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European Topic Centre on Inland Waters

EUROWATERNET-Emissions Guide for data collection

First Draft

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EUROWATERNET-Emissions
Guide for data collection

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1 Emissions to waters

1.1 Introduction

This paper contains guidance on the collection of data for EUROWATERNET-Emissions, and the subsequent inclusion of data and information into WATERBASE. This is a first exercise on a complete voluntary basis, which aim is to evaluate the practical application of EUROWATERNET-Emissions, and it is thus asked to the participants to provide the maximum information available in their respective country.

The data and information obtained through EUROWATERNET is required for the formulation of indicators that will be used in, and for the production of, a number of EEA reports.

We would very much appreciate to obtain the information before November 2002 for inclusion in the database and to produce a first report.

EUROWATERNET is “the process by which the European Environment Agency (EEA) obtains the information on water resources it needs to answer questions raised by its customers”. Some key concepts are that :

- it samples existing national monitoring and information databases
- it compares like-with-like
- it provides a representative assessment

1.2 EUROWATERNET

This is developed by the European Topic Centre for Water of the EEA, and all the member countries of the EEA are kindly requested to participate, on a complete voluntary basis. It is a step-by-step process taking into account the already existing tools and methodologies, and the different existing situation of each member country.
It provides a simple and transparent system to support European wide comparability of data.
EUROWATERNET is divided in six main areas that are

- EUROWATERNET-Rivers,
- EUROWATERNET-Lakes,
- EUROWATERNET-Groundwaters,
- EUROWATERNET-transitional, coastal and marine waters,
- EUROWATERNET-quantity
- and EUROWATERNET-emissions.

Each of these areas is at a different development stage, and very interesting results have already been obtained.

1.3 Emissions to water

For EUROWATERNET-emissions, as in other EUROWATERNET processes, the data collection should be conducted in stages, from the easiest to access to the best and most complete dataset.

The emission of pollutants is the major cause of bad quality of waters in Europe. However, information currently available on emissions to water in Europe is not consistent or comparable between countries.
In order to improve this situation, the ETC/WTR has already published the technical report n°8 in 1998 “A European Inventory of Emissions to Inland Waters, a first proposal”. This was

further developed in the last years and in 2002 a report was published that details all the necessary elements and the concepts, called “EUROWATERNET-Emissions, A European Inventory of Emissions To Water: Proposed Operational Methodology, fourth draft”. Many interactions occurred during the elaboration of this report with other organisations such as the DGEnv, EUROSTAT and Marine conventions, in order to avoid duplication of effort and to streamline the data collection process.

The present document is based on this report and is intended to help the National Focal Points, the National Reference Centres and other voluntary participants to collect and organise the necessary data to report on emissions to water. It describes some organisational aspects and the main practical elements needed in this exercise.
The proposed methodology, called the European Emissions Inventory (EEI) is based on the DPSIR approach used by the EEA where Pressures (sources of emission) depend on Driving forces (activities creating the emissions). Those emissions give rise to the State of the environment and observable Impacts. The Responses by society are an important element in policy assessment.

2 The principle

In order to build an emissions inventory, it is important to define the basic organisation of the system. At the EEA level only aggregated information is needed in order to have the main elements giving a global overview of what happens in this specific field. However, no emissions limit values are given, as small and diffuse sources can also have an important impact. The information is organised as in the following scheme :

