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Preliminary Water Framework Directive Screening Assessment

Final Report

Prepared for	Date
Natural Resources Wales	11/03/2026

Cyfoeth Naturiol Cymru
Natural Resources Wales

Document Status

Issue date	11/03/2026
Issued to	Natural Resources Wales
BIM reference	RWR-JBA-XX-XX-RP-EN-0003-S3-P01-Llan_SSP_Prelim_WFD_Screening
Revision	P01
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This report describes work commissioned by Natural Resources Wales, on behalf of by an instruction dated 02/02/2026. The Client's representative for the contract was Sherron Kitchen of Natural Resources Wales. James Nixon and Hannah Webster of JBA Consulting carried out this work.

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Abbreviations

EC	European Community
ID	Identifier
JBA	Jeremy Benn Asscioates
NGR	National Grid Reference
NRW	Natural Resources for Wales
RBMP	River Basin Management Plan
SAC	Special Area of Conservation, protected under the EU Habitats Directive
UK	United Kingdom
WFD	Water Framework Directive

NGR	National Grid Reference
NVZ	Nitrate Vulnerable Zones
RBD	River Basin District
RBMP	River Basin Management Plan
SgZ	Safeguard Zones
WFD	Water Framework Directive

Executive Summary

JBA Consulting was commissioned by Natural Resources Wales (NRW) to undertake a Preliminary Water Framework Directive (WFD) Screening assessment on 100m of sheet piling on the right bank of the Afon Mawddach. The site is located on the Afon Mawddach, near Llanelltyd, North Wales.

The site is located at SH 71184 19081. A 30m section of the piling has catastrophically failed along the right bank of the river leaving the sheet piling foundations dangerously exposed. The sheet piling was originally protecting part of a 1000m long earth embankment that acts as an informal flood bund for the farmland behind it. This embankment, the sheet piling and an outfall are an NRW legacy asset, so are inspected every two years, however the assets are not classed as a formal flood defence. The project aims to achieve a solution which eliminates future liability and withdraws maintenance obligations, addresses health and safety concerns and reaches an agreement with the landowner. This project will ensure that NRW is meeting its regulatory and legal duties.

The Screening assessment concludes that both the Afon Mawddach water body and the Meirionnydd groundwater body have been screened in due to the potential impact from temporary works during construction. This means that the works are required to be considered further at a WFD scoping stage before a decision can be made on whether a full impact assessment is needed to determine WFD compliance.

1 Introduction

1.1 WFD Overview

The Water Framework Directive (WFD) came into force in 2000 and is the most substantial piece of EU water legislation to date. The Directive imposes legal requirements to protect and improve the water environment. All activities in the water environment need to take the Directive into account. The EU Water Framework Directive was transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The 2003 regulations were consolidated and replaced with the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 ensure that the legislation continues to be operable in the United Kingdom following withdrawal from the EU in January 2021. The instrument addresses deficiencies in retained EU law arising from the UK's withdrawal from the EU. The purpose of the instrument is to preserve and protect the existing policy regime rather than to introduce new policy. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, as amended by the Floods and Water (Amendment etc.) (EU exit) Regulations 2019, are hereafter referred to as the WFD Regulations in this report.

1.1.1 Scope of the WFD Assessment

The WFD Regulations require that Environmental Objectives be set for all surface and groundwaters in England and Wales to enable them to achieve Good Status (or Good Ecological Potential for Heavily Modified and Artificial Water Bodies) by a defined date. These Environmental Objectives are listed below:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters.
- Aim to achieve at least good status/potential for all water bodies by 2021. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status/potential by 2027.
- Meet the requirements of Water Framework Directive Protected Areas.
- Promote sustainable use of water as a natural resource.
- Conserve habitats and species that depend directly on water.
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment.
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants.
- Contribute to mitigating the effects of floods and droughts.

1.1.2 Preventing Deterioration in Status

Any activity which has the potential to have an impact on the ecology of a water body will need consideration in terms of whether it could cause deterioration in its Ecological Status or Potential[1].

For each water body, three different status objectives are identified within the River Basin Management Plan (RBMP). These are the overall status objective, the ecological status or potential objective and the chemical status objective. A default objective for all water bodies is to prevent the deterioration in the Ecological Status (or Ecological Potential for Heavily Modified and Artificial Water Bodies) of the water body. Note, the Ecological Status applies only to surface water bodies, and not groundwater bodies. A separate assessment may be required to assess the impacts on the chemical and quantitative status of a groundwater body, if the proposed activity is likely to cause impact.

The Ecological Status of a water body is determined through analysis of its constituent Biological Quality Elements. These elements are in turn supported by a series of Physico-Chemical and Hydromorphological Quality Elements. These Quality Elements are taken from Annex V of the WFD Regulations and are listed below. The overall Ecological Status is determined by the lowest element status.

