Contents

Executive summary

This report analyses the requirements for 'reference conditions' under the EU Water Framework Directive from a legal point of view. It details the requirements as included in the Directive, researches the preparatory works, supplements the analysis with relevant supporting documents, and maps the legal requirements to which the Member States are subject when they define reference conditions in their implementation of the Directive. It then applies these findings to the quality elements composition and abundance of other aquatic flora, represented by eelgrass as proxy, and phytoplankton abundance, biomass, and composition, as they relate to Danish coastal waters.

The study concludes that the legal detail for reference conditions under the Directive leaves much to be desired. Yet that under the core statutory obligation of 'consistency', the historical method for reference conditions is inferior. It also concludes that the reference conditions as set out for Danish coastal waters are legally problematic as likely not meeting with the requirement of consistency.

I. The development of the EU Water Framework Directive

The history of European water legislation and policy can roughly be divided into two parts. Between 1975 and 1980 the main focus of European action was on combating point source pollution; more precisely on prevention of pollution of fresh waters with dangerous substances. The overall aim of the policy at that time was the protection of human health rather than the environment. Legislation was enacted mostly on the basis of the internal market provisions of the EU Treaties, later, once it had been introduced, jointly on the environmental title.

Directives establishing environmental quality standards (EQS) for specific types of water were, amongst others the Drinking Water Directive,[1] the Bathing Water Directive,[2] the Directive on water as a habitat for fish[3] and shellfish.[4] Emission limit values (ELV) were established through the Dangerous Substances Directives[5] and the Groundwater Directive.[6] Most of these Directives, in an amended version, still exist to date.

Later, in the years 1980 – 2000, both policy and law tried to address diffuse pollution. Enforcement in the area of diffuse pollution is problematic seeing as the cause and reason of the pollution and the polluter often are not easy to identify. The Nitrates Directive[7] is a case in point. Other key Directives at that time were the Urban Waste Water Treatment Directive[8] and the IPPC Directive,[9] which however aimed at tackling point pollution rather than diffuse pollution.

The main instruments applied were the application of EQS, plans and designated areas, as for example under the Urban Wastewater Directive, environmental licenses (IPPC Directive) and emission standards. The regulation was a top down regulation for specific sources of pollution, with EQS set by the EU and granted rights to individuals, as the Court of Justice of the EU (CJEU) confirmed in *TOS*.[10]

A major review of the legislation and policy resulted in the Water Framework Directive ('WFD').[11] The Directive creates an integrated river basin management system setting the overall framework. Specific issues are still addressed by explicit legislation, for example in the area of ground, drinking and bathing water.

Further, the "Blueprint to Safeguard Europe's Water Resources" aimed at improved implementation of water policy at the EU level and evaluating the existing policy. It consists of three pillars. The first pillar is the Blueprint Communication which outlines existing obstacles in the water policy and solutions regarding the achievement of the good water status, inter alia concerning land use, the chemical and ecological status in the EU, as well as pollution and vulnerability of EU waters and water efficiency.[12] The second pillar consists of the 3rd Implementation Report on the Water Framework Directive on the River Basin

[1] Directive 75/440 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States, [1976] OJ L 194/26.
[2] Directive 76/160 concerning the quality of bathing water, [1975] OJ L 31/1.
[3] Directive 78/659 on the quality of fresh waters needing protection or improvement in order to support fish life, [1987] OJ L 222/1.
[4] Directive 79/923 on the quality required of shellfish waters, [1979] OJ L 281/47.
[5] Directive 76/464 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community, [1976] OJ L 129/23.
[6] Directive 80/68 on the protection of groundwater against pollution caused by certain dangerous substances,[1980] OJ L 20/43.
[7] Directive 91/676 concerning the protection of waters against pollution caused by nitrates from agricultural sources, [1991] OJ L 375/1.
[8] Directive 91/271 concerning urban waste-water treatment, [1991] OJ L 135/40
[9] Directive 96/61 concerning integrated pollution prevention and control, [1996] OJ L 257/26.
[10] Case C-381/*07 Association nationale pour la protection des eaux et rivières - TOS v Ministère de l'Écologie, du Développement et de l'Aménagement durables*, [2008] ECR I-8281.
[11] Directive 2000/60 establishing a framework for Community action in the field of water policy, [200] OJ L327/1.
[12] A Blueprint to Safeguard Europe's Water Resources, COM (2012) 673, at 4- 19.

