European Commission

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

Guidance document n.° 1

Economics and the environment

The implementation challenge of the Water Framework Directive

DISPROPORTIONATE COSTS

Directive references: *Article 4* (Paragraphs 3-5 and 7)
3-Step Approach: *Step 3.3*
See other information sheets: *Estimating Costs*, *Cost-effectiveness Analysis*

This information sheet will help you assess whether the costs of the Programme of Measures are disproportionate and whether derogation from the Directive's objectives could be justified following an assessment of costs and benefits.

1. When is it Necessary to Assess Disproportionate Costs?

This information sheet presents an approach for determining whether the total costs of the programme of measures are disproportionately costly or expensive and is relevant for justifying derogation. In particular, this approach is relevant for:

- **Designating heavily modified water bodies (HMWB)** when the beneficial objectives served by the artificial or modified characteristics of the water body cannot, for reasons including **disproportionate costs**, reasonably be achieved by other means, which are a significantly better environmental option (*Article 4.3*, see *Illustration 1* of this information sheet for further explanation);

- **Time derogation** when completing the improvements in the status of water bodies within the time scale would be **disproportionately expensive** (*Article 4.4*, see *Illustration 2* of this information sheet for further explanation);

- **Less stringent environmental objectives** when the achievement of these objectives would be infeasible or **disproportionately expensive** and the environmental and socio-economic needs served by such human activity cannot be achieved by other means, which are a significantly better environmental option not entailing **disproportionate costs** (*Article 4.5*); and

- Failure to achieve good status or failure to prevent deterioration as a result of **new modifications** to the water body when the beneficial objectives served by those modifications or alterations of the water body cannot for reasons including **disproportionate costs** be achieved by other means, which are a significantly better environmental option (*Article 4.7*).

The analysis of whether costs are disproportionate or not will need to be initiated relatively early in the process, around 2006, in order to ensure that the public can be consulted on such a key element of the economic assessment (by 2008) and that work can be co-ordinated with other expertise, as this process will require a combination of technical and economic expertise. The precise tasks of the analysis are described in *Box 5* at the end of this information sheet. If achievement of good quality status is only possible after 2015, an interim lower objective can be set for 2015 and a time derogation be registered in the RBMP. If in 2009 it is considered that good status cannot be achieved by 2027, less stringent objectives should be registered in the plan.

European Commission

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

Guidance document n.° 4

Identification and Designation of Heavily Modified and Artificial Water Bodies

2 IMPLEMENTING THE DIRECTIVE: SETTING THE SCENE

This Section introduces you to the overall context for the implementation of the Water Framework Directive and informs you of the initiatives that led to the production of this Guidance Document.

2.1 DECEMBER 2000: A MILESTONE FOR WATER POLICY

2.1.1 A long negotiation process

December 22, 2000, will remain a milestone in the history of water policies in Europe: on that date, the Water Framework Directive (or the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy) was published in the Official Journal of the European Communities and thereby entered into force!

This Directive is the result of a process of more than five years of discussions and negotiations between a wide range of experts, stakeholders and policy makers. This process has stressed the widespread agreement on key principles of modern water management that today form the foundation of the Water Framework Directive.

2.2 THE WATER FRAMEWORK DIRECTIVE: NEW CHALLENGES IN EU WATER POLICY

2.2.1 What is the purpose of the Directive?

The Directive establishes a framework for the protection of all waters (including inland surface waters, transitional waters, coastal waters and groundwater) which:

- Prevents further deterioration of, protects and enhances the status of water resources;
- Promotes sustainable water use based on long-term protection of water resources;
- Aims at enhancing protection and improvement of the aquatic environment 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;
- Ensures the progressive reduction of pollution of groundwater and prevents its further pollution; and
- Contributes to mitigating the effects of floods and droughts.

2.2.2 ...and what is the key objective?

Overall, the Directive aims at achieving *good water status* for all waters by 2015.

