

Stage 2 Report, Site 2: Waddow weir, Waddington

Introduction

This study follows on from a pre feasibility report produced by Inter Hydro Technology on behalf of the Forest of Bowland AONB, this is published at www.forestofbowland.com. This stage two study has focussed on: scheme layout (see site layout plan), power and energy predictions, and Environment Agency feedback.

The existing infrastructure on site includes an approximately 150 year old weir and associated mill race, plus an approximately 25 year old fish pass with associated fish counter and trap belonging to the Environment Agency. The mill race itself now supports an established wetland habitat which is continuing to adapt as the mill race becomes increasingly silted up.

Proposal

Multiple options for schemes at this site have been suggested by the landowner. They include putting a turbine directly on the weir; using the existing mill race entrance and placing a turbine between a pool here and the river; and/or transforming the silted-up mill race into a deep and flowing channel (including a pond in series) and install turbines at the end of the mill race, between the race channel and the river.

It is understood that the outflow from the turbine should be adjacent to the entrance to the fish pass to attract fish toward the fish pass. The outlet from the fish pass is currently in the middle of the existing weir. Installing a turbine in the middle of the weir however, is unlikely to be practical from a construction or aesthetic point of view. It would be more suitable to install the turbine on the end of the weir. The geometry of the river here would suggest that the opposite bank to the fish pass would be most suitable for the turbine. Land ownership issues also favour this position. It is therefore likely that a further fish pass will be required on this bank. In the event of this scheme going ahead, a fish pass specialist will be required to design a fish pass.

It can be confirmed that any works in the river associated with the development of this scheme would be designed not to affect the water level behind the weir.

It is proposed that access for the development will be made from Waddington Road through Low Moor.

Power and energy predictions

Spaans Babcock has quoted for an Archimedean screw turbine at this site. The screw turbine will use 10m³/s and assumes three metres of head. It is recommended that the exact fall over the weir is investigated as soon as possible.

Spaans Babcock has advised that a maximum capacity of between 200-250kW is possible, and an annual average energy of 800 MWh is predicted. This would return annual average revenue of approximately £120,000 (assuming 11.5 pence per kilowatt, plus a 3.5 pence export tariff).

They have suggested a budget cost of £300,000 for a steel trough design Archimedean screw turbine, including transport, lifting, control panel, covers over the screw, gates, hydraulics, bar screen, all mechanical, electrical and hydraulic equipment, installation, supervision, SAT tests and performance testing. The quote excludes civil works, cable trenching, control and drive train cubicle, high velocity cabling, earthing and grid connection.



Planner and Environment Agency Feedback

Consents

There is an historic right to water written into the deeds of the development land, but this does not include a volume. Therefore it is likely that applications will need to be made for the full complement of permissions.

Fish Passage

Ribblesdale Angling Association own the fishing rights and is the riparian owner for much of the south bank, and leases the rights on the north bank.

The Environment Agency state that purely in the interests of the ecology of the river, the best option would be to dismantle the weir entirely. The Environment Agency also advise that any development must not reduce the efficiency of fish passage over the weir. It would also be optimal to keep any depleted reach as short as possible.

The Environment Agency has stated that the efficiency of passage over the weir must not be reduced by any development, and that this is a legal requirement (SAFFA 1975, section 12). It is the applicant's responsibility to demonstrate that efficiency is not reduced. A major priority at this site should therefore be to investigate the provision of efficient fish passage to ensure that the installation of a hydro scheme does not adversely affect this.

Under the Water Framework Directive this stretch of the River Ribble is classified as being at Moderate Ecological Status. Any scheme here must not result in the deterioration of this classification.

Any new fish pass will also require a fish counter; with the cost of maintaining this counter and processing the data being covered in perpetuity by the developer of the scheme.

Biodiversity

The area proposed for development is within a Biological Heritage Site: therefore discussions with Lancashire County Council ecologists will be necessary. Of particular interest are several grasses. It was suggested that in the event of development encroaching on this habitat, species could be relocated. The identification of appropriate local analogous habitat was not discussed. It will be important to establish the extent of ecological assessment required.

Otters are known to be present in this area, so an assessment of whether they, and their habitat, will be affected by the scheme will be necessary.

Public consultation

Any development at Waddow weir will require thorough public consultation with residents, anglers and other users and stakeholders to ensure all viewpoints and issues are considered prior to any further proposals for development.

Next Steps

The next steps at Waddow weir are to:

- Get advice from a fish pass specialist on options to maximise efficiency of fish passage post installation
- Commission an ecological survey
- Commission a full feasibility study to apply for planning applications and Environment Agency licensing
- Commission a survey of the weir to confirm the head difference