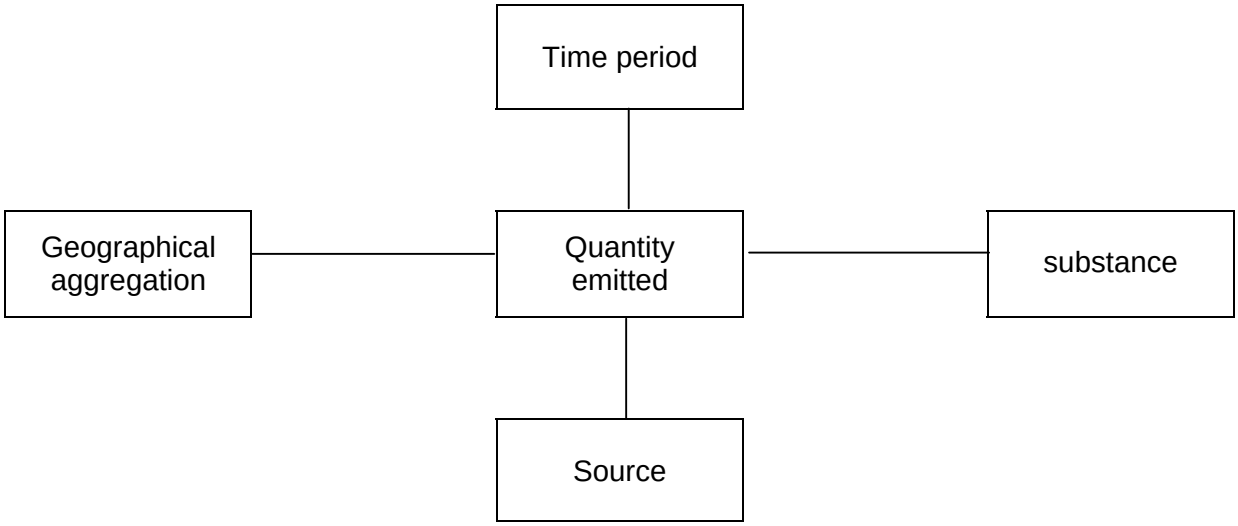

Figure 1 : Global organisation scheme

To help the development of this EEI, an information unit needs to be defined. This information unit is called the ***Assessment unit***. It consists of the following elements:

- **a source category**: seven categories that are Urban, Industrial, Agricultural, Forestry, Transport, Wastes, Natural and Semi-Natural Contributions (see the detailed table in the next chapter);
- **a substance**: BOD or another organic pollution indicator, Ntot, Ptot and one or two priority substances;
- **a spatial aggregation**: a catchment level of about 5 000 to 10 000 km², at the NUTS level 2 or 3;
- **a temporal aggregation**: the annual load and if possible the month of maximum activity.

3 The collected data

3.1 Description of the Assessment Unit

As previously seen, the data collected is based on a so called Assessment unit. It has a unique code and a unique name to allow future identification of the same area, a water type to identify whether the emissions are related to surface water, groundwater or transitional and coastal water. It has also some other main attributes that are the population, the area, a map representation and its coordinates system, but also if possible the soil occupation.

3.2 Source categories

This section gives the seven source categories identified for emissions to water.

Table 2 : EEI classification of emission sources.

Source category	Sub-group	Definition
1. Urban	Domestic	Activities related to individuals in their home
	Metabolic	Liquid waste from WC
	Household	Washing machines, dishwashers
	Services	Businesses, restaurants, hotels, hospitals, schools, auto repair, construction, zoos, botanical gardens, beaches, etc.
	Diffuse urban	Leaching from impermeable surfaces, erosion , run-off, refuse dumps
2. Industrial	Active industrial sites	Any industrial activity that can generate emissions to water (including farm-produce industry, chemical, energy, manufacturing, storage, waste water treatment plants)
	Abandoned industrial sites	Contaminated ground, industrial waste, contaminated infrastructures
	Extracting industries, mining and quarries	Extraction of naturally occurring minerals , solid, liquid or gas, underground, on the surface or in wells
3. Agricultural	Large-scale farming	Industrial grains and farming
	Permanent cultivation	Orchards, vines and tree nurseries
	Cultivation in greenhouses or shelters	Fruits, vegetables, flowers and permanent cultivation (e.g. nurseries) cultivated in glass or plastic shelters
	Pasture, fallow land and fodder farming (except grains)	Cultivation that needs very little or no fertilisers or pesticides
	Animal breeding	All breeding, fish farming and aquaculture
	Horticulture	Vegetables, flowers
4. Forestry	Tree farming	A forestation and re-a forestation, conservation of natural and managed forests
	Timber cutting and transportation	Tree felling, cutting and transportation
5. Transport	Urban	Urban movement of passengers, in cars, motorcycles or taxis, light trucks and road maintenance traffic
	Road/motorway	Long-distance movement of passengers and goods, in cars, large vehicles, tankers, etc.
	Railway	Rail transportation of passengers and freight
	Waterway	Transportation of passengers and freight over maritime, coastal and river ways
	Harbour loading/unloading	Loading or unloading of merchandise in maritime ports
6. Wastes	Removal and treatment of household waste	Removal of household waste, landfills, incineration

