



Consultation - Part 2 new sections

'Good practice guidelines to the environment agency
hydropower handbook - The environmental assessment of
proposed low head hydropower developments, Published
August 2009'

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1 New sections

1.1 New weirs

The Environment Agency is unlikely to approve the construction of new weirs, solely for hydropower, on lowland rivers due to the likelihood of adverse effects on the environment. If such schemes are proposed we will require a comprehensive environmental report, with particular focus on:

- Effect on flood risk
- Effects on navigation rights
- The cumulative effects of weirs on fish migration
- The ecological effects of 'ponding' a reach of river.
- Disruption of instream processes such as sediment transport.
- The effects on designated habitats and species.
- The effects on other peoples rights and uses
- How the objectives of WFD are to be met.

We recognise that the effects of new small weirs on upland watercourses may be less and more easily mitigated. New weirs in these situations are generally less than 1.5 metres high but can be associated with the creation of long depleted reaches. We will need to consider carefully the potential effects of the depleted reach which should be set out in an Environmental Report. (See also statement on High Head)

Consultation question 7 - New weirs

There are currently a substantial number of impoundments on our rivers.

The Environment Agency is unlikely to approve the construction of new weirs solely for hydropower on lowland rivers due to the likelihood of adverse effects on the environment.

However, we are more likely to consider the construction of new low weirs on smaller, upland streams associated with high head hydropower projects. The effects of these are likely to be less and more easily mitigated.

Do you agree with this? Y/N

Please provide your reasons and any supporting evidence

1.2 Raising weirs

We do not encourage raising weirs. Where there are proposals to raise weirs we will require a comprehensive environmental report and will consider the scheme on a site specific basis, with particular focus on:

- Effects on flood risk
- Effects on navigation rights
- The cumulative effects of weirs on fish migration
- The ecological effects of 'ponding' a reach of river.
- Disruption of instream processes such as sediment transport.
- The effects on designated habitats and species.
- The effects on other peoples rights and uses
- How the objectives of WFD are to be met.

Consultation question 8 - Raising weirs

Raising weirs as part of a hydropower scheme is likely to be proposed when:

1. The weir is raised to compensate for the drop in water level over the weir caused by operating the hydropower scheme.
2. The weir is raised by an amount over and above scenario 1 to increase electricity generating potential.

The second option is likely to have more environmental effects and will be considered accordingly.

Do you agree with our general approach towards raising weirs as part of hydropower schemes? Y/N

Please provide your reasons and any evidence to support them.

1.3 Multiple schemes on one weir

In principle, we do not favour two independent schemes being developed on one impoundment/weir.

Where a hydropower scheme has already been permitted, it may need to be protected from the effects of a second scheme on the same weir.

We will, in the revision of the Good Practice Guidelines, outline a process we will follow if we receive multiple applications for hydropower schemes on the same weir. We may make a decision to only permit one scheme.

Consultation question 9 - Multiple Schemes on one weir

Do you have any suggestions for criteria which might be helpful when assessing more than one application for hydropower schemes on the same weir or impoundment?

1.4 High head hydropower

There are many similarities between high and low head hydropower schemes, but also some differences that need to be addressed in scheme design.

High head hydropower schemes are proposed in hilly areas of the country where a large drop in level can occur in a fairly short distance. There is likely to be more than 10m drop in head over the site.

- High head schemes use the steep, natural gradient of a watercourse, rather than an impoundment, to gain the majority of their head.
- Compared to lowland rivers, the water courses are typically small in flow terms.
- Schemes tend to be located in small catchment areas with typically flashy flow characteristics.
- High head hydropower normally requires a new build small weir and offtake using fine screens, usually Coanda type.
- The site specific ecological factors are more likely to relate to upland environments but will be identified by use of the environmental site audit checklists.
- High head schemes often include a “depleted reach”, or a section of the river with less water than under natural conditions, caused by water being diverted from the river into a turbine.

The table below is proposed by the Environment Agency as a basis for consenting high head hydropower schemes. It should be used in conjunction with the following guidelines:

- Justification will be required for departures from the proposed flows.
- Where the impacts of a scheme on the ecology, landscape, recreation or amenity value are unacceptable, the application will be rejected.
- As explained in Section 1.4 of this part of the consultation, developers should contact the appropriate conservation agency – Natural England or the Countryside Council for Wales – where their proposal affects a SSSI or SAC as soon as possible if considering a high head hydropower scheme in a designated site.
- Schemes may be licensed using a proportional flow split in the more sensitive locations. This means that as the river flow increases the

proportions of water that go through the turbine and stay in the river remain the same up to the maximum.

- Where proportional flow splits are used it may be possible to use a maximum turbine flow of 1.3 to 1.5 Q_{mean} .
- Where a Q_{max}/HOF is used (with no proportional split) the default maximum take will be Q_{mean} (as in the current Good Practice Guidelines).
- Use of the checklists will enable decisions on which flow splits are appropriate – though further work may be required to assess the sensitivity of particular species to hydrological change in the deprived reach.
- Seasonal variations in the amount of water abstracted may be needed in fish spawning and nursery areas.
- If a new barrier is created, fish passage will normally be part of weir/intake design.

Guideline flows proposed, subject to the notes above:

Descriptors	Schemes with rare or flow sensitive species	Schemes with other ecological assemblages		
		Issues: fish Migration	No issues for fish migration	Flow split option for either case
Max abstraction	40% of natural flow up to $1.3Q_{mean}$	Q_{40}	Q_{mean}	60% of natural flow up to $1.3Q_{mean}$
HOF	Q_{90}	Q_{85}	Q_{85}	Q_{90}

Consultation question 10 - High head

Do you agree with this approach to the permitting of high head schemes?

Please explain with evidence what other model/criteria we should use.

1.5 Environmental monitoring

We wish to gather more evidence from the monitoring of environmental effects of hydropower both to inform future policy and to ensure no adverse environmental impact of individual schemes, including the Water Framework Directive requirement of No Deterioration. Our guidance will emphasise the need for monitoring which is well defined and proportionate.

If developers follow our revised Good Practice Guidelines, we will not generally require them to monitor the potential environmental effects of their schemes. However in sensitive locations, where there is uncertainty that the Guidelines will afford adequate protection, pre-and/or post-determination monitoring may be required. Developers

should contact the appropriate conservation agency – Natural England or the Countryside Council for Wales – as soon as possible if considering a hydropower scheme affecting a designated site such as an SSSI or a SAC.

Where monitoring is required, it should be relevant to assessment of potential risk identified through the permitting of the scheme. Timescales need to be sufficient to allow for natural variations in conditions over time but will not generally be open-ended.

We know that fish populations vary significantly from year to year due to natural variations. Monitoring of these changes and the potential effects hydropower may have on fish populations may involve both monitoring at a specific scheme by developers and more general, background monitoring.

Consultation question 11 - Environmental monitoring

11a. Under what circumstances should environmental monitoring (pre and post scheme) be required in association with the development of a hydropower scheme?

11b. What aspects of the environment should be monitored?

11c. Who should fund this monitoring?

2 General Observations

Consultation question 12 - General observations

Please let us know of any further points that you feel have not been captured in this consultation.

If it relates to a specific piece of text it would be useful if you could cross reference it.

If not please identify the issue clearly and provide any supporting evidence.

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