Strategy for the Reduction of Micropollutants in the Rhine

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Strategie Mikroverunreinigung

Themes

1. 2007 Ministerial Meeting
2. Basic approach and work program
3. Inventory of data & information and assessment
4. Conclusions for some groups of substances
5. Approaches for solutions

Strategy Micropullutants

Ministerial Meeting October 2007:

„to develop a **joint and comprehensive strategy** for **reducing and avoiding** micro-pollutant inputs from urban wastewater and other sources into the Rhine and its tributaries by improving knowledge on emissions, eco-toxicological reactions in nature and to draft suitable treatment methods“

Basic Approach and Workplan (1)

Strategy for micro-pollutants - Strategy for municipal and industrial wastewater - (Report Nr. 181 - 2010)

Objective

Substances in Rhine water may neither individually, nor in mutual interaction have detrimental impacts on the biocoenosis of flora, fauna and micro-organisms and water quality must be such that drinking water production is possible with simple, natural treatment methods

Definition

Micro-pollutants are synthetic organic substances occurring in waters in concentrations of ng/l and µg/l and in even lower concentrations

Basic Approach and Workplan(2)

Approach:

- ✓ **selection of substances / groups of substances**
- ✓ **inventory of data and information**
- ✓ **assessment for each substance / group of substances**
- ✓ **synthesis of Assessments (Publikation Dezember 2012)**
- **possibilities for measures or action: Municipal and industrial wastewater (2013)**
- **diffuse sources (2013)**

Selection of Substances

Selection of Groups of Substances with an expert judgement of available information:

- ✓**Pharmaceuticals for human use** (Report *182*)
- ✓**Biocides and anti-oxidating agents** (Report *183*)
- ✓**Oestrogens** (Report *186*)
- ✓**Radio-opaque substances** (Report *187*)
- ✓**Odoriferous Substances** (Report *194*)
- ✓**Complexing agents** (Report *196*)
- ***In preparation:*** *Industrial chemical agents (inter alia: flame retardants, Bisphenol A, Diglyme and Nonylphenol) (Dec. 2012)*

Inventory of Data

Collection of data (coordinated by Lead Countries):

- **General data** (commercial name, persistence, bio-degradability, toxicity)
- **Production and use**
- **Quantities discharged** (via different input pathways) resulting from production and use
- **Monitoring-data** for groundwater, surface water and treatment plants
- Applicable national and international **limit values and quality criteria** for surface and drinking water

Assessment of information

Assessment reports for each group of substances with:

- **An analysis of the problem** – description of the substance in the environment
- **An analysis of the different input pathways** – to assess the most effective way to take measures
- **Possibilities for measures**
  - at source, for instance already by approval or via alternatives
  - de-central treatment of waste water and avoidance of generation of waste
  - central treatment at waste water treatment plants
  - improved information
  - addressing gaps in knowledge

Conclusions (1)

Pharmaceuticals for human use

- widespread detection in the Rhine catchment area
- with highest concentrations in the lower parts of the Rhine and in tributaries with a high proportion of waste water effluents
- highest values of the order of proposals for environmental quality standards. Binding standards do not (yet) exist
- detection in influent of drinking water production facilities and sometimes also in drinking water itself, in particular when this is produced following bank infiltration

Conclusions (2)

Biocides and anti-oxidating agents

- are being detected in the Rhine catchment area with high variation in concentration levels
- concentrations can be at eco-toxicologically relevant levels
- no binding quality standards
- very complex input pathways
- may gaps in available information

Conclusions (3)

Oestrogen

- very few monitoring data for the main channel of the Rhine
- concentration levels:
  - in the Rhine and its main tributaries mostly below detection limit of 1 ng/l
  - in other tributaries of the order of some ng/l
- however, the trigger value for endocrine effect is below these levels
- current proposals for quality standards for oestrogens are below detection limits

Conclusions (4)

Radio-opaque substances (ROS)

- no eco-toxicological data available identify quality standards
- ROS and their transformation products are being found in the lower parts of the Rhine and in tributaries used for the production of drinking water
- concentration levels expressing general precaution for the production of drinking water (IAWR) are being exceeded
- sometimes detected in drinking water

Synthesis (1)

Analysis of input pathways

- discharges from municipal treatment plants are the most relevant pathway for many of the selected substances
- households as well as industry are the most important sources
- individual companies may be an important source in particular for complexing agents

Synthesis (2)

Concentrations and Quality Standards

Relatively high concentrations are being found in the lower and delta Rhine and in stretches with a high proportion of discharges from treatment plants for:

- human pharmaceuticals, biocides, anti-oxidating agents and radio-opaque substance
- to a lesser extent for complexing agents, odoriferous substances and industrial chemical agents
- and partly for oestrogens

Binding environmental quality standards do not exist for the groups of substances selected or their indicator substances. This is the case at the national level, at the level of the Rhine catchment area and at the European level

Synthesis (3)

Concentrations and Quality Standards

- maximum measured concentrations of individual Indicators of **human pharmaceuticals**, **biocides, anti-oxidating agents** and **oestrogens** do exceed proposed quality standards or can be are eco-toxicologically relevant levels
- this is not the case for **odoriferous substances and complexing agents**
- in particular polar, persistent substances are being found in the intake of facilities for the production of drinking water and sometimes also in drinking water itself

Possibilities for measures (1)

EU-Level

- development of **test methods**, **quality standards** and **criteria for approval of substances**

National level

- **measures at source** in industrial production processes and for the use of products in industry and households
- **centralised measures** e.g. by adding a fourth treatment stage
- **decentralised measures** e.g. by optimisation of industrial processes and the use of treatment of internal waste water

Possibilities for measures (2)

Cooperation with NGO
aimed at improving **exchange of Information** with respect to:

- the **general public** (e.g. regarding use and disposal / collection of products)
- the **professional community** (e.g. information regarding environmental impact, alternatives and environmental labels)

Knowledge
Improving exchange of experiences (e.g. regarding analytical methods, use of substances and products, and environmental pathways and concentrations and impact and assessment thereof)

Thanks for your attention!

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