	Elimination and treatment of industrial, hospital and agricultural waste	Incineration, transformation
	Unauthorised landfill sites	Non authorised burial sites, non authorised waste deposit sites
	Treatment and evacuation of sludge from waste water treatment plants	Incineration, spreading of sludge
7. Natural and semi-natural contributions	Soil erosion	Removal of the upper layers of soil by wind and water action
	Leaching and dissolving of mineral particles	Deposition of dust on the ground, dissolution of minerals, release of pollutants tied to specific inorganic materials
		Animal and vegetal debris, humus, organic matter attached to atmospheric particles
	Decomposition of organic matter	Drainage of wetlands, swamps and marshes, transportation of sediments and debris in waterways, liming of reservoirs, algal blooms
	Contributions intrinsic to aquatic systems and liming	

3.3 The substances

The choice of the substances is based on the pilot study led in the past years, that has shown that the main parameters for which the data is easy to collect are the organic pollution defined as BOD, and the eutrophication parameters defined as total Nitrogen and total Phosphorus. It would however be interesting if countries could provide also data as a minimum on one or two of the priority Substances as defined in Annex X of the Water Framework Directive (see at the end of this document).

3.4 The aggregations

The spatial aggregation is a geographical area of 5 to 10 000 km², that could be in the future a subpart of a District, as defined under the Water Framework Directive.
The temporal aggregation is the civil year and the month of maximum emissions.

