the significance of the data, including health effects and name and shame efforts related to the PRTR Protocol or to the Aarhus Convention in general.

Providing links to supporting information
The UK Pollution Inventory website links not only to other national and international PRTR websites but also to international conventions dealing with specific substances, guidance documents, other national agencies providing additional information, such as DEFRA, NGOs working in a specific area (for example links to Environmental Defense's Scorecard) and even scientific institutions or companies where further information can be obtained.

Links to other PRTR databases

~~55.~~54. The PRTR is supposed to be a computerized database. However, the PRTR Protocol allows for the Parties to link several databases where relevant PRTR information can be found, allowing Parties cost savings in putting in place a PRTR system. A national PRTR website thus might simply be a link to a regional PRTR website. Parties that already have in place specific registers or websites dealing with pollution, for example in a specific media such as air, may wish to link these into a national PRTR.

Article 4: "In accordance with this Protocol, each Party shall establish and maintain a publicly accessible national pollutant release and transfer register that: … (j) is a structured, computerised database or several linked databases maintained by the competent authority."

Article 5.6: "Each Party shall provide links in its register to the pollutant release and transfer registers of other Parties to the Protocol and, where feasible, to those of other countries."

List of Internet links that could be included in a PRTR web site

~~o~~55. Other national, regional or international PRTR websites: The parties have the obligation to provide links to PRTRs of other Parties. Where feasible, the Parties are also obliged to provide links to PRTRs of countries that have not ratified the Protocol. These links could include the future E-PRTR, USA's TRI, Canada's NRPI, the Netherlands, UK, Japan, Australia and so on. The creation of Regional PRTRs could reduce the efforts and therefore the costs for many countries in setting up a PRTR (see section 7).

~~o~~56. Other register websites: the Parties can also provide links to specific registers dealing with other issues related to environmental protection in general and more precisely to pollution. These websites can be national or international. Examples include, for air pollution, the EMEP website, and existing websites on accidental releases or diffuse sources of pollution at national or regional level (even if not in a format compiling with PRTR Protocol requirements).

VI. BUILDING CAPACITY AND PUBLIC AWARENESS

1. Effective implementation of a PRTR system will require capacity building. A national initiative to develop a PRTR is thus an opportunity to review and strengthen relevant capacity in public authorities as well as in stakeholders, in particular the industries and facilities reporting to the register as well as the groups that will use its information. Moreover, public awareness and use are needed for a PRTR to function, so raising public awareness is closely tied to capacity building. The PRTR Protocol addresses both issues in article 15.

Article 15 – Capacity-Building

1. Each Party shall promote public awareness of its pollutant release and transfer register, and shall ensure that assistance and guidance are provided in accessing its register and in understanding and using the information contained in it.

2. Each Party should provide adequate capacity-building for and guidance to the responsible authorities and bodies to assist them in carrying out their duties under this Protocol.

Box 1: Article 15 – Capacity-building

2. Section A. below reviews capacity-building and section B. discusses public awareness. The PRTR Protocol also links international cooperation to capacity building:

this is the topic of section C. Section D. addresses the related topic of convergence of PRTR systems.

A. Capacity-building

3. The PRTR Protocol addresses countries with a range of economic conditions and different institutions and legal systems for environmental management. The scale and type of capacity building and awareness raising activities needed with thus differ. Some countries, including those with economies in transition, will face important challenges in strengthening their institutions, e.g., in such areas as environmental monitoring and information systems.

4. Each country acceding to the Protocol will need to integrate capacity-building and awareness raising activities into its overall strategy for PRTR development. Experience across countries has shown that several areas for capacity-building have proved crucial in PRTR development (IOMC, 2003). Based on this experience, countries developing PRTRs ~~should~~ may pay close attention to the following issues:

(a) Developing an appropriate national legal framework;
(b) Ensuring adequate financial means;
(c) Developing capacity on the part of reporting facilities to monitor or estimate pollutant releases and transfers accurately;
(d) Strengthening public authorities' human and technical capacity to process pollution data and to manage PRTR databases and web sites.

5. Methods for capacity-building can include workshops and training for government officials and for key stakeholder actors and representatives. In many countries, national research institutes and universities can play an important role developing appropriate methods and providing training. The use of international experience – through both multilateral forums as well as bilateral technical assistance – can also be quite valuable. Once a national PRTR system is in place, it can benefit from mechanisms to review its performance and provide for steady improvement. {proposal on mechanism for participation will be submitted later}

Strengthening government capacity

6. Countries beginning PRTR development may benefit strongly from cooperation with Parties that already have a system in place. International organizations such as UNITAR can also provide important expertise in planning. Funding for the early stages of PRTR development may be necessary. In general, international cooperation can help the body proposing a PRTR to build support across levels and sectors of government.

7. Initiatives to strengthen government capacity for PRTRs will be more successful if they are linked to efforts to strengthen related areas, such as industrial permitting and monitoring. Here, countries may need to improve communication and coordination among authorities. Different national bodies may be responsible for monitoring pollution to different media, such as air and water. In decentralized systems, coordination may

need to be strengthened between national and sub-national agencies responsible for pollution monitoring. This has been the case in EECCA countries, some of which are developing unified monitoring systems to strengthen coordination. PRTR development can provide a further opportunity for such efforts.

8. Improving the information technology base and capacity of environmental authorities will also be important. Ties with sub-national authorities will also be important, as these may have close knowledge of and working relationships with main polluting facilities. In this context, a strong pilot PRTR, hosted by an active regional government, will be useful to build momentum for introducing a national PRTR. The local or regional officials who have gained experience in piloting the regional PRTR can help to share skills with their colleagues in other regions.

Effective reporting by facilities

9. An effective PRTR depends on timely and accurate reporting from facilities. National authorities may need to develop:

- Appropriate reporting forms and methods – indeed, PRTRs can provide an opportunity to improve existing reporting methods, e.g. through on-line reporting; and
- Guidance documents for technical issues related to pollution monitoring or estimation (these can, in particular, be based on part II of this guidance).

~~9.~~10. Pilot PRTR projects can help test and refine these methods. Moreover, workshops and discussions with representatives from reporting facilities will be useful to ensure that the methods are understood. Industry associations can play an important role in disseminating methods and possibly also in providing training. It may be useful to focus attention first on sectors with high emissions – these commonly include energy, chemicals, oil refining, and ferrous and non-ferrous metals.

