

**Application details**

**Application number:** NPS/WR/019555

**Licence number:** NW/071/0302/001/R01

**EA Area:** Cumbria and Lancashire

**Date of Application:** 30 November 2015

**Applicant details:** Settle Hydro Limited (Settle Hydro Ltd)

**Summary of the proposal:**

We have granted an application by Settle Hydro Ltd to renew and vary their licence for an Archimedes screw hydropower scheme at Settle (licence number NW/071/0302/001). We have granted: an increase to the instantaneous abstraction rate from 2.86 to 3 cubic metres per second; and a proportionally smaller increase to the hourly rates from 10,296 to 10,360 cubic metres per hour; and to the daily rate from 247,104 to 248,660 cubic metres per day.

**Source of Supply:** River Ribble, Bridge End Weir, Settle, North Yorkshire.

**Points of abstraction and quantities:**

At National Grid Reference SD 81754 64129. At a rate of: 10,360 cubic metres per hour; 248,640 cubic metres per day; 60,000,000 cubic metres per year; at an instantaneous rate not exceeding 3000 litres per second (3 cubic metres per second).

**Means of abstraction:**

Gravity flow to an open channel controlled by an intake sluice gate and a 2.6 metre diameter 4-blade variable speed Archimedes screw turbine.

**Purpose of abstraction:**

Hydro-electric power generation; supply to a water wheel, which is not used for power.

**Abstraction period:** all year.

**Case history:**

Licence number NW/071/0302/001 was issued on 13 March 2009 with an expiry date of 31 March 2016. The hydropower scheme began abstracting in 2010. The validity of the licence has been extended until a decision was made on this application.

The licence also authorises abstraction for an old waterwheel that pre-dates the hydropower scheme.

**Justification of quantities:**

The instantaneous, hourly and daily rates that Settle Hydro Ltd have applied for have been calculated from the target power to be generated, site head and efficiency of the scheme. The annual rate is based on peak monthly generation and anticipated increase in yield due to the variable control system now fitted; it is equivalent to 252 days of abstraction at full capacity.

**Resource assessment:**

The abstraction is non-consumptive and all of the water abstracted will be returned to the River Ribble a short while after.

The change in maximum instantaneous abstraction rate from 2.86 to 3 cubic metres per second amounts to an increase of 4.9% (0.14 cubic metres per second). The increase to hourly abstraction rate is even less in proportionate terms. The hourly rate is increasing from 10,296 to 10,360 cubic metres per hour, which is an increase of 0.6%. This means that abstraction at the peak rate would not be maintained for a full hour. 10,360 cubic metres per hour equates to an average abstraction rate of 2.88 cubic metres per second.

The scheme operates within the flow limits set out in our guidance document *Guidance for run-of-river hydropower development*. The hands-off flow (flow at which abstraction must stop to protect low flows) will continue to be 0.8 cubic metres per second in the fish pass and 0.1 cubic metres per second over the remainder of the weir (0.9 cubic metres per second in total). Flow in the river rises above the hands-off flow approximately 69% of the time ( $Q_{69}$ ). The dry weather flow in the river ( $Q_{95}$ ) is 0.28 cubic metres per second. The instantaneous rate on the renewed licence equates to 66% of the mean flow in the river (4.58 cubic metres per second).

Settle Hydro Ltd have proposed a more robust and accurate means of measuring the hands-off flow, which we have incorporated into the renewed licence. The fish pass hands-off flow will be measured from within the fish pass. It will be Settle Hydro Ltd's responsibility to carry out this monitoring in accordance with the renewed licence.

#### **Impact assessment of proposal:**

##### Geomorphology:

There is a growing gravel bar at the intake to the hydropower scheme. Settle Hydro Ltd may want to manage this build-up of sediment if it obstructs flow into the hydropower scheme. No adverse impacts on ecology are envisaged provided any management of the gravel bar is done in a safe manner. We have conditioned the licence to ensure that this is done safely. We can only condition the renewed licence to control the activity of gravel removal in connection with the scheme. This does not bestow any right of entry to the river bed, or the right to remove gravel as that can only be granted by the owner of the river bed.

