



Meeting minutes of Laboratory WG's meeting at Vienna in the 9th month, contains the main decisions for protocol development

Deliverable D 4.1.4

Project title	Sediment-quality Information, Monitoring and Assessment System to support transnational cooperation for joint Danube Basin water management
Acronym	SIMONA
Project duration	1st June 2018 to 1st May 2021, 36 months
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HARMONIZATION AND CRITICAL EVALUATION OF ANALYTICAL METHODS OF SEDIMENTS

1. THE TASK OF THE WORKING GROUP IS HARMONIZATION AND CRITICAL EVALUATION:

- 1.1. Analytical methods for measuring pesticides
- 1.2. Analytical methods for measuring organic industrial pollutions
- 1.3. Analytical methods for measuring inorganic compounds as heavy metals.

The main difference between the tasks is that the first two groups of materials are contaminants (pollutions), the third can be both of natural geochemical origin and of anthropogenic pollution. For the decision on which components have to be measured in the sediments, two basic information sources were used:

(A) Common Implementation Strategy for the Water Framework Directive (2000/60/EC),

(B) Guidance Document No. 25 and Priority Substances relevant to the European Commission's 2012 proposal under the Water Framework Directive.

According to (A) above, as a rule of thumb, compounds with a log Kow>5 (octanol-water) should *preferably* be measured in **sediments**, or in suspended particulate matter (SPM), while compounds with a log Kow<3 should preferably be measured in water. The first list is the following:

1. *Anthracene (PAH)*
2. *Brominated diphenyl ethers*
3. *C10-13-chloroalkanes C₁₀H₁₈Cl₄ and C₁₃H₂₁Cl₇*
4. *Chlorpyrifos (-ethyl, -methyl)*
5. *Di(2-ethylhexyl)phthalate (DEHP) (PVC)*
6. *Fluoranthene (PAH)*
7. *Hexachlorobenzene*
8. *Hexachlorobutadiene*
9. *Hexachlorocyclohexane -Lindane*
10. *Nonylphenols (detergent)*
11. *Pentachlorobenzene (PAH-pesticide)*
12. *Polyaromatic Hydrocarbons: Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)-pyrene*
13. *Trifluralin*
14. *DDT (including DDE, DDD)*
15. *Aldrin*
16. *Endrin*
17. *Dieldrin*

According to (B) above, the list is the following:

1. *Pesticides (herbicides, insecticides): Aclonifen, Bifenox, Cypermethrin, Dicofol, Heptachlor, Heplataclorepoxide, Quinoxifen, Cybutrine, Dichlorvos, Tetrabutryn*
2. *Industrial chemicals: Perflourooctane sulfonic acid(PFOS), Hexabromocyclo-dodecane (HBCDD)*
3. *Combustion by products: Dioxins and dioxin-like PCB-s*

4. *Pharmaceutical substances (steroids-hormons): 17-alpha-ethinylestradiol, 17-beta-estradiol, Diclofenac.*

In order to make a common list of sediment analysis procedures by selecting the best international method (standardized) for each (group of) hazardous substances, the selection of methods and components for sediments are the following:

EN 16181:2018 for ***Polyaromatic Hydrocarbons: Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)-pyrene, Fluoranthene***

EPA 1614A for ***Brominated diphenyl ethers***

EN ISO 12010 for ***C10-13-chloroalkanes***

EPA 8260C for ***Hexachlorobutadiene***

CEN/TS 15968 for ***Perflourooctane sulfonic acid(PFOS)***

EN ISO 18857-2 for ***Nonylphenols***

EPA 1698 for ***17-alpha-ethinylestradiol, 17-beta-estradiol***

EPA 542 for ***Diclofenac***

EPA 8280B for ***Dioxins and dioxin-like PCB-s***

As for **Hexabromocyclo-dodecane (HBCDD)** there is no standardized method. The best available method mentioned in international literature is the following: **Chemosphere 82 (2011) p. 698-707: „Determination of HBCD isomers by isotopic dilution LC-MS/MS”**.

2. FOR THE SIMONA LABORATORY WORKING GROUP MEMBERS THE FOLLOWING TASKS WERE FORMALIZED.

Tasks I.

1. Obtain the original copies of the above recommended methods (ISO, EPA, etc. standards).
2. Read methods carefully and consider if you (your laboratory) are able to fulfil all analytical requirements, or you have to give the task to an accredited laboratory for the project implementation, and also on the long term in the future.
3. Send your comments, suggestions about the use of the above standard methods in your country and inform the WG Leader (prof. Peter Fodor) until 30 June 2019 about the availability of competent labs accredited for the above components analysis in sediments in your country.

Tasks II: (regarding that Analytical methods are in the middle between Sampling and Evaluation)

Task for sampling:

On the basis of recommended Analytical methods:

1. Calculate the amount of samples (how many grams from one sampling place) is needed
2. Plan the physical condition of sampling and sample transport and storage.

Task for evaluation:

How many data is needed for the Evaluation.