Pennant Walters

# FOEL TRAWSNANT GRID CONNECTION

## Appendix 10A: Water Framework Directive Assessment



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Pennant Walters

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## Appendix 10A: Water Framework Directive Assessment

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# 1 INTRODUCTION

1.1.1. WSP UK Ltd, hereafter referred to as WSP, has been commissioned by Pennant Walters to undertake a Water Framework Directive (WFD) screening and scoping assessment to support a planning application being prepared for submission to Planning and Environment Decisions Wales (PEDW), seeking consent for the proposed Foel Trawsnant Wind Farm electricity network infrastructure connection. The application consists of 66 kilovolts (kV) overhead line (OHL) and underground cables (UGC), herein referred to as the 'Project'. The Project will provide a connection between the wind farm and the wider national grid.

1.1.2. The Project has the potential to impact the following WFD water bodies (**Figure 10A.2 and Figure 10A.3**):

- Ffrwd Wyllt - Headwaters to Tidal Limit (GB110058026100);
- Afan - Conf with Corrwg to Confluence with Pelenna (GB110058026130);
- Kenfig – Headwater to Tidal (GB110058026170);
- Llynfi - Headwaters to Lletty Brongu STW (GB110058026331);
- Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332); and,
- Swansea Carboniferous Coal Measures (GB41002G201000).

1.1.3. Therefore, the risks to the water environment posed by the Project will be assessed against the biological, physico-chemical and hydromorphological quality elements that comprise the WFD. The potential construction impacts are also evaluated in terms of the effects they may have upon the status of WFD quality elements.

## 1.2 PROJECT LOCATION AND STUDY AREA

1.2.1. The Project is located in south Wales, to the southwest of the town of Llangnwyd, and passes partially through the town of Maesteg. The proposed grid connection is centred at OS NGR 284175, 187428 and falls within two local authorities - Bridgend County Borough Council (BCBC) in which the Project mostly resides, and Neath Port Talbot County Borough Council (NPTCBC), where the start and end sections of the connection are located.

1.2.2. The Study Area is shown in **Annex A** (**Figure 10A.1 and Figure 10A.2**).

1.2.3. A 1 km study area has been adopted for this Water Framework Directive (WFD) assessment to provide an appropriate spatial scope for identifying potential direct and indirect impacts of the Project on nearby water bodies. The Study Area distance is considered proportionate to the scale and nature of the Project, allowing for the assessment of hydrological and ecological linkages while capturing any relevant pathways for potential effects, such as surface water runoff, sediment transport, or connectivity to downstream water bodies. The 1 km radius also aligns with standard best practice for WFD assessments, ensuring that potential impacts to both upstream and downstream receptors are adequately considered, without extending beyond a reasonable area of influence based on the Project's location and footprint.

## 1.3 DESCRIPTION OF THE PROJECT

1.3.1. The Key features of the Project are summarised in **Table 1-1**.

**Table 1-1 – Key Features of the Project**

| Component | Description |
|---|---|
| Cable | Length: 27.5 km<br>Dimensions: 630 mm diameter<br>Description: Cu Cable (not oil filled) |
| Overhead Line Poles | Quantity: 72 wooden poles (at 36 locations)<br>Height:<br>• 10 poles at 11 m<br>• 42 poles at 12 m<br>• 10 poles at 13 m<br>• 4 poles at 14 m<br>• 6 poles at 15 m |
| Cables Trenches | Length: 5.1 km<br>Dimensions: ~1.5 m depth, and between 600 mm to 1.5 m wide. |
| Joint Bay Boxes | Quantity: 22<br>Dimensions: ~2 m depth, and 5 m x 3 m |
| Temporary Construction Compound | Approximately centred on (E) 283826 (N) 193954<br>Dimensions: ~20 m by 20 m<br>Maximum Compound Footprint: ~0.04 ha |
| Watercourse Crossings | Number: One temporary dam on the Nant Sychbant |

## OVERHEAD LINE POLESETS

1.3.2. The proposed overhead line (OHL) will be supported by wooden H-pole structures, typically made from Scots Pine and consisting of two single poles joined by a crossarm. At termination points, double H-pole structures will be used. While the route aims to remain straight, deviations will be made to avoid environmental features, with angle poles and cable stays used at these points. The poles, which do not require concrete foundations, will be supported by below-ground pre-cast kicking blocks. Pole heights will generally be 12 m, with a maximum of 15 m, maintaining a minimum clearance of 4 m from trees. The OHL will carry a single circuit with one conductor per phase using Poplar conductor wire, with spans of 90–130 m depending on topography. Telemetry and monitoring capabilities, such as fault detection, will be provided by a microwave link.

## CABLE TRENCHES

1.3.3. The installation of the below-ground cable route will involve underground cabling works using a ducted system, in which the electrical cables will be laid within protective ducts housed inside an excavated trench. The chosen method of trench excavation is open cut, which involves the direct excavation of a trench up to approximately 1.5 m in depth (refer to **Environmental Statement Chapter 4: Description of the Project (Appendix 4C)** for further detail). The ducts will be laid at the base of the trench, and the immediate area surrounding the ducts will be backfilled with sand to provide thermal protection and mechanical cushioning. The remainder of the trench will then be

backfilled with the original excavated material, reinstating the surface as close as possible to its original condition.

