



Water Use

Supporting Guidance (WAT-SG-91)

Decision Framework for addressing risks posed by excess inputs of nutrients

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Update Summary

Version	Description
v1.0	First issue for Water Use

Notes

References: Linked references to other documents have been disabled in this web version of the document. See the References section for details of all referenced documents.

Printing the Document: This document is uncontrolled if printed and is only intended to be viewed online.

If you do need to print the document, the best results are achieved using Booklet printing or else double-sided, Duplex (2-on-1) A4 printing (both four pages per A4 sheet).

Always refer to the online document for accurate and up-to-date information.

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1. Purpose

This guidance is designed to help SEPA's regional Regulatory Services teams and its Permitting Service members decide when to seek to constrain or reduce discharges of the plant nutrient, phosphorus, into river and lochs.

SEPA's statutory purpose is to protect and improve the environment (environmental success) in ways that, as far as possible, create health and well-being benefits (social success); and sustainable economic growth (economic success). To deliver this purpose, we need to ensure that, when we decide to take action, our decisions are based on the best information and evidence we have that the action is needed. This is important so that we don't unnecessarily impose any costs and burdens on those we regulate.

SEPA needs to make decisions about discharges of nutrients:

- when determining applications;
- when designing action to achieve river basin management plan objectives (eg as part of a licence review);
- whenever it identifies from monitoring or other evidence that water quality may be deteriorating (eg phosphorus concentrations increasing); and
- when it identifies a potential unauthorised breach of a nutrient standard.

In each case, SEPA needs to decide what if any action is necessary to:

- prevent ecological quality deteriorating; or
- improve ecological quality where it is already affected by elevated concentrations of phosphorus.

The circumstances under which action should be taken are summarised in the general framework set out in Figure 1.

There are three key decision steps in this framework for which you will need appropriate environmental evidence. Further information on each of these can be found as follows:

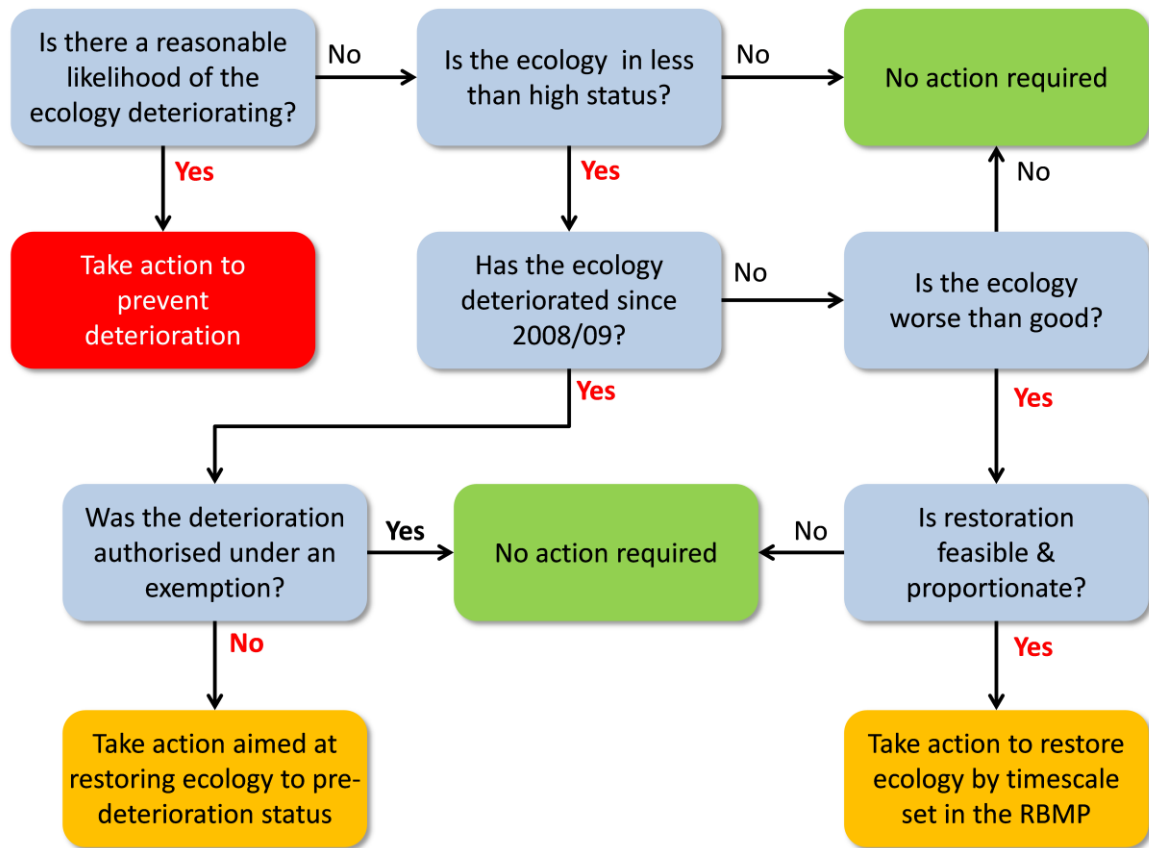
Is there a reasonable likelihood of the ecology deteriorating? [Annex 1, Table 1](#)

