

UK Technical Advisory Group on the Water Framework Directive

Classification Schemes in River Basin Planning: An Overview

(Public Working Draft)

This Guidance Paper is a working draft defined by the UKTAG. It documents the principles to be adopted by agencies responsible for implementing the Water Framework Directive (WFD) in the UK. This method will evolve as it is tested, with this draft being amended accordingly.			
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Introduction

1. The classification schemes will provide the basis for describing the state of the aquatic environment and for assessing the effectiveness of the programmes of measures in achieving the environmental objectives established through the river basin management planning process.
2. The classification of water bodies will identify:
 - the current status of each water body; and
 - changes to the status of each water body over time in response to measures.
3. This paper describes how classification schemes are being developed across the UK and how it is envisaged they would be applied as part of the river basin planning process. It also describes how monitoring and classification schemes interact with Characterisation, Programme of Measures and the setting of objectives for water bodies. Worked examples will be produced to illustrate how the classification schemes and environmental standards will be applied in practice.

Classification Schemes

4. The Directive requires the following classification schemes:
 - Ecological status and chemical status classification schemes for surface water bodies. There will be differing ecological status classification schemes for rivers, lakes, transitional waters and coastal waters;
 - Heavily modified and artificial water bodies will be assessed in relation to their ecological potential and chemical status classification schemes; and
 - Groundwater quantitative status and groundwater chemical status classification schemes for bodies of groundwater.
5. The quality elements¹ relevant in assessing **ecological status** and **ecological potential** for surface waters are:
 - Biological quality elements (covering algae, plants, fish and invertebrates)²;
 - General physico-chemical quality elements;

¹ Annex V of the WFD defines those general conditions (i.e. physico-chemical) and hydromorphological quality elements as 'supporting' the biological elements.

² The assessment of the status of a biological quality element may be based on monitoring results for a number of different 'metrics', or indicators, of the condition of that element. Ecological status cannot be determined from physico-chemical measurements alone (refer Ecostat WG2a, 5 Nov 2003, Guidance on ecological classification. Para. 2.4 and 4.15 and CIS working group 2.7, Guidance on Monitoring for the Water Framework Directive, 15 October 2002, para.2.8.3.)

- Environmental Quality Standards (EQSs) for specific pollutants (i.e. synthetic and non-synthetic pollutants); and
- Hydromorphological quality elements.

The schemes to support the assessment of the above elements are developed by the UK.

Surface water bodies will be assigned to one of five ecological status classes (high, good, moderate, poor or bad) or one of five ecological potential classes (maximum, good, moderate, poor or bad). The status assigned will be determined by the worst classed quality element. (This is also termed the 'one out - all out' principle as applies under the WFD).

6. The quality elements relevant in assessing **surface water chemical status** are:
 - Priority substances (Annex X to the WFD) for which EQSs are to be agreed at European Community-level; and
 - List I Dangerous Substances for which EQSs are specified in the relevant European directives listed in Annex IX to the WFD.
7. There will be two surface water chemical status classes; Good and Not Good. The surface water chemical status of a water body will be 'not good' if an EQS for one or more relevant priority substances or dangerous substances is exceeded. The surface water chemical status classification scheme will be common to all surface water bodies.
8. To achieve the overall aim of "good status", a surface water will have to be at least good for ecological and chemical status.
9. Groundwater bodies will be classified as:
 - Good groundwater quantitative status or poor groundwater quantitative status; and
 - Good groundwater chemical status or poor groundwater chemical status.
10. The class of a body of groundwater will depend in part on whether human alterations to groundwater levels or water quality are causing significant impacts on surface waters associated with the body, or significant damage to terrestrial ecosystems dependent on the body. If such impacts are being caused, the groundwater body must be classed as being at poor groundwater status. The requirement relating to good chemical status will also depend on a new groundwater "daughter" directive which is expected to be agreed in early 2006.