The Biological Quality Elements assessed in the WFD include:

- Fish
- Invertebrates
- Macrophytes
- Phytobenthos

The WFD defines the flow, shape and physical characteristics of a watercourse as its 'hydromorphology'. Any in-channel works can impact upon the shape of a watercourse and the natural processes that occur within it, including:

- Flow patterns
- Width and depth of a channel
- Features such as pools, riffles, bars and bank slopes
- Sediment availability/ transport
- Interaction between a channel and its floodplain
- Ecology and biology (i.e. habitats which support plants and animals)
- The WFD considers the chemistry of a watercourse through general water quality (physico-chemical measurements) and chemical pollutants. All three environmental components; morphology, hydrology and chemistry, support the Biology of a water body.

1 Environment Agency (2010) Assessing new modifications for compliance with WFD: detailed supplementary guidance: 488_10_SD01

Any activity that has the potential to have an impact upon any of the Quality Elements will need consideration in terms of whether it could cause a deterioration in the status of a water body. The activity will also need to be considered in terms of whether it will compromise the ability of the water body to reach Good Ecological Status or Good Ecological Potential by the date specified in the Catchment Data Explorer.

Any adverse impacts can cause a water body's ecology to deteriorate and prevent environmental improvements from being undertaken. Nevertheless, in-channel works can also be beneficial if they can be designed to help achieve environmental improvements included in the RBMP, thus enhancing the water environment for plants and animals.

1.1.3 Artificial or Heavily Modified Water Bodies

Whilst good ecological status is defined as a slight variation from undisturbed natural conditions in natural water bodies, artificial and heavily modified water bodies are unable to achieve natural conditions. Instead, artificial and heavily modified water bodies have a target to achieve Good Ecological Potential, which recognises their important uses, whilst making sure ecology is protected as far as possible. Ecological potential is also measured on the scale high, good, moderate, poor and bad. The chemical status of these water bodies is measured in the same way as for natural water bodies.

Specific mitigation measures have been identified for each Artificial and Heavily Modified Water body and are listed in the RBMP. These mitigation measures are necessary to reduce the existing hydromorphological impacts on the water body and all measures need to be in place in order for the water body to achieve Good Ecological Status or Potential.

1.2 Purpose of this WFD Assessment Screening

JBA Consulting was commissioned by Natural Resources Wales (NRW) to undertake a preliminary WFD screening assessment for the removal of sheet piling at Llanelltyd, North Wales. This preliminary WFD assessment only includes a screening assessment at this stage as the final design has not yet been determined. This preliminary screening assessment has combined the proposed design options and assessed them together given the similar nature of the proposed works. The preliminary screening will help to identify if the proposed works will require a full WFD Assessment to be compliant at later design stages.

This WFD assessment aims to determine the effects of the proposed works on ecological, hydromorphological and chemical quality and identify any potential impacts that could cause deterioration in the current status of the water body or could hinder the water body from meeting its WFD objectives in the future.

The site of works is located on and adjacent to the Mawddach water body and falls within the Western Wales River Basin District (RBD). The Environmental Objectives, together with the specific actions (mitigation measures) necessary to enable the water body to meet these objectives, are set out on the Water Watch Wales Website (Natural Rescources Wales, 2026).