Has the ecology deteriorated since 2008/09? [Annex 1, Table 2](#)

Is the ecology worse than good? [Annex 1, Table 3](#)

Evidence and Flooding will provide the necessary assessments, analyses and interpretation of the environmental evidence. In most cases, you should ask your local Environmental Quality Coordination Unit member to coordinate this work. The Evidence and Flooding lead will work working with you and others in Regulatory Services who have relevant knowledge about the site.

Figure 1 General framework for deciding if action should be taken to control or reduce nutrient inputs



2. Key principles

When considering whether or not action is appropriate, you should be aware of the following principles:

2.1 Role of phosphorus standards

Phosphorus standards are one of the key tools SEPA uses when assessing the risk of ecological deterioration. This is because the standards represent concentrations at which the best science indicates there is a significant risk of ecological quality shifting from one status class to another.

2.2 Importance of considering the weight of evidence

When making decisions, you need to bear in mind that no biological and chemical monitoring is error free and even the best environmental standards are not perfectly matched to ecological risk at all sites. To make good decisions on whether or not action is needed, you should take account of the confidence in classification results and the weight of evidence of risk or impact provided by any other relevant information that is available. Remember, the face value classification should normally only be a starting point¹.

2.3 Degree of certainty needed before acting

We have a clear objective of acting to prevent unauthorised deterioration of ecological quality. The policy framework set for us by Scottish Ministers says we should do so whenever there is a reasonable likelihood that a breach of a phosphorus (or biological) standard could occur. [Table 1](#) provides some further guidance on the type of evidence that you should consider. However, the key principle is that if the balance of probability is that deterioration will occur, you should act to try to ensure it does not.

The bar for requiring action to achieve an improvement objective set in the relevant river basin management plan is different. These objectives are aimed at environmental impacts that were already present prior to river basin management planning. But note, some of these impacts were not detected by the monitoring programmes in place at that time and have only come to light more recently. The policy framework set for us by Scottish Ministers says that we must have suitably high confidence that the environment is damaged before we ask people to invest. Specifically, we need suitably high confidence that ecological quality is really worse than good. This is because

¹ You need to be particularly cautious about water body classifications based on monitoring data from other water bodies with which the water bodies concerned have been grouped. Such groupings are made where the water bodies are thought to have similar characteristics and be subject to similar pressures. Before requiring any targeted action to improve such a grouped water body, you will normally need additional evidence to confirm that the impact is present

the action required to reduce phosphorus inputs can be expensive and requiring it when we are not sure it is needed could lead to unnecessary costs. You can find further information in [Table 3](#).

2.4 Unauthorised breaches of standards

In principle, there should have been no breaches of phosphorus standards or any deterioration in ecological quality since 2008/2009 (the start of river basin planning and publication of the first full classification results). If you discover a possible breach since this time, your first step should be to decide whether or not there really has been a breach. Apparent “breaches” often simply reflect:

- (i) improvements in our understanding of the condition of the water environment (eg changes in environmental standards, changes in assessment methods or just more monitoring data); or
- (ii) random variability in monitoring results.

Further information on how to decide if a breach is real or not is provided in [Table 2](#).

In very exceptional circumstances, SEPA may have permitted deterioration from high to good status to facilitate sustainable development. Before you consider taking action, you also need to rule out this possibility.

An unauthorised breach may have resulted from unauthorised discharges, including those resulting from non-compliance with the conditions of an authorisation. Where this is the case, enforcement action may be appropriate. Even if it is not, you should consider what can be done to, as relevant, restore ecological quality or reduce the risk of ecological deterioration.

2.5 Timing of action

Where you have identified a risk of deterioration, you should always try to ensure action is taken in time to prevent the deterioration.

If you have discovered an unauthorised breach of a standard, you should seek to ensure the breach is addressed as soon as possible and in line with SEPA’s enforcement policy and guidance.

If you are planning action to achieve an improvement objective established in the river basin management plan, you should timetable that action so that it enables achievement of the objective by the deadline set in the plan. You can set a different timetable for achieving an improvement objective if the operator wants to act earlier. You can and should extend the deadline or even set a less stringent objective if, as part of the licence review process, you determine that making the improvement by the original deadline would be technically infeasible or disproportionately expensive.