2.2.3 What are the key actions that Member States need to take?

- To identify the individual river basins lying within their national territory, assign them to individual River Basin Districts (RBDs) and identify competent authorities by 2003 [Art. 3, Art. 24];
- To characterise river basin districts in terms of pressures, impacts and economics of water uses, including a register of protected areas lying within the river basin district, by 2004 [Art. 5, Art. 6, Annex II, Annex III];
- To carry out, together with the European Commission, the intercalibration of the ecological status classification systems by 2006 [Art. 2(22), Annex V];
- To make operational the monitoring networks by 2006 [Art. 8];
- Based on sound monitoring and the analysis of the characteristics of the river basin, to identify by 2009 a programme of measures for achieving the environmental objectives of the Water Framework Directive cost-effectively [Art. 11, Annex III];
- To produce and publish River Basin Management Plans (RBMPs) for each RBD, including the designation of heavily modified water bodies, by 2009 [Art. 13, Art. 4(3)];
- To implement water pricing policies that enhance the sustainability of water resources by 2010 [Art. 9];
- To make the measures of the programme operational by 2012 [Art. 11];
- To implement the programmes of measures and achieve the environmental objectives by 2015 [Art. 4].

Look out!

Member States may not always reach good water status for all water bodies of a river basin district by 2015, for reasons of technical feasibility, disproportionate costs or natural conditions. Under such conditions that will be specifically explained in the RBMPs, the Water Framework Directive offers the possibility to Member States to engage into two further six- year cycles of planning and implementation of measures.

2.2.4 Changing the management process – information, consultation and participation

Article 14 of the Directive specifies that Member States shall encourage the active involvement of all interested parties in the implementation of the Directive and development of river basin management plans. Also, Member States will inform and consult the public, including users, in particular about:

I

(Acts whose publication is obligatory)

DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 23 October 2000

establishing a framework for Community action in the field of water policy

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Having regard to the opinion of the Committee of the Regions [3],

Acting in accordance with the procedure laid down in Article 251 of the Treaty [4], and in the light of the joint text approved by the Conciliation Committee on 18 July 2000,

Whereas:

(1) Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such.

(2) The conclusions of the Community Water Policy Ministerial Seminar in Frankfurt in 1988 highlighted the need for Community legislation covering ecological quality. The Council in its resolution of 28 June 1988 [5] asked the Commission to submit proposals to improve ecological quality in Community surface waters.

(3) The declaration of the Ministerial Seminar on groundwater held at The Hague in 1991 recognised the need for action to avoid long-term deterioration of freshwater quality and quantity and called for a programme of actions to be implemented by the year 2000 aiming at sustainable management and protection of freshwater resources. In its resolutions of 25 February 1992 [6], and 20 February 1995 [7], the Council requested an action programme for groundwater and a revision of Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances [8], as part of an overall policy on freshwater protection.

(4) Waters in the Community are under increasing pressure from the continuous growth in demand for sufficient quantities of good quality water for all purposes. On 10 November 1995, the European Environment Agency in its report 'Environment in the European Union – 1995' presented an updated state of the environment report, confirming the need for action to protect Community waters in qualitative as well as in quantitative terms.

(5) On 18 December 1995, the Council adopted conclusions requiring, inter alia, the drawing up of a new framework Directive establishing the basic principles of sustainable water policy in the European Union and inviting the Commission to come forward with a proposal.

(6) On 21 February 1996 the Commission adopted a communication to the European Parliament and the Council on European Community water policy setting out the principles for a Community water policy.

(7) On 9 September 1996 the Commission presented a proposal for a Decision of the European Parliament and

[1] OJ C 184, 17.6.1997, p. 20, OJ C 16, 20.1.1998, p. 14 and OJ C 108, 7.4.1998, p. 94.
[2] OJ C 355, 21.11.1997, p. 83.
[3] OJ C 180, 11.6.1998, p. 38.
[4] Opinion of the European Parliament of 11 February 1999 (OJ C 150, 28.5.1999, p. 419), confirmed on 16 September 1999, and Council Common Position of 22 October 1999 (OJ C 343, 30.11.1999, p. 1). Decision of the European Parliament of 7 September 2000 and Decision of the Council of 14 September 2000.
[5] OJ C 209, 9.8.1988, p. 3.
[6] OJ C 59, 6.3.1992, p. 2.
[7] OJ C 49, 28.2.1995, p. 1.
[8] OJ L 20, 26.1.1980, p. 43. Directive as amended by Directive 91/692/EEC (OJ L 377, 31.12.1991, p. 48).

