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Access to Justice in Environmental Matters

Working Group on Pollutant Release and Transfer Registers
(Second meeting, Geneva, 13-15 April 2005)

IV. DATA MANAGEMENT ^{*/}

1. This chapter gives guidance on how Parties could organise the PRTR data flows. Quality assessment is the responsibility of the Parties which are obliged to validate the PRTR data. Quality assessment is important to assure completeness, consistency and credibility of the data on the releases and transfers of pollutants in the PRTR.

^{*/} This document was submitted late due to the need to hold in-depth consultations over the text with a number of leading experts on the topic of pollution registers.

2. Figure 1 illustrates the different data flows.

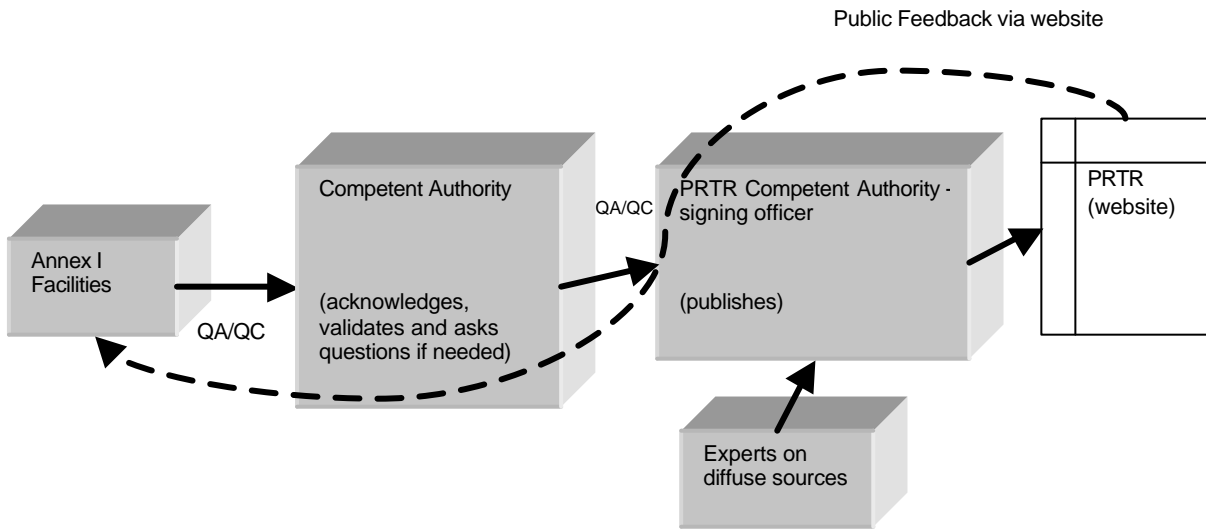


Figure 1: Data flows of PRTR data

3. 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. 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.

1. Responsibility

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

(a) Responsibility for data flows

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

6. 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.

7. 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

8. 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**

9. 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) 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) determining the releases and transfers of pollutants of the below threshold facilities of annex I; and

(d) determining the releases and transfers of pollutants of other sources.

(d) **Responsibility of national authority**

10. The national authority is responsible for:

(a) Publishing the PRTR data on a publicly assessable web site; and

(b) Response on public feedback.

2. Methods of reporting and transmitting data and software solutions

(a) **Submitting facility data**

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

(a) electronic submission, eg. over the Internet;

(b) magnetic or optic media like floppy disks or CD-ROMs; and

(c) paper forms.

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.

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

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.

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.

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

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

- (i) Thresholds;
- (ii) CAS numbers;
- (iii) Global warming potential;
- (iv) Associated types of release;
- (v) etc...

(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

- (i) Facilities for above threshold annex 1 facilities; facility properties and attributes are stored in a table "facilities"; or
- (ii) 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.