3.5 Organisation of the database

The database will be organised as in the following scheme

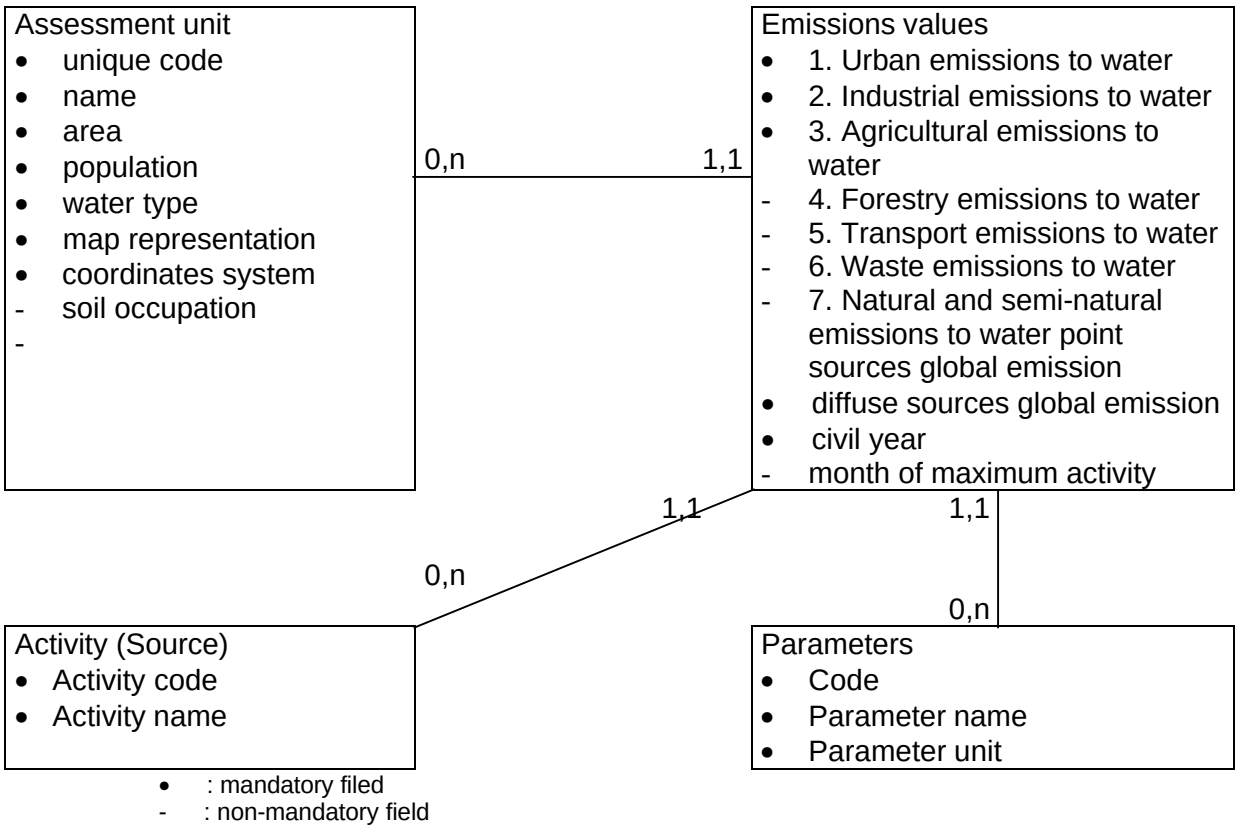

Figure 2 : Global organisation scheme

4 Data collection tables

To fulfill the database presented in the previous chapter, countries will be asked to select the assessment units that will constitute the network and also to provide the data for each assessment unit, in order to cover the whole EEA territory. This give rise to the elaboration of two data collection tables, with their dictionary to have all the necessary information to fill the tables.

Table 3 : The assessment unit

	national code	assessment unit name (including name of the area, of the main river, of the groundwater, of the main town… to help the localisation)	permanent population	maximum population (including tourists)	area	water type (surface water, groundwater, coastal and transitional water)	type of coordinates system name of the projection	map (1/1000000, Mapinfo or ESRI files to be provided with the answer)	Total Agricultural	Arable	Pasture	Forest	Urban area	Remarks
unit		max 50 characters	inhabitant	inhabitant	km²			yes/no	%	%	%	%	%	

Field	Mandatory	Definition
National code	Yes	National Assessment unit ID: (Indexed field) ID provided by the participating countries. This will be kept to enable linkage with the data provided by the participating countries and Waterbase. This can be made of numbers and letters. Text.
Assessment unit name	Yes	This is the complete name, it can be the name of the river basin or any name, as for example the name of the main river or lake, it is made to allow an easy localisation of the assessment unit. Text, maximum 50 characters.
Permanent population	Yes	This is the population that leaves permanently on the Assessment unit area, based on the regular population census. Number, integer
Maximum population	No	This is the maximum population that leaves on the Assessment unit area. It includes tourists, seasonal workers and others. Number, integer
Area	Yes	This is the area covered by the Assessment unit in km². Number, Integer
Water type	Yes	The answer can only be : surface water, groundwater, coastal or transitional water
Coordinate system	No	The best is to use the GISCO parameters at the 1/1 000 000 scale and Lambert 2 Azymuthal and then answer “GISCO” but you can else give the name of the projection and the parameters
Map	No	The answer here is yes if you send a file with the assessment unit map (borders) and no if you don’t.

Total Agricultural	No	Percentage of Agricultural area using Corine Land Cover
Arable	No	Percentage of Arable area using Corine Land Cover
Pasture	No	Percentage of Pasture area using Corine Land Cover
Forest	No	Percentage of Forest area using Corine Land Cover
Urban area	No	Percentage of Urban area using Corine Land Cover
Remarks	No	Any additional remark concerning the data of this table. Text.

Table 4 : the emissions table

			1. Urban Emissions to water		2. Industrial Emissions to water		3. Agricultural Emissions to water		4. Forestry Emissions to water		5. Transport Emissions to water		6. Wastes Emissions to water		7. Natural and semi natural Emissions to water				
	code of the assessment unit	determinand name	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	year	month	Remarks
unit	national code	EWN name	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	4 digits	n° of month (1 to 12)	

Field	Mandatory	Definition
Code of the assessment unit	**Yes**	National Assessment unit ID: as defined in the Assessment unit table. Text.
Determinand name	**Yes**	Determinand name. Text.
1. Urban emissions to water on the civil year	**Yes**	Quantity discharged in water in one year together by all the urban sources of the assessment unit in tons per year. Number, integer, if **–1 the quantity is considered negligible, if empty : no data available.**
1. Urban emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the urban sources of the assessment unit in tons per month. Number, integer.
2. Industrial emissions to water on the civil year	**Yes**	Quantity discharged in water in one year together by all the industrial sources of the assessment unit in tons per year. Number, integer.
2. Industrial emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the industrial sources of the assessment unit in tons per month. Number, integer.
3. Agricultural emissions to water on the civil year	**Yes**	Quantity discharged in water in one year together by all the agricultural sources of the assessment unit in tons per year. Number, integer.