~~10.~~11. When the European Union established its European Pollutant Emission Register (EPER), European Union (EU) officials held workshops and met with authorities in each member country to review implementation requirements. In addition, in Germany, implementing officials held ~~two~~ three rounds of national workshops with all relevant stakeholders, including facility representatives, to review EPER requirements. The first workshops were held at the introduction of the new system, to explain the reporting requirements. The second were held in conjunction with the first reporting cycle, to help resolve technical questions in monitoring, estimating and submitting pollution data. The third workshop dealt with the development of the EPER to the PRTR, the second EPER-Reporting and the new PRTR-requirements.

Capacity building of PRTR users through NGOs

~~11.~~12. Capacity building of the PRTR users – right from the beginning of the national PRTR system design – should be based mainly on education through seminars, training

courses, information campaigns and electronic means.. Examples of activities would include: financing NGO pilot projects, launching and maintaining special NGO websites and databases, organising NGO seminars, training course extending capacity to carry out awareness raising campaigns concerning health and environment for workers and citizens, especially vulnerable populations. NGOs play an important role as transmitters in capacity building and raising public awareness, therefore NGOs, state authorities and other relevant stakeholders should co-operate in those activities where appropriate. Limited financial resources of NGOs should be taken into account when funding of activities in this field is under discussion.

B. Raising public awareness

~~12.~~13. A PRTR system is not effective unless it is used by the public and by key stakeholders. Thus, raising public awareness is an essential element in PRTR development and implementation.

~~13.~~14. It is important for public authorities to define the public and stakeholders as broadly as possible. Potential users to be informed and encouraged to participate in PRTR development can include:

(a) Environmental and health NGOs;
(b) Industry and economic associations;
(c) Workers and management at industrial facilities;
(d) Public health institutions and groups and health professionals (e.g. toxicologists);
(e) Teachers, students and educational groups;
(f) Neighborhood community groups ;
(g) The press, in particular interested journalists;
(h) Insurance companies;
(i) Standardisation organisations.

~~14.~~15. Just as important, the general public needs to be aware of the PRTR and its potential uses. Press contacts and press releases are a key method to seek the attention of newspapers, TV channels and other news organizations. The graphic elements of PRTRs, such as map-based information, can provide an interesting element for news stories. Officials should consider innovative channels for reaching the public, such as television teletext services.

~~15.~~16. Different forms of awareness raising can take place at different stages of PRTR development:

(a) Stakeholders should be informed of plans for the design and development of a PRTR, to encourage their participation in the development process and their support for implementation (this could be posted in register's web site);

(b) The launch of a new PRTR is a key moment to raise public awareness, for example through press releases and other attention-getting activities. An effective launch will create momentum for ongoing use. For example, the EPER web site was visited by over 100,000 users in its first three months. In Hungary, authorities invited the press to the March 2004 launch of the national EPER site; and

(c) The regular updates (usually annual) of a PRTR are also opportunities to renew interest, for example, through press releases that summarize major developments in pollution levels. Information notes could be tailored to different interests, such as pollution levels in particular areas or releases from specific industries. These can be linked to other information, such as dissemination of local air quality levels.

In addition, many types of users will be interested in PRTR information between updates. Journalists and researchers, for example, may use PRTR information for in-depth articles about specific facilities, industries, or localities.

Publicity for PRTRs
The European Commission and European Environment Agency organized a launch event for the inauguration of the EPER web site. The press was invited, as well as representatives of governments, industrial sectors and NGOs. The event was announced on the front page of DG Environment web site. Some news organizations, including the BBC, described the event and provided electronic links to the EPER site from their own web sites. Posters, T-shirts, brochures, a video, which can now be seen at EPER web site, and mouse pads were also distributed in the promotional campaign.

Box 2: Publicity for PRTRs

C. International cooperation

~~16.~~17. Under the Protocol, international cooperation is an important mechanism for implementation, and is closely tied to capacity building, information exchange and public awareness, as well as convergence among PRTR systems.

Article 16 – International cooperation
1. The Parties shall, as appropriate, cooperate and assist each other:
(a) In international actions in support of the objectives of this Protocol;
(b) On the basis of mutual agreement between the Parties concerned, in implementing national systems in pursuance of this Protocol;
(c) In sharing information under this Protocol on releases and transfers within border areas; and
(d) In sharing information under this Protocol concerning transfers among Parties.
2. The Parties shall encourage cooperation among each other and with relevant international organizations, as appropriate, to promote:
(a) Public awareness at the international level;
(b) The transfer of technology; and

(c) The provision of technical assistance to Parties that are developing countries and Parties with economies in transition in matters relating to this Protocol.

Box 3: Article 16 – International cooperation

International organizations working on PRTRs

~~17.~~18. The work of several international organizations may be useful to Parties establishing PRTR systems. Some have developed guidance documents and others organize workshops and provide training.

~~18.~~19. The United Nations Economic Commission for Europe (UNECE) hosts the secretariat for the Aarhus Convention and itsProtocol on PRTRs. UNECE also runs several related activities, such as work under the 'Environment for Europe' Ministerial process to strengthen environmental monitoring and reporting in Eastern Europe, Caucasus and Central Asia (EECCA) countries. The Aarhus Convention secretariat has set up a Clearinghouse, through which countries can exchange information on needs and technical assistance opportunities (See http://aarhusclearinghouse.unece.org/resources.cfm). The Aarhus Clearinghouse provides a central electronic means to exchange information on laws and practices related to the Aarhus Convention, including the development of national PRTRs. This can be a key mechanism to exchange information on specific needs and opportunities for bilateral cooperation.

~~19.~~20. The United Nations Institute for Training and Research (UNITAR) has developed resource documents and guidance for PRTR development and has also organized workshops in developing countries. UNITAR has compiled both its own materials and those of many countries and international organizations in a CD-ROM. UNITAR also runs a web-based "virtual classroom" for PRTRs.

~~20.~~21. The Organisation for Economic Co-operation and Development (OECD), which brings together 30 member countries with advanced economies, has worked on PRTRs for almost 10 years. OECD has recommended their use in member countries. OECD has developed guidance documents for PRTRs, covering both overall implementation as well as technical issues such as emissions estimation. The IOMC's PRTR Co-ordinating Group sought to improve coordination between international organizations, governments and other interested parties in ongoing and planned efforts for PRTR development and implementation. A successor group, the International PRTR Coordinating Group, seeks to promote capacity building for PRTR development in countries with economies in transition and developing countries.