Management Plans[13] and the review of the Strategy on Water Scarcity and Droughts.[14] Finally the Water Information System for Europe (WISE) is a web-based information exchange platform on EU water policy and legislation (secondary legislation, implementation reports and action plans), data, modelling and research activities created by the European Commission (DG Environment, Joint Research Centre and Eurostat), and the European Environment Agency in 2007.[15]

II. Aims and Structure of the Water Framework Directive

The Water Framework Directive aims at establishing

> a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which (a) prevents further deterioration and protects and enhances the status of aquatic ecosystems […] (b) promotes sustainable water use based on a long-term protection of available water resources; (c) aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances; (d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and (e) contributes to mitigating the effects of floods and droughts […]. (Article 1).

The system of river basin management was first established in the international Helsinki Treaty. National boundaries are neglected; the natural boundaries of the individual rivers serve as management units. A river basin is defined as the

> area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta" (Article 2 (13)).

According to Article 3 WFD, Member States have to identify the individual river basins lying within their national territory, and assign them to individual river basin districts. Transboundary rivers basins are further assigned to an international river basin district. For each river basin a management plan has to be drafted (Article 13 in combination with Annex VII).

Article 4, in combination with Annex V to the Directive, specifies the environmental objectives and standards which need to be reached for surface waters, groundwater and protected areas. The Article further contains a number of exemptions that allow less strict objectives and derogations (Article 4(4) –(7)).[16] Article 4(4) to (7) provide for time table extensions and exemptions.

Importantly, a program of measures is designed for each river basin (Article 11 in combination with Annex VI) to achieve 'good ecological status'. The program has to include instruments based on an integrated approach of point and diffuse source pollution (Article 10).

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[13] Report on the Implementation of the Water Framework Directive (2000/60/EC) River Basin Management Plans, Brussels, COM (2012) 670.
[14] Report on the Review of the European Water Scarcity and Droughts Policy, Brussels, COM (2012) 672.
[15] The platform and further information is available at http://water.europa.eu/
[16] For further explanation and guidance on the exceptions provided under Article 4 see the Guidance Document No. 20 of the Common Implementation strategy of the WFD, https://bit.ly/3o1H0jx

Key to the integrated approach is therefore the achievement of 'good water status', more precisely a good chemical and ecological status for surface waters and a good quantitative and chemical status for groundwater. In *Bund für Umwelt und Naturschutz Deutschland eV*[17] the CJEU reinforced Member States' duty to prevent deterioration under the WFD, as well as the obligation to enhance water quality.[18] The Court further emphasised that these are not "solely basic obligations, but that this also concerns individual projects."[19] It follows from that that "Member States are required— unless a derogation is granted— to refuse authorisation for an individual project where it may cause a deterioration of the status of a body of surface water or where it jeopardises the attainment of good surface water status or of good ecological potential and good surface water chemical status by the date laid down by the directive."[20]

Top of the regulatory tree in the WFD, is as noted above, the ecological status of surface water.

Chemical environmental quality standards are implemented in the daughter Directives such as the Groundwater Directive and the Dangerous Substances Directive, as well as in national legislation. Setting standards for emissions and chemicals is less cumbersome than the definition of ecological objectives. The underlying idea of the good ecological status is to leave the waters in their 'natural state', thus to minimize human interference and disturbance. Even if this is practically not possible, the CJEU confirmed that the achievement of the good ecological status is an obligation of result and not one of best effort.

The CJEU held in *Commission v Luxembourg*: "*Article 2 of the directive, read in conjunction with, for example, Article 4, imposes on Member States precise obligations to be implemented within the prescribed timescales in order to prevent deterioration of the status of all bodies of surface water and groundwater*."[21] (emphasis added)

III. Common Implementation Strategy

To support implementation of the WFD the Commission drafted, together with the 'EU Water Directors'[22] a common implementation strategy.[23] The demanding timetable in the nine preparatory years, capacity building and the technical character of the Directive were perceived as key problems.[24] The strategy focused on the methodology of understanding the technical and scientific effects of the WFD,[25] through the establishment of different guidance

