

## Hydromorphology and seaport development

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Jan Brooke, Director, Environmental Consultant Ltd.  
Peterborough, UK  
[jan@janbrooke.co.uk](mailto:jan@janbrooke.co.uk)

### Background

European countries depend on maritime transport. Nearly 90% of the EU's external trade and more than 40% of its internal trade goes by sea. Almost 2 billion tons of freight are now handled in more than 1200 EU ports each year, and volumes are continuing to increase<sup>1</sup>. As a result, recent years have seen a number of applications and approvals for major seaport developments. Many such developments have been required in order to accommodate the significant global increase in containerised transport, and further increases in such cargoes are anticipated. In addition to rationalised or new cargo handling and transshipment facilities, new container vessels require deeper access channels to certain ports.

But not all seaport growth is about containerisation. The active promotion of short sea shipping in Europe, *inter alia* to reduce the amount of freight carried by road, is likely to result in some new development (eg. of RoRo facilities at some smaller ports). And the recent revitalisation of the cruise ship industry in Europe may have similar implications for the provision of suitable infrastructure.

Many such seaport activities depend on hydromorphological modification. Dredging for berths and access channels is commonplace, with an associated requirement for disposal of the sediment arising. Channel works such as training walls or breakwaters may be needed. Flood embankments and/or quay walls may have to be constructed. Some developments may also involve land claim and/or impoundment. Potential impacts associated with these modifications can include<sup>2</sup>:

- the physical removal of habitats or species;
- changes to physical processes (erosion, accretion and sediment transport);
- barriers to movement of species or the loss of connectivity between habitat sites (eg. due to impoundment or reclamation)

The WFD may therefore have implications for such developments insofar as their hydromorphological impacts are concerned. The designation of heavily modified water bodies, the setting of good ecological potential (GEP) targets and the application of Article 4(7) to seaport development are all of particular relevance. Further, whilst many of Europe's major seaports are located in or close to protected areas where integration with the requirements of the EU Birds and/or Habitats Directives will be required (ie. development may require not only environmental impact assessments but also an 'appropriate assessment'), the WFD will also potentially apply to the many smaller seaports (and some large ones) which are not in protected areas.

### Hydromorphology in the WFD

The WFD makes clear provision both for human economic activity and for new development. It recognises that certain activities depend on hydromorphological modification, for example through the designation of heavily modified/artificial water bodies and the setting of appropriate ecological objectives (GEP). Indeed, the WFD 'Article 5' reports showed that (after diffuse pollution) hydromorphological modifications were typically the second most important reason why water bodies may fail to meet good status. The recent Common Implementation Strategy (CIS) hydromorphology (HyMo) guidance stresses the need for effective policy integration. It also promotes good practice, both in methodological decision making and in identifying technical solutions to hydromorphological issues.

The policy paper 'Recommendations for better policy integration'<sup>1</sup> highlights the need for better integration between policy areas at different levels and scales. The paper explores the

relationship between the WFD and three key hydromorphological pressures - hydropower, navigation and flood defence - and recommends amongst other things the need for proper consideration of European Transport Policy (including the promotion of Motorways of the Sea and Short Sea Shipping). It also notes that significant progress can be made by: enhancing the recognition of the different interests, fostering co-operation between the different competent authorities and stakeholders, and promoting more integrated development strategies. At project level, for developments on the coast and estuaries it is recommended that due attention be paid to the dynamic nature of the environment in achieving ecological objectives established by the WFD and/or for water dependent Natura 2000 sites, achieving "favourable conservation status" (the latter requiring close coordination with the implementation of the Birds and Habitats Directives). Similarly, whilst it is recognised that sediment transport is not directly addressed by EU specific legislation, it is suggested that supplementary measures dealing with sediment transport management could be part of the (sub) basin river management plans to support the achievement of WFD objectives.

The CIS technical good practice guide<sup>2</sup> discusses the actions that might be required to deal with hydromorphological change, both with regard to existing and possible new modifications. It recognises that it may be very expensive to retrofit measures into existing modifications. It also highlights the need to pay proper attention to 'legacy' issues, where historic modifications continue to affect the status of the water body - examples might include now-obsolete structures such as breakwaters or training walls, or a situation where the physical effects of a historic capital dredge (which was carried out in accordance with the conditions of the licence issued at the time) continue to be experienced.