2 Assessment Methodology

2.1 Overview

The following chart summarises the WFD Assessment process

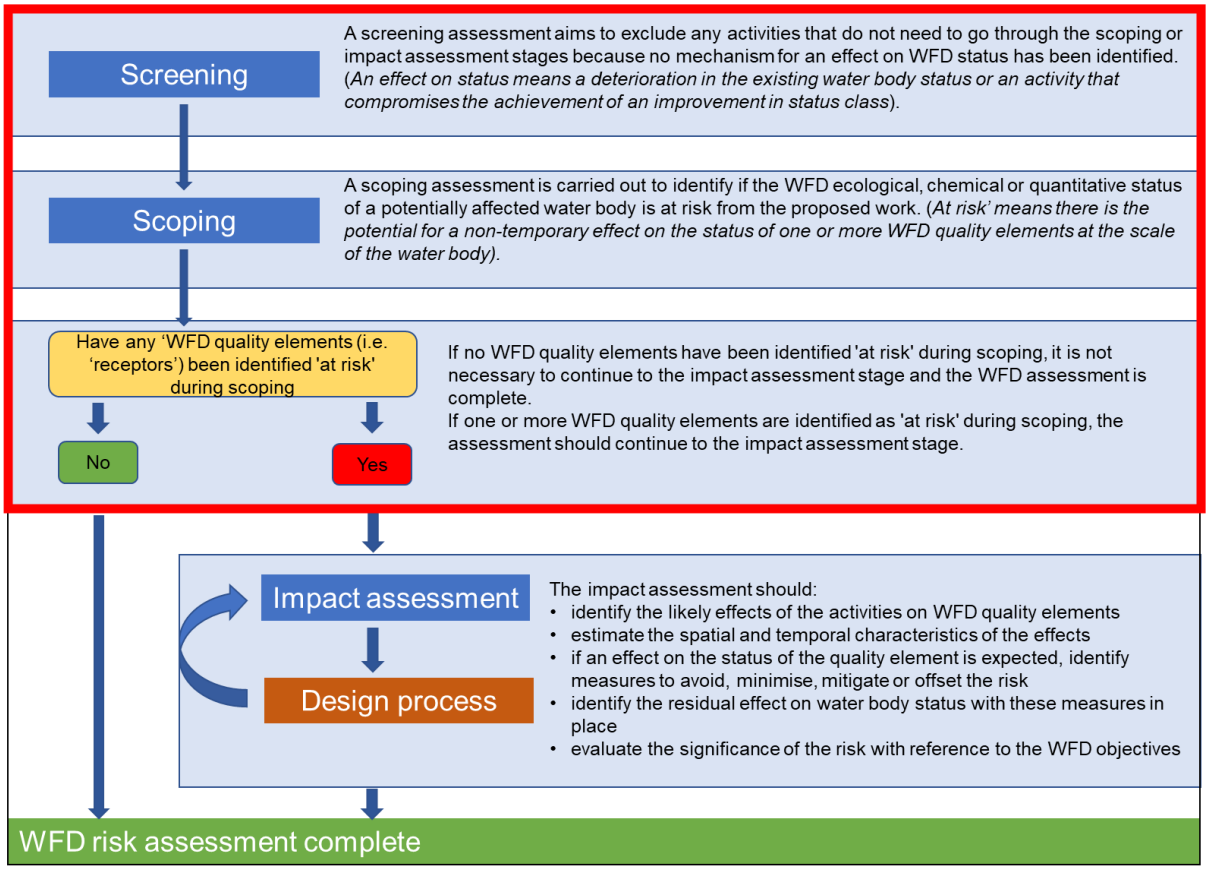

Figure 2-1: WFD assessment process flow chart

2.2 Screening Assessment

The Screening Assessment aims to exclude any activities that do not need to go through the scoping or impact assessment stages.

The Water Watch Wales website was used to determine which water bodies could be potentially affected by the proposed works. The names, ID numbers, designation, status classification and objectives for all relevant water bodies were obtained and downloaded from the Water Watch Wales website.

The initial stage of the assessment screens the proposed works against the Ecological and Chemical Status objectives for the water bodies potentially affected by the works, together with their Quality Elements. The aim of this process is to determine whether the works could have an impact upon any of these criteria. Those criteria for which no potential adverse effects are identified are not considered further in the assessment. Any potential adverse effects are screened into the assessment and are carried forward to a detailed assessment.

3 Project Description

3.1 Project Overview

JBA Consulting was commissioned by NRW (Natural Resources Wales) in 2026 to undertake a study into a 100m section of failed sheet piling (Figure 3-1, Figure 3-2, **Error! Reference source not found.** and Figure 3-4) on the banks of the Afon Mawddach at Llanelltyd, near Dolgellau, North Wales. The site is located at SH 71184 19081. A 30m section of the piling has failed along the right bank of the river which has allowed a pocket of scour to develop leaving the sheet piling foundations dangerously exposed. The sheet piling was originally protecting part of a 1000m long earth embankment that acts as an informal flood bund for the farmland behind it. This embankment, the sheet piling and an outfall are an NRW legacy asset, so are inspected every 2 years, however the assets are not classed as a formal flood defence. The project aims to achieve a solution which eliminates future liability and withdraws maintenance obligations, addresses health and safety concerns and reaches an agreement with the landowner. This project will ensure that NRW is meeting its regulatory and legal duties.