[17] C-461/13 *Bund für Umwelt und Naturschutz Deutschland*, ECLI:EU:C:2015:433.
[18] Ibid, at 39.
[19] Ibid., at 47.
[20] Ibid., at 51.
[21] Case C-32/05 *Commission v Luxembourg*, ECR [2006] I-11323, at 63. As also previously recognized in Case C-121-03*Commission v Spain*, ECR [2006] I-11323 at 108 regarding Directive 80/778 relating to the quality of water intended for human consumption.
[22] As far as we could ascertain, a collection of civil servants tasked with among others WFD implementation across the Member States.
[23] Common Strategy on the Implementation of the Water Framework Directive, as agreed by the water directors under Swedish Presidency, 2nd May 2001, available at http://ec.europa.eu/environment/water/water-framework/objectives/pdf/strategy.pdf. See also N. Volvoulis ,K. Arpon, T. Giakoumis, 'The EU Water Framework Directive: From great expectations to problems with interpretation', *Science of the total environment*, 2017, p.358-356.
[24] Ibid. at 1.
[25] Ibid. at.2.

documents and thematic information sheets for addressing inter alia river basin management, reporting, the ecological status, groundwater, chemicals flood risk management, and hydromorphology.

IV. Reference conditions

A. Definition

Reference conditions are generally understood to be a water's 'pristine conditions'.[26] 'The reference condition is a description of the biological quality elements that exist, or would exist, at high status, that is, with no, or very minor, disturbance from human activities.'[27] High status nota bene provides the direction, not the target, for restoration.[28]

Astonishingly, no definition of 'reference conditions' exists in the WFD. The WFD has no clear legal instruction in the WFD itself.

There is a roundabout way of defining the concept where the WFD defines 'poor' and 'bad' water status, in Annex V under 1.2:

> Waters achieving a status below moderate shall be classified as poor or bad.
> Waters showing evidence of major alterations to the values of the biological quality elements for the surface water body type and in which the relevant biological communities deviate substantially from those normally associated with the surface water body type under undisturbed conditions, shall be classified as poor.
> Waters showing evidence of severe alterations to the values of the biological quality elements for the surface water body type and in which large portions of the relevant biological communities normally associated with the surface water body type under undisturbed conditions are absent, shall be classified as bad.

'Undisturbed conditions is what seems to be the key, however what this concept means is not further defined. The EC has given a bit more insight when it refers to 'minimal anthropogenic impact' in a website-based introduction to the WFD (hardly therefore a legally binding instrument)'

> Good ecological status is defined in Annex V of the Water Framework Directive, in terms of the quality of the biological community, the hydrological characteristics and the chemical characteristics. As no absolute standards for biological quality can be set which apply across the Community, because of ecological variability, the controls are specified as allowing only a slight departure from the biological community which would be expected in conditions of minimal anthropogenic impact. A set of procedures for identifying that point for a given body of water, and establishing particular chemical or hydromorphological standards to achieve it, is provided, together with a system for ensuring that each Member State interprets the procedure in a consistent way (to ensure comparability). The system is somewhat complicated, but

[26] K. Nielsen, B. Sømod, C. Ellegaard, D. Krause-Jensen, "Assessing Reference Conditions According to the European Water Framework Directive Using Modelling and Analysis of Historical Data: An Example from Randers Fjord, Denmark," AMBIO: A Journal of the Human Environment, 32(4), 287-294, (1 June 2003).
[27] Final Draft Guidance on typology, reference conditions and classification systems for transnational and coastal waters, CIS working group 2.4, 21-22 November (year not specified but believed to be 2001), https://bit.ly/39NwXK8 p.43.
[28] Ibidem, at 4.1.7, p.44.

> this is inevitable given the extent of ecological variability, and the large number of parameters, which must be dealt with.[29] (emphasis added)

There is also a description of reference conditions in the WFD Annexes. Annex II 1.3 (i):

> For each surface water body type characterised in accordance with section 1.1, type-specific hydromorphological and physicochemical conditions shall be established representing the values of the hydromorphological and physicochemical quality elements specified in point 1.1 in Annex V for that surface water body type at high ecological status as defined in the relevant table in point 1.2 in Annex V. Type-specific biological reference conditions shall be established, representing the values of the biological quality elements specified in point 1.1 in Annex V for that surface water body type at high ecological status as defined in the relevant table in section 1.2 in Annex V.

However such description does not define what a reference condition actually is.

B. Establishment of reference conditions

At the heart of current opinion lies Annex II: 1.3 (i-vi). It reads in relevant extract:

> Establishment of type-specific reference conditions for surface water body types: For each surface water body type….type-specific hydromorphological and physico-chemical conditions shall be established representing the values of the hydro-morphological and physicochemical quality elements specified….for that surface water body type at high ecological status….Type-specific biological reference conditions shall be established, representing the values of the biological quality elements…for that surface water body type at high ecological status…. ….

