Environmental Quality Standards (EQS) for NP and OP under the Water Framework Directive

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Water Framework Directive - I

- **Objectives of Directive 2000/60/EC:**
  - Good chemical and good ecological status of surface waters
  - Good chemical and quantitative status of groundwaters
- **Mechanisms**
  - River basin management planning
  - Monitoring
- **Chemical status of surface waters:**
  - Determined by the concentrations of the priority substances (45) plus 8 "other pollutants" (in Annex X) – against environmental quality standards (EQS) set for inland surface waters and other surface waters

Water Framework Directive - II

Article 16 – Strategies against pollution of water

"The European Parliament and the Council shall adopt specific measures against pollution of water by individual pollutants or groups of pollutants presenting a significant risk to or via* the aquatic environment, including such risks to waters used for the abstraction of drinking water.

...Measures shall be aimed at the progressive reduction and, for priority hazardous substances, at the cessation or phasing-out of discharges, emissions and losses...."

** - including secondary poisoning of wildlife/humans via the consumption of fish/shellfish*

Water Framework Directive - III

- **Article 2(29) – definition of PHS**

  "'Hazardous substances' means substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern"
- This has been interpreted as covering substances that would be covered by Article 57 of REACH - and others in other policy sectors that are similar.
- JRC categorisation of endocrine disruptors (EDs) has been used in PS reviews.

EQS Directive – 2008/105/EC

- **Main features**
  - Sets EQS for PS and eight other pollutants based on the most sensitive endpoint (environment / human health)
  - Requires trend monitoring of substances that tend to accumulate in sediment and/or biota (but not NP/OP!)
  - Requires emissions inventories & allows for mixing zones
- **Amendments (Directive 2013/39/EU):**
  - Additional PS (from 33 to 45) and EQS, and revised EQS for some existing PS, revised status (PHS) for DEHP and Trifluralin
  - Provision for Watch List and Strategic Approach to Pharmaceuticals
  - Review of PS list every 6 instead of every 4 years

EQS cf phasing out of emissions

- **Why set an EQS for PHS?**
  - Target to measure progress against
  - Based on best-available science at the time

- **Uncertainties**
  - Long-term effects of chronic exposure
  - Effects of exposure to multiple chemicals

NP and OP in the EQSD

- **NP**
  - PHS
  - AA-EQS = 0.3 ug/l (all surface waters)
  - MAC-EQS = 2.0 ug/l (all surface waters)
  - Currently being reviewed
- **OP**
  - PS, but likely to become PHS at next amendment (as originally proposed in 2001)
  - AA-EQS = 0.1 ug/l (inland surface waters) and 0.01 ug/l (other surface waters)
  - MAC-EQS "not applicable" – AA-EQS considered protective enough
  - not currently being reviewed

Basis of Nonylphenol EQS

- **Listing as PS specifies:**

  Nonylphenol (CAS 25154-52-3, EU 246-672-0) including isomers 4-nonylphenol (CAS 104-40-5, EU 203-199-4) and 4- nonylphenol (branched) (CAS 84852-15-3, EU 284-325-5)

- **EQS refers to CAS no 84852-15-3**

  AA-EQS of 0.3 ug/l based on deterministic approach and *"traditional toxicity" (not endocrine) effect*

  freshwater alga *Scenedesmus subspicatus* with a 72-hour EC10 (biomass) of 3.3 µg/l, AF=10

  MAC-EQS of 2 ug/l based on deterministic approach, *"traditional toxicity",* freshwater invertebrate *Hyalella azteca* with a 96-hour EC50 of 0.0207 mg/l, AF=10

  https://circabc.europa.eu/d/a/workspace/SpacesStore/af1b09f2-ff9a-46f6-ba2d-d4bc2adfeee0/24_Nonylphenol_EQSdatasheet_310705.pdf