Development of classification tools for surface waters

11. For the ecological status and ecological potential classification schemes, the Directive provides detailed normative definitions of the degree of human disturbance to each relevant quality element that is consistent with each of the ecological status/potential classes. These definitions are being used to develop classification tools and appropriate numeric class boundaries (or Ecological Quality Ratios) for each quality element. The results of applying these classification tools will be used to determine the status of each water body or group of water bodies.
12. The classification tools are being developed on a UK wide basis under the auspices of the UK Technical Advisory Group (UKTAG).
13. The work is being carried out both 'in house' and by consultants and funded from a number of sources including by the Environment Agencies, SNIFFER, and the Irish North South (SHARE) project, which is INTERREG funded and is being managed jointly between authorities in Northern Ireland and the Republic of Ireland.
14. It is anticipated that ecological classification tools for transitional and coastal waters will be available by end 2005. Ecological classification tools for rivers and lakes will be available at the beginning of 2006. This will allow testing of, and training in, the tools during 2006 so that they can be used in the monitoring programmes from 2007 onwards.

15. The good status class boundary values (i.e. ecological quality ratios) for the biological quality elements identified by Member States will be compared through the **Intercalibration Exercise**. The Exercise is designed to ensure that the good status class boundaries used in the classification schemes are in-line with the normative definitions and comparable across Europe. The first Intercalibration Exercise is being carried out in 2005/6. The results of the Exercise will be reported by the Commission by mid-2007 at the latest.
16. A number of new classification tools are being developed, for example classification tools for plants and fish quality elements. The extent to which the good status class boundaries relevant to these quality elements can be compared across Europe through the Intercalibration Exercise will vary according to available data and the state of development of the classification tools. Consequently, the first intercalibration report will not cover all the biological quality elements. The level of knowledge will improve over future river basin planning cycles.
17. The surface water classification schemes will take account of environmental standards. Environmental standards are standards for the non-biological quality elements that need to be achieved to protect the biological quality elements. They comprise of:
 - General physico-chemical quality elements;
 - Specific pollutants; and
 - Hydromorphological quality elements (only used in assessing high status in ecological status).
18. Environmental standards are the standards for the physico-chemical elements for ecological status classification schemes and establishing the programme of measures (including licensing activities) and setting objectives under the river basin planning process (refer to UKTAG Guidance 14e for more information on how the environmental standards will support the programme of measures).

Development of classification scheme for groundwater

19. As groundwater quantitative status is defined in terms of the impact of alterations to groundwater levels, and groundwater chemical status (i.e. water quality) is expected (subject to any changes which may be made to the new groundwater “daughter” directive before it is agreed) to be defined largely in terms of impacts on associated surface water ecosystems and dependent terrestrial ecosystems, the classification schemes for groundwater is likely to consist of an overall framework within which environmental standards drawn from a variety of sources will be used in assessing groundwater status.
20. A framework for groundwater classification will be available by end of 2005, with quantitative standards developed by the end of 2006. The final groundwater chemical status scheme awaits both the development of surface water standards and agreement on the Groundwater Daughter Directive and may not be available until the second half of 2006.

Development of Environmental Quality Standards for Specific Pollutants to support Ecological Status classification

21. Member States are required to derive EQSs for synthetic and non-synthetic pollutants or specific pollutants (i.e. other substances identified as being discharged in significant quantities into the body of water) in accordance with Annex V (1.2.6) of the Directive. Compliance with these standards will provide one element of overall compliance with Good Ecological Status. Such substances are covered by Annex VIII (points 1-9).
22. A prioritised programme for the development of Environmental Quality Standards (EQSs) for these pollutants is being defined based on risk to the environment and levels of

current use. The list of substances will be available late 2005, with the aim for an initial batch of standards to be released in mid-2006.