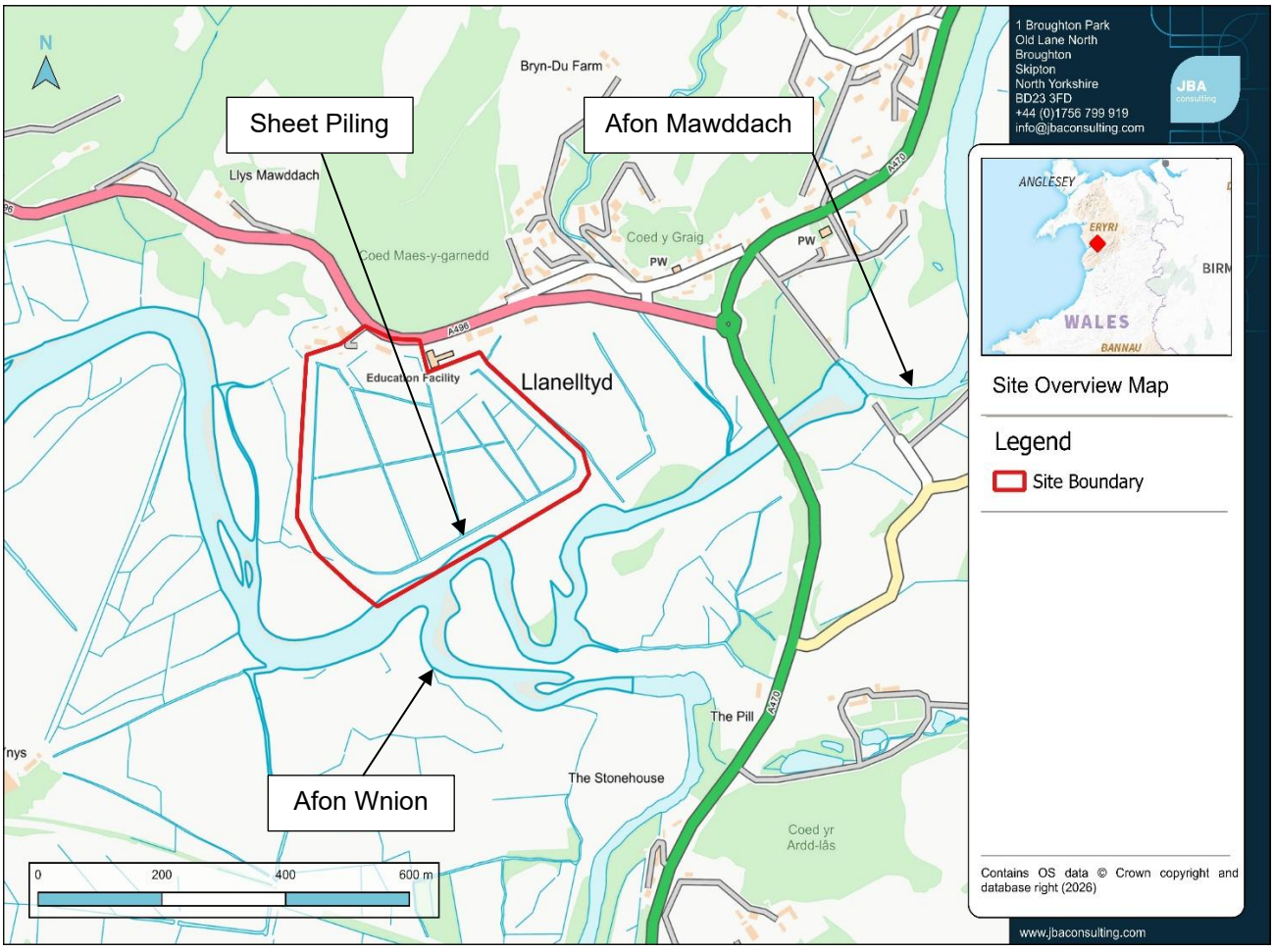

Figure 3-1 Site Overview Map

Figure 3-2 Map showing the positioning of the sheet piling, failed sheet piling and area of erosion

Figure 3-3 Shows the section of failed sheet piling (between white arrows) on the Afon Mawddach (right bank looking downstream, SH 71235 19076)

Figure 3-4 Shows the section of failed sheet piling and the extent of subsequent lateral channel movement and scour. White line represents where the existing bank line and sheet piling was. With the red area representing the extent of scour (right bank looking upstream, SH 71174 19069).

3.2 Proposed Works

The proposed works currently include four different options for sheet pile removal at the site:

1. Full 100m sheet pile removal.
2. Cutting the 100m sheet pile down as low as possible (down to silt bed level).
3. Leaving 70m of piling in-situ and removing the 30m length of failed piling.
4. Cutting down the 30m of failed piling to bed level to remove immediate risk.

4 WFD Screening Assessment

4.1 Overview

This screening assessment aims to screen in any works that require WFD Assessment and to identify which WFD water bodies are within and near to the proposed works.

The results of the screening assessment are presented below. The baseline status of the Quality Elements within the water bodies screened into the assessment are discussed in this chapter. As discussed in the Introduction and Methodology, if this section finds there is potential for the proposed works to cause deterioration in the status of a water body, or prevent it from achieving its status objectives, the relevant water body and its Quality Elements should be taken forward and consider further in a Scoping Assessment.

4.2 WFD Water Bodies

The site is located within the Mawddach catchment. The following water bodies are considered:

- Mawddach (Transitional) - Water Body
- Wnion - lower - Water Body
- Cardigan Bay North (Coastal) - Water Body
- Meirionnydd - Groundwater Body

4.2.1 Current Status

Details of the classification, status and objectives, as described by the Water Watch Wales, are summarised in Table 4-1.

