



# Water Quality Planning: no deterioration and the Water Framework Directive

Operational instruction 50\_12

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## What's this document about?

This document explains how the no deterioration requirements of the Water Framework Directive (WFD) should be implemented when doing water quality planning in flowing freshwaters. This guidance does not apply to lakes or transitional and coastal waters



Document details

## Who does this apply to?

This document applies to all staff undertaking water quality planning (WQP) work. These staff may be located in:

- Regional Strategy Units (RSUs)
- Area Environmental Planning
- Environment Management
- National Permitting Service (NPS)



Related documents

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Feedback

**Contact for queries**

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## Introduction

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### Background

The WFD requires that member states “*implement the necessary measures to prevent deterioration of the status of all water bodies....*” (Article 4.1). All practicable action must be taken to prevent the deterioration in the status of all water bodies in England and Wales.

The permitting of a discharge into a water body will cause some localised deterioration. The deterioration from one status class to a lower one is not permitted. The no deterioration requirements also apply independently to each of the elements that come together to form the water body classification, although this requirement may not apply to elements at high status.

This guidance should be used when making decisions about permits for continuous discharges only to surface waters. It includes the determination of a new permit, the variation of an existing permit and how to deal with housing growth and economic development.

No deterioration, as set out here, does not apply to Article 7.3 (Drinking Water Protected Areas) of the Water Framework Directive.

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### What determinands does it apply to?

The no deterioration rules set out in this note only apply to the environmental standards for the determinands Biochemical Oxygen Demand (BOD), Ammonia and Phosphate.

Other chemical parameters, such as those in Annex VIII and Annex X, are not covered by these arrangements.

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### Framework

The following guidance is in three parts:

- Establishing the no deterioration baseline or target
  - Setting permit limits for sanitary determinands
  - Setting permit limits for Phosphate
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## Establishing the no deterioration baseline or target

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### What is the target?

There are a number of ways of determining an environmental standard to set permit limits:

- Class limit
- 10% deterioration
- Current downstream quality
- Achieving a higher standard
- No current monitoring data is available

These are not listed here in priority order. The tables at the end of this document suggest a hierarchical approach to no deterioration targets.

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**What is the target?, continued**

When looking at the monitoring data the location of the sample points in relation to the existing and any proposed discharges is important. The sample points used for any assessment need to be representative and baseline data from adjacent water bodies may be valid to use as upstream or downstream target quality.

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**Class limit**

Allow a deterioration to the baseline quality or status that is reported in the current River Basin Management Plan (RBMP). The current RBMP was published in 2009. No deterioration limits are applied independently to each of the individual elements and it is these that should be used, not the overall water body status, although the overall water body status can be important in determining if a deterioration of one element is allowable. This can only be supported where there has not been an improvement in water quality status between the baseline being established and the time that the no deterioration assessment is done. We do not want to wipe out improvements in status that have been made.

If improvements in quality are planned as part of the PR09 National Environment Programme (NEP) then we should use the 2015 planned improvement status (the “predicted status”) and not the “2009” status reported in the current RBMP. Other quality improvements in or impacting on the water body that have taken place since 2009 will also need to be accounted for to ensure that delivered improvements are not reversed.

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**10% deterioration**

In many cases we can allow up to a 10% deterioration in the receiving water for each element provided that this will not cause a deterioration beyond the class limit established in the 2009 RBMP.

For each element you may allow the receiving water to deteriorate by up to 10% in the mean and 90<sup>th</sup> percentile quality.

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**Current downstream quality**

Where the current water quality is Bad there is no lower class boundary and a 10% deterioration would lead to a significant increase in the pollutant load you can use a target that allows for a less than a 10% deterioration in the downstream water quality for an individual determinand. Alternatively you may decide to set a target to meet the current downstream quality when looking at a proposal for an increased flow from an existing permitted discharge.

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**Achieving a higher standard**

You may need to set a permit limit to meet a higher standard than the current water body status. This could be the case, for example, if previously the River Quality Objective (RQO) was the equivalent of Good under WFD but the more recent sampling has led to the status for any of the individual physico-chemical parameters being reported as Moderate or worse. No deterioration under WFD in these circumstances could lead to a permanent deterioration in the established targets for water quality.

The permit limit should be set to meet the previously established RQO, rather than the baseline WFD class.

