



*WFD Bathing Waters Impact Data Risk Assessment Methodology*

**GUIDANCE ON THRESHOLDS AND METHODOLOGY TO BE APPLIED IN IRELAND'S RIVER BASIN DISTRICTS**

*Paper by the Working Group on Characterisation and Risk Assessment*

**Surface water guidance document**

This is a guidance paper on the application of a proposed **Bathing Water Risk Assessment** methodology. It documents the principles to be adopted by River Basin Districts and authorities responsible for implementing the Water Framework Directive in Ireland. This is a working draft describing a method that will evolve as it is trialled, and will be amended accordingly.

**REVISION CONTROL TABLE**

<b>Status</b>	<b>Approved by National Technical Coordination Group</b>	<b>WFD Requirement</b>	<b>Relevant EU Reporting sheets</b>	<b>Date</b>
Final		Impacts and Pressures		April 2005

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## 1. Background and Introduction

Annex IV of the Water Framework Directive<sup>1</sup> sets out the requirement to establish a Register of Protected Areas for each River Basin District. These are areas that have been designated as requiring special protection under EU legislation, either to protect their surface water or groundwater or to conserve habitats and species that directly depend on those waters. The purpose of the Register is to ensure that the management of the relevant water bodies is geared towards achieving the Protected Area objectives as set out in relevant legislation. The register required as part of a river basin management plan must include maps indicating the location of each protected area and a description of the community, national or local legislation under which they have been designated.

The WFD Protected Areas Register requirement includes under Annex IV, Article 1 (iii)

*“bodies of water designated as recreational waters, including areas designated as bathing waters under Directive 76/160/EEC”.*

Bathing water designation and quality requirements are set out under clear separate legislative instrument but need to be co-ordinated closely with the Water Framework Directive. The Water Framework Directive provides for this through the general objective of achieving 'good ecological status' for all waters and specific objectives for so-called 'protected areas'.

In Ireland the primary legislation governing the quality of bathing waters is set out in the Quality of Bathing Waters Regulations, 1992<sup>2</sup> and amendments. These Regulations transpose the requirements of the EC Directive concerning the Quality of Bathing Waters (76/160/EEC), the purpose of which is to ensure that bathing water quality is maintained and if necessary improved so that it complies with specified standards designed to protect public health and the environment. The Regulation sets out the monitoring requirement, including frequency and parameters to be monitored.

The Irish Regulations set more stringent limits for microbiological parameters compared to EU mandatory values and also includes an additional parameter, Faecal streptococci, for compliance purposes. All parameters specified are used by the EPA in assessing compliance with the Regulations whereas the European Commission use a sub set of parameters in assessing compliance with the Directive<sup>3</sup>.

The National Limit Values and EU Guide and Mandatory values are provided in Table 1. Sampling for dissolved oxygen is undertaken where water quality issues in respect of this parameter arise. Additional parameters may be specified for analysis where pollution by such parameters is suspected (e.g. Heavy metals, ammonia, nitrates and phosphates).

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<sup>1</sup> Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000 establishing a Framework for Community Action in the field of Water Policy

<sup>2</sup> (S.I. No. 155/1992: Quality Of Bathing Waters Regulations, 1992.)

<sup>3</sup> The Quality of Bathing Water in Ireland, 2003, EPA, Delaney and Stafford

**Table 1 National Limit Values and EU Guide and Mandatory Values**

Parameters	EC Directive concerning the quality of bathing waters 76/160/EEC		National Limit Values(SI 155 of 1992)
	G (Guide)	I (Mandatory)	
<i>Total Coliforms (Number/100ml)</i>	$\leq 500^1$	$\leq 10,000^3$	$\leq 5,000^1$ $\leq 10,000^3$
<i>Faecal Coliforms (Number/100ml)</i>	$\leq 100^1$	$\leq 2,000^3$	$\leq 1,000^1$ $\leq 2,000^3$
<i>Faecal Strep (Number/100ml)</i>	$\leq 100^2$		$\leq 300^3$
<i>Salmonella (Number/litre)</i>		$0^3$	$0^3$
<i>Enteric viruses (PFU/10 litres)</i>		$0^3$	$0^3$
<i>pH</i>		6 - 9 <sup>3</sup>	$\leq 9^3$
<i>Colour</i>		no abnormal change in colour <sup>3</sup>	no abnormal change in colour <sup>3</sup>
<i>Mineral oils (mg/l) _ 0.3<sub>2</sub></i>	$\leq 0.3^2$	no film visible on the surface of the water and no odour <sup>3</sup>	no film visible on the surface of the water and no odour
<i>Surface active substances (mg/l)</i>	$\leq 0.3^2$	no lasting foam	no lasting foam <sup>3</sup>
<i>Phenol (mg/l as C<sub>6</sub>H<sub>5</sub>OH)</i>	$\leq 0.005^2$	no specific odour $\leq 0.05^3$	No specific odour and $\leq 0.05^3$
<i>Transparency (m)</i>	$\geq 2^2$	$\geq 1^3$	$\geq 1^3$
<i>DO (% saturation O<sub>2</sub>)<sub>4</sub></i>	80 - 120 <sup>2</sup>		$\geq 70$ and $\leq 120^3$
<i>Tarry residues and floating materia</i>	Absence <sup>2</sup>		no offensive presence <sup>3</sup>