Table 4-1: Current WFD Status

Water Body ID	Water Body Name	Hydromorphological Designation	Current Ecological Status/ Potential	Overall Status Objective
GB511006407100	Mawddach (2024)	Natural	Good	Good by 2027
GB110064048800	Wnion - lower (2024)	Natural	Good	Good by 2027
GB621009600000	Cardigan Bay North (2024)	Natural	Good	Good by 2033
GB41002G203200	Meirionnydd (Groundwater) (2021)	Natural	Poor	Good by 2027

4.3 Screening Outcome: Water Bodies

The Table 4-2 indicates which water bodies have been screened in or out of the assessment and the reasons for this decision.

Table 4-2: Water Body Screening Outcome

Water Body	Reason	Screening Outcome
Mawddach (Transitional)	The proposed sheet piling removal works will be undertaken within this water body. The permanent works are likely to provide an overall improvement for WFD, but the temporary works have the potential to impact upon WFD quality elements during construction, so this water body has been screened in.	**Screened In**
Wnion - lower	The end of this water body is located approximately 500m upstream of the proposed works, so they are not anticipated to impact upon this water body.	**Screened Out**
Cardigan Bay North	This water body is located approximately 11.5km downstream of the proposed work site, so is not anticipated to be impacted by the proposed works.	**Screened Out**
Meirionnydd (Groundwater)	The Meirionnydd Water Body lies beneath the proposed work site. The Works are not anticipated to directly impact upon the groundwater body, however the temporary works have the potential to impact upon WFD quality elements during construction, so this water body has been screening in.	**Screened IN**

4.4 Baseline Status of Screened in Water Bodies

For each water body screened into the assessment, details on the status of each element, as described by the Water Watch Wales website, are given below.

4.4.1 Mawddach (Transitional) Water Body (GB511006407100)

The tables below describe the current status of the Ecological Elements according to the most recent WFD cycle.

Table 4-3: Biological Quality Elements Status (Trac)

Biological Quality Element	Current Status (2024)	Objective
Invertebrates	Good	Good by 2027
Macroalgae	Good	Good by 2027
Opportunistic Macroalgae sub element	Good	Good by 2027
Fish	Not assessed	Not assessed
Macrophytes	Not assessed	Not assessed
Phytobenthos	Not assessed	Not assessed

Table 4-4: Hydromorphological Quality Element Status

Hydromorphological Quality Element	Current Status (2024)	Objective
Hydrological Regime	Not High	Good by 2027
Morphology	Not High	Good by 2027
Hydromorphological Supporting Elements	Not High	Good by 2027

Table 4-5: Physico-Chemical Quality Elements Status

Physico-Chemical Quality Element	Current Status (2024)	Objective
Physico-chemical quality elements	Good	Good by 2027
Dissolved oxygen	High	High by 2027
Dissolved Inorganic Nitrogen	Good	Good by 2027

Table 4-6: Chemical Quality Elements Status

Chemical Quality Element	Current Status (2024)	Objective
Chemical (overall)	Moderate	Good by 2027
Specific Pollutants	High	High by 2027
Priority hazardous substances	Moderate	Good by 2027

Chemical Quality Element	Current Status (2024)	Objective
Priority substances	High	High by 2027
Copper	High	High by 2027
Zinc	High	High by 2027
Mercury	High	High by 2027

Table 4-7: Reasons for not achieving good (RNAG) and reasons for deterioration (RFD)

Reason Type	Significant Water Management Issue	Activity	Category	Classification Element
RNAG	Diffuse Source	Contaminated water body bed sediments	Industry, Manufacturing and other Business	Brominated diphenylether (BDPE) Calc
RNAG	Point Source	Sewage discharge (continuous)	Water Industry	Brominated diphenylether (BDPE) Calc

4.4.2 Meirionnydd (Groundwater) (GB41002G203200)

The tables below describe the current status of the Ecological Elements according to the most recent WFD cycle.

Table 4-8: Quantitative Status Elements Status (Groundwater)

Quantitative Quality Elements	Current Status (2021)	Objective
Quantitative GWDTEs test	Good	Good by 2027
Quantitative Dependant Surface Water	Good	Good by 2027
Quantitative Saline Intrusion	Good	Good by 2027
Quantitative Water Balance	Good	Good by 2027

Table 4-9: Chemical Status Elements (Groundwater)

Chemical Quality Elements	Current Status (2021)	Objective
General Chemical Test	Good	Good by 2027
Chemical GWDTEs test	Good	Good by 2027
Chemical Saline Intrusion	Good	Good by 2027
Chemical Dependant Surface Water Body Status	Poor	Poor by 2027

Table 4-10: Reasons for not achieving good (RNAG) and reasons for deterioration (RFD)

Reason Type	Significant Water Management Issue	Activity	Category	Classification Element
Reason for not achieving good	Diffuse Source	Abandoned Mine	Mining and Quarrying	Chemical Dependent Surface Water Body Status

4.5 Protected Areas

The WFD specifies that areas requiring special protection under other retained EC Directive and waters used for the abstraction of drinking water are identified as protected areas. These areas have their own objectives and standards. Regulation 13 of the WFD requires compliance with the standards and objectives set for each protected area by 22nd December 2021, unless otherwise specified in the legislation under which the protected area was established.