Upstream quality data used for modelling should be taken for ideally a three year window, using the results of routine (ie non investigational) sampling, when the previously established RQO was met and the target becomes up to a 10% deterioration over the upstream quality used for each element providing that the deterioration does not go beyond the WFD equivalent boundary.

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**Achieving a higher standard, continued**

This method cannot be used for phosphate as there were no equivalent RQO criteria for that determinand.

**Table 1 Alignment of classes for Ammonia, BOD and Dissolved Oxygen**

River Quality Objectives	RE1	RE2	RE3	RE4	RE5
WFD	High	Good	Moderate	Poor	Bad

**Protected areas and Natura 2000**

You may need to apply a more stringent target for a protected area downstream of the discharge, for example a Natura 2000 site.

Any new consent application likely to have a significant effect on the integrity of a Natura 2000 site must also be subject to an Appropriate Assessment using the established [guidance](#).

**No current monitoring data available**

There are circumstances where there are no monitoring points and the baseline water body class may be either:

- derived from grouped water bodies where monitoring locations in adjacent upstream or downstream water bodies are used to infer water quality, or
- no water quality status is listed.

The water body may also have sample point(s) used for classification on the main watercourse but the tributaries may not be monitored.

In these situations there is a method hierarchy to define the quality of a water body with no upstream data from classification sample points:

Option	Data to use
1	Use current upstream data from a sample point not used for classification. Do not use data collected in response to a pollution incident investigation if the sample point is below the polluting input.
2	Consider using any available historic upstream data. You need to check that there have been no changes in the water body that would make the data unrepresentative of the current situation.  Do not use data collected in response to a pollution incident investigation if the sample point is below the polluting input.
3	Use current downstream available data whether the sample point is used for classification or not. For new discharges this can be assumed to be the upstream quality. For existing discharges a validation back calculation should be used to derive the upstream quality.
4	Use historic downstream available data whether the sample point is used for classification or not. This can be treated the same as data in 3 depending on whether it is a new or existing discharge.
5	Where no data described in 1 - 4 above is available assume that the upstream quality is mid to high class and model to protect the first downstream classification sample point.

## Dealing with permit headroom

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### Headroom

Some discharge permits, if operated to their full limit, could lead to a deterioration from the 2009 baseline status or the previously established RQO.

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### Permit variation applied for (flow increase)

Where an application is made to vary the flow of a permit, and this will increase either the dry weather flow or the flow to treatment, the new permit conditions will be set to fully comply with the no deterioration principles.

The four year “hands off” rule applies to bespoke permit conditions for discharges to surface water, although the applicant can waive this right. In order to avoid un-necessary appeals you should check to see if any conditions are subject to this clause and try to secure this waiver for a full no deterioration assessment.

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### Permit variation applied for (flow decrease)

Where an application is made to vary the flow of a permit, and this will decrease either the dry weather flow or the flow to treatment, an approach of the maintenance of the permitted load can be considered. Where this approach is taken you must ensure that the full permitted load will not allow a deterioration beyond the 2009 baseline class boundary or eliminate improvements in the water body since the 2009 assessment.

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### Permit variation not applied for

The take up of headroom within an existing permit will normally be allowed for “no deterioration”. This may not be the case when considering other objectives that apply to the water body such as those sites that fall within Natura 2000 boundaries.

Erosion of hydraulic headroom can be gauged through the flow monitoring returns, although you should remember that the weather can play a significant role in influencing these figures in any individual year.

Where the reduction of headroom results in deterioration in the actual or predicted status of a water body with 95% confidence the permit will be reviewed by the Environment Agency to ensure that the no deterioration baseline is restored. The review will take place as part of the six year river basin planning cycle.

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### Baseline effluent conditions

To model an existing discharge the full permitted load of the effluent should be taken, not the current performance, in order to protect against deterioration because of works over performance.

The coefficient of variation (CoV) of the existing discharge quality for each determinand should be used to scale up to define a 90%ile figure for “look-up table” (LUT) parameters or 95%ile figure for permit conditions expressed as a maximum allowable concentration (MAC).

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## Setting permit limits for sanitary determinands

### How to set a permit limit for sanitary determinands

Depending on the situation and the target limit used for sanitary determinands (BOD and Ammonia) a number of options can be taken. These form a suite of options to choose from depending on the situation.

These options are not mutually exclusive and there may be a situation where permit scenarios are investigated using more than one option, depending on the individual circumstances.