The classification process – using monitoring data

23. Each water body will be classified by assessing the impacts of the pressures to which the body is subject on the basis of data collected by targeted, risk-based monitoring. Monitoring will use quality elements most sensitive to the pressures placing the body at risk.
24. Figure 1 illustrates the relative roles of biological, hydromorphological and physico-chemical quality elements in ecological status classification for surface waters according to the normative definitions in Annex V (section 1.2).
25. Figure 2 explains the process of classifying surface water bodies (excluding heavily modified water bodies and artificial water bodies), taking into account the results of characterisation.
26. The level of confidence and precision of the results provided by the monitoring programmes must be reported in the river basin management plans.
27. A similar process will be required for groundwater classification and is outlined in UKTAG *Guidance 11b) Outline of groundwater classification for the purpose of WFD*.
28. For information on the principles underlying monitoring programmes across the UK, please refer to UKTAG *Guidance 12a) Selection of monitoring sites and building monitoring networks for surface and groundwaters for further information on UK approaches*.

Figure 1: Tests for assigning a surface water body to an ecological status class.

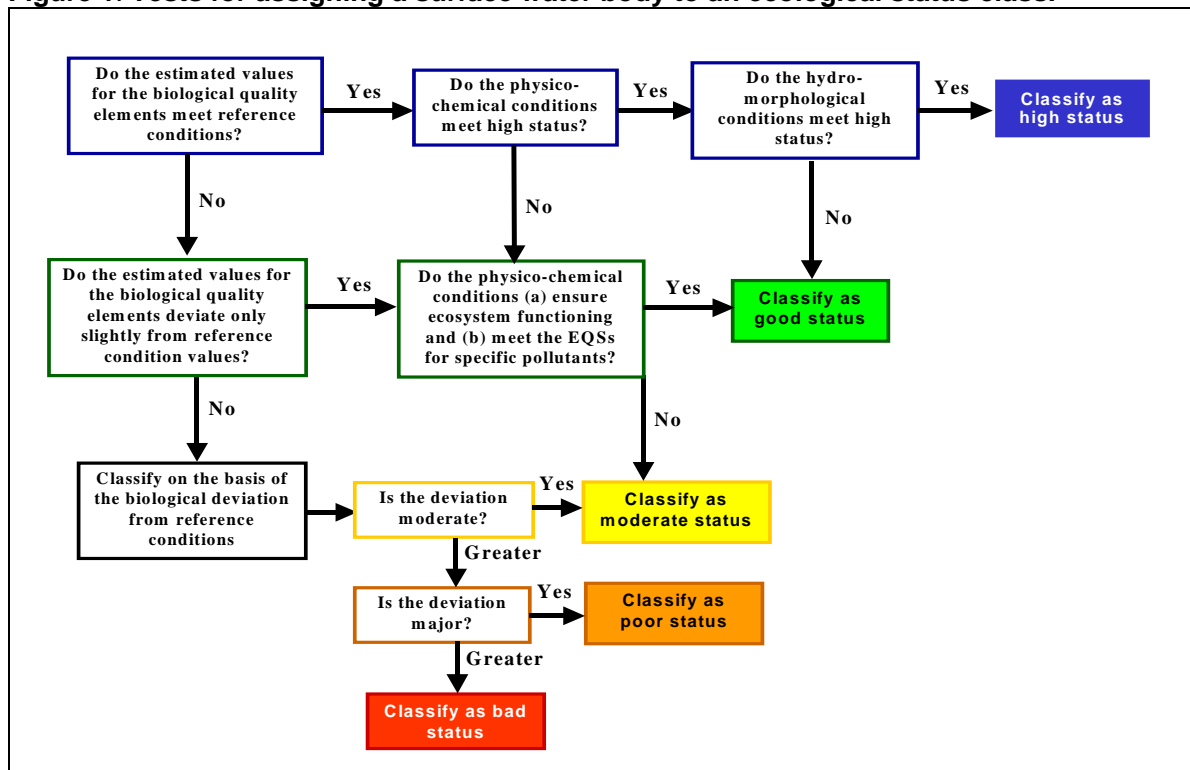
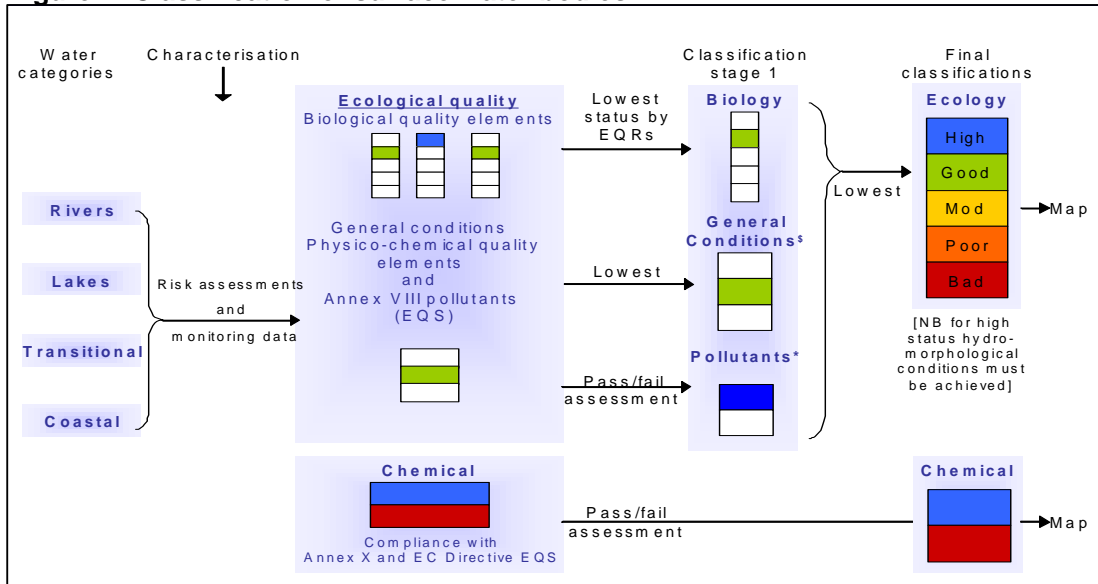