Annex 1: Guide to key decision steps

- [Table 1: Is there a reasonable likelihood of the ecology deteriorating?](#)
- [Table 2: Has the ecology deteriorated since 2008/09?](#)
- [Table 3: Is the ecology worse than good?](#)

Table 1 Guide to deciding if there is a reasonable likelihood of the ecology deteriorating (ie dropping to a lower class)

Test		Evidence
1	An upward trend in phosphorus concentration is likely to breach a phosphorus standard	<ul style="list-style-type: none"> • Analysis of phosphorus data confirming that the trend is: <ol style="list-style-type: none"> (i) real (ie not just random variability in monitoring results; a change in sampling or analytical methods; etc); and (ii) likely to cause a breach of a phosphorus standard if unaddressed; <p>And, particularly where the trend is weak or still some distance from breaching a standard:</p> <ul style="list-style-type: none"> • a plausible explanation for the increase in concentrations and its likely continuation; and • if available, corresponding trend in ecological monitoring results or other signs of increasing ecological disturbance.
2	A breach of a phosphorus standard has occurred since 2008/2009 (where ecology is currently assessed as being in a better class	<ul style="list-style-type: none"> • Confidence that breach has occurred; and • Time since the breach has occurred. <p>The longer ago, the more evidence of worsening conditions you should look for to conclude that there is a reasonable likelihood that ecological deterioration will follow. Such evidence might include an on-going upward trend in phosphorus concentrations or indications that the ecology is showing signs of disturbance as a result of the increase in phosphorus concentrations.</p> <p>To take action you need: (a) the evidence of worsening conditions referred to above; or (b) to be satisfied that neither the latest nor the previous phosphorus classifications were misclassifications, taking account of statistical assessments of confidence of classifications; trends in monitoring results; and estimates of trends in phosphorus loadings.</p> <p>Further investigation or monitoring may be needed to increase certainty about the current classification before a decision can be made. However, if there is uncertainty about the original classification, it may not be possible to conclude that deterioration has occurred since 2008/2009. In this case, you should apply test 4 when deciding what action is appropriate to ensure deterioration is prevented.</p> <p>Note: Unless the breach (i) resulted from land use changes; (ii) the cumulative effects of authorised activities operated in compliance with authorisation conditions; or (iii) was authorised under an exemption, it may be subject to enforcement action. Such action should be taken in accordance with SEPA's enforcement policy and guidance.</p>

3	If authorised, a proposed increase in phosphorus discharge would cause a breach of a phosphorus standard or result in a “red” risk of deterioration of phosphorus class	<ul style="list-style-type: none"> • Standard SEPA risk assessment of proposed discharges
4	Where ecology is currently assessed as being in a better class than phosphorus, a proposed increase in phosphorus inputs poses a significant risk of tipping the ecology into a lower class even though the phosphorus class would not change	<ul style="list-style-type: none"> • The degree of increase in phosphorus concentration proposed in relation to your best understanding of the condition of the ecology. <p>For example, if:</p> <ul style="list-style-type: none"> • the ecology is already showing signs of disturbance as a result of elevated phosphorus concentrations but is still more likely than not to be in a better class than the phosphorus class; or • the ecology is not very clearly towards the top end of its class; <p>you should conclude that any non-negligible increase in phosphorus concentration is likely to cause ecological deterioration. However, in all cases, further inputs should be tightly constrained.</p>

Table 2 Guide to deciding if the ecology has deteriorated since around 2008/2009

	Test	Evidence
1	Ecology is in a lower class than it was previously in the period since 2008/2009	<ul style="list-style-type: none"> • Confidence that there has been a change of class <p>You need to be satisfied that neither the latest nor the previous classifications were misclassifications, taking account of statistical assessments of confidence of classifications; trends in ecology monitoring results; trends in phosphorus concentrations; and estimates of trends in phosphorus loadings.</p> <p>Further investigation or monitoring may be needed to increase certainty about the current classification before a decision can be made. This may include looking at additional ecological indicators of nutrient pollution. However, if there is uncertainty about the original classification, it may not be possible to conclude that deterioration has occurred.</p> <p>Note: Unless the breach (i) resulted from land use changes; (ii) the cumulative effects of authorised activities operated in compliance with authorisation conditions; or (iii) was authorised under an exemption, it may be subject to enforcement action. Such action should be taken in accordance with SEPA’s enforcement policy and guidance.</p>

Table 3 Guide to deciding if the ecology is worse than good

Test		Evidence
1	Ecology has not been misclassified as worse than good	<ul style="list-style-type: none"> • High confidence that the ecology is worse than good <ol style="list-style-type: none"> i. Statistical confidence that the ecology is at least moderate (ie the sum of the probabilities of it being moderate, poor or bad); ii. If (i) does not provide high confidence on its own, you should consider the overall weight of evidence that the class is worse than good. This will include consideration of any other relevant ecological data; the concentrations of nutrients, including the degree to which they exceed the standard for good; and analyses of trends. <p>Further investigation or monitoring may be needed to increase certainty about the current classification before a decision can be made. This may include looking at additional ecological indicators of nutrient pollution.</p>

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