4.5.1 Designated Nature Conservation Sites

There are a total of nine statutory designated sites within 2km of the proposed site. These include three Special Areas of Conservation (SACs) and five Sites of Special Scientific Interest (SSSIs). The site is also located within Eryri (Snowdonia) National Park. These designated sites and the distance from the proposed site of works are listed below and mapped below.

- Pen Llŷn a'r Sarnau/ Lleyn Peninsula and the Sarnau SAC -Within site
- Afon Eden - Cors Goch Trawsfynydd SAC - 0.65km East
- Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC - 1.7km South
- Aber Mawddach / Mawddach Estuary SSSI - Within site
- Foel Ispri SSSI - 0.65km North
- Bryn y Gwin Isaf SSSI - 1.2km South

- Llwyn-iarth SSSI -1.3km Southwest
- Penmaenuchaf Hall - 1.4km West

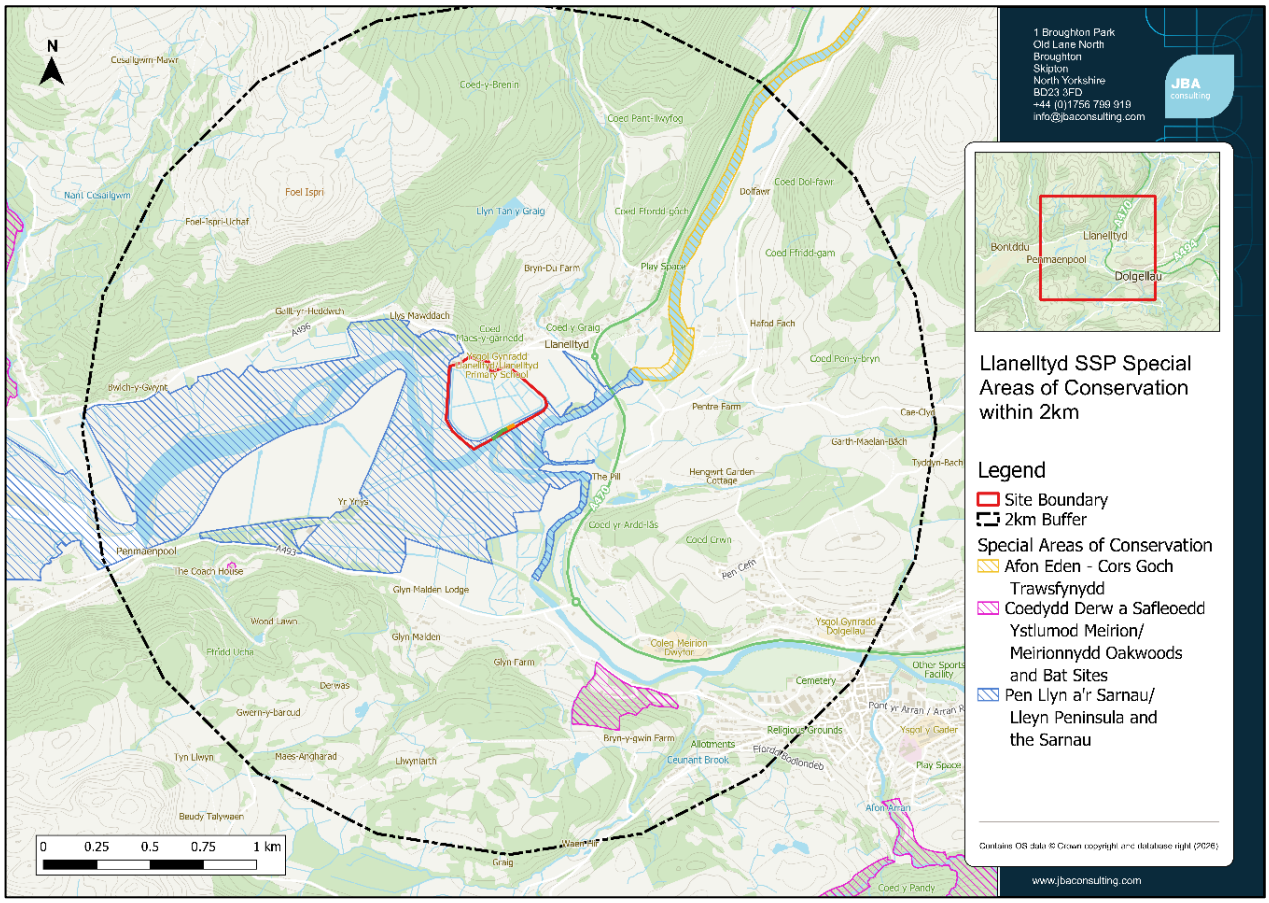

Figure 4-1. Special Areas of Conservation within 2km of the proposed works.