For example, you may want to do an assessment based on options 1 and 3.

Whatever permitting option is chosen you must be mindful of the status objective for the receiving water body and any downstream water bodies where the declared objective is higher than the currently reported baseline status.

Permit decisions must not be allowed to undermine other measures delivered since the publication of the RBMP or planned to be delivered in the current RBMP to move towards the status objective. This will necessarily involve a degree of judgement when looking at applying no deterioration principles.

You must also note standards derived for protected areas. In such situations any derivation of permit limits should take account of any tighter applicable standards.

**Note for options coloured red** the approval of the Regional WQ Planning Manager plus the relevant NPS, OTS and E&B Managers is required.

Option	Which target	When to use it	Comments
1	Current quality + 10%	<p>In most cases it is feasible to achieve the permit limit and it will not result in deterioration beyond the class limit.</p> <p>If determining a new permit use the current upstream quality as the baseline.</p> <p>If determining a permit variation use the current downstream quality as the baseline.</p>	<p>Is it technically feasible to achieve the derived permit limit?</p> <p>Is the cost of achieving the permit limit proportionate to the benefit?</p> <p>If 10% is too tight to be technically feasible or is disproportionately costly look at allowing incremental changes until these conditions are acceptable or the lower class boundary of the data used for the upstream quality is reached immediately downstream of the discharge.</p>
2	Class limit immediately downstream of the discharge	In some cases where it is not feasible to achieve no more than 10% deterioration in the water quality	<p>Can be done with simple Monte Carlo modelling.</p> <p>It will often be appropriate to use this approach for existing discharges where limits would have been set originally to meet a river quality objective, not to prevent &gt;10% deterioration.</p>
3	Achieve a higher	Where the baseline WFD	This is to prevent a temporary

Option	Which target	When to use it	Comments
	standard based on previously established RE class. Historic compliant quality + 10%	class is lower than the historic reported RE class because of a temporary deterioration in the data used to produce the classification.	deterioration becoming permanent. Is it technically feasible to achieve the derived permit limit? Is the cost of achieving the permit limit proportionate to the benefit? If 10% is too tight to be technically feasible or disproportionately costly look at allowing 5% incremental changes until these conditions are acceptable or the historic RQO boundary is reached.
4	Allow 15% of the water body or 1.5 km of classified watercourse length (whichever is the lower amount) to be in worse condition than the overall status	Where the receiving water is little more than a small tributary with little amenity or ecological value so long as deterioration is prevented when the tributary reaches the major watercourse.  In other exceptional cases where it is not feasible to set limits using the approach in 1, 2 or 5 this approach may be used.	The WFD “blue line” network can be used to determine if a watercourse is significant. If it is not on this network you can make a pragmatic decision with local officers on the most appropriate limits to set. Your calculations should give you confidence that the no deterioration target will be met once the tributary joins the “blue line” network.
5	Class limit at downstream monitoring point	In some cases where it is not feasible to achieve <10% deterioration in receiving water quality or to achieve the class limit immediately downstream of the discharge.	Requires catchment modelling.  This approach meets the WFD requirements of no deterioration which is based on reported status. There must be sound technical feasibility or cost benefit arguments to support this approach.  It may be appropriate to use this approach in areas where housing growth is planned to support economic and social objectives and where permit limits set using other approaches would be beyond what is considered a sustainable level of wastewater treatment.
6	Current downstream quality + <10%	This approach may be considered, along with 7 below when you want to limit deterioration where there is no lower class limit.	Can be done with simple Monte Carlo modelling.  You need to consider the long term objectives for the receiving water body whether

Option	Which target	When to use it	Comments
			any further deterioration can be permitted.
7	Current downstream quality	Only use in exceptional circumstances, e.g. to prevent a poor or bad water body from getting significantly worse	For existing discharges this can be achieved by setting limits based on maintaining current performance load, not current permitted load.
8	Allow deterioration from High to Good status	Only in exceptional circumstances on the grounds of new sustainable development activity.	<p>Conditions that need to be met in order to allow this:</p> <ul style="list-style-type: none"> <li>▪ The overall status is not High</li> <li>▪ the River Basin Management Plan has not set an objective for the water body of High status</li> <li>▪ the requirements of protected areas are met</li> <li>▪ the other provisions of the no deterioration guidance are applied, and</li> <li>▪ action is taken to limit deterioration in the high and good status classes as far as practicable</li> </ul>

## Setting permit limits for Phosphate

### How to set a permit limit for P

As well as the Phosphate standards set in the WFD there are also standards derived for protected areas, such as rivers designated under the Habitats Directive. In such situations any derivation of permit limits should take account of any tighter applicable standards.