22. Other organizations working on PRTRs include the North American Commission for Environmental Cooperation (CEC), which has supported Mexico in its PRTR development. The Regional Environmental Center for Central and Eastern Europe (REC) has organized workshops to raise awareness and build capacity for PRTR development in Member countries. The REC has also assisted countries to undertake pilot PRTR studies and initiatives.

Bilateral technical assistance

23. There are several examples of bilateral co-operation for PRTRs, both within the UNECE region and globally. For example, the Netherlands sponsored workshops in EU

accession countries and in Central and Eastern European countries prior to the signing of the Protocol. Environment Canada (working with UNITAR) has supported a project in Chile, and Norway in Zambia.

24. Overall, however, the IOMC concludes that "international financial and technical support for PRTR development remains small," and it calls on both multilateral institutions and bilateral donors to integrate PRTR initiatives into their major funding programs.

International PRTR systems

25. The PRTR Protocol encourages information sharing among Parties, in particular for transboundary transfers as well as in border areas (art. 16). There are already a few examples of transboundary PRTRs. Most notable is the EPER, which collects and presents emissions data from EU member countries .[25] EPER currently provides information across 15 Member States and voluntarily data from Norway and Hungary, and its future versions will cover at least 25 EU members. While several EU member countries have their own EPER web sites, others refer users to the EPER site. The EPER system is being replaced by the E-PRTR in the course of the implementation of the PRTR Protocol. EPER may provide a model for other sub-regional groups, which could share resources for a common PRTR web site. However, individual countries, which are themselves Parties to the PRTR Protocol, should undertake their own non-electronic means of dissemination.

26. The North American Commission for Environmental Cooperation (CEC) operates the Taking Stock database, which brings together data from the Canadian National Pollutant Release Inventory (NPRI) and United States Toxic Release Inventory (TRI) (and, as it becomes available, data from the Mexican Registro de Emisiones y Transferencia de Contaminantes).[26]

27. In at least two cases, pollution inventories have been developed for shared ecosystems. The Great Lakes Commission, which brings together two Canadian provinces and eight states of the United States, has set up a Regional Air Toxics Emissions Inventory to cover releases. The participating Canadian provinces and states of the United States provide data for the inventory, which will be available to the public via an on-line interface scheduled for development at the end of 2004.[27]]

[25] See http://www.eper.cec.eu.int/

[26] See http://www.cec.org/takingstock/highlights/PRTR-CEC.cfm

[27] See http://www.glc.org/air/

28. In Europe, the International Commission for the Protection of the Danube River has assembled an inventory of water pollution releases to the Danube River basin. In 2004, data for 2000 were available via an on-line, map-based interface.[28]

Raising awareness at international level

29. Countries may find it useful to pool their resources for international programs to raise public awareness. The Regional Environmental Center for Central and Eastern Europe (REC) has worked to raise awareness and encourage development of PRTRs in that region.

30. Efforts to raise public awareness at international level have been carried out mainly by environmental NGOs and NGO coalitions. The European ECO forum, a coalition of 200 environmental NGOs, has disseminated information on the PRTR protocol, including an explanatory booklet, to encourage international public support.

~~D.~~D. Convergence

31. The convergence of PRTR systems will be a key task for international co-operation within the context of the PRTR Protocol. Article 3 of the Protocol, on General Provisions, states that "Parties shall strive to achieve convergence among national pollutant release and transfer registers." This call is taken up in article 17 on the Meeting of the Parties, paragraph 3 of which refers to convergence between the two types of PRTR system, pollutant-specific and waste-specific. Paragraph 2, subsection (a), has a more general call to "Review the development of pollutant release and transfer registers, and promote their progressive strengthening and convergence." The Protocol thus sets a long-term goal of convergence between different PRTR systems, tied to efforts to review and strengthen national PRTRs.

32. On a sub-regional basis, the North American Commission for Environmental Cooperation has promoted comparability between the three North American PRTR systems through regular studies as well as an Action Plan adopted in 2002. Moreover, since 1996, the Canadian NPRI and United States TRI and have taken a series of steps to improve the comparability of their data and reporting.

33. In Europe, the development of the E-PRTR will create a harmonized common PRTR across all member countries of the European Union.

34. Convergence is a long-term goal under the Protocol. Already in the short-term, the PRTR Protocol will promote further environmental cooperation among UNECE countries. Overall, the Protocol is a remarkable development that has come out of the Aarhus Convention and the broader 'Environment for Europe' process. It will join other

[28] See http://www.icpdr.org

international agreements in encouraging public access to information and public participation in decision-making on the environment, and it will also help to reduce pollution across the UNECE region.

Annexes

I. GLOSSARY AND TABLE OF DEFINITIONS

BAT: Best Available Techniques
BREF notes: BAT reference documents
BTEX: Benzene, Toluene, Ethyl Benzene and Xylenes
CAS: Chemical Abstract Service
CEC: Commission for Environmental Corporation
CEFIC: Cefic - European Chemical Industry Council
CEN: European Committee for Standardization
CRF: Common Reporting Format (United Nations Framework Convention on Climate Change (UNFCCC) reporting)
EECCA: Eastern Europe, Caucasus and Central Asia
EPER: European Pollutant Emission Register
E-PRTR: European PRTR
EU: European Union
ICCA: International Council of Chemical Associations
IOMC: Inter-Organization Programme of Sound Management of Chemicals
IPCC: Intergovernmental Panel on Climate Change
IPPC Directive: Directive concerning Integrated Pollution Prevention and Control (96/61/EC)
ISIC: International Standard Industrial Classification
ISO: International Organization for Standardization
LRTAP: UNECE Convention on Long-Range Transboundary Air Pollutants
MARPOL: International Convention for the Prevention of Pollution from Ships
MPU: Threshold value related to the amount of substance manufactured, used or processed by a facility
NACE: Nomenclature of economic activities …
NFR: Nomenclature for reporting (LRTAP reporting format)
NGO: Non-governmental organization
NMVOC: The generic term for the sum of all non methane volatile organic compounds. The group includes individual VOCs such as benzene, polycyclic aromatic hydrocarbons (PAHs) and ethylene oxide
NPRI: Canada's National Pollutant Release Inventory
OECD: Organisation For Economic Cooperation and Development
OSPAR: Convention for the Protection of the Marine Environment of the North-east Atlantic
POPs: Persistent Organic Pollutants
PRTR: Pollutant Release and Transfer Register
QA/QC: Quality assurance and quality control

