

Draft Terms of Reference for CEDA Working Group on Contaminants of Emerging Concern

Rev.1.0, April 2024

Introduction

Substances of possible concern in sediment are substances that might merit action by international frameworks (like OSPAR and HELCOM or the EU Frameworks like the Water and Waste Framework Directive) due to their persistency, liability to bioaccumulate and toxicity or other equivalent concern. In Europe the Regulation on the registration, evaluation, authorisation and restriction of chemicals (REACH) is the main EU law to protect human health and the environment from the risks that can be posed by chemicals. This is done by better and earlier identification of the intrinsic properties of chemical substances and by taking measures. For dredging, disposal and beneficial use of sediments this means that substances of possible concern can impact sediment management, if not now than in the foreseeable future.

PFAS as an example of a Contaminants of emerging concern

PFAS is an example of a substance of possible concern in water and sediment. Before 2009 (Stockholm convention) the focus was mainly on PFOS and PFOA. Anno 2024 many more PFAS components are on the REACH Candidate List of substances of very high concern (SVHC) (see Figure 1).

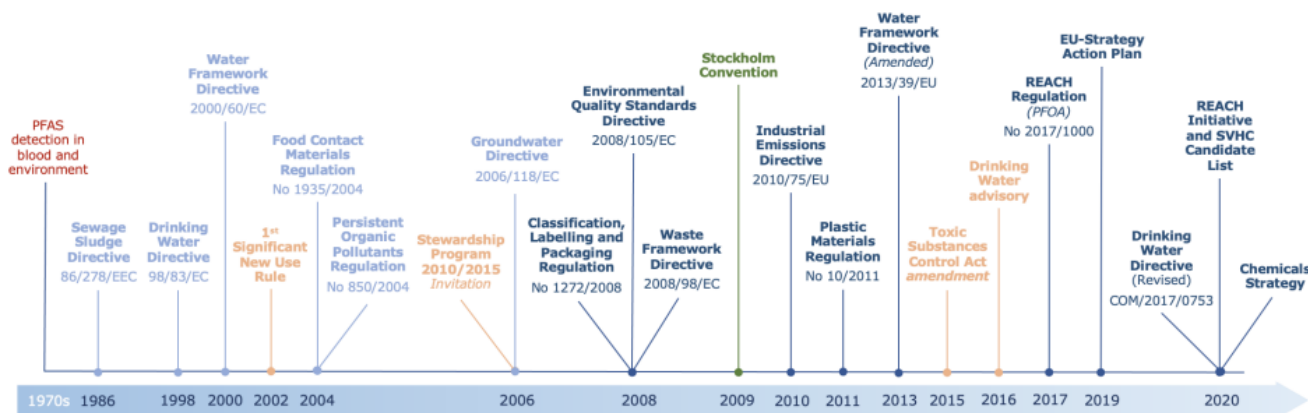


Figure 12. Main legislative documents posing restrictions on PFAS in the EU, USA and at global level. Since the detection of PFAS in human blood and environmental samples, European directives and regulations ensured indirect protective measures by establishing general rules for a range of substances (light blue). Further, the EU legislative restrictions including amendments of previous frameworks as well as future strategies specifically mentioned PFAS (dark blue). The USEPA included several PFAS already in the first Significant New Use Rule (SNUR) in 2002 and in subsequent amendments until 2020 (orange). At global level, the Stockholm Convention remains the main international provision restricting PFAS after the first review in 2009 (green). SVHC: Substance of Very High Concern

Figure 1 From the JRC Technical Report, Per- and polyfluoroalkyl substances (PFAS) of possible concern in the aquatic environment, JRC125254, 2021, doi:10.2760/377564

PFAS is a group of thousands of chemicals of synthetic origin with an organofluorine chemical compound (see <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/>)¹. PFAS has been (and is) produced and used for many applications, and their presence in the environment, including their presence in sediments, is often a diffuse blanket.

¹ There is not yet an official definition of what belongs to the Per- and polyfluoroalkyl substances (PFAS) group. We follow the RIVM definition of all substances with either a -CF₂ or -CF₃ group.