##### Fisheries and fish passage:

While salmon numbers have recognisably declined in the upper Ribble, sea trout numbers have improved and there is a suggestion that wild brown trout and grayling numbers have also increased in recent years. The reduction in salmon numbers is recognised as part of a widespread international decline in the abundance of the species, and not a localised decline that can be readily attributed to the operation of this abstraction. Fish passage will be protected through the fish pass hands-off flow and other conditions on the renewed licence. The renewal and increase will not result in an increased barrier to fish passage. Settle Hydro Ltd have taken steps to reduce the noise of the turbine, and fish migration studies have not demonstrated any overt impact of turbine operation on upstream fish migration.

We have modelled the flows and energy densities (a measure of the energy of the water flowing through the pass that the fish must overcome in order to migrate upstream) in the fish pass and found that 0.8 cubic metres per second through the pass will create suitable conditions for salmon migration. An

important element of fish pass efficiency relates to the attraction flow from the downstream end of the fish pass into the river. The desired head drop from, and attraction flow to, the fish pass are being maintained at the favourable range during periods of turbine operation. This renewal application will not change this head drop and attraction flow.

We have cleaned out and removed gravel from the pools within the fish pass making it less turbulent. We have also added an extra lip to the side wall of the upper fish pass pool to avoid loss of water in the first 2 pools. This has visibly increased the amount of water continuing through the fish pass. We anticipate that these measures should improve the passability of the fish pass.

At the present time our hydropower screening guidance does not require the screening of Archimedes screw turbines if they are within certain parameters. The diameter, speed of rotation and number of blades of the hydropower scheme are within the limits set out in our guidance to prevent the entrainment of small fish through these turbines. The turbine blades are also fitted with rubber bumpers to protect fish. While there is a suggestion of a risk to downstream migrating smolts, there is insufficient robust and reliable evidence to justify either physical screening or operational changes being required at this site.

We do not anticipate any significant change in the numbers of adult salmon and sea trout available to be caught by anglers, caused by the operation of this abstraction. The hands-off flow and passability of the fish pass will always be maintained when abstraction is taking place.

**General:**

We have received sufficient information from Settle Hydro Ltd on which to make a decision on their application. The information we require applicants to submit is proportional to the risk posed by their proposal. In this case, we do not consider a full Environmental Impact Assessment to be proportional to the risk posed by the proposal.

We deal with renewals with a regulatory 'light touch' which means licences will be renewed unless there is hard evidence to suggest otherwise. In the case of the Settle hydropower scheme, there is no evidence that the scheme could cause damage. Care has been taken to ensure that Settle Hydro Ltd will operate the scheme safely. A number of conditions are included in the renewed licence to ensure that this is the case.

Any issues around compliance with licence conditions are dealt with through our enforcement.

**External Representations:**

5 representations were received. The points raised in those representations are addressed in the resources and impact assessment sections above.

**Costs and benefits:**

The costs and benefits were considered for the following options:

- Grant the renewal and increased abstraction rates with updated conditions (including measurement of the hands-off flow, means of abstraction, and drawings)

- Refuse both the renewal and the increase.
- Grant the renewal with updated conditions but refuse the increase.

The approach to grant the renewal and increased abstraction rates with updated conditions was favoured because:

- There is no evidence of the site causing damage when it is operated correctly.
- The proposed increase is very small and is expected to have negligible impact.
- Both the current scheme and the proposed increase comply with our current guidance concerning hydropower schemes.
- Compliance issues are being addressed.
- Consequently, there appear to be few, if any, costs avoided by choosing one of the alternative approaches, both of which also limit potential benefits. Hence, there are insufficient grounds on which to refuse to renew the existing licence or refuse to grant the proposed increase.

**Conclusion and recommendation:**

We have applied our policy and guidance on time limiting abstraction licences to this application. With regards to renewals, our policy states: “time limited licences will carry a presumption of renewal where the following three tests are met: environmental sustainability is not in question; there is continued justification of need; and water is used efficiently”.

We have considered the application to renew the existing licence and to increase the maximum rates of abstraction. In doing so, we have taken account of all the relevant circumstances, including relevant legal duties, written representations it has received, and the requirements of Settle Hydro Ltd (in so far as they appear to be reasonable requirements).

Full and due consideration has been given to the representations made, and due regard has been taken of protected rights and other lawful interests.

Having done so, we recommend that the application is approved and that the renewed licence (number NW/071/0302/001/R01) should be issued with certain conditions included.

The conditions incorporated on the renewed licence are considered to be necessary and reasonable in the light of the available and presented evidence. The conditions are also considered to be clear enough to be enforced by us and understood by the licence holder.

**Contact the Environment Agency team responsible for this decision:**

PSC-WaterResources@environment-agency.gov.uk