RET: Release estimation technique
SME: Small and medium-sized enterprises
TEQ: Toxic equivalent (mass unit for dioxins and furans)
TOC: Total organic carbon
TRI: United States Toxics Release Inventory
UNCED: United Nations Conference on Environment and Development
UNECE: United Nations Economic Committee for Europe
UNFCCC: United Nations Framework Convention on Climate Change
UNITAR: United Nations Institute for Training and Research
XML: Extensible markup language

(ii) Definitions

1. The definitions below appear frequently in major PRTR reference documents and in this guidance.

a. *Definitions from Article 2 of the PRTR Protocol*

i. "Competent authority" means the national authority or authorities, or any other competent body or bodies, designated by a Party to manage a national pollutant release and transfer register system;
ii. "Convention" means the Convention on Access to Information, Public Participation in Decision making and Access to Justice in Environmental Matters, done at Aarhus, Denmark, on 25 June 1998;

iii. "Diffuse sources" means the many smaller or scattered sources from which pollutants may be released to land, air or water, whose combined impact on those media may be significant and for which it is impractical to collect reports from each individual source;
iv. "Facility" means one or more installations on the same site, or on adjoining sites, that are owned or operated by the same natural or legal person;
v. The terms "national" and "nationwide" shall, with respect to the obligations under the Protocol on Parties that are regional economic integration organizations, be construed as applying to the region in question unless otherwise indicated;
vi. "Off-site transfer" means the movement beyond the boundaries of the facility of either pollutants or waste destined for disposal or recovery and of pollutants in waste water destined for waste-water treatment;
vii. "Party" means, unless the text indicates otherwise, a State or a regional economic integration organization referred to in article 24 which has consented to be bound by this Protocol and for which the Protocol is in force;
viii. "Pollutant" means a substance or a group of substances that may be harmful to the environment or to human health on account of its properties and of its introduction into the environment;
ix. "The public" means one or more natural or legal persons, and, in accordance with national legislation or practice, their associations, organizations or groups;

x. "Release" means any introduction of pollutants into the environment as a result of any human activity, whether deliberate or accidental, routine or non-routine, including spilling, emitting, discharging, injecting, disposing or dumping, or through sewer systems without final wastewater treatment;

xi. "Waste" means substances or objects which are:

(a) Disposed of or recovered;
(b) Intended to be disposed of or recovered; or
(c) Required by the provisions of national law to be disposed of or recovered;

xii. "Hazardous waste" means waste that is defined as hazardous by the provisions of national law;

xiii. "Other waste" means waste that is not hazardous waste;

xiv. "Waste water" means used water containing substances or objects that is subject to regulation by national law.

~~b.~~b. Definitions based on the European Union ~~EPER Decision (update with E-~~PRTR Guidance

i. 'reporting year' means the calendar year for which data on releases of pollutants and off-site transfers must be gathered

ii.'site' means the geographical location of the facility

iii. 'substance' means any chemical element and its compounds, with the exception of radioactive substances

~~i."Emission" is the direct release of a pollutant to air, soil and water as well as the indirect release by transfer to an off-site wastewater treatment plant.~~

~~ii."Reporting cycle" is the cycle of the total reporting process, consisting of the collection, validation, submission, management and dissemination of the reported data.~~

~~iii."Site" is the geographical location of the facility.~~

~~iv.~~i. ~~"Substance" means any chemical element and its compounds, with the exception of radioactive substances.~~

~~c.~~c. Definitions based on the European Union IPPC Directive

i. "Emission" shall mean the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in the installation into the air, water or land;

ii. "Installation" means a stationary technical unit where one or more activities listed in Annex I are carried out, and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution.

iii. Operator" shall mean any natural or legal person who operates or controls the installation or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of the installation has been delegated.

iv. "Pollution" shall mean the direct or indirect introduction as a result of human activity, of substances, vibrations, heat or noise into the air, water or land which may be harmful to human health or the quality of the environment, result in damage to material

property, or impair or interfere with amenities and other legitimate uses of the environment.

II. FURTHER READING

A. United Nations Institute for Training and Research (UNITAR)

1. International guidance documents on PRTR design[29]

(a) Implementing a National PRTR Design Project 1997 English, Spanish
(b) Supplement 1: Preparing a National PRTR Infrastructure Assessment 1997 English, Spanish
(c) Supplement 2: Designing the Key Features of a National PRTR System 1997 English, Spanish
(d) Supplement 3: Implementing a PRTR Pilot Reporting Trial 1997 English, Spanish
(e) Supplement 4: Structuring a National PRTR Proposal 1997 English, Spanish
(f) Addressing Industry Concerns Related to PRTRs 1998 English
{add REC recommendations; OECD ; OECD refs}

2. Estimation and reporting of emission releases[30]

(a) Guidance for Facilities on PRTR Data Estimation and Reporting 1998 English
(b) Estimating Environmental Releases for Facility PRTR Reporting: Introduction and Guide to Methods, The Hampshire Research Institute for UNITAR 1997 English
(c) Guidance on Estimating Non-point Source Emissions 1998 English
(d) International PRTR Conferences, Workshops and Related Events

3. Pollutant release and transfer registers in the Americas[31]

(a) Memorias del Taller Sobre el registro de Emisiones y Transferencia de Contaminantes Para los Paises de las Americas, 29-31 July 1997, Queretaro, Mexico - UNITAR, OECD, SEMARNAP, CEC, UNEP 1998 Spanish, Memoria-7 with annex, table and PRTR web sites.

[29] See http://www.unitar.org/cwm/prtr/UNITAR.htm

[30] Op cit.

[31] Op cit.

4. Training and Capacity Building Programme[32]

(a) UNITAR Training and Capacity Building Programme to Facilitate the Design and Implementation of National Pollutant Release and Transfer Registers (PRTRs) Online Version and Offline (PDF) Version.