Cont'd

Draft Terms of Reference for CEDA Working Group on Contaminants of Emerging Concern

Within the Water Framework Directive PFOS (and its derivatives) is currently the only PFAS component listed as a priority hazardous substance with an Environmental Quality Standards (EQS) of 0.65 ng/l in fresh water. In the future legislation on PFAS in water can become stricter, both in EQS (7 pg/l for PFOS) and in scope (23 PFAS components). Stricter standards for water quality also means more focus on sediments as a potential source for PFAS emissions, and hence a driver for more strict legislation on PFAS contamination levels in soils and sediments.

But are sediments relevant when it comes to PFAS emissions, or can sediments be used in a way that PFAS is removed from the water phase and stored in the sediment? Figure 2 illustrates the impact of sediment/water interactions on the mass balance of PFOS in two Dutch rivers (not taking into account Dutch sources of PFOS).

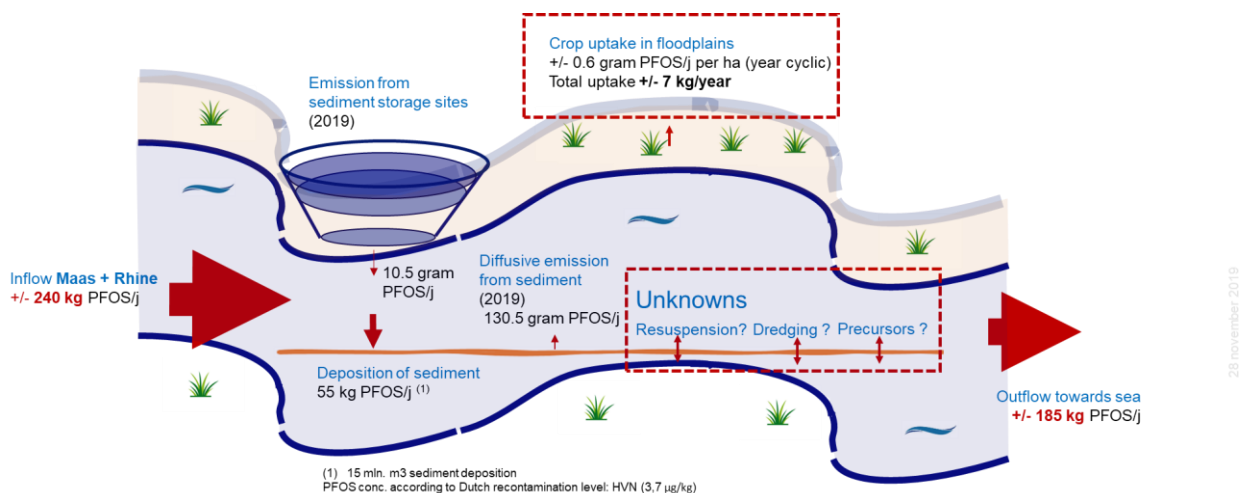


Figure 2 A mass balance for PFOS for two of the main Dutch rivers, based on the inflow at the border, the role of sediments.

The example in Figure 2 is based on the current PFOS background levels in the two Dutch rivers, but historically the water and therefore sediment quality could be worse since PFAS is produced since the 1950 but regulation only became stricter in the period leading up to the Stockholm convention (2009).

What makes PFAS different from other contaminants is that the binding mechanism of PFAS to sediment differs from other contaminants like metals or other organic contaminants. Also there is a differences in behaviour between the different PFAS components (Poly- en PerFluor Alkyl components with a carbon chain length from 2 to 16 carbon atoms). The behaviour and fate of PFAS in water, soils and sediments is a topic of study in EU (and national) research programs like PROMISCES². Using these insights to put dredging and the application of dredged materials in perspective and find solutions to minimise the release of PFAS due to dredging is needed to prevent an EU wide PFAS dredging crisis.

The CEC has decided to initiate a Work Group that investigates the possibility to elaborate on substances of possible concern in sediment. PFAS will be an important example, but the workgroup will also look at other substances of possible concern. This ToR is a first step in that process and will be handed to the work group that will be established to further investigate this subject.

