

# **Risk Assessment of the proposed Conwy Falls Hydro Scheme Intake**

## **Summary:**

This report sets out the risk assessment process carried out by Tom Parker on behalf of Save The Conwy on the water extraction structure proposed by RWE Npower upstream of Conwy Falls as part of their proposed hydroelectric scheme. The risk assessment details the issues surrounding the site and structure, particularly at the levels of flow when other water users are likely to be in proximity to the structure. The assessment draws the conclusion that there are a number of features that make the structure hazardous to the public and subsequent rescue very problematic.

## **Experience and remit of assessor:**

The assessment was carried out by Tom Parker. Mr Parker has very extensive expertise allowing him to carry out the assessment. He is a Rescue 3 Europe Instructor Trainer with 10 years experience in delivering Rescue 3 courses to the emergency services sector and thorough knowledge of the DEFRA Concept of Operations. He is also a British Canoeing Level Five Kayak Coach with National Trainer status for Wales.

He was asked to perform this assessment by Save The Conwy. It should be noted in the interests of openness that Mr Parker has lodged objections to the scheme with the National Park Authority as a concerned member of the public and has known many of those active in Save The Conwy for many years. However, the risk assessment pro forma used mitigates against potential bias in the assessment.

## **How the assessment was performed:**

The assessment was performed using the Environment Agency Wales/Rescue 3 Europe Weir Assessment System. For those unfamiliar with this, a copy is enclosed with the report. The assessment considers four areas; hazard posed by the structure, likelihood of the structure to cause harm, consequent risk and rescue options available.

The plans of the proposed structure, drawn up by Dulas Ltd, were used, along with previous site visits to enable the assessment to be carried out. It should also be noted that in the event of a score in the assessment sitting in two scoring brackets, for example '*Likely*' and '*V. Unlikely*', the result has been rounded down.

## **Areas of assessment:**

### **Section one – Hazards:**

This section considers a number of factors. The report will consider each:

- A – Towback. Given that there appears to be an anti scour function built 2-3 metres downstream of the face, it is likely that a towback of two - three metres will be present when water is flowing over the structure, giving a score of three.
- B – Depth of Hydraulic. The presence of anti scour functions tend to lead to a powerful, deep hydraulic, hence it is likely that a depth of a metre will be present, scoring three.
- C - Height of drop over the weir. From the plans, a drop of one to two point five metres is expected, giving a score of three.
- D – Slope of weir face. From the plans, the angle of the slope appears to be between 45 and 60 degrees, giving a score of two.

- E – Floating debris in the stopper. Since this assessment is being performed from plans, the report is unable to comment on this element.
- F – Uniformity of hydraulic. While a flush point has been included in the design, it is small and central, giving a score of two.
- G – Sides of hydraulic. From the plans, both sides of the hydraulic appear to be blocked by walls, giving a score of 4.
- H – Orientation of hydraulic to flow. The plans show the structure at somewhere between 30 and 90 degrees to the current, giving a score of two.
- I – Additional hazards downstream. The structure is upstream of Conwy Falls. This is a known hazard, rating at least Class 5 on the international river grading system and the site of numerous incidents requiring the emergency services to attend. This gives a score of five.
- J – Composition of bed at structure base. The plans show a smooth concrete bed, giving a score of one.

Adding the stated scores up, gives a total of 24. This equates to a high risk when the volume of water is such that it will flow over the top of the structure.

### **Section two – likelihood of structure to cause harm:**

This section considers three elements; public access, control measures and ability to self rescue. The assessment divides the site into sections – upstream left and right, downstream left and right and water upstream and downstream. For the purposes of orientation, left and right are taken facing downstream.

There is no public access from the banks upstream and downstream, giving a score of zero. However, it is the opinion of the assessor that whilst there is no public access, the site is by no means inaccessible, particularly considering the access road downstream river left.

Regarding control measures, the plans show fencing downstream to prevent access and concrete walls parallel and upstream, giving a score of zero. However, there appears to be no consideration given to control measures preventing people being swept into the feature from above. There are also no downstream control measures. This gives a score of 1 collectively. Consequently, it is unlikely that anyone could self rescue above or below the feature, giving a collective score of one also.

The total score for these three elements is three which means that the structure is likely to cause harm.

### **Section three – Structure risk rating:**

This is calculated by multiplying the hazard by the likelihood, giving a score of 12, which equates to **HIGH**.

### **Section four – Rescue options:**

This section considers the variables that will effect the rescue options available to the emergency services when an incident occurs at this site. They are as follows:

- A – Distance across channel. From the plans and knowledge of the site, this is between 10 and 20 metres, scoring two in the assessment.
- B – Access to both banks. This is problematic. The banks are relatively steep

- around the site, with only one vehicle access option which gives a score of four.
- C – Shape of the weir. This is straight, scoring one.
  - D – Towback. As stated earlier, the towback is projected to be between two and three metres, giving a score of three.
  - E – Remoteness. The rural setting of the location leads to a score of two. It should be noted, however, that rescues on the site are likely to be technical in nature and requiring a skill set only possessed by local Mountain Rescue organisations (MRT). These are known to have a *significantly longer* response time to incidents. Given the potential feature that is likely to be formed, it is questionable whether the situation will be a rescue, as opposed to a recovery, by the time they arrive.
  - F – Nature of river downstream. As has already been noted, there is a significant downstream hazard at the site, giving a score of four. It must be noted that many of the incidents that occur at this site are stabilized by those involved before people are swept over the cataract below. The local MRT then arrives to extricate those involved. It must be asked whether those involved in the incident will have the capability to prevent anyone being swept into the falls below once that person has swam through the hydraulic likely to form at the bottom of the structure in higher flows.
  - G – Working areas on banks. The working areas are limited, giving a score of three.
  - H – anchors for rope systems. The banks are being cleared to allow the construction to take place. This means that workable anchors for rope rescue systems will be limited. This gives a score of three.
  - I – Available rescue techniques. Given these factors, the options are limited to single bank methods or the use of motorised boats, meaning a score of three.
  - J – Height of banks surrounding base of hydraulic. From the plans, these appear to be between one and three metres, giving a score of two.

The scores added together total 25, giving a **High** level of rescue difficulty.

### **Conclusions:**

The main points that can be drawn from this assessment are as follows; the structure is likely to pose a high risk to the public at the river levels where the section of the Conwy upstream is popular with water users. Various design features will make access problematic and rescue highly technical and time consuming.

Urgent action is required to control these risks otherwise there is a *significant risk to public safety*.