5. European PRTR Guidance ~~(to be added)~~[33]

(a) Guidance document for the implementation of the European PRTR (available in 10 languages on 1 September 2006)
(b) Supporting document on the determination of diffuse methane releases from landfill sites (available in English)
(c) Supporting document on the determination of releases from pig and poultry farms (available in English)

III. ANALYTICAL PROCEDURES FOR 86 POLLUTANTS

1. In tables 1 – 3 indicative lists are given of standardized analytical procedures for the measurement of some of the 86 PRTR pollutants of annex II in releases and transfers to air, water and land. When no standardized analytical procedure is given it means that there is (yet) no agreement on an international level on how to determine the pollutant and one should look for procedures used nationally.

A. Standardized analytical procedures for the determination of pollutants of annex II released to air

2. Table 1 gives an indicative list of measurement methods of pollutants to air.

Table 1 indicative list of standardized analytical procedures for the determination of the 86 pollutants of annex II in releases and transfers to air, water and land

No.	CAS number	Pollutant	
1	74-82-8	Methane (CH4)	
2	630-08-0	Carbon monoxide (CO)	ISO 12039:2001
3	124-38-9	Carbon dioxide (CO2)	ISO 12039:2001
4		Hydro-fluorocarbons (HFCs)	
5	10024-97-2	Nitrous oxide (N2O)	

[32] Op cit.

[33] See http://www.prtr.ec.europa.eu (Guidance information included under "NEWS", PRTR Guidance or EPER Guidance)

No.	CAS number	Pollutant	
6	7664-41-7	Ammonia (NH3)	
7		Non-methane volatile organic compounds (NMVOC)	EN 12619:1999
			EN 13526:2001
			EN 13649:2001
8		Nitrogen oxides (NOx/NO2)	ISO 10849:1996,
			ISO 11564:1998,
9		Perfluorocarbons (PFCs)	
10	2551-62-4	Sulphur hexafluoride (SF6)	
11		Sulphur oxides (SOx/SO2)	ISO 7934:1989, ISO 7935:1992, ISO 11632:1998
12		Total nitrogen	
13		Total phosphorus	
14		Hydrochlorofluorocarbons (HCFCs)	
15		Chlorofluorocarbons (CFCs)	
16		Halons	
17	7440-38-2	Arsenic and compounds (as As)	EN 14385:2004
18	7440-43-9	Cadmium and compounds (as Cd)	EN 14385:2004
19	7440-47-3	Chromium and compounds (as Cr)	EN 14385:2004
20	7440-50-8	Copper and compounds (as Cu)	EN 14385:2004
21	7439-97-6	Mercury and compounds (as Hg)	EN 13211:2001
22	7440-02-0	Nickel and compounds (as Ni)	EN 14385:2004
23	7439-92-1	Lead and compounds (as Pb)	EN 14385:2004
24	7440-66-6	Zinc and compounds (as Zn)	
25	15972-60-8	Alachlor	
26	309-00-2	Aldrin	
27	1912-24-9	Atrazine	
28	57-74-9	Chlordane	
29	143-50-0	Chlordecone	
30	470-90-6	Chlorfenvinphos	
31	85535-84-8	Chloro -alkanes, C10-C13	
32	2921-88-2	Chlorpyrifos	
33	50-29-3	DDT	
34	107-06-2	1,2-dichloroethane	
35	75-09-2	Dichloromethane	
36	60-57-1	Dieldrin	
37	330-54-1	Diuron	
38	115-29-7	Endosulphan	
39	72-20-8	Endrin	
40		Halogenated organic compounds (as AOX)	
41	76-44-8	Heptachlor	
42	118-74-1	Hexachlorobenzene (HCB)	
43	87-68-3	Hexachlorobutadiene (HCBD)	
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	
45	58-89-9	Lindane	
46	2385-85-5	Mirex	
47		PCDD + PCDF (dioxins + furans) as Teq	EN 1948-1:1996 / EN 1948-2:1996 / EN 1948-3:1996
48	608-93-5	Pentachlorobenzene	
49	87-86-5	Pentachlorophenol (PCP)	
50	1336-36-3	Polychlorinated biphenyls (PCBs)	
51	122-34-9	Simazine	
52	127-18-4	Tetrachloroethylene (PER)	
53	56-23-5	Tetrachloromethane (TCM)	
54	12002-48-	Trichlorobenzenes (TCBs)	

No.	CAS number	Pollutant	
	1		
55	71-55-6	1,1,1-trichloroethane	
56	79-34-5	1,1,2,2-tetrachloroethane	
57	79-01-6	Trichloroethylene	
58	67-66-3	Trichloromethane	
59	8001-35-2	Toxaphene	
60	75-01-4	Vinyl chloride	
61	120-12-7	Anthracene	
62	71-43-2	Benzene	
63		Brominated diphenylethers (PBDE)	
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	
65	100-41-4	Ethyl benzene	
66	75-21-8	Ethylene oxide	
67	34123-59-6	Isoproturon	
68	91-20-3	Naphthalene	
69		Organotin compounds (as total Sn)	
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	
71	108-95-2	Phenols (as total C)	
72		Polycyclic aromatic hydrocarbons (PAHs) b/	ISO 11338-1:2003 ISO 11338-2:2003
73	108-88-3	Toluene	
74		Tributyltin and compounds	
75		Triphenyltin and compounds	
76		Total organic carbon (TOC) (as total C or COD/3)	
77	1582-09-8	Trifluralin	
78	1330-20-7	Xylenes	
79		Chlorides (as total Cl)	
80		Chlorine and inorganic compounds (as HCl)	EN 1911-1:1998
			EN 1911-2:1998
			EN 1911-3:1998
81	1332-21-4	Asbestos	ISO 10397:1993
82		Cyanides (as total CN)	
83		Fluorides (as total F)	
84		Fluorine and inorganic compounds (as HF)	
85	74-90-8	Hydrogencyanide (HCN)	
86		Particulate matter (PM10)	ISO 9096:2003, ISO 10155:1995, ISO 12141:2002, ISO 14164:1999, EN 13284-1:2001 EN 13284-2:2004

B. Standardized analytical procedures for the determination of pollutants of annex II in water

3. Table 2 gives an indicative list measurement of pollutants to water.

Table 2 indicative list of standardized analytical procedures for the determination of the 86 pollutants of Annex II in releases and transfers to water.