3. Agricultural emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the agricultural sources of the assessment unit in tons per month. Number, integer.
4. Forestry emissions to water on the civil year	No	Quantity discharged in water in one year together by all the Forestry sources of the assessment unit in tons per year. Number, integer.
4. Forestry emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the Forestry sources of the assessment unit in tons per month. Number, integer.
5. Transport emissions to water on the civil year	No	Quantity discharged in water in one year together by all the transport sources of the assessment unit in tons per year. Number, integer.
5. Transport emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the transport sources of the assessment unit in tons per month. Number, integer.
6. Waste emissions to water on the civil year	No	Quantity discharged in water in one year together by all the waste sources of the assessment unit in tons per year. Number, integer.
6. Waste emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the waste sources of the assessment unit in tons per month. Number, integer.
7. Natural and semi-natural emissions to water on the civil year	No	Quantity discharged in water in one year together by all the natural and semi-natural sources of the assessment unit in tons per year. Number, integer.
7. Natural and semi-natural emissions to water on the month of maximum activity	No	Maximum quantity discharged in water in a month together by all the natural and semi-natural sources of the assessment unit in tons per month. Number, integer.
Year	**Yes**	Year of the data reported
Month	**Yes**	Month of the data reported for the month of maximum activity
Remarks	No	Any additional remark concerning the data of this table. Text.

For each of the seven sources identified it will be necessary to fill the table and all the parameters. However for this first exercise, we'll focus on the three main sources that are Urban, Industrial and Agricultural and on three parameters that are BOD5 or another organic pollution parameter (BOD7, COD, TOC…), Total Nitrogen, Total Phosphorus and if possible (on one assessment unit only) one or two priority substances under the Water Framework Directive. The general rule to fill the cells is whether to put the figure or (–1) : the quantity is considered negligible, or empty : no data available.

5 Example of tables

In this section you'll find an example based on the real situation. The maximum amount of metadata is limited to 13 fields per Assessement unit and requested only one time. The maximum amount of data is limited to 21 data per year for each assessment unit, of which 9 are highly requested (emissions to water for each of the three sectors and each of the three parameters).

Table 5 : The assessment units

	national code	name of the assessment unit (including name of the area, of the main river, of the groundwater, of the main town… to help the localisation)	permanent population	maximum population (including tourists)	area	water type (surface water, groundwater, coastal and transitional water)	type of coordinates system name of the projection	map (1/1000000, Mapinfo or ESRI files to be provided with the answer)	Total Agricultural	Arable	Pasture	Forest	Urban area	Remarks
unit		Max 50 characters	inhabitant	inhabitant	km²			yes/no	%	%	%	%	%	
	0402	Loire de Roanne à Nevers			10125	surface water	Lambert II E, first standard parallel 45°53'56".11, second standard parallel 47°41'45".65, central meridian 2°20'14".025, Latitude Projection origin 46°48'00", false easting 600000, false northing 2200000	yes						
	0416	Côtiers vendéens			7578	surface water	Lambert II E	yes						

Table 6 : The emissions table

	code of the assessment unit	determinand name	1. Urban Emissions to water		2. Industrial Emissions to water		3. Agricultural Emissions to water		4. Forestry Emissions to water		5. Transport Emissions to water		6. Wastes Emissions to water		7. Natural and semi natural Emissions to water		year	month	Remarks
			on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity	on the civil year	on the month of maximum activity			
unit	national code	EWN name	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	T/year	T/month	4 digits	n° of month (1 to 12)	
	0402	Total Nitrogen	1131,5		255,5		182,5										1997		
	0416	Total Nitrogen	3029,5		1569,5		15184										1997		
	0402	Total Phosphorus	255,5		36,5		146										1997		
	0416	Total Phosphorus	511		109,5		474,5										1997		

ANNEX I : Indicative list of substances to report

Water Framework Directive, ANNEX VIII : INDICATIVE LIST OF THE MAIN POLLUTANTS

1. Organohalogen compounds and substances which may form such compounds in the aquatic
environment.
2. Organophosphorus compounds.
3. Organotin compounds.
4. Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment.
5. Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances.
6. Cyanides.
7. Metals and their compounds.
8. Arsenic and its compounds.
9. Biocides and plant protection products.
10. Materials in suspension.
11. Substances which contribute to eutrophication (in particular, nitrates and phosphates).
12. Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.).