Sub (v) reads in full:

> Type-specific biological reference conditions may be either spatially based or based on modelling, or may be derived using a combination of these methods. Where it is not possible to use these methods, Member States may use expert judgement to establish such conditions. Type-specific biological reference conditions based on modelling may be derived using either predictive models or hindcasting methods. The methods shall use historical, palaeological and other available data and shall provide a sufficient level of confidence about the values for the reference conditions to ensure that the conditions so derived are consistent and valid for each surface water body type.

Other language versions of the Directive do not immediately offer additional instruction.

This proviso was not part of the initial Commission proposal. It was introduced in the amended proposal,[30] however in the preparatory works neither the EC, nor the Parliament or Council appear to have discussed the referencing issue, let alone the use of historical data at all.[31]

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[29] European Commission, Introduction to the new EU Water Framework Directive, 2016, https://ec.europa.eu/environment/water/water-framework/info/intro_en.htm

[30] COM (99) 271, https://bit.ly/38Zz0v6.

[31] We reviewed the entire travaux préparatoires via Œil: https://oeil.secure.europarl.europa.eu/oeil/home/home.do

In its proposal that led to the WFD, the EC signals that despite the clear complications in harmonisation of standards as well as reporting across the EU Member States, national approaches to methodology and reported values are meant to support the effort to reach a pan-EU water quality effort:

> Clearly, the natural conditions of surface waters and groundwaters vary enormously throughout the Community and, therefore, it is not always possible or desirable to establish identical methods or, for example, parameters or parametric values for use in all circumstances. Nevertheless, the Commission believes that the basic criteria have been established for the technical Annexes which, combined with the broad definitions of "good status" in Article 2, will allow fair comparisons to be made and will allow the environmental objectives of Article 4 to be truly "common" to all Member States.[32]

Neither the reference conditions nor the specific issue of use of historical data, was flagged by the EC as a point of attention in its 2019 WFD Fitness Test[33] or in its 2019 Report on the implementation of the Directive.[34] Further work on reference conditions was identified as a necessity for Estonia and for Slovakia, however not for any other Member State including Denmark.[35]

C. Implementation and interpretation of the criteria for establishing reference conditions

1. A myriad of possibilities

The aforementioned 2001 implementation strategy[36] confesses in its discussion of the identification of reference conditions, to what it is in effect the very unfinished state of referencing conditions, including the admission that

> It is particularly important to develop an operational definition of reference conditions and to agree on the historical period or other circumstances corresponding to reference conditions.

An element of the WFD that lies at the core of its legal obligations, therefore was not properly agreed at its inception.

As the EC notes in the Guidance document number 10 Rivers and Lakes – Typology, reference conditions and classification systems,[37] the WFD without any specific ranking of the methods, lists the main options for establishing reference conditions as:

[32] COM(97) 49 https://bit.ly/2XX23JC , p.15.
[33] SWD (2019) 439, https://bit.ly/3p0Scyb .
[34] COM (2019) 95, https://bit.ly/3bPTmsR
[35] Annex to COM (2019) 95, https://bit.ly/38Ud7NY .
[36] Note 23 above, p.36.
[37] 2003, available at https://bit.ly/2XstKd2 , p.32-33. Of note is that these guidance documents are not legally binding. Rather, they represent examples of best practice and common understanding of the various legal concepts in the WFD.

• Spatially based reference conditions using data from monitoring sites;
• Reference conditions based on predictive modelling;
• Temporally based reference conditions using either historical data or paleoreconstruction (i.e. the sediment archive, GAVC) or a combination of both;
• A combination of the above approaches; finally
• where it is not possible to use these methods, reference conditions can be established with expert judgement.

This list indicates that in the absence of a common EU measuring method, Member States' freedom of manoeuvre clearly is very broad indeed. The only benchmark is a qualitative one: whatever method Member States use, it has to provide a sufficient level of confidence about the values for the reference conditions to ensure that the conditions so derived are consistent and valid for each surface water body type.

In summary:

The method has to provide a
- sufficient level of confidence
- about the values for the reference conditions
- to ensure that the conditions so derived are
    - consistent and
    - valid for each surface water body type.