The HyMo policy paper suggests that for already deteriorated aquatic ecosystems, "win-win" situations can be achieved if new projects are designed so as to improve the ecosystems concerned, and there may well be certain cases where it is reasonable for such "win-win" measures to be agreed as part of the site-specific mitigation or restoration package for a particular development. However, the sheer scale of some historic modifications and the costs associated with their restoration mean that the approach of dealing with historic modifications through mitigation for new development should not be assumed to be the norm. As highlighted in the technical good practice guide, legacy issues need to be properly recognised and appropriately dealt through the identification of both measures and delivery mechanisms as part of the River Basin Planning process. This is especially important where significant restoration or mitigation measures are required.

#### New hydromorphological modifications associated with seaport development

Where the hydromorphological change(s) associated with proposed new development would cause deterioration or failure to achieve good ecological status/potential, Article 4(7) of the WFD applies. This requires that developments which will affect water status must meet the following criteria:

- implementation of all practicable mitigation measures;
- confirmation that there are no environmentally better but not disproportionately costly alternatives for delivering the beneficial objectives of the project;
- demonstration of overriding public interest or equivalent; and
- the reasons for the development are set out in the relevant River Basin Management Plan

A recent CIS guidance document on Article 4(7)<sup>3</sup> has provided some useful clarification on how these criteria might be applied. Of particular relevance to port development, this document clarifies that:

- the WFD objective of preventing deterioration of status refers to adverse changes between rather than within status classes;
- Article 4(7) will not apply to certain temporary effects (eg. short-duration effects of construction or maintenance works);
- for certain small projects, a 'generic approach' can be used in order to reduce the assessment burden;
- new developments which are not cited in the River Basin Management Plan may still proceed as long as certain conditions are met; and

- Article 4.7 does not require compensatory measures.

### Practical implications

So, what does all this mean for new seaport development? Many seaports which have promoted new development in areas protected under the EU Birds and Habitats Directives have experience of frustrating and often expensive challenges and disputes; of sometimes major delays; and of significantly increased costs. Will the WFD have similar consequences, and, if so, how can the risks be reduced? The following paragraphs set out some guiding principles to facilitate the 'WFD-proofing' of future new development proposals and hence reduce the risk and/or consequences of negative experiences under the Water Framework Directive.

It is worth noting at this point that, whereas the Birds and Habitats Directives apply only to certain protected sites, species and habitats, the WFD applies to all coastal and transitional waters in the EU. There are also other key differences between these three Directives, notably the vital role of economic considerations in the Water Framework Directive: all 'measures' required under the WFD must be shown to be cost-effective and not disproportionately costly. In this regard, however, if an area is protected as a Natura 2000 site and the objectives set by the Birds and Habitats Directives are more stringent than those of the WFD, the objectives of the former will take precedence.

### Suggested steps in delivering future WFD-compliant hydromorphological modifications

The first step in considering the likely effects of a new hydromorphological modification is to develop a thorough understanding of the often complex natural environment in which that modification will take place, as well as its likely hydromorphological effects. Indeed, as mentioned earlier, the CIS policy paper recommends that developments on the coast and in estuaries should pay specific attention to the dynamic nature of the environment. A full appreciation of the WFD characteristics of the affected water body is also required (ie. is it a coastal or transitional water body; is it classed as heavily modified or not; and what is the current and target ecological status (or GEP)?).

As far as possible, any hydromorphological modification should then be designed so as to avoid causing deterioration of water status: indeed, this principle should be good practice irrespective of WFD requirements. Where hydromorphological modifications which affect water status are unavoidable and restoration measures are not viable, practicable measures to mitigate the adverse effects should be promoted. In this respect, some of the recommendations made in the CIS HyMo technical good practice guide, including the case study experiences, may be useful. Specifically, the guidance includes:

- an illustrative range of possible hydromorphological alterations typically associated with navigation activities and navigation infrastructure (Figure 4b);
- guidance on the role of a generic list of potential measures in measure selection (Figure 8); and
- guidance on the use of impact criteria in the design of mitigation and restoration measures (Annex III, part 3)

PIANC also has a number of publications of potential value, including those entitled 'Bird habitat management for ports and waterways'<sup>4</sup> and the forthcoming 'Best management practices applied to dredging and dredged material disposal projects for protection of the environment'<sup>5</sup>.