Water Framework Directive, ANNEX X : LIST OF PRIORITY SUBSTANCES IN THE FIELD OF WATER POLICY (*)

	CAS number (1)	EUnumber (2)	Name of priority substance	Identified as priority hazardous substance
(1)	15972-60-8	240-110-8	Alachlor	
(2)	120-12-7	204-371-1	Anthracene	(X)(***)
(3)	1912-24-9	217-617-8	Atrazine	(X)(***)
(4)	71-43-2	200-753-7	Benzene	
(5)	na	n.a.	Brominated diphenylethers(**)	X (****)
(6)	7440-43-9	231-152-8	Cadmium and its compounds	
(7)	85535-84-8	287-476-5	C_{10-13}-Chloralkanes(**)	X
(8)	470-90-6	207-432-0	Chlorfenvinphos	
(9)	2921-88-2	220-864-4	Chlorpyrifos	(X)(***)
(10)	107-06-2	203-458-1	1,2-Dichloroethane	
(11)	75-09-2	200-838-9	Dichloromethane	
(12)	117-81-7	204-211-0	Di (2-ethylhexyl) phthalate (DEHP)	(X)(***)
(13)	330-54-1	206-354-4	Diuron	(X)(***)
(14)	115-29-7	204-079-4	Endosulfan	(X)(***)
	959-98-8	n.a.	(alpha-Endosulfan)	
(15)	206-44-0	205-912-4	Fluoranthene (*****)	
(16)	118-74-1	204-273-9	Hexachlorobenzene	X
(17)	87-68-3	201-765-5	Hexachlorobutadiene	X
(18)	608-73-1	210-158-9	Hexachlorocyclohexane	X
	58-89-9	200-401-2	(gamma-isomer, Lindane)	
(19)	34123-59-6	251-835-4	Isoproturon	(X)(***)
(20)	7439-92-1	231-100-4	Lead and its compounds	(X)(***)
(21)	7439-97-6	231-106-7	Mercury and its compounds	X
(22)	91-20-3	202-049-5	Naphthalene	(X)(***)
(23)	7440-02-0	231-111-4	Nickel and its compounds	
(24)	25154-52-3	246-672-0	Nonylphenols	X

	104-40-5	203-199-4	(4-(para)-nonylphenol)	
(25)	1806-26-4	217-302-5	Octylphenols	(X)(***)
	140-66-9	n.a.	(para-tert-octylphenol)	
(26)	608-93-5	210-172-5	Pentachlorobenzene	X
(27)	87-86-5	201-778-6	Pentachlorophenol	(X)(***)
(28)	n.a.	n.a.	Polyaromatic Hydro-carbons (PAH)	X
	50-32-8	200-028-5	(benzo-a-pyrene)	
	205-99-2	205-911-9	(benzo-b-fluoranthene)	
	191-24-2	205-883-8	(benzo-g,h,i-perylene)	
	207-08-9	205-916-6	(benzo-k-fluoranthene)	
	193-39-5	205-893-2	(indeno(1,2,3-cd) pyrene)	
(29)	122-34-9	204-535-2	Simazine	(X)(***)
(30)	688-73-3	211-704-4	Tributyltin compounds	X
	36643-28-4	n.a.	(Tributyltin-cation)	
(31)	12002-48-1	234-413-4	Trichlorobenzenes	(X)(***)
	120-82-1	204-428-0	(1,2,4-trichlorobenzene)	
(32)	67-66-3	200-663-8	Trichloromethane (Chloroform)	
(33)	1582-09-8	216-428-8	Trifluralin	(X)(***)

(*)Where groups of substances have been selected, typical individual representatives are listed as indicative parameters (in brackets and without number).The
establishment of controls will be targeted to these individual substances, without prejudicing the inclusion of other individual representatives, where appropriate.
(**)These groups of substances normally include a considerable number of individual compounds. At present, appropriate indicative parameters cannot be given.
(***)This priority substance is subject to a review for identification as possible “priority hazardous substance ”.The Commission will make a proposal to the European
Parliament and Council for its final classification not later than 12 months after adoption of this list. The timetable laid down in Article 16 of Directive 2000/60/EC for
the Commission's proposals of controls is not affected by this review.
(****)Only Pentabromobiphenylether (CAS-number 32534-81-9).
(*****)Fluoranthene is on the list as an indicator of other, more dangerous Polyaromatic Hydrocarbons.
(1)CAS: Chemical Abstract Services.
(2)EU-number: European Inventory of Existing Commercial Chemical Substances (EINECS)or European List of Notified Chemical Substances (ELINCS).’