Depending on the situation and the target Phosphate limit used a number of options can be taken. These form a suite of options to choose from depending on the specific situation.

These options are not mutually exclusive and there may be situations where permit scenarios are investigated using more than one option, depending on the individual circumstances.

Whatever permitting option is chosen you must be mindful of the status objective for the receiving water body and any downstream water bodies where the declared objective is higher than the currently reported baseline status.

Permit decisions must not be allowed to undermine other measures delivered since the publication of the RBMP or planned to be delivered in the current RBMP to move towards the status objective. This will necessarily involve a degree of judgement when looking at applying no deterioration principals.

**Note for options coloured red** the approval of the Regional WQ Planning Manager plus the relevant NPS, NTS and E&B Managers is required.



Option	Which target	When to use it	Comments
1	No permit limit necessary	For discharges <50m <sup>3</sup> /d unless there are very good reasons for setting a permit	<p>Habitats Directive Review of Consents considered these smaller discharges trivial in overall effect.</p> <p>Exceptional cases where a P limit may be required:</p> <ul style="list-style-type: none"> <li>▪ Discharge immediately upstream of a protected area</li> <li>▪ Discharge to a water body at high risk of deterioration</li> </ul>
2	Class limit at downstream monitoring point	In some cases, particularly larger existing discharges	<p>Requires catchment modelling.</p> <p>This approach meets the WFD requirements of no deterioration which is based on reported status and is appropriate for phosphate where the impact of eutrophication is combined throughout a catchment.</p> <p>It may be appropriate to use this approach in areas where housing growth is planned to support economic and social objectives and where permit limits set using other approaches would be beyond what is considered a sustainable level of wastewater treatment.</p>
3	Class limit immediately downstream of the discharge	In some cases, particularly new discharges where it is feasible to achieve the permit limit and there are sound reasons why a stringent permit limit is required.	<p>Can be done with simple Monte Carlo modelling.</p> <p>Is it technically feasible to achieve the derived permit limit?</p> <p>Is the cost of achieving the permit limit proportionate to the benefit?</p>
4	Allow 15% of the water body or 1.5 km of classified watercourse length (whichever is the lower amount) to be in worse condition than the overall status for P	<p>Where the receiving water is little more than a small tributary with little amenity or ecological value so long as deterioration is prevented when the tributary reaches the major watercourse.</p> <p>In other exceptional cases where it is not feasible to set limits using the approach in <b>3, 5 or 6</b> this approach may be used.</p>	<p>The WFD “blue line” network can be used to determine if a watercourse is significant. If it is not on this network you can make a pragmatic decision with local officers on the most appropriate limits to set. Your calculations should give you confidence that the no deterioration target will be met once the tributary joins the “blue line” network.</p>

Option	Which target	When to use it	Comments
5	Current downstream quality	Only use in exceptional circumstances, e.g. to prevent a poor or bad water body from getting significantly worse	For existing discharges this can be achieved by setting limits based on maintaining current load.
6	Current water quality +10%	<p>In exceptional cases where it is feasible to achieve the permit limit and there are very good reasons why a stringent permit limit is required.</p> <p>If determining a new permit use the current upstream quality as the baseline.</p> <p>If determining a permit variation use the current downstream quality as the baseline.</p>	<p>Is it technically feasible to achieve the derived permit limit?</p> <p>Is the cost of achieving the permit limit proportionate to the benefit?</p>
7	Allow deterioration from High to Good status	Only in exceptional circumstances on the grounds of new sustainable development activity.	<p>Conditions that need to be met in order to allow this:</p> <ul style="list-style-type: none"> <li>▪ The overall status is not High</li> <li>▪ the River Basin Management Plan has not set an objective for the water body of High status</li> <li>▪ the requirements of protected areas are met</li> <li>▪ the other provisions of the no deterioration guidance are applied, and</li> <li>▪ action is taken to limit deterioration in the high and good status classes as far as practicable</li> </ul>

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## Related documents

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### Links

There are no related documents.

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