No.	CAS number	Pollutant	Standard	Analytical method	Working range

No.	CAS number	Pollutant	Standard	Analytical method	Working range
1	74-82-8	Methane (CH4)		Only in air	
2	630-08-0	Carbon monoxide (CO)		Only in air	
3	124-38-9	Carbon dioxide (CO2)		Only in air	
4		Hydro-fluorocarbons (HFCs)		Only in air	
5	10024-97-2	Nitrous oxide (N2O)		Only in air	
6	7664-41-7	Ammonia (NH3)		Only in air	
7		Non-methane volatile organic compounds (NMVOC)		Only in air	
8		Nitrogen oxides (NOx/NO2)		Only in air	
9		Perfluorocarbons (PFCs)		Only in air	
10	2551-62-4	Sulphur hexafluoride (SF6)		Only in air	
11		Sulphur oxides (SOx/SO2)		Only in air	
12		Total nitrogen	DIN 38409-27	Oxid. or Red./Chemolumin,	over 0,5 mg/l
			EN 12260	Oxidation / Chemolumin.	0,5 -200 mg/l
			EN ISO 11905-1	Oxidation with Peroxodisulfat	0,02 - 5 mg/l
13		Total phosphorus	ISO 15681-1/-2	Peroxodisulfat, FIA/CFA	0,1 -10 mg/l
			EN 1189	Peroxodisulfat, Photometry	0,005 - 0,8 mg/l
14		Hydrochlorofluorocarbons (HCFCs)		Only in air	
15		Chlorofluorocarbons (CFCs)		Only in air	
16		Halons		Only in air	
17	7440-38-2	Arsenic and compounds (as As)	ASTM D5673	ICP-MS	over 1 µg/l
			EN ISO 11969	Hydrid-AAS	1 -10 µg/l
		DIN 38406-29 should be deleted, because by 02/2005 it is planed to replace it by DIN EN ISO 17294-2	DIN 38406-29	ICP-MS	over 1 µg/l
			ISO 17294-2	ICP-MS	over 1 µg/l
			EN ISO 11885	ICP-AES	over 0.08 mg/l
18	7440-43-9	Cadmium and compounds (as Cd)	ASTM D5673	ICP-MS	over 0,1 µg/l
			EN ISO 5961	ET-AAS	0,3 - 3 µg/l
			DIN 38406-16	Voltammetry	0,1 µg/l - 50 mg/l
		see above	DIN 38406-29	ICP-MS	over 0,5 µg/l
			ISO 17294-2	ICP-MS	over 0,1 µg/l
			EN ISO 11885	ICP-AES	over 0.01 mg/l
19	7440-47-3	Chromium and compounds (as Cr)	ASTM D5673	ICP-MS	over 0,1 µg/l
			EN 1233	ET-AAS	5 - 100 µg/l
		see above	DIN 38406-29	ICP-MS	over 1 µg/l

No.	CAS number	Pollutant	Standard	Analytical method	Working range
			ISO 17294-2	ICP-MS	over 1 µg/l
			EN ISO 11885	ICP-AES	over 0,01 mg/l
20	7440-50-8	Copper and compounds (as Cu)	ASTM D5673	ICP-MS	over 0,1 µg/l
			DIN 38406 -7	ET-AAS	2 - 50 µg/l
			DIN 38406-16	Voltammetry	1 µg/l - 50 mg/l
		see above	DIN 38406-29	ICP-MS	over 1 µg/l
			ISO 17294-2	ICP-MS	over 1 µg/l
			EN ISO 11885	ICP-AES	over 0,01 mg/l
21	7439-97-6	Mercury and compounds (as Hg)	EN 1483	Cold vapour-AAS	0,1 -10 µg/l
			EN12338	CV-AAS with amalgamation	0,01- 1 µg/l
22	7440-02-0	Nickel and compounds (as Ni)	ASTM D5673	ET-AAS	over 0.2 µg/l
			DIN 38406-11	ET-AAS	5 - 100 µg/l
			DIN38406-16	Voltammetry	0,1 - 10 µg/l
		see above	DIN 38406-29	ICP-MS	over 1 µg/l
			ISO 17294-2	ICP-MS	over 1 µg/l
			EN ISO 11885	ICP-AES	
23	7439-92-1	Lead and compounds (as Pb)	ASTM D5673	ICP-MS	over 0,1 µg/l
			DIN 38406-6	ET-AAS	5 - 50 µg/l
			DIN 38406-16	Voltammetry	0,1 µg/l - 50 mg/l
		see above	DIN 38406-29	ICP-MS	over 0,1 µg/l
			ISO 17294-2	ICP-MS	over 0,1 µg/l
			EN ISO 11885	ICP-AES	over 0,07 mg/l
24	7440-66-6	Zinc and compounds (as Zn)	ASTM D5673	ICP-MS	over 0.2 µg/l
			DIN 38406-16	Voltammetry	1 µg/l - 50 mg/l
		see above	DIN 38406-29	ICP-MS	over 1 µg/l
			ISO 17294-2	ICP-MS	over 1 µg/l
			EN ISO 11885	ICP-AES	over 0,005

No.	CAS number	Pollutant	Standard	Analytical method	Working range
					mg/l
25	15972-60-8	Alachlor	ISO/TS 11370	TLC, AMD-Technique	over 50 ng/l
26	309-00-2	Aldrin	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
27	1912-24-9	Atrazine	ISO/TS 11370	TLC, AMD-Technique	over 50 ng/l
			EN ISO 11369	HPLC/UV	over approx. µg/l
			EN ISO 10695	GC/NPD (MS for conf.)	over 50 ng/l
28	57-74-9	Chlordane			
29	143-50-0	Chlordecone			
30	470-90-6	Chlorfenvinphos	ISO/TS 11370	TLC, AMD-Technique	over 50 ng/l
			DIN EN 12918	GC	0,01 - 1 µg/l
31	85535-84-8	Chloro -alkanes, C10- C13			
32	2921-88-2	Chlorpyrifos	DIN EN 12918	GC	0,01 - 1 µg/l
33	50-29-3	DDT	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
34	107-06-2	1,2-dichloroethane	EN ISO 10301	GC or Headspace-GC	over 5 or over 100 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
35	75-09-2	Dichloromethane	EN ISO 10301	GC or Headspace-GC	over 50 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
36	60-57-1	Dieldrin	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
37	330-54-1	Diuron	EN ISO 11369	HPLC/UV	over 0,1 µg/l
38	115-29-7	Endosulphan	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
39	72-20-8	Endrin	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN	GC/ECD	over