² <https://promisces.eu/>

Cont'd

Draft Terms of Reference for CEDA Working Group on Contaminants of Emerging Concern

Objective

The main objective of the information paper is to inform the dredging industry about the subject of substances of possible concern on an EU scale. Apart from PFAS³, what other substances of possible concern are currently addressed within regulation? What are the sources and pathways of these substances and to what extent does sediment management (including dredging, disposal of dredged materials and the beneficial use of sediment) impact these pathways?

The paper should make clear that sediments are not the source of substances of possible concern (we are, with our production and use of these substances) and that sediments play an important role in buffering their impact and release of these substances to surface and groundwater. The drawback is also that sediments, when contaminated, can have an impact on the water quality on a timescale of decades.

The paper should focus on the action perspective for a sediment manager to limit the release of substances of possible concern in general and PFAS specific from sediments. The paper should also investigate what is known regarding the behaviour of PFAS in sediments when dredged and investigate the risks of the transfer of PFAS to other compartments ((ground)water/air) when sediments are dredged or dredged sediments are applied.

Scope

Issues to address:

- What substances of possible concern are currently addressed within regulation frameworks?
- What are their known sources in water bodies, from point sources to diffuse loads. And is there a gap between observed concentrations in water and sediment and these sources (what do we miss, based on unknown current and historical emissions)?
 - Can we make a mass balance on a water catchment scale, and
 - What do sediments store or contribute to this mass balance?
- What is the fate of substances of possible concern in water bodies, especially known processes that influence the binding of these substances to (suspended) sediment. As an example, for PFAS:
 - What is the role of precursors on the measured concentration in surface and ground water, and
 - Does conversion of precursors in sediment play a role in the water quality assessment?
- What is the impact of dredging and disposal of dredged sediment on the release of substances of possible concern from sediments?
- What is the impact of substances of possible concern on the Beneficial Use of sediments?
- The impact of legislation of substances of possible concern on the dredging industry.
- What solutions are there to remove substances of possible concern from sediments.
- Defining action perspective for water/sediment managers for substances of possible concern in sediments.
- How can the dredging industry help in taking measures to reduce the substances of possible concern in water?

³ As an example. ECHA lists some biocides as substances of possible concern and refers to the Biocidal Product Regulation (BPR), but also some legal and illegal drugs and medicines are listed.

Cont'd

Draft Terms of Reference for CEDA Working Group on Contaminants of Emerging Concern

Deliverables

Information paper on the topic of substances of possible concern for the dredging industry, addressing:

- The topics in the scope.
- The relevance to the dredging industry.
- Quick wins / low hanging fruit to reduce the emissions from sediments due to dredging.
- Proposition for further research on the role of sediment regarding the mass balance and transport pathways of substances of possible concern
- Identify information gaps.

Length of the documents

8 - 12 pages

Timetable

2024 – Q1 set up a task group and complete ToR

2024 – Q2 start of workgroup, +/- 8 weekly progress meetings (7 in total)

2025 – Q2 Draft version of the information paper

2025 – Q3 Final version of the information paper

Subscription to the workgroup

Send an email to both ceda@dredging.org and Arjan.Wijdeveld@Deltares.nl

References

- OSPAR List of Substances of Possible Concern (LSPC) <https://www.ospar.org/work-areas/hasec/hazardous-substances/possible-concern#:~:text=Substances%20of%20possible%20concern%20The%20OSPAR%20List%20of,to%20bioaccumulate%20and%20toxicity%20or%20other%20equivalent%20concern>
- New POPs under the Stockholm Convention <http://www.pops.int/TheConvention/ThePOPs/-TheNewPOPs/tabid/2511/Default.aspx>
- JRC Technical Report, Per- and polyfluoroalkyl substances (PFAS) of possible concern in the aquatic environment, 2021, JRC125254, doi:10.2760/377564
- EPA technical factsheet on PFOS and PFOA: https://19january2021snapshot.epa.gov/sites/static/files/2017-12/documents/ffrrofactsheet_contaminants_pfos_pfoa_11-20-17_508_0.pdf
- OECD portal on PFAS <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/>
- EFSA data on risk for human health of PFAS <https://www.efsa.europa.eu/en/efsajournal/pub/6223>
- ECHA information on PFAS <https://echa.europa.eu/hot-topics/perfluoroalkyl-chemicals-pfas>