ANNEX II

1 SURFACE WATERS

1.1. Characterisation of surface water body types

Member States shall identify the location and boundaries of bodies of surface water and shall carry out an initial characterisation of all such bodies in accordance with the following methodology. Member States may group surface water bodies together for the purposes of this initial characterisation.

(i) The surface water bodies within the river basin district shall be identified as falling within either one of the following surface water categories — rivers, lakes, transitional waters or coastal waters — or as artificial surface water bodies or heavily modified surface water bodies.

(ii) For each surface water category, the relevant surface water bodies within the river basin district shall be differentiated according to type. These types are those defined using either 'system A' or 'system B' identified in section 1.2.

(iii) If system A is used, the surface water bodies within the river basin district shall first be differentiated by the relevant ecoregions in accordance with the geographical areas identified in section 1.2 and shown on the relevant map in Annex XI. The water bodies within each ecoregion shall then be differentiated by surface water body types according to the descriptors set out in the tables for system A.

(iv) If system B is used, Member States must achieve at least the same degree of differentiation as would be achieved using system A. Accordingly, the surface water bodies within the river basin district shall be differentiated into types using the values for the obligatory descriptors and such optional descriptors, or combinations of descriptors, as are required to ensure that type specific biological reference conditions can be reliably derived.

(v) For artificial and heavily modified surface water bodies the differentiation shall be undertaken in accordance with the descriptors for whichever of the surface water categories most closely resembles the heavily modified or artificial water body concerned.

(vi) Member States shall submit to the Commission a map or maps (in a GIS format) of the geographical location of the types consistent with the degree of differentiation required under system A.

1.2. Ecoregions and surface water body types

1.2.1. Rivers

System A

Fixed typology	Descriptors
Ecoregion	Ecoregions shown on map A in Annex XI
Type	Altitude typology high: > 800 m mid-altitude: 200 to 800 m lowland: < 200 m Size typology based on catchment area small: 10 to 100 km^2 medium: > 100 to 1 000 km^2 large: > 1 000 to 10 000 km^2 very large: > 10 000 km^2 Geology calcareous siliceous organic

System B

Alternative characterisation	Physical and chemical factors that determine the characteristics of the river or part of the river and hence the biological population structure and composition
Obligatory factors	altitude latitude longitude geology size
Optional factors	distance from river source energy of flow (function of flow and slope) mean water width mean water depth mean water slope form and shape of main river bed river discharge (flow) category valley shape transport of solids acid neutralising capacity mean substratum composition chloride air temperature range mean air temperature precipitation

1.2.2. Lakes

System A

Fixed typology	Descriptors
Ecoregion	Ecoregions shown on map A in Annex XI
Type	Altitude typology high: > 800 m mid-altitude: 200 to 800 m lowland: < 200 m Depth typology based on mean depth < 3 m 3 to 15 m > 15 m Size typology based on surface area 0,5 to 1 km^2 1 to 10 km^2 10 to 100 km^2 > 100 km^2 Geology calcareous siliceous organic

System B

Alternative characterisation	Physical and chemical factors that determine the characteristics of the lake and hence the biological population structure and composition
Obligatory factors	altitude latitude longitude depth geology size
Optional factors	mean water depth lake shape residence time mean air temperature air temperature range mixing characteristics (e.g. monomictic, dimictic, polymictic) acid neutralising capacity background nutrient status mean substratum composition water level fluctuation

1.2.3. Transitional Waters

System A

Fixed typology	Descriptors
Ecoregion	The following as identified on map B in Annex XI: Baltic Sea Barents Sea Norwegian Sea North Sea North Atlantic Ocean Mediterranean Sea
Type	Based on mean annual salinity < 0,5 ‰: freshwater 0,5 to < 5 ‰: oligohaline 5 to < 18 ‰: mesohaline 18 to < 30 ‰: polyhaline 30 to < 40 ‰: euhaline Based on mean tidal range < 2 m: microtidal 2 to 4 m: mesotidal > 4 m: macrotidal