Basis of possible revised Nonylphenol EQS – CH proposal

- **EQS refers to Nonylphenol, branched and linear**
- **EQS based on SSD approach**
  - AA-EQS = 0.043 ug/l (AF=5)
  - MAC-EQS = 3.8 ug/l (AF=7)
  - http://www.ecotoxcentre.ch/expert-service/quality-standards/proposals-for-acute-and-chronic-quality-standards/?_ga=2.249800390.1187598368.1501852275-848254315.1501852275
  - Dossier (in German) available on request from Oekotoxzentrum

Basis of Octylphenol EQS

- **Listing as PS specifies**

  Octylphenol (CAS 1806-26-4, EU 217-302-5) including isomer 4-(1,1',3,3'-tetramethylbutyl)-phenol (CAS 140-66-9, EU 205-426-2)

- **EQS refers to CAS no 140-66-9**

  AA-EQS *of 0.1 ug/l based on* deterministic approach *and "traditional toxicity" (not endocrine) effect*

  Oncorhynchus mykiss NOEC (growth) of 6.1 µg/l from 60-day post-hatch early life stage toxicity study *(AF=50)*

  MAC-EQS *of 0.133 ug/l (*deterministic*, "traditional toxicity")* *Gammarus pulex* EC50 (immobilisation) of 13.3 µg/l (AF=100)

  https://circabc.europa.eu/d/a/workspace/SpacesStore/38053232-85b7-4668-895b-22bf91aca0e3/25_Octylphenols_EQSdatasheet_310705.pd

Implementation of NP and OP EQS

- **NP & OP**
  - A few exceedances of EQS reported during last PS review process, mainly in rivers
  - Comment that prefer to monitor in sediment/biota
  - Measures taken to reduce use of NPnEO and OPnEO
  - Call for regulation of both in imported products
- **2nd RBMP assessment**
  - Ongoing, report due in 2018
  - Should yield more information about pressures/sources, emissions, measures

NB – if no exceedances, good, but not enough to meet EQS if EQS should be lower and if emissions should be phased out altogether

Outlook – relevant issues / actions

- How to deal with ever-growing list of individual priority substances? (33 PS in 2001 -> 45 PS in 2013 -> ??) More holistic approach to assessing chemical status under the WFD?
- Risk assessment under WFD currently mostly on substance-by-substance basis. A few exceptions (groups) – but perhaps there could be more?
- Watch List monitoring of estrogens (E2, EE2, estrone) – not easy because of low LoQ
- Estrogen-monitoring project led by CH has been investigating use of effect-based methods (EBMs)
- Activity on effect-based methods starting under WFD

Activity on Effect-Based Methods

- *Under the Common Implementation Strategy (CIS) for the WFD, Working Group Chemicals, led by volunteer Member States (IT, SE), CH and the JRC*
- *Following up work on an earlier technical document (2014) on aquatic effect-based tools*
- *Aiming to deliver outputs by the end of 2018*
- *Aiming to examine and further document the possible implementation of EBT/EBM for monitoring and assessment of chemical status in the WFD context, bearing in mind their possible application under the Marine Strategy Framework Directive*
  - **More holistic approach?**
  - **Overcoming detection / quantification difficulties?**

Activity on EBM cont'd

- Particular tasks for EBT/EBM activity:
  - Identifying relevant MoAs (effects; e.g. Cumulative Assessment Groups) and available EBTs for them
  - Deriving trigger values
  - Assessing the robustness and comparability of different tools, and their maturity for routine implementation (also their cost)
  - Identifying the most significant contributors to the pollution effect → measures
- Other considerations:
  - Usability alongside traditional chemical analysis
  - Equivalent level of protection (trigger value cf EQS)
  - Coordination with approaches under other legislation
  - Coverage of secondary poisoning (not just direct ecotoxicology)

Outlook – other relevant initiatives

- Fitness check of the chemicals legislation
- Non-toxic environment strategy (consistent with aim in 7th Environmental Action Programme to address combination effects of chemicals)
- Commission inter-service group (ISG) on mixture effects
- Research projects – EuroMix, HBM4EU, SOLUTIONS…