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2. Inferiority of the historical method

In its Guidance document,[38] the EC discusses the historical method under one heading, together with paleoreconstruction, as 'temporally based reference conditions'. Most of the discussion in that heading in fact concerns paleoreconstruction, which is lauded for being able to validate the efficacy of other approaches if conditions are stable, however which the EC also warns against for its often site- and species specificity.

On the historic method, the EC has very little to say:

> 'Regarding the widespread use of historical data, it may be limited by its availability and unknown quality.'

Clearly, it is not impressed by an abundant reliance on the method.

Unlike the EC, which as noted above does not suggest that the WFD as such defines a hierarchy in the reference conditions method, the COAST working group within the Common Implementation Strategy ('CIS') 'water directors' of the EU do suggest a hierarchy, as follows:

> A hierarchical approach for defining reference conditions is suggested using the various methods in the following order: 1. An existing undisturbed site or a site with only very minor disturbance; or 2. historical data and information; or 3. models; or 4. expert judgement.[39]

[38] Note 37 above, p.32-33.
[39] Final Draft Guidance on typology, reference conditions and classification systems for transnational and coastal waters, CIS working group 2.4, 21-22 November (year not specified but believed to be 2001), http://www.ecowin.org/ticor/documents/CIS%202.4%20COAST%20guidance.pdf, p.48.

At 4.5.2 the group notes

> Models are generally not well developed or validated for the marine environment and given the problems with using historical data, the reference network of high status sites is the preferred approach for deriving reference conditions for transitional and coastal waters.

The CIS Working Group goes into a little more detail as to how it sees historical data[40]

> 4.5.7. It may be possible to use historical information to derive reference conditions if the historical data are of assured quality. If reference conditions are derived from historical conditions, these should be based upon the condition of water bodies at times of no or very minor anthropogenic influence. No single date can be used to determine the reference conditions, for example, in urbanised estuaries a historical period of low nutrient inputs from agriculture may have corresponded to high industrial discharges and the release of untreated sewage.
> 4.5.8. A site at which there are historic pressures may still be used to derive biological reference conditions if the pressures are not causing current ecological disturbance to that quality element.

Later in that same document, it is suggested that 'expert judgment' is required to ensure the suitability of historical data (and indeed to guarantee the soundness of all other methods):[41]

> 4.5.10. It is emphasised that expert judgement is required with all the above techniques: for example, use of historical data will require expert judgement in deciding which data are appropriate. In addition, robust predictive models can only be developed using data plus expert judgement. In the early stages of implementation of the Directive, expert judgement will be used alongside the developing classification tools outlined in section 6 to derive reference conditions consistent with the normative definitions.

Historical data have also been said to suffer from potential bias, e.g. because a specific species was not on the radar of those collecting the data, e.g. because of a lack of interest, or because the data were collected for very different reasons than ecological ones.[42]

3. Variability across the EU.

'Undisturbed' or 'pristine' conditions, it has been suggested, may be defined as the conditions existing before the onset of intensive agriculture or forestry and before largescale industrial disturbances. However the actual time period arguably varies across Europe due to differences in anthropogenic stress.[43] A spatial or temporal benchmark must be set in respect of anthropogenic pressures so that appropriate comparison against the current condition of water bodies can be made across all Member States. The aforementioned Guidance document No.10 mentions

[40] Note 27 above, p.49.
[41] Ibidem, p. 50.
[42] A. Econoumou, 'Development, Evaluation & Implementation of a Standardised Fish-based Assessment Method for the Ecological Status of European Rivers - A Contribution to the Water Framework Directive (FAME)', May 2002, https://bit.ly/2LEgOyF p.11-12.
[43] R. Johnson, M. Lindegarth, J. Carstensen, 'Establishing reference conditions and setting class boundaries', Waters Report No 2013:2, https://bit.ly/3qAtwNo, p.16.

> High status or reference conditions is a state in the present or in the past corresponding to very low pressure, without the effects of major industrialisation, urbanisation and intensification of agriculture, and with only very minor modification of physicochemistry, hydromorpology and biology.[44]

4. Common meaning, purpose, and teleological interpretation

The principles of interpretation of EU statutory law, are: literal and grammatical interpretation (including linguistic analysis, taking into account that EU law is generally equally authentic in all language versions taken together); purpose and general schemes of the rules of which the law forms a part; place of the provision in question in the broader legal context of which it forms part (systematic or contextual interpretation) and the objectives pursued by it (teleological or functional interpretation); finally, if the wording is open to more than one interpretation, preference should be given to the interpretation which renders the provisions consistent with higher ranking norms (such as primary law), and to that interpretation which ensures that the provisions retain their effectiveness (effet utile).[45]

