

Guidance for run-of-river hydropower

December 2013

Monitoring

This document is part of our set of advice notes to help you design your hydropower scheme. You should read our [Guidance for run-of-river hydropower development](#) first, which contains an overview of our guidance and a glossary of technical terms.

Licences for hydropower installations include conditions about operational control and monitoring. Operators are responsible for ensuring on-going compliance with licences and may be required to provide us with records to demonstrate this. This forms part of our **compliance monitoring**.

We may also ask for **environmental monitoring**, to ensure that individual schemes don't harm the environment. You can also use any environmental monitoring evidence that you have gathered when you apply to renew your abstraction licence.

We will ask for monitoring of site-specific safeguards and make site visits.

What you need to do

Pre application

At the pre-application stage we may require you to carry out ecological surveys. This will help you understand the ecological sensitivity associated with the site and should address any potential impacts of your scheme on these features. This information will be used to help determine aspects of your scheme design. This information should be submitted within your environmental report.

We may also require you to monitor your site before we determine any licence application so that you have baseline data which we can use to set conditions if any licence is granted.

Pre- and post-installation

If you follow the advice in this guidance, we are less likely to require you to monitor the environmental effects of your scheme during operation. We may only require you to carry out operational monitoring (described in the section on compliance monitoring below).

We may ask you to monitor environmental effects before and/or after we make our decision on licensing your scheme in locations where it's unclear whether the scheme design will adequately protect particular species or hydrological and morphological conditions.

You will be required to undertake and pay for any monitoring specified in the licence.

Compliance monitoring

There are two main aspects of compliance monitoring:

- **Installation compliance monitoring** demonstrates that the scheme has been built and installed as licensed.

- **Operational compliance monitoring** provides evidence that the scheme continues to operate as licensed, complying with environmental and ecological safeguards and with the requirements for flow management.

Installation compliance: key points

We must be satisfied that schemes are built, installed and maintained in accordance with our licence conditions. We may need to visit your scheme to confirm details on site. We may check that you have:

- built the scheme in accordance with licence conditions
- installed the turbine and associated infrastructure in accordance with the method statement
- met the requirements for safeguarding the ecology
- complied with the conditions set down for the scheme's design, such as flow and level constraints

Operational compliance monitoring: key points

When we grant licences, we specify requirements for operational controls and monitoring:

- The developer should demonstrate compliance with the licence conditions. These may include the quantity of water that can be used, and the measurement of flows and water levels.
- The precise method chosen to measure and record such flows or levels may be different for each site.
- We will expect the operator to have a system in place to control and monitor the flows in their schemes. The data from this system must be properly recorded so it can be used to demonstrate compliance with licence conditions.

The Water Resources Act 1991 requires us to specify the maximum volumes of water that may be abstracted on full abstraction licences, in terms of daily and annual abstraction rates. We may also specify the maximum volumes of water that may be abstracted on transfer abstraction licences.

We may also require monitoring systems to demonstrate that specified safeguards, such as fish passage flows and behavioural systems for screening fish, are operating in accordance with the licence conditions.

Compliance monitoring: flows

We will require you to monitor flows to show that the scheme is complying with your licence conditions, that:

- the hands off flow does not fall below the required level
- the maximum licensed flow volumes are not exceeded

Where electronic controls are used to control flows and water levels, you must archive the data and be able to provide it when asked. We will aim to agree with you how often and when we will require data. We will specify these requirements as part of your licence conditions. This may include:

- operational compliance data (for example on levels or flows) either at intervals of 15 minutes, or at other specified intervals
- volumetric data for weekly, monthly and annual periods, or for any other specified periods

The level and frequency of data we require will reflect the level of risk the scheme poses to the watercourse, to the ecology and environment, and to other licensed and lawful users.

If you don't control and monitor operations electronically, we shall specify other verifiable control and compliance systems you can use to demonstrate you are complying with the licence conditions.

You will need to assess the volumes of water your hydropower scheme uses and how much electricity it generates.

You can assess flow by converting the records of electricity generated. You will need to calculate the conversion factor for your site, as explained in our Flow Measurement Analysis guide. Ask your Account Manager for a copy of the guide.

Environmental monitoring

We need to be sure that individual schemes don't harm the environment. For some schemes, we will ask for environmental monitoring to help manage any risks from these potential changes. Any monitoring we request will be proportionate to environmental risk. We will ask you to set up a suitable monitoring programme, which we will agree with you.

Your monitoring programme must define:

- the specific risk you are assessing and how it can be distinguished from other environmental pressures
- whether you need to collect new data or data from existing programmes
- how you will analyse data and what results you will generate
- your timescales for monitoring and submitting results to us

We will work with you to identify how the monitoring outputs will influence how your scheme operates, including:

- the triggers for action
- operational changes (for example inform renewal, cessation clause, additional screening)

Normally we only ask for environmental monitoring to be carried out for a set period of time. However, we may extend this period if we need to gather clear evidence of the scheme's effects, or lack of effects, on the environment and ecology.

Timescales may need to be long enough to allow for the natural variations which might occur over time. We may need monitoring for several years or even the lifetime of the licence. Examples of monitoring required over long periods include:

- Fish populations can fluctuate significantly from year to year due to natural variations. You may need to monitor and assess these natural changes in order to establish any direct effects of your hydropower scheme on fish populations.

It may be several years before we see the effects on populations of sensitive lower plants and ferns (see our advice note on [Water Framework Directive, nature conservation and heritage](#) for more information). Some plant populations are dynamic, so you may need to monitor potential new areas of growth as well as directly monitor existing growth.

If environmental monitoring demonstrates that your scheme is causing environmental damage, we may need you to amend how you operate your scheme.

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