Figure 2: Classification of surface water bodies



[§] The Directive gives definitions for three classes for these physico-chemical quality elements (high, good and moderate status) but for the purposes of planning improvements and assessing deterioration, we need numeric values equivalent to all five biological classes.

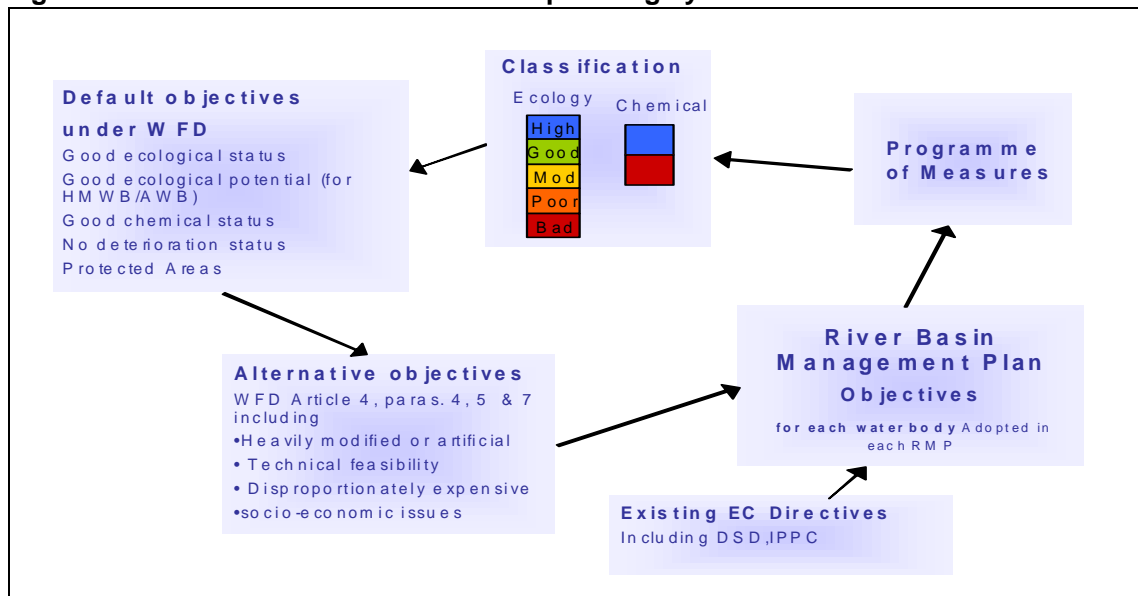
* The Directive requires that pollutants must not be discharged in significant quantities that may cause detectable ecological harm. The 'significant quantity' is set by the concentration defined by the EQS for any pollutant. Provided this concentration is not exceeded, no ecological harm should occur and the EQS is passed for the purposes of classification.

