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

Reference number (The number you generated in form WRA). Example: WRNATURALRESOURCESWALES1101

WRGREENBLADESENGINEERING1903

Are you applying for a licence for a new impoundment or an existing impoundment

a new impoundment

Impoundment details

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

	Impoundment location name/reference	Left bank National Grid Reference	Right bank National Grid Reference
	Intake	SH7943418556	SH7943218557
	-	-	-
	-	-	-

Provide details about the type of impoundment you propose to construct at the points specified above and how the works will operate. This should include a description of any existing works and how your proposal will affect the flow of inland water.

Tell us the purpose of the works. If the water is to be impounded for more than one purpose, list both the primary and secondary purpose

The intake weir will supply a 34kW hydropower scheme. The weir will be the full width of the watercourse. Built into this weir will be a rectangular, broad crested notch, positioned lower than the main weir crest. This will control the 'Hands Off Flow' of Q95 and, until this has been satisfied, no water will flow over the main weir crest to be abstracted. When water does flow over the main weir crest it will fall though a stainless steel coanda screen, with 1.3mm apertures, into a chamber and then into the HDPE penstock (plastic pipe) which feeds the hydro turbine. Only 70% of the water in excess of the 'Hands Off Flow' will flow to the hydro turbine as only 70% of the weir's width will be made up of the coanda. The remaining 30% will continue down stream. There will be a plunge pool downstream of the intake, at least 300mm deep, to aid downstream migration of fish. See the intake drawings attached to this application for more details.

Description of impoundment

Name of watercourse

Nant Helygog

Will your proposed impoundment result in a change to the submerged area (downstream) or new submerged areas behind (upstream of) the impounding works?
(If yes, ensure this is shown on any map or drawings submitted)

Yes

Will the ponded area created by the impoundment be lined?

No

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).

Downstream toe 312.405mAOD, crest 313.707mAOD (ie 1302mm height)

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

313.707mAOD

Will the proposal create a raised reservoir?

(A raised reservoir is one where water is stored at a level above the natural level of the lowest level of the surrounding area.)

No

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

6

Does the proposal involve the controlled release of water to safeguard downstream flows?

This could be the release of flood attenuation flows, reservoir compensation flows or a residual flow via a notch or orifice.

Yes

Tell us what the proposed flow at the outlet will be and how you intend to measure this. If the works involve monitoring of levels or flows, include details of this.

The broad crested ‘Hands Off Flow’ notch, in the intake weir's crest, has been sized to pass Q95 of 14 l/s using the following formula:
Q = Cd * w * h^1.5 = 1.6 * 0.291 * 0.097^1.5 = 14.07 l/s
(w = notch width, h = notch height and Cd = the coefficient of discharge)

Is the impounded water to be used for a subsequent purpose?

Yes

Provide details of subsequent purpose (for abstractions, state the daily and annual quantities in cubic metres).

Hydropower.

Daily abstraction: 4,432.3 cubic metres
Annual abstraction: 1,617,797 cubic metres

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

Example: by rainwater, overland flow or pumped from another source.

By overland flow.

Fish and eel passage

Confirm the fish species present at your site.

Unknown.

Please confirm type of fish screen

Intake Coanda

Outfall Vertical flat bar

Please confirm screen height and width - intake (millimetres)

Width 2020

Height 450

Please confirm screen height and width - outfall (millimetres)

Width 830

Height 850

Please confirm screen aperture size (millimetres)

Intake 1.3

Outfall 40

Please confirm type of upstream fish/eel passage intake

Boss tile.

Please confirm type of downstream fish/eel passage
Plunge pool.

Please confirm proposed flow for fish pass
N/A

Construction, maintenance and operation

Provide details of maintenance or activities relating to the operation of the impoundment. Include the extent and frequency of activities. This could include the operation of scour valves or maintenance of a fish pass. Describe any sediment management plan associated with the impoundment.
If gravel builds up behind the ‘Hands Off Flow’ notch it will be moved downstream during high flows. This will be achieved by removing some of the stop logs to allow movement of gravel through the opening at a time when flows are above the maximum capacity of the hydropower scheme’s abstraction. During lower flows it will be removed with a shovel. This gravel will be reintroduced downstream, placing the gravel along the bank for a more gradual reintroduction during future high flows. Care will be taken to ensure there is no reduction in water quality when this is carried out. Debris will be removed regularly from the eel pass. The coanda screen may need brushing regularly with a nylon brush to remove peat residue or algae.

Do you intend to divert the flow of the inland water while you are building, changing or removing the impounding works?
Yes

How do you intend to divert the flow of the inland water while you are building, changing or removing the impounding works. Give details.
A temporary dam will be built approximately 5 metres upstream of the intake weir site. This will consist of boulders, sand bags and plastic sheeting. The sandbags will be wrapped in fencing mesh to prevent them being washed away in high water. A 450mm diameter plastic pipe will run from this temporary dam diverting the water approximately 5 metres down stream of the intake weir site. This will ensure that the intake construction work is carried out in a dry area, removing the issue of water being contaminated with silt or concrete during construction. This temporary diversion will be required for at least four weeks to allow for construction and curing of the new intake.

Proposed Design of Structure

Upload design drawings and calculations here. (Spreadsheet file formats need to be: .xls, .xlsx, or .ods)

- File: 220730LB01-v4 Site layout (A1).pdf - Download
- File: 221029LB01-v2 Intake Reference Points.pdf - Download
- File: 23030701 Mark Sealy Dolgellau - Powerhouse section and levels.pdf - Download
- File: 23030702 Mark Sealy Dolgellau - Powerhouse General Layout.pdf - Download
- File: 23030704 Mark Sealy Dolgellau - Powerhouse Plan layout - location of reference points.pdf - Download
- File: 23030710 Mark Sealy Brithdir Outfall.pdf - Download
- File: 23030801 Mark Sealy Dollgellau Intake Front Elevation, Levels and Take Calcs.pdf - Download
- File: 23030802 Mark Sealy Dollgellau Intake Long Section.pdf - Download
- File: 23030803 Mark Sealy Dollgellau Intake GA and Nomenclature.pdf - Download
- File: Energy output prediction with flow duration curve & catchment area .pdf - Download

Please upload your stage 1 geomorphology photosurvey. Find out more on how to complete your survey on our Geomorphology Photosurveys for Hydropower developments page

- File: 220715-v3 Sealy Geomorphology Photo Survey.pdf - Download

Other permissions

Planning permission advice received?

Yes

Is planning permission required?

Yes

What is the status of the planning permission?

Not Submitted

Planning permission reference

NP5/54/459A

Have you applied for or do you hold a Flood Risk Activity Permit (FRAP) for the proposed works?

No

Commercial confidentiality and national security

Are you applying for Commercial Confidentiality?

No

Have you applied to the Welsh Ministers for national security for your application?
No

Declaration

By signing below, you are declaring that, to the best of your knowledge; the information given in this form, on any map and in any supporting or additional information; is true.	
Signed	Mark Sealy
Print name	MARK SEALY
Position	Owner

Date
* 20/03/2023

Would you like a copy of your submission?
Yes

Your email address
greenbladeseng@gmail.com