No.	CAS number	Pollutant	Standard	Analytical method	Working range
			38407-2		approx. 10 ng/l
40		Halogenated organic compounds (as AOX)	DIN 38409-22	SPE-AOX	over 10 µg/l
			ISO 9562	AOX	over 10 µg/l
41	76-44-8	Heptachlor	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
42	118-74-1	Hexachlorobenzene (HCB)	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
43	87-68-3	Hexachlorobutadiene (HCBD)	EN ISO 10301	GC after extraction	over 0,01 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
45	58-89-9	Lindane (Gamma-HCH)	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
46	2385-85-5	Mirex			
47		PCDD + PCDF as Teq (dioxins + furans)	ISO 18073	GC/MS	
48	608-93-5	Pentachlorobenzene	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
49	87-86-5	Pentachlorophenol (PCP)	EN 12673	GC/ECD/MS after derivatization	0,1 - 1000 µg/l
			ISO 8165-2	GC/ECD after derivatization	over 0,1 µg/l
50	1336-36-3	Polychlorinated biphenyls (PCBs)	EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
51	122-34-9	Simazine	ISO/TS 11370	TLC, AMD-Technique	over 50 ng/l
			EN ISO	HPLC/UV	over 0,1

No.	CAS number	Pollutant	Standard	Analytical method	Working range
			11369		µg/l
			EN ISO 10695	GC/NPD (MS for conf.)	over 50 ng/l
52	127-18-4	Tetrachloroethylene (PER)		Only in air	
			EN ISO 10301	GC or Headspace-GC	over 0,1 or over 0,2 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
53	56-23-5	Tetrachloromethane (TCM)		Only in air	
			EN ISO 10301	GC or Headspace-GC	over 0,01 or over 0,1 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
54	12002-48-1	Trichlorobenzenes (TCBs)		Only in air	
			EN ISO 6468	GC/ECD	over approx. 10 ng/l
			DIN 38407-2	GC/ECD	over approx. 10 ng/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
55	71-55-6	1,1,1-trichloroethane		Only in air	
			EN ISO 10301	GC or Headspace-GC	over 0,02 or over 0,1 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
56	79-34-5	1,1,2,2-tetrachloroethane		Only in air	
			EN ISO 10301	GC after Extraction	over 0,05 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
57	79-01-6	Trichloroethylene		Only in air	
			EN ISO 10301	GC or Headspace-GC	over 0,05 or over 0,2 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
58	67-66-3	Trichloromethane		Only in air	
			EN ISO 10301	GC or Headspace-GC	over 0,05 or over 0,3 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
59	8001-35-2	Toxaphene			
60	75-01-4	Vinyl chloride	DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
61	120-12-7	Anthracene	ISO 17993	HPLC/Fluorescence	over 0,01 µg/l

No.	CAS number	Pollutant	Standard	Analytical method	Working range
62	71-43-2	Benzene	DIN 38407-9	Headspace-GC/FID	over 5 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
			ISO 11423-1/-2	Headspace-GC or GC after extraction	over 2 µg/l or over 5 µg/l
63		Brominated diphenylethers (PBDE)			
64		Nonylphenol ethoxylates (NP/NPEs) and related substances	ISO/FDIS 18857-1	GC/MS	0,02 - 0,2 µg/l
65	100-41-4	Ethyl benzene	DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
			DIN 38407-9	Headspace-GC/FID	over 5 µg/l
			ISO 11423-1/-2	Headspace-GC or GC after extraction	over 2 µg/l or over 5 µg/l
66	75-21-8	Ethylene oxide			
67	34123-59-6	Isoproturon	EN ISO 11369	HPLC/UV	over 0,1 µg/l
68	91-20-3	Naphthalene	DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
			ISO 17993	HPLC/Fluorescence	over 0,01 µg/l
69		Organotin compounds (as total Sn)	DIN 38407-13	GC/MS - FPD - AED	10 - 1000 ng/l
			ISO 17353	GC/MS - FPD - AED	10 - 1000 ng/l
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)	prEN ISO 18856	GC/MS	0,02 - 0,150 µg/l
71	108-95-2	Phenols (as total C)	EN 12673	GC/ECD/MS after derivatisation	0,1 - 1000 µg/l
			ISO 8165-2	GC/ECD after derivatisation	over 0,1 µg/l
			CNR-IRSA 5060	Destillation/Photometry	over 1 µg/l
72		Polycyclic aromatic hydrocarbons (PAHs) b/	ISO 17993	HPLC/Fluorescence	over 0,01 µg/l
73	108-88-3	Toluene	DIN 38407-9	Headspace-GC/FID	over 5 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
			ISO 11423-1/-2	Headspace-GC or GC after extraction	over 2 µg/l or over 5 µg/l
74		Tributyltin and compounds	DIN 38407-13	GC/MS - FPD - AED	10 - 1000 ng/l
			ISO 17353	GC/MS - FPD - AED	10 -

No.	CAS number	Pollutant	Standard	Analytical method	Working range
					1000 ng/l
75		Triphenyltin and compounds	DIN 38407-13	GC/MS - FPD - AED	10 - 1000 ng/l
			ISO 17353	GC/MS - FPD - AED	10 - 1000 ng/l
76		Total organic carbon (TOC) (as total C or COD/3)	DIN EN 1484	TOC/DOC	0,3 - 1000 mg/l
			ISO 8245	TOC/DOC	0,3 - 1000 mg/l
77	1582-09-8	Trifluralin	ISO/TS 11370	TLC, AMD-Technique	over 50 ng/l
			EN ISO 10695	GC/NPD (MS for conf.)	over 50 ng/l
78	1330-20-7	Xylenes	DIN 38407-9	Headspace-GC/FID	over 5 µg/l
			DIN EN ISO 15680	Purge/Trap + Therm. Desorp.	10 ng/l - 100 µg/l
			ISO 11423-1/-2	Headspace-GC or GC after extraction	over 2 µg/l or over 5 µg/l
79		Chlorides (as total Cl)	EN ISO 10304-1*	IC	0,1 - 50 mg/l
			EN ISO 10304-2*	IC	0,1 - 50 mg/l
			EN ISO 10304-4*	IC	0,1 - 50 mg/l
			CNR-IRSA 4070	Potentiometric titration	over 0.7 mg/l
80		Chlorine and inorganic compounds (as HCl)		Only in air	
			DIN EN ISO 7393-1/-2/-3	Titrimetric or colorimetric or iodometric	0,03 - 5 or 0,71-15 mg/l Cl_2
81	1332-21-4	Asbestos		Only in air	
82		Cyanides (as total CN)	DIN EN ISO 14403	UV-Digestion/CFA	over 3 µg/l
			DIN 38405-14	Destillation/Photometry	0,01 - 1 mg/l
			ISO 6703-1	Photometric or titrimetric	
83		Fluorides (as total F)	DIN EN ISO 10304-1[6]	IC	0,01 - 10 mg/l
			ISO 10359-1	Elektrochemical technique	0,2 - 2 mg/l
			DIN 38405-4	Ionselective electrode	0,2 - 2000 mg/l
84		Fluorine and inorganic compounds (as HF)		Only in air	
85	74-90-8	Hydrogencyanide (HCN)		Only in air	