The roles of classification in the River Basin Planning Process

29. The River Basin Planning process will set the objectives, which the Programmes of Measures will aim to achieve for each water body. These include the prevention of groundwater pollution; prevent deterioration of the water body status and the aim to achieve good status by 2015.
30. The objectives "no deterioration" and "aim to achieve good status by 2015" are considered the default objectives for surface water bodies and groundwater bodies.
31. If a surface water body is designated as heavily modified or artificial, the default objectives for the water body will be "no deterioration" and to "aim achieve good ecological potential" and good surface water chemical status by 2015.
32. Alternative objectives to achieving good status or good ecological potential by 2015 will be set if, for example, achieving good status by 2015 would be technically unfeasible or disproportionately expensive. The circumstances under which these alternative objectives will be used is outlined in UKTAG guidance 13c) *Draft principles for an objective setting framework for river basin management planning in accordance with the Water Framework Directive*.
33. The collection of information from further characterisation, the application of the classification tools and environmental standards will inform objective setting and design of programme of measures as they are undertaken concurrently during 2006-2009.
34. The results of classification will also be used to (see Figure 3):
 - Assess whether the measures implemented are on course to achieve these objectives [Article 11(5)] or whether further measures are needed;
 - Assess whether the Programmes of Measures have achieved these objectives; and
 - Inform the review of the pressures and impact analysis required by 2013. This review will form the basis for developing the second river basin management plan.

35. Classification results will also be used in helping to identify any deterioration in status and any long-term changes resulting from widespread human activity that would be likely to lead to deterioration of status, unless appropriate measures are taken.

Figure 3: Classification in the river basin planning cycle*



**In the first river basin planning cycle, the Programme of Measures will be developed concurrently with classification process.*

Monitoring Programmes

36. The first priorities for the monitoring networks will be to provide the data needed a) to classify the status of water bodies; b) to support the development of Programmes of Measures; and c) the setting of objectives for the first river basin management plans.

37. In particular, monitoring effort will be targeted at assessing the magnitude by which the environmental standards needed to achieve good status are being exceeded, and hence the scale of improvement that would be required to achieve good status.

38. The classification schemes, classification tools and environmental standards will be reviewed prior to each planning cycle. This will ensure that improvements in scientific knowledge gained from the accumulated monitoring information can be taken into account in the next planning cycle.

39. The timetable relevant to classification is summarised in the following table:

12/2004	Existing monitoring data used to support pressures and impacts analysis
2005-2006	Develop monitoring programmes based on risk assessments
01/2007	Monitoring programmes operational
07/2008	First partial classification results available for inclusion in the draft river basin management plans
12/2009	First maps of water body status included in river basin management plans (RBMPs)
12/2013	Up-to-date classification results used in the review of the pressures and impacts analysis
2013 - 2014	Up-to-date classification results used in assessing whether measures are on course to achieve the objectives set for 2015
12/2015	Up-to-date classification results used to assess achievement of the 2015 objectives
03/2016	Second maps of water body status reported to the Commission in RBMPs.