Note 1  $\geq 80\%$  of samples

Note 2  $\geq 90\%$  of samples

Note 3  $\geq 90\%$  of samples

Monitoring of bathing waters is carried out in Ireland by the Local Authorities and the monitoring data is submitted to the EPA for compilation, analysis for compliance and publication in an Annual Bathing Water Quality Report<sup>3</sup>.

The 2003 Report on the quality of bathing waters indicates that there were 133 designated bathing waters in Ireland of which 122 were seawater locations and 9 were freshwater locations. The compliance assessment reported by the EPA indicated that the quality of the bathing water was generally very good with 78% of bathing areas (102 of 131 sites) complying with the National standards. An assessment based on compliance in line with the European Commission approach, using only a subset of parameters and with less stringent limit values, indicated that Irish bathing water quality was among the best in Europe with 97% of bathing areas (127 of 131 sites) complying with the minimum mandatory standards specified in the Directive. Eighty five percent of bathing areas (111 of 131 sites) complied with the stricter guide values specified in the Directive. The Report however, did indicate a downward trend in recent years particularly with regard to EU Guide values. These guide values can be regarded as quality objectives which all bathing sites should endeavour to achieve.

### Proposal for a new Bathing Water Directive

The Bathing Water Directive (76/160/EEC) is more than 25 years old and has, since its adoption, contributed greatly to improvement in water quality in the coastal and inland bathing areas in Europe. However, it is recognised that the Directive needs to be updated particularly in relation to the specified water quality parameters for

monitoring and their associated limit values. In 2002 the European Commission presented a proposal for a new Directive on bathing water quality<sup>4</sup>. The new proposal is intended to deliver general benefits in relation to improved health-protection for bathers and a more pro-active approach to beach management, including public involvement. New proposed standards, which are considered to be more stringent, are intended to provide a significantly higher protection to bathers and may result in changes to the future status of Ireland's Bathing Waters.

The European Parliament adopted its first-reading Opinion on 23 October 2003 and it is still with the Working Party on the Environment who continue to discuss the proposal in depth.

## 2. Pressures and Impacts

The main Pressures which act upon bathing water quality objectives arise from Point and Diffuse Sources.

Urban Wastewater Treatment Plants can give rise to significant deterioration in microbiological quality of waters and impact directly on bathing waters and human health.

Industrial point source discharges can also give rise to poor bathing water quality through increased nutrient input (phosphates and nitrates) and chemical substances (phenols, tarry substances, heavy metals etc) and impact directly on bathing water quality.

Diffuse Agriculture runoff to rivers flowing into or adjacent to bathing waters can give rise to increased microbial pollution and increased eutrophication decreasing the recreational value of such waters.

Unsewered development in the catchment area of bathing water designated areas can also impact on microbial and nutrient bathing water quality parameters leading to a deterioration of water quality and recreational area.

## 3. Risk Analysis Procedure for Bathing Water Compliance

A risk assessment of whether Bathing Water protected areas are likely to achieve their objectives has been undertaken based on the 2003 compliance reporting for the Bathing Waters Regulations. The assessment is based on water quality data obtained in relation to Bathing Water quality monitoring carried out in 2003 by Local Authorities for their respective areas and reported to the EPA.

All National data on Bathing Water Quality Monitoring has been compiled by the EPA and evaluated for compliance with the requirements of the Bathing Water

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<sup>4</sup> Proposal for a Directive of the European Parliament and of the Council concerning the quality of bathing water /\* COM/2002/0581 final - COD 2002/0254 \*/ Official Journal 045 E , 25/02/2003 P. 0127 - 0149

Regulations. This data was provided in excel spreadsheet format. The evaluation included compliance with the limits set for the parameters listed in Table 1 and also for the required frequency of monitoring set out in the Regulations.

The compliance assessment undertaken by the EPA resulted in the relevant Bathing water being categorised into one of four categories, Table 2 as follow:

**Table 2 EPA Categorisation of Bathing Waters**

Guide and Mandatory Compliant	<b>1</b>
Mandatory Compliant only	<b>2</b>
Non Compliant with Guide and Mandatory	<b>3</b>
Insufficiently sampled	<b>4</b>

Risk assessment undertaken under the National Characterisation report results in water bodies being placed into one of four categories for the purpose of reporting, as indicated in Table 3.

