

Comments on trend monitoring in sediment under the Water Framework Directive.

- (i) On behalf of the WFD Navigation Task Group¹ we submit the following remarks on preferred practices for trend monitoring. The Guidance doc 25 provides extensive advice on good practices regarding trend monitoring in sediment or in suspended matter. We largely subscribe to the advice given, but it seems necessary to articulate some points.
- (ii) The observation made by several member states at the WG Chemicals meeting of March 2015, namely that statistical significance of trends in pollution can only be established when enough data points are available (thus with a periodicity of 1x/3 yrs only after decades!), is supported.
- (iii) Trend monitoring programmes must thus be designed for years to come, in order to be able to compare results and conclude trends. The selection of the best compartment and the sampling methods chosen are to be set for a period of decades.
- (iv) Sediment constitutes the bottom of the water compartment. A significant advantage of sediment for the purposes of trend monitoring is that it 'integrates' to a certain extent the history of chemical contamination. Over time hydrophobic substances in the water column will associate with suspended matter and settle eventually on the bottom of the compartment. The pollutants found in the sediment characterise the history, but are not always representative of the actual chemical status of the water body; this depends *inter alia* on how tightly bound the pollutants are to the sediment. For some e.g. PAHs that are tightly bound, sediment levels may not be at all representative of the chemical status of the water body. For others e.g. TBT that are less tightly bound, levels in sediment may be more representative of the chemical status of the water body.
- (v) Once the sediment is covered with a fresh layer of silt or sand, compounds at the surface are no longer exposed to (u.v.) light whilst deeper sediment layers are no longer exposed to oxygen. Some degradation of organic compounds will thus occur - although the same sediments can then be re-exposed to the water body through disturbance from natural sources (e.g. currents) or man-made sources (e.g. dredging and fishing). Microbial action can also be relevant. In some cases therefore, priority hazardous substances may still be found in the sediment that have been phased out for a long time and are no longer present in the water

¹ The WFD Navigation Task Group comprises the following professional bodies, trade associations and other stakeholders concerned with ports, commercial and leisure navigation and dredging: Central Dredging Association; European Barge Union; European Boating Association; European Community Shipowners' Associations; European Dredging Association; European Federation of Inland Ports; European Sea Ports Organisation ; EU Recreational Marine Industries Group ; PIANC; and Inland Navigation Europe. Central Commission for Navigation on the Rhine, the Danube Commission and the International Sava River Basin Commission are also invited to attend our meetings as observers.

column; in other cases, sediment may be more representative of the current situation.

- (vi) Similar issues arise in fresh water bodies. In small or shallow navigations, regular disturbance due to vessel movements means it is not always possible to be certain whether any contaminants identified in sediment are recent or are several years old. Extreme hydrological events can also impact on sediment trends due to remobilisation of older sediments including historic pollution, with an associated risk of false interpretation of monitoring data.
- (vii) Overall, therefore, it is clear that great care is required in determining whether trend monitoring in sediment is likely to be representative in a particular water body. Certainly, it is not a panacea.
- (viii) As pointed out in the Guidance doc 25, attention should be given to the nature of the water body (fresh water, transitional or coastal (TraC), marine) as well as to the flow characteristics and the level of suspended matter (slow and stable flows, variable flows, tidal influences, turbidity). These factors have an impact on the procedures to be followed (thin layer of sand, fraction below 63 micron only, preference for suspended matter?). It seems to us that in particular trend monitoring in transitional water bodies in particular can be very complex (how to ensure that the sampling conditions are the same over time?) and there is a risk that the variability over time is such that no trend can be derived. We acknowledge that the Guidance points this out and gives practical advice; but we stress the vital importance of ensuring that potential difficulties particularly in TraC water bodies are properly recognised.
- (ix) The Guidance doc 25 suggests that trends could also be monitored via suspended matter (SPM) in the water column. Point (vi) above highlights some potential issues requiring attention if suspended matter is to be monitored in fresh water bodies. In transitional waters, the scale at which natural processes operate can exacerbate these types of problem. Indeed, experience has shown that the inherent temporal and spatial variability in suspended matter in such water bodies can make it extremely difficult to establish statistically significant trends in chemical status. Overall, whilst we recognise that sampling upstream of the tidal zone can sometimes be helpful, we would nonetheless urge caution in the monitoring of SPM in fresh water bodies, and we cannot support the monitoring of trends via suspended matter in the water column in transitional and coastal water bodies.
- (x) All of these observations lead us to conclude that it may be wise to formulate more stringent recommendations for good practices in sediment monitoring than those currently provided in Guidance doc 25. A focus on a few representative monitoring sites in fresh water bodies is probably pragmatic and cost-effective, but the guidance needs to better reflect the potential issues associated with sediment monitoring in transitional and coastal waters.