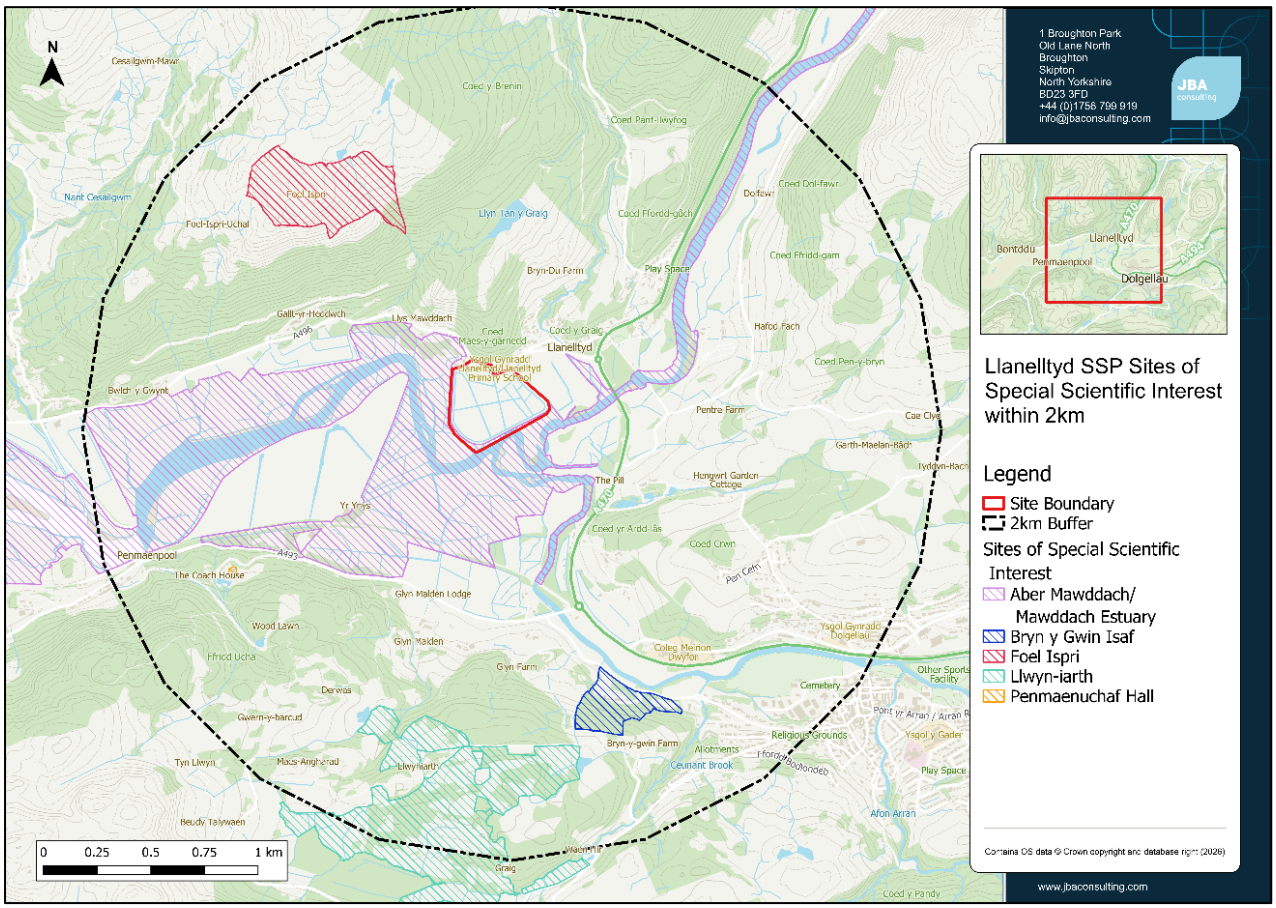

Figure 4-2. Sites of Special Scientific Interest within 2km of the proposed works.

4.5.2 Nitrate Vulnerable Zones (NVZ)

The retained European Commission Nitrates Directive requires areas of land that drain into waters polluted by nitrates to be designated as Nitrate Vulnerable Zones (NVZs).

There are no NVZ within the catchment or close to the site of the proposed works.

4.5.3 Drinking Water Protected Areas (DrWPA)

Drinking Water Protected Areas (DrWPA) are designated under the Water Framework Directive, with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Drinking Water Groundwater Safeguard Zones (SgZs) are areas where actions will be targeted to address the causes of DrWPA objective failure/risk of failure.