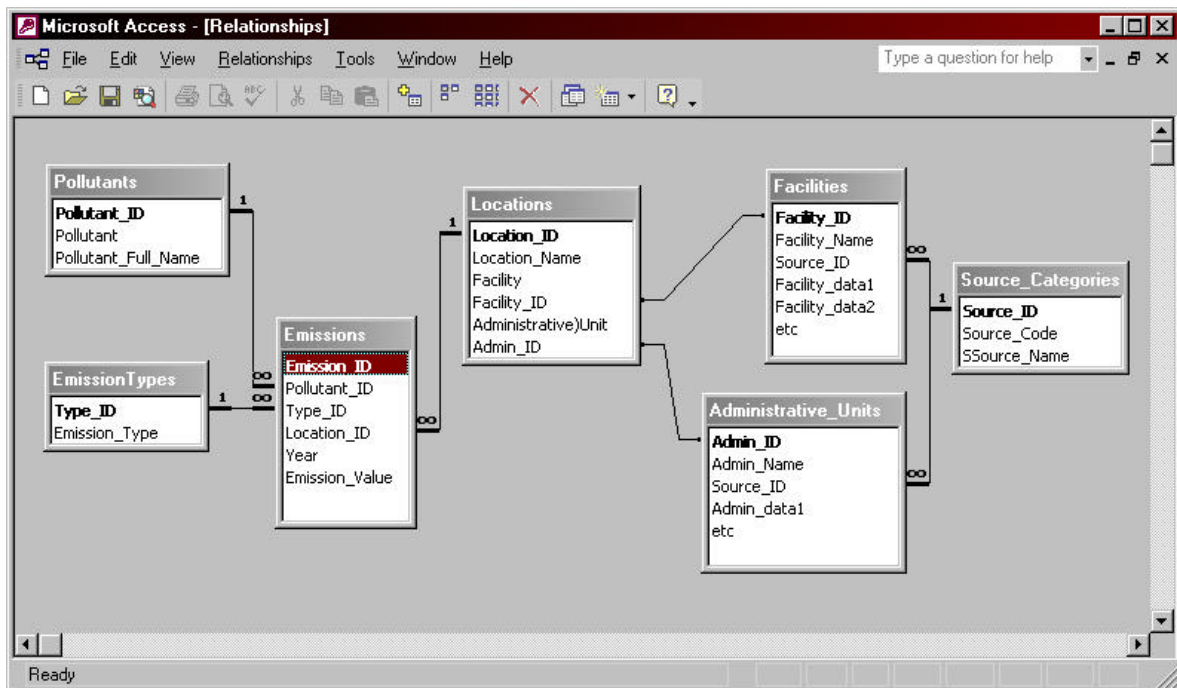


Figure 2: Relationships in a relatively simple PRTR relational database (screenshot of MS Access)

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.

B. Quality assessment

Article 10: QUALITY ASSESSMENT

1. 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.
2. 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.

Box 2: Article 10 – Quality assessment

1. Data validation

18. 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. There is a difference between data validation and data verification. Validation focuses on whether or not guidance has been applied correctly. Verification (such as “ground truthing”), while important, is not part of a data collection and dissemination process of a PRTR (see Figure 3).

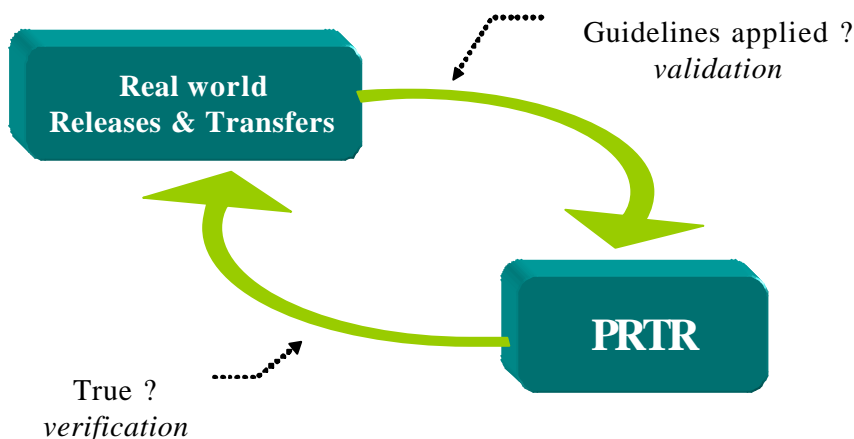


Figure 3: Quality assessment of PRTR data on releases and transfer of pollutants, wherein the verification takes mainly place by public feedback

23. 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.

24. 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.

25. 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.

26. Another important issue is transparency. Transparency 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.

27. 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.

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

C. Data presentation

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

- (a) Pollutants;
- (b) sources or sectors; and
- (c) administrative units in a spatial aggregation.

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 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, 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 the Environmental Agency's data for England and Wales and access to the pollution inventory. 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://216.31.193.171/asp/1_introduction.asp]

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

D. Timetable

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.

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

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

32. Article 8 establishes an annual reporting cycle. Nevertheless, for the second cycle, the PRTR allows that the second reporting year is 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. For countries with experience, such as simplified version of a PRTR in place, it seems more logical to use an annual reporting cycle from the beginning.

2. 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: Reporting time table

33. Article 8 also establishes the timeframe to incorporate data into the register, i.e., within 15 months from the end of each reporting year or even two years for the first reporting year. Article 8, paragraph 3, allows regional integration organizations (i.e., the European Community) 6 more months to incorporate the data into a PRTR.

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 more¹ 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. Parties where this goal could be achieved should be encouraged to adopt a tighter time schedule.

36. 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.

1. Proposal for a 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

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.

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

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

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

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

¹ or for regional economic integration organization, until 21 (or 30, if the option of two years is adopted).