System B

Alternative characterisation	Physical and chemical factors that determine the characteristics of the transitional water and hence the biological population structure and composition
Obligatory factors	latitude longitude tidal range salinity
Optional factors	depth current velocity wave exposure residence time mean water temperature mixing characteristics turbidity mean substratum composition shape water temperature range

1.2.4. Coastal Waters

System A

Fixed typology	Descriptors
Ecoregion	The following as identified on map B in Annex XI: Baltic Sea Barents Sea Norwegian Sea North Sea North Atlantic Ocean Mediterranean Sea
Type	Based on mean annual salinity < 0,5 ‰: freshwater 0,5 to < 5 ‰: oligohaline 5 to < 18 ‰: mesohaline 18 to < 30 ‰: polyhaline 30 to < 40 ‰: euhaline Based on mean depth shallow waters: < 30 m intermediate: (30 to 200 m) deep: > 200 m

System B

Alternative characterisation	Physical and chemical factors that determine the characteristics of the coastal water and hence the biological community structure and composition
Obligatory factors	latitude longitude tidal range salinity
Optional factors	current velocity wave exposure mean water temperature mixing characteristics turbidity retention time (of enclosed bays) mean substratum composition water temperature range

1.3. **Establishment of type-specific reference conditions for surface water body types**

(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.

(ii) In applying the procedures set out in this section to heavily modified or artificial surface water bodies references to high ecological status shall be construed as references to maximum ecological potential as defined in table 1.2.5 of Annex V. The values for maximum ecological potential for a water body shall be reviewed every six years.

(iii) Type-specific conditions for the purposes of points (i) and (ii) and 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. In defining high ecological status in respect of concentrations of specific synthetic pollutants, the detection limits are those which can be achieved in accordance with the available techniques at the time when the type-specific conditions are to be established.

(iv) For spatially based type-specific biological reference conditions, Member States shall develop a reference network for each surface water body type. The network shall contain a sufficient number of sites of high status to provide a sufficient level of confidence about the values for the reference conditions, given the variability in the values of the quality elements corresponding to high ecological status for that surface water body type and the modelling techniques which are to be applied under paragraph (v).

(v) 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.

(vi) Where it is not possible to establish reliable type-specific reference conditions for a quality element in a surface water body type due to high degrees of natural variability in that element, not just as a result of seasonal variations, then that element may be excluded from the assessment of ecological status for that surface water type. In such circumstances Member States shall state the reasons for this exclusion in the river basin management plan.

1.4. **Identification of Pressures**

Member States shall collect and maintain information on the type and magnitude of the significant anthropogenic pressures to which the surface water bodies in each river basin district are liable to be subject, in particular the following.

Estimation and identification of significant point source pollution, in particular by substances listed in Annex VIII, from urban, industrial, agricultural and other installations and activities, based, *inter alia,* on information gathered under:

(i) Articles 15 and 17 of Directive 91/271/EEC;

(ii) Articles 9 and 15 of Directive 96/61/EC [1];

and for the purposes of the initial river basin management plan:

(iii) Article 11 of Directive 76/464/EEC; and

(iv) Directives 75/440/EC, 76/160/EEC [2], 78/659/EEC and 79/923/EEC [3].

Estimation and identification of significant diffuse source pollution, in particular by substances listed in Annex VIII, from urban, industrial, agricultural and other installations and activities; based, *inter alia*, on information gathered under:

(i) Articles 3, 5 and 6 of Directive 91/676/EEC [4];

(ii) Articles 7 and 17 of Directive 91/414/EEC;

(iii) Directive 98/8/EC;

and for the purposes of the first river basin management plan:

(iv) Directives 75/440/EEC, 76/160/EEC, 76/464/EEC, 78/659/EEC and 79/923/EEC.