The site does not sit with any drinking water protected areas, which includes river catchments and groundwater.

5 Summary

To conclude the Screening Assessment, the following quality elements need to be considered further within a Scoping Assessment:

Mawddach (Transitional) Water Body

- Biological Elements
- Hydromorphological Elements
- Physico-chemical Elements
- Chemical Elements

Meirionnydd Groundwater Water Body

- Quantitative Elements
- Chemical Elements

Protected Areas

- Pen Llŷn a'r Sarnau/ Lleyn Peninsula and the Sarnau SAC
- Afon Eden - Cors Goch Trawsfynydd SAC
- Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC
- Aber Mawddach / Mawddach Estuary SSSI
- Foel Ispri SSSI
- Bryn y Gwin Isaf SSSI
- Llwyn-iarth SSSI
- Penmaenuchaf Hall

The proposed works at Llanelltyd have been initially screened for compliance with WFD Objectives to determine which water bodies could be potentially affected by the proposed works. This assessment has been undertaken with the current site plans provided and without the final design determined at this stage. The preliminary screening assessment has considered the impact of each of the four proposed design options on the local water bodies, with the result combined given the similar nature of the proposed works. Should the design or scope of the work alter significantly, this report would need to be revised to ensure that all screened in water bodies outlined in this report have been considered and to determine whether the final scheme is WFD-compliant. It should also be noted that for these works to be WFD-compliant a WFD scoping assessment is required and if necessary, a WFD impact assessment.

6 References

Natural Rescources Wales. (2026). Water Watch Wales. Retrieved from https://waterwatchwales-nrw.hub.arcgis.com/

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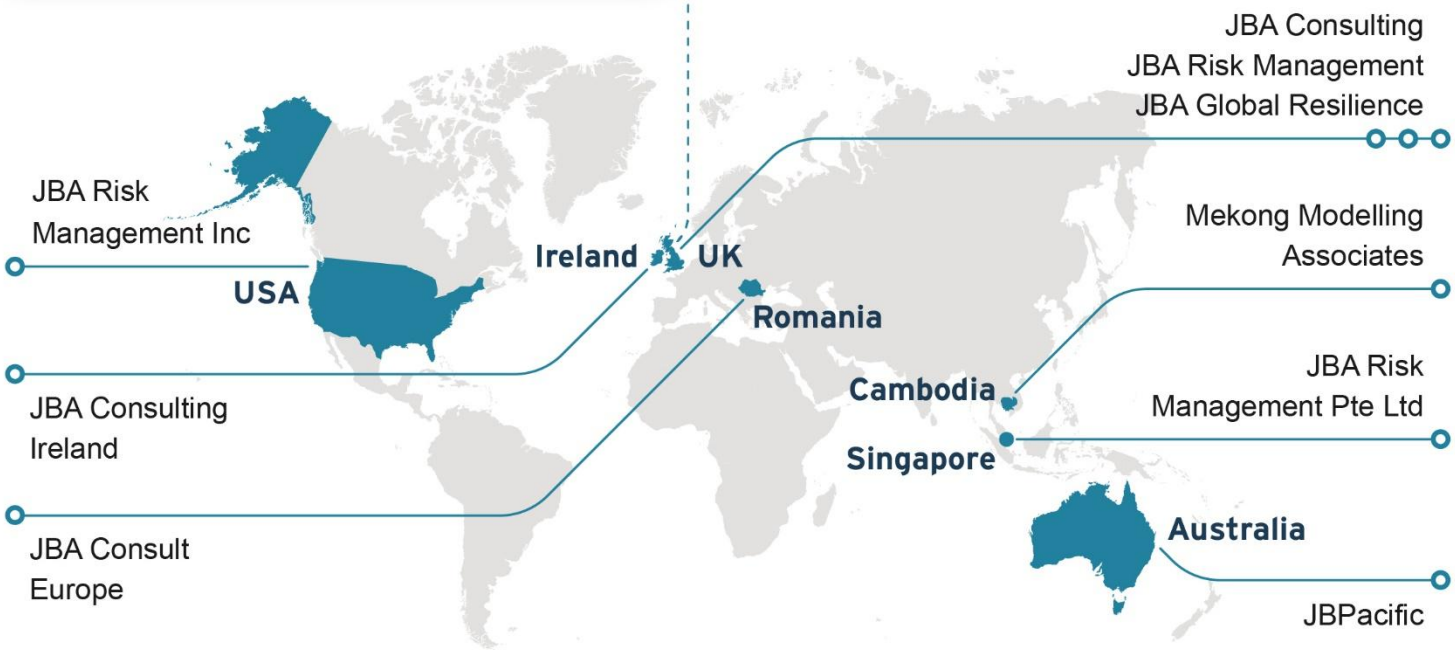

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