# Form WRE: Application for a new impoundment licence, technical variation to an impoundment licence or the removal of an existing impoundment

**Water Resources Act 1991, Environment Act 1995, The Water Resources (Abstraction and Impoundment) Regulations 2006, The Natural Resources Body for Wales (Functions) Order 2012**

## 1. Application type

| | | |
|---|---|---|
| New impoundment licence | ☐ | |
| Removal of an existing impoundment | ☐ | Complete sections 2 and 4 |
| To licence an existing impoundment | ☒ | |
| Technical variation to an impoundment licence | ☐ | |

Give existing licence or pre- application reference number(s): PPN-00212

## 2. Impoundment details

All information should correspond with any maps and drawings submitted with this application

**2.1** Provide details of all impoundment points. For structures spanning a watercourse, provide a National Grid Reference for each bank. If necessary, continue on a separate sheet and tick here to show that you have done this. ☐

| Impoundment location name / reference | National Grid Reference for each bank, looking downstream (12 digit) | |
|---|---|---|
| | Left bank | Right bank |
| River Marchnant Weir | SJ 04235 19798 | SJ 04215 19816 |
| | | |
| | | |
| | | |

**2.2** Please provide a full description of the impoundment, outlining its purpose and how it will operate. If this information is detailed in a supporting document, provide the document title or reference in the space below.
If necessary, continue on a separate sheet and tick here to show that you have done this. ☐

Marchnant Pool Weir is an impounding structure located on the River Marchnant; which is a tributary of the Afon Vyrnwy several kilometres downstream. The weir is approximately 3m in height and the structure overall stretches 27m across the River Marchnant.

The weir has a crest level of 255.12m AOD which discharges directly into the river downstream. Immediately to the right of the weir is an entrance to a tunnel at invert level 253.15m AOD which conveys water to Lake Vyrnwy. Given the substantially lower level of the tunnel entrance compared to the main weir crest, in most flow scenarios except for very high spates 100% of the river flow is diverted via the tunnel to Lake Vyrnwy. This means the River Marchnant downstream of the control structure is dry apart from in periods of exceptionally high flow.

The intention of applying to licence the existing impoundment on the River Marchnant is to support a proposal to undertake modifications to the weir and diversion structure which will allow a proportion of river flow upstream of the weir structure to continue to flow in the River Marchnant downstream. Details of these proposed modifications are presented in 'Marchnant Detailed Design Drawings' attached.

## 3. Description of impoundment

**3.1** Name of watercourse

River Marchnant

**3.2** Will your proposed impoundment result in a change to the wetted perimeter (downstream) or new submerged areas behind (upstream of) the impounding works?
No ☐ Yes ☒ If yes, ensure this is shown on any map or drawings submitted

**3.3** Will the ponded area created by the impoundment be lined? No ☒ Yes ☐
If yes, give details.

The ponded area upstream of the impoundment will not change significantly in area or volume. Only the downstream wetted perimeter will change as a result of diverting 25% of flow back into the river.

**3.4** Give the height of the impoundment structure, from the downstream toe to crest or top of spillway (in metres above Ordnance Datum). If the proposal involves an existing impoundment, state the change in height (in millimetres).

Impoundment height = 3m, new impoundment height = 3.77m (change of 770mm)

**3.5** What is the overflow or crest level of the impoundment (in metres above Ordnance Datum)?

Main (rarely overtopped) weir = 253.7 m AOD. Tunnel entrance invert = 252.4 m AOD

**3.6** What is the proposed capacity of the impoundment when full to spillway level (in cubic metres)?

Given its small size, the impoundment does not have a quoted capacity and bathymetry is not available. However, by measuring the surface area as approximately 3200$m^2$ and conservatively assuming an average depth of 1m (maximum weir height is 3m, however, the TWL governed by the tunnel invert is actually 1.42m lower) It can be stated that the impounded capacity when full to spillway level is less than 3200$m^3$. The construction of a weir immediately upstream of the tunnel inlet will increase the impoundment TWL by 0.77m. However, this will still only result in an enlarged impoundment capacity of 5700$m^3$.

**3.7** Will the proposal create a raised reservoir? (it already is) No ☐ Yes ☒

**3.8** Does the proposal involve the controlled release of water to safeguard downstream flows? No ☐ Yes ☒ If yes, provide details

Marchnant Pool Weir in its current form rarely releases water downstream to safeguard flows. However, the proposed improvement works discussed within the attached documents will ensure 25% of the River Marchnant flow as measured immediately upstream of the control structure will be released back into the watercourse downstream.