Estimation and identification of significant water abstraction for urban, industrial, agricultural and other uses, including seasonal variations and total annual demand, and of loss of water in distribution systems.

Estimation and identification of the impact of significant water flow regulation, including water transfer and diversion, on overall flow characteristics and water balances.

Identification of significant morphological alterations to water bodies.

Estimation and identification of other significant anthropogenic impacts on the status of surface waters.

Estimation of land use patterns, including identification of the main urban, industrial and agricultural areas and, where relevant, fisheries and forests.

1.5. **Assessment of Impact**

Member States shall carry out an assessment of the susceptibility of the surface water status of bodies to the pressures identified above.

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[1] OJ L 135, 30.5.1991, p. 40. Directive as last amended by Directive 98/15/EC (OJ L 67, 7.3.1998, p. 29).
[2] OJ L 31, 5.2.1976, p. 1. Directive as last amended by the 1994 Act of Accession.
[3] OJ L 281, 10.11.1979, p. 47. Directive as amended by Directive 91/692/EEC (OJ L 377, 31.12.1991, p. 48).
[4] OJ L 375, 31.12.1991, p. 1.

Member States shall use the information collected above, and any other relevant information including existing environmental monitoring data, to carry out an assessment of the likelihood that surface waters bodies within the river basin district will fail to meet the environmental quality objectives set for the bodies under Article 4. Member States may utilise modelling techniques to assist in such an assessment.

For those bodies identified as being at risk of failing the environmental quality objectives, further characterisation shall, where relevant, be carried out to optimise the design of both the monitoring programmes required under Article 8, and the programmes of measures required under Article 11.

2. GROUNDWATERS

2.1. **Initial characterisation**

Member States shall carry out an initial characterisation of all groundwater bodies to assess their uses and the degree to which they are at risk of failing to meet the objectives for each groundwater body under Article 4. Member States may group groundwater bodies together for the purposes of this initial characterisation. This analysis may employ existing hydrological, geological, pedological, land use, discharge, abstraction and other data but shall identify:

— the location and boundaries of the groundwater body or bodies,

— the pressures to which the groundwater body or bodies are liable to be subject including:

  — diffuse sources of pollution

  — point sources of pollution

  — abstraction

  — artificial recharge,

— the general character of the overlying strata in the catchment area from which the groundwater body receives its recharge,

— those groundwater bodies for which there are directly dependent surface water ecosystems or terrestrial ecosystems.

2.2. **Further characterisation**

Following this initial characterisation, Member States shall carry out further characterisation of those groundwater bodies or groups of bodies which have been identified as being at risk in order to establish a more precise assessment of the significance of such risk and identification of any measures to be required under Article 11. Accordingly, this characterisation shall include relevant information on the impact of human activity and, where relevant, information on:

— geological characteristics of the groundwater body including the extent and type of geological units,

— hydrogeological characteristics of the groundwater body including hydraulic conductivity, porosity and confinement,

— characteristics of the superficial deposits and soils in the catchment from which the groundwater body receives its recharge, including the thickness, porosity, hydraulic conductivity, and absorptive properties of the deposits and soils,

— stratification characteristics of the groundwater within the groundwater body,

— an inventory of associated surface systems, including terrestrial ecosystems and bodies of surface water, with which the groundwater body is dynamically linked,

— estimates of the directions and rates of exchange of water between the groundwater body and associated surface systems,

— sufficient data to calculate the long term annual average rate of overall recharge,

— characterisation of the chemical composition of the groundwater, including specification of the contributions from human activity. Member States may use typologies for groundwater characterisation when establishing natural background levels for these bodies of groundwater.