In terms of potential additional workload - and hence cost - it is important to be aware that many of the above steps are consistent with those required under the EIA Directive 85/337/EEC (as amended). Therefore, although some extra detail may be required in order to deal with the WFD-specific 'water status' requirements, much of the other work needed at this stage may well be necessary for other purposes. Rather than re-invent the wheel, it will therefore be prudent to make maximum use of existing processes - for example in respect of data collection and evaluation, also modelling and assessment - thus limiting the potential additional costs.

As well as demonstrating that all practicable mitigation measures have been investigated and adopted, a project which is going through the Article 4(7) process will also have to demonstrate:

- that there are no technically feasible, environmentally better options for delivering the beneficial objectives of the project which are not disproportionately costly, and
- that there are reasons of overriding public interest or that the benefits to the environment and to society of achieving the relevant WFD objectives are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety, or to sustainable development.

The CIS guidance paper on Article 4(7) provides some useful insights as to how this process will work, although - ultimately - case law will be needed to clarify these provisions. Providing evidence to demonstrate that a proposed modification meets these requirements may well involve developers in some additional work but, even so, it is again worth drawing parallels with the work necessary to satisfy the EIA process as this requires both the consideration of alternatives and, in many cases, a statement of need/justification for the project.

And finally, a note of caution. Legal advice provided to the European Commission suggests that Article 4(7) of the WFD may already be in force. Developers considering the promotion of projects which involve hydromorphological modifications - or indeed, those which might otherwise fall within the scope of Article 4(7) are therefore recommended to take the steps necessary to ensure that their proposals are WFD-compliant - at least in as far as the current stage of WFD implementation permits. But how?

So, what do we already know, and what can we already do to ensure WFD compliance?

It is often said that it is not yet possible to assess the practical implications of Article 4(7) because we do not yet have confirmation of what good ecological status means for a certain water body, or because river basin management plans (RBMPs) have not yet been prepared. In the light of the Commission's advice that Article 4(7) may already apply, however, and if delays to projects are to be minimised, it would seem to be prudent to use what we do already know to make sure that proposals for future hydromorphological change are as 'WFD-proof' as is possible. Indeed, the same argument applies to any development which may affect water status. In this regard, the following guiding principles may be useful:

- we do know that WFD objectives relate not only to chemical but also to ecological *and hydromorphological* status
- we do know that high status means at or close to pristine natural conditions and good status (the WFD target) is slightly below high status. However, we also know that the WFD makes provisions for hydromorphological modification
- we do know that developments which affect status will be subject to Article 4(7); we also know the types of activity that may be exempt
- we do know that economic considerations (cost-effectiveness, disproportionate cost) are important in WFD decision making
- although we don't yet have RBMPs, we do know that Article 4(7) guidance expects 'interested parties to have the chance to express their views in advance of a decision'
- we do know that the WFD has a strict no deterioration requirement and that Member States should aim to achieve good status/potential
- we do have extensive experience with assessment and mitigation
- we do know that Article 4(7) does not require compensatory measures, and
- we do know that Article 4(7) may already apply.

## References

- <sup>1</sup> CIS, 2006. WFD and Hydro-morphological pressures: Policy paper. Focus on hydropower, navigation and flood defence activities. Recommendations for better policy integration.
- <sup>2</sup> CIS, 2006. Good practice in managing the ecological impacts of hydropower schemes, flood protection works, and works designed to facilitate navigation under the Water Framework Directive.
- <sup>3</sup> CIS, 2006. Exemptions to the environmental objectives under the Water Framework Directive allowed for new sustainable human development activities (WFD Article 4(7))
- <sup>4</sup> PIANC, 2005. Bird habitat management for ports and waterways. PIANC, Brussels.
- <sup>5</sup> PIANC, 2007 (forthcoming). Best management practices applied to dredging and dredged material disposal projects for protection of the environment. PIANC, Brussels.