It is clear from the above that there is little specific legal instruction on reference conditions in the WFD. While of course the use of a Directive rather than a Regulation, signals the EU's intention to leave a large margin of manoeuvre to the Member States,[46] it is most odd and unhelpful that a core element in reaching the WFD's obligation, is left with such little instruction in the Directive. That leaves one with having to interpret and apply the provisions using the common meaning of its terms, the overall objectives of the WFD and the place of reference conditions in same, and teleological interpretation (meaning: applying the provisions with their statutory aim in mind).

If the historical benchmark is used, it must be chosen such that reference conditions can be adequately described.[47] As noted above, the WFD in Annex requires that the historical reference method, if used, guarantees i.a. that the reference conditions thus derived are 'consistent'. No further detail is given of what consistency might entail.

The Oxford English Dictionary – OED defines 'consistent' as 'Remaining in the same state or condition; settled, persistent; durable'; and as 'Standing still or firm; staying, remaining: as opposed to moving or giving way'.

An argument may be made that even if the historic benchmark for 'pristine conditions' may differ across territorial units (which may or may not correspond to Member States), it *must not* differ for the different quality elements within one and the same water unit. The reference conditions' role is to provide the benchmark, the direction of travel for authorities to aim their water improvement efforts at. Those efforts concern specific surface water bodies, such as here, coastal areas. Anchoring those reference conditions unto different historical timesets for one and the same surface water body type, would seem inevitably to lead to a disjointed implementation effort.

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[44] Note 37 above, p.29.
[45] K. Lenaerts, P. Van Nuffel, *European Union Law*, London, Sweet & Maxwell, 3rd ed. 2011, 21-061.
[46] See also O. Green, A. Garmestani, H. van Rijswick, A. Keessen, 'EU water governance: Striking the right balance between regulatory flexibility and enforcement?', *Ecology and Society*, 2013.
[47] Note 37 above, p.36.

In the case at issue, the biological quality elements *phytoplankton abundance, biomass, and composition*, for the pelagic elements; and *composition and abundance of other aquatic flora*, for the benthic elements, together with 'benthic invertebrate fauna' are the three quality elements for setting the reference conditions for Danish coastal waters. For eelgrass (used as a proxy for other aquatic flora), as noted the dataset is based on a historical dataset from 1900. For phytoplankton, chlorophyll *a* is used as the main indicator.

The chain of pressure-state-response appears to be: nitrogen loading from land (pressure) affects chlorophyll concentration, which in turn affects water clarity, conditioning eelgrass growth at the sea bottom (state). In order to change the state, response measures should be implemented by policy-makers.

However, no historical dataset for N loading is available from 1900. Scientists in various stages (as reported in the two scientific reports, by Profs. Ferreira and Oenema, part of current joint study) have attempted to reconstruct N loading around the 1900s. Using different historical periods for the biological quality elements and for assessment of the (presumed) causative factors (nitrogen loading), because data are not or do not seem available for all three components within the same water unit for the same timeframe, is hardly 'consistent'. Likewise, mixing the historical method for eelgrass with an inconsistent attempt to reconstruct historical data for N loading, reverse engineered using current scientific insight, is inconsistent. Such methodology amplifies the bias and reliability issues which as flagged above are a general point of attention for the historical method.

V. Concluding on the legal framework

From the above, the following emerges.

Firstly, 'hard' legal requirements for reference conditions and for the methodology adopted by Member States in setting them, are simply absent from the WFD. The WFD does not define 'reference conditions'. It does not define a historical period of 'pristiness' against which human interference must be measured. It grants Member States a plethora of methodological means to set reference conditions on their territories.

The WFD itself does not impose a ranking on the potential methods for setting the reference conditions. Guidance documents, implementation guides and scholarly opinion do classify the historical method as inferior.
Whatever method is chosen, the WFD provides that it has to ensure a

- sufficient level of confidence
- about the values for the reference conditions
- to ensure that the conditions so derived are
    - consistent and
    - valid for each surface water body type

The Danish method examined in this report employs different historical periods for the quality elements of one and the same water unit. It also combines hard historical data for one indicator, with reconstructed data for another. This in our view endangers a sufficient level of confidence and rules out consistency. It rules out proper implementation efforts for the surface water body type concerned.