2.3. **Review of the impact of human activity on groundwaters**

For those bodies of groundwater which cross the boundary between two or more Member States or are identified following the initial characterisation undertaken in accordance with paragraph 2.1 as being at risk of failing to meet the objectives set for each body under Article 4, the following information shall, where relevant, be collected and maintained for each groundwater body:

(a) the location of points in the groundwater body used for the abstraction of water with the exception of:

— points for the abstraction of water providing less than an average of 10 m^3 per day, or,

— points for the abstraction of water intended for human consumption providing less than an average of 10 m^3 per day or serving less than 50 persons,

(b) the annual average rates of abstraction from such points,

(c) the chemical composition of water abstracted from the groundwater body,

(d) the location of points in the groundwater body into which water is directly discharged,

(e) the rates of discharge at such points,

(f) the chemical composition of discharges to the groundwater body, and

(g) land use in the catchment or catchments from which the groundwater body receives its recharge, including pollutant inputs and anthropogenic alterations to the recharge characteristics such as rainwater and run-off diversion through land sealing, artificial recharge, damming or drainage.

2.4. **Review of the impact of changes in groundwater levels**

Member States shall also identify those bodies of groundwater for which lower objectives are to be specified under Article 4 including as a result of consideration of the effects of the status of the body on:

(i) surface water and associated terrestrial ecosystems

(ii) water regulation, flood protection and land drainage

(iii) human development.

2.5. **Review of the impact of pollution on groundwater quality**

Member States shall identify those bodies of groundwater for which lower objectives are to be specified under Article 4(5) where, as a result of the impact of human activity, as determined in accordance with Article 5(1), the body of groundwater is so polluted that achieving good groundwater chemical status is infeasible or disproportionately expensive.

European Commission

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

Guidance document n.° 2

Identification of Water Bodies

3.2.5 Heavily modified and artificial water bodies[18]

Heavily modified water bodies may be identified and designated where good ecological status is not being achieved because of impacts on the hydromorphological characteristics of a surface water resulting from physical alterations (Figure 5).

Heavily modified and artificial water bodies[19] must be (at least) provisionally identified during the characterisation of surface waters[20]. Their identification and designation should be finalised for the purposes of the first river basin planning cycle on publication of the river basin management plans in 2009. The designations must be reviewed every six years[21].

The identification of heavily modified water bodies must be based on the designation criteria set out in Article 4.3. In principle, the boundaries of heavily modified water bodies are primarily delineated by the extent of changes to the hydromorphological characteristics that (a) result from physical alterations by human activity and (b) prevent the achievement of good ecological status.

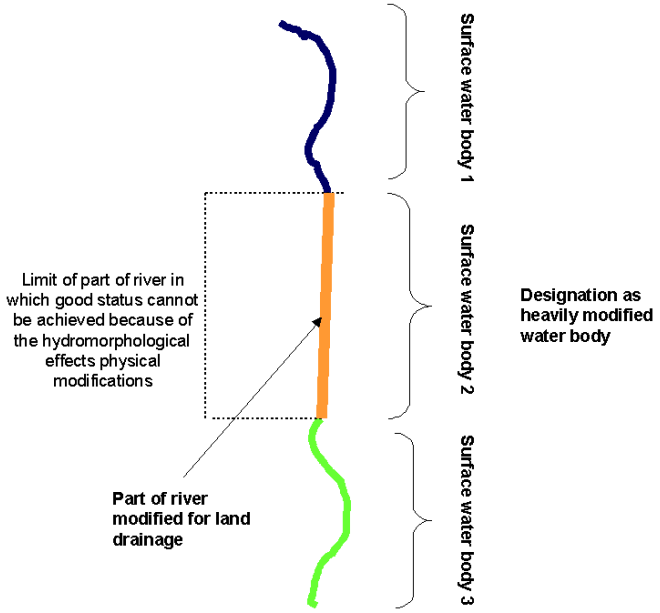

Figure 5: The establishment of water body boundaries through the identification and subsequent designation of heavily modified water bodies

3.2.6 Summary

The above-mentioned criteria can be directly drawn from the Directive. They represent a hierarchy of definitions that is already sufficient to enable a first identification of "water bodies" in the river basin (districts). As first step, the water category and the water body type

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[18] *CIS Working Group 2.2 is developing detailed Guidance on the identification and designation of heavily modified water bodies (WFD CIS Guidance Document No. 4)*

[19] *Article 2.9*

[20] *Annex II 1.1(i)*

[21] *Article 4.3*