**3.9** Is the impounded water to be used for a subsequent purpose? No ☐ Yes ☒
If yes, provide details (for abstractions, state the daily and annual quantities in cubic metres).

The impounded water is transferred to Lake Vyrnwy via a tunnel, where it is used for public water supply and regulation (compensation flows) of the River Severn.
Estimate of average abstraction is 0.1 $m^3/s$
Daily abstraction estimate = 8,640 $m^3$
Annual abstraction estimate = 3 million $m^3$

**3.10** How will the impounded area be filled initially, and subsequently refilled if applicable?

The impounded area is currently filled. It will likely require drawdown and overpumping to complete the works. Upon completion of the works, the impoundment will be refilled via river flows.

## 4. Fish and eel passage

**4.1** Confirm the fish species present at your site.

Downstream fish passage: There were no sightings of fish upstream of Cownwy Weir during the Aquatic walkover survey. Upstream of Afon Cownwy is currently isolated, however provides a suitable habitat for fish. Tail water levels downstream of the weir will be checked to ensure minimum depth of water compatible with brown trout. If analysis shows that the depth is insufficient a small secondary weir could be placed downstream to create a plunge pool.
Upstream fish passage: Downstream of the weirs the habitat is currently sub optimal for fish. Increasing flow may improve habitat for fish but there are additional potential barriers to fish movement along the River Marchnant.
An upstream fish passage would affect the design and agreed hydraulic regime (75/25 split) because of minimum flow requirements within the fish passage. To include a fish passage would require further studies and changes in the design which would result in significant delays to the delivery of the improved compensation flow scheme.

**4.2** Complete the table below with full details of the measures you intend to take to safeguard these fish species.

| | Intake | Outfall |
|---|---|---|
| Type of fish screen | TBC | TBC |
| Screen aperture size (mm) | TBC | TBC |
| Screen height and width (mm) | TBC | TBC |
| Type of upstream fish passage | TBC | |
| Proposed flow for fish pass (m/s) | TBC | |
| Type of downstream fish passage | TBC | |

## 5. Construction, maintenance and operation

**5.1** Provide details of maintenance or activities relating to the operation of the impoundment. If necessary, continue on a separate sheet and tick here to show that you have done this. ☒

The maintenance regime will remain the same as previous, with the addition of an extra weir which will require inspection and debris clearance. For further detail please see 'Marchnant Intake – Construction Methodology' attached.

**5.2** Provide details of diversion works or removal of existing works.

Please see 'Marchnant Intake – Construction Methodology' attached.

## 6. Planning application

Have you sought advice on your planning application?

No ☐ Yes ☒

If yes, submit a copy of the Planning Authority's response.

Planning submitted on 06/12/2018, based on previous experience and project works area it is envisaged that planning permission will not be required. A response will be provided as soon as available.

## 7. Declaration

Please see Guidance Note WRX for details of who can sign this section and note the information in that document relating to the Data Protection Act 1998.

By signing below, you are declaring that as far as you know and believe the information given in this form, on any map and in any supporting or additional information, is true.

| | |
|---|---|
| Signed | William Adams |
| Print name | WILL ADAMS |
| Position | Civil Engineer |
| Date | 06/12/2018 |

## Application Checklist

**Please tick the following checklist items to indicate that you have included the required information. If any sections of the form are left blank and no supporting information submitted, where we have insufficient information to make a decision on your application, we will return your application to you.**

### Essential:

| | |
|---|---|
| Form WRA completed, if there have been any changes since pre-application an updated Form WRA is required | ☒ |
| Map with all impoundment points and new wetted perimeters/submerged areas clearly marked | ☒ |
| Drawings and Design Statement | ☒ |
| State number of continuation sheets (enter 0 if none included) | 3 |

### Where relevant:

| | |
|---|---|
| Form WRD completed, if your proposal also requires an abstraction licence | ☐ |
| Stage 1 photo survey (contact us for more details on this requirement) | ☐ |
| Letter of authorisation from the applicant, allowing an agent to act as signatory | ☒ |
| Further information requested in our pre-application response letter to you | ☒ |
| Planning Authority response, where available | ☐ |

Additional supporting information:

- Marchnant Detailed Design Drawings
- Marchnant Intake – Construction Methodology
- River Marchnant Intake Flow Split Weir Geomorphological Impact Assessment (Atkins, Nov 2018)
- Cownwy & Marchnant Aquatic Ecological Constraints Report (Atkins, Nov 2018)
- Peer Review for Cownwy & Marchnant Intakes (Severn Trent Water by Jacobs August 2017)