**Table 3 Irish Risk Categories**

	<b>Irish reporting categories for water bodies</b>
I. Water bodies for which it is already clear without the need for further characterisation or additional monitoring data, that the objectives will be failed;	1a - Water Body at significant risk
II. Water bodies for which it is possible that the objectives of the Directive will be failed but, because of inadequate data, further characterisation and operational monitoring are considered necessary to be sufficiently confident that this is the case;	1b - Water Body probably at significant risk
	2a - Water Body probably not at significant risk but available information could be improved
III. Water bodies for which it is already clear, without the need for further characterisation or additional monitoring data, that the achievement of the objectives are not at risk.	2b - Water Body not at risk and available information is comprehensive and / or conclusive

The Bathing Waters are assigned a Risk Category on the basis of the EPA compliance assessment as set out in Table 4

**Table 4 Risk Category for Irish Bathing Water Compliance**

<b>Risk Category</b>	<b>1a</b>	<b>1b</b>	<b>2a</b>	<b>2b</b>
<b>EPA Compliance Category</b>	3-Bathing Water Non compliant with Guide and Mandatory Value	4 – Bathing Water Insufficiently sampled	2 – Bathing Water Mandatory Compliant only	1 –Bathing water Guide and Mandatory Compliant

#### 4. Mapping of Bathing Water Risk Assessment

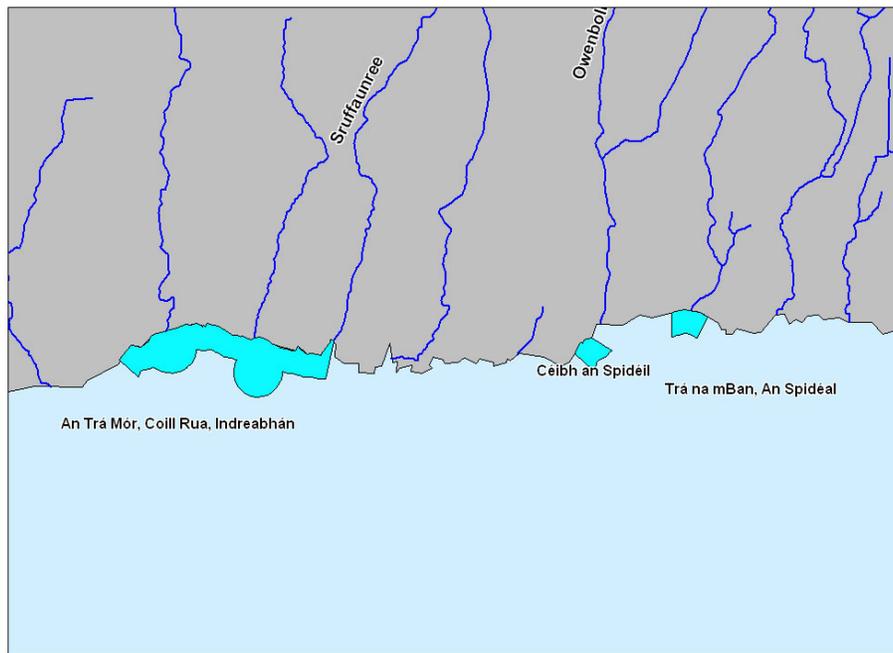
Protected Areas may encompass part of a water body or may extend fully or partially over several water bodies. Generally Bathing water sites comprise only a small part of a water body. This is particularly the case where bathing waters are located within large coastal water bodies.

In order to assign the risk assessment category to a Bathing Water it is necessary to generate a small Bathing Waters waterbody. Mapping of the bathing water areas was undertaken using information supplied to the EPA by Local Authorities. This consisted of GIS files in point format, indicating the bathing water monitoring point at each bathing water, and a polyline GIS file for each bathing water which is based upon the descriptions of the Bathing Waters set out in the National Legislation (Quality of Bathing Waters Regulations, 155/1992). The polylines indicate the stretch of the High Water Mark adjacent to the bathing water monitoring point and the landside extent of the bathing water. Small water bodies were created for each bathing water area in shape file format by extrapolating out from the polyline to a distance of 200m to represent the recreation area (see example Figure 1)

Where polylines were not available, the bathing water location was identified from the point GIS coordinates and a new polyline created for the bathing water area which was subsequently used to generate the small Bathing Water waterbody.

The Risk Categories 1a, 1b, 2a and 2b were then assigned to each small Bathing Water waterbody as appropriate (see example Figure 2).

**Figure 1 Typical Bathing Water small waterbody**



**Figure 2 Risk categories Assigned to Bathing Waters**