No.	CAS number	Pollutant	Standard	Analytical method	Working range
86		Particulate matter (PM10)		Only in air	
			ISO 11923	Glass-fibre filtration	

C. Standardized analytical procedures for the determination of pollutants of annex II in waste

4. Table 3 gives an indicative list measurement of pollutants in waste and sludge. The overview is based on CEN standards cited in the IPPC Bref on monitoring.

Table 3 indicative list of standardized analytical procedures for the determination of the 86 pollutants of annex II in waste (solid and/or sludge).

No.	CAS number	Pollutant	Sampling plan / taking / transport storage	Pre treatment	Extraction	Analysis quantification	Overall measurement report
1	74-82-8	Methane (CH4)					
2	630-08-0	Carbon monoxide (CO)					
3	124-38-9	Carbon dioxide (CO2)					
4		Hydro-fluorocarbons (HFCs)					
5	10024-97-2	Nitrous oxide (N2O)					
6	7664-41-7	Ammonia (NH3)					
7		Non-methane volatile organic compounds (NMVOC)					
8		Nitrogen oxides (NOx/NO2)					
9		Perfluorocarbons (PFCs)					
10	2551-62-4	Sulphur hexafluoride (SF6)					
11		Sulphur oxides (SOx/SO2)					
12		Total nitrogen	GR1 / GR5 / GR6			EN 13342 (2000)	
13		Total phosphorus	GR1 / GR5 / GR6			WI 308-034	
14		Hydrochlorofluorocarbons (HCFCs)					
15		Chlorofluorocarbons (CFCs)					
16		Halons					
17	7440-38-2	Arsenic and compounds (as As)					
18	7440-43-9	Cadmium and compounds (as Cd)					
19	7440-47-3	Chromium and compounds (as Cr)	GR4			WI 292-036 / WI 292-036	
20	7440-50-8	Copper and compounds (as Cu)					
21	7439-97-6	Mercury and compounds (as Hg)					

22	7440-02-0	Nickel and compounds (as Ni)					
23	7439-92-1	Lead and compounds (as Pb)					
24	7440-66-6	Zinc and compounds (as Zn)					
25	15972-60-8	Alachlor					
26	309-00-2	Aldrin					
27	1912-24-9	Atrazine					
28	57-74-9	Chlordane					
29	143-50-0	Chlordecone					
30	470-90-6	Chlorfenvinphos					
31	85535-84-8	Chloro -alkanes, C10-C13					
32	2921-88-2	Chlorpyrifos					
33	50-29-3	DDT					
34	107-06-2	1,2-dichloroethane					
35	75-09-2	Dichloromethane					
36	60-57-1	Dieldrin					
37	330-54-1	Diuron					
38	115-29-7	Endosulphan					
39	72-20-8	Endrin					
40		Halogenated organic compounds (as AOX)	GR1 / GR5 / GR6	WI 308-047	WI 308-047	WI 308-047	
41	76-44-8	Heptachlor					
42	118-74-1	Hexachlorobenzene (HCB)					
43	87-68-3	Hexachlorobutadiene (HCBD)					
44	608-73-1	1,2,3,4,5,6-hexachlorocyclohexane (HCH)					
45	58-89-9	Lindane					
46	2385-85-5	Mirex					
47		PCDD + PCDF (dioxins + furans) as Teq					
48	608-93-5	Pentachlorobenzene					
49	87-86-5	Pentachlorophenol (PCP)					
50	1336-36-3	Polychlorinated biphenyls (PCBs)	GR4 / GR1 / GR5 / GR6			WI 292-021 / WI308-046	
51	122-34-9	Simazine					
52	127-18-4	Tetrachloroethylene (PER)					
53	56-23-5	Tetrachloromethane (TCM)					
54	12002-48-1	Trichlorobenzenes (TCBs)					
55	71-55-6	1,1,1-trichloroethane					
56	79-34-5	1,1,2,2-tetrachloroethane					
57	79-01-6	Trichloroethylene					
58	67-66-3	Trichloromethane					
59	8001-35-2	Toxaphene					
60	75-01-4	Vinyl chloride					
61	120-12-7	Anthracene					
62	71-43-2	Benzene					
63		Brominated diphenylethers (PBDE)					
64		Nonylphenol ethoxylates (NP/NPEs) and related					

		substances					
65	100-41-4	Ethyl benzene					
66	75-21-8	Ethylene oxide					
67	34123-59-6	Isoproturon					
68	91-20-3	Naphthalene					
69		Organotin compounds (as total Sn)					
70	117-81-7	Di-(2-ethyl hexyl) phthalate (DEHP)					
71	108-95-2	Phenols (as total C)					
72		Polycyclic aromatic hydrocarbons (PAHs) b/					
73	108-88-3	Toluene					
74		Tributyltin and compounds					
75		Triphenyltin and compounds					
76		Total organic carbon (TOC) (as total C or COD/3)	GR1 / GR5 / GR6			EN 13137 (2001)	
77	1582-09-8	Trifluralin					
78	1330-20-7	Xylenes					
79		Chlorides (as total Cl)					
80		Chlorine and inorganic compounds (as HCl)					
81	1332-21-4	Asbestos					
82		Cyanides (as total CN)					
83		Fluorides (as total F)					
84		Fluorine and inorganic compounds (as HF)					
85	74-90-8	Hydrogencyanide (HCN)					