1.3.4. Cabling will be installed in continuous lengths wherever feasible, with joint bays required approximately every 500 m to facilitate the connection of cable sections. These joint bays typically measure 5 m by 3 m in area and are excavated to a depth of 1–2 m. Once all ducts are in place along the route, the electrical cable will be pulled through the ducts using cable winches and associated equipment.

### TEMPORARY CONSTRUCTION COMPOUND

1.3.5. A single temporary construction compound will be established in the northern section of the Site, occupying an area of approximately 20 m x 20 m. This compound will be secured with appropriate fencing and will include a single-storey welfare unit powered by an on-site generator to provide facilities for site personnel. The majority of the compound's surface will be covered with geogrid matting or a similar material to stabilise the ground and minimise surface disturbance. The precise location of the compound is illustrated in **Figure 4-1** of the EIA report.

1.3.6. The compound will serve as the primary storage area for materials, including poles and cables. Poles will be transported from the compound to the installation location and laid down within the Site boundary on the same day as installation to minimise ground-level storage and disruption. In addition to the main welfare unit at the compound, portable welfare facilities will be deployed along the cable route as needed. These will be positioned in proximity to active work areas where the main compound is not within reasonable walking distance, ensuring compliance with health, safety, and welfare requirements throughout the construction period.

### WATERCOURSE CROSSINGS

1.3.7. For the OHL sections of the Project, it is assumed that pole sets would be set back on either side of any watercourse crossings, erected, and then cables would be strung across the watercourse with minimal interactions.

1.3.8. For the UGC route section, there is only one watercourse crossing which is of the Nant Sychbant which is within the Llynfi - headwaters to Lletty Brongu STW WFD Catchment and forming a direct tributary to the River Llynfi. The Nant Sychbant crossing will be undertaken through installing a temporary dam and laying the cable through an open cut method (see **Chapter 4: Description of the Project** of the EIA report**)**.

1.3.9. The proposed crossing of other watercourses will be within existing highway infrastructure through Nantyffyllon and to the west of Maesteg.

### SITE ACCESS

1.3.10. Access to the Site will be primarily provided via the existing access track for the consented Foel Trawsnant Wind Farm, travelling northwards from the B4282 road through the forestry and connecting to the proposed construction compound.

1.3.11. No new access tracks will be constructed. Access will be from the existing highway network, as well as the forestry track which is part of the consented Foel Trawsnant Wind Farm. The minimal number of vehicles required for erection of the poles will travel within the Site boundary and use geo-grid matting or similar where appropriate.

1.3.12. General access along the Site for the OHL sections will be provided via existing farmers gates. The minimal number of vehicles required for the erection of the poles will travel within the Site boundary and use geo-grid matting or similar where appropriate (i.e. poor weather conditions creating soft ground). The underground section of the Project will be accessed via the existing road network. It is therefore assumed that no temporary culverts or watercourse crossings would be required to install the OHL polesets.

### RIPARIAN VEGETATION CLEARANCE

1.3.13. Riparian vegetation clearance is required for the construction of watercourse crossings and OHL pole sets. This activity is limited to the watercourse crossing at Nant Sychbant and the construction of OHL pole sets located near watercourses. OHL pole sets situated near watercourses are primarily confined to Nant y Castell and Nant y Ffyllon, which are the only watercourses where substantial riparian vegetation removal will occur in connection with OHL pole set construction. Nant y Castell runs roughly parallel to the OHL route for approximately 800 m, with the distance between the watercourse and individual pole sets ranging from 3 m to about 80 m.

### Decommissioning

1.3.14. Following the operational phase, the connection (underground and overground) will be left in situ as it has the potential to become integrated into the wider distribution network. This would also avoid further disruption to the surrounding environment. Therefore, decommissioning is not considered further.

## 1.4 CONSULTATION

1.4.1. Given the programme and short timescales of the project, a consultation meeting with Natural Resources Wales (NRW) to discuss the WFD compliance assessment was not feasible.

## 1.5 BACKGROUND TO THE WFD

1.5.1. An impact assessment of any works/modifications to surface water bodies is required under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the 2017 Regulations) (SI 2017/407)[1]. For groundwater, an assessment of potential impacts of works/modifications to water bodies is required under the policy paper The Groundwater (Water Framework Directive) (England) Direction 2016[2]. Compliance with the WFD legislation is required for permitting of the Project.

1.5.2. The WFD assessment should also comply with relevant CEN/ISO Standards, as stated within Annex V of the WFD legislation (Water Framework Directive (2000/60/EC)[3].

The primary aim of the WFD is to improve/maintain the Ecological Status/Potential of all water bodies and to prevent deterioration in status of the water bodies and their associated WFD quality elements. Ecological Status/Potential is determined by a suite of biological, physico-chemical and

[1] HM Government (2017) The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 [Online]. Available at: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
[2] HM Government (2016) The Groundwater (Water Framework Directive) (England) Direction 2016 [Online]. Available at: The Groundwater (Water Framework Directive) (England) Direction 2016 - GOV.UK
[3] HM Government (2020) Directive 2000/60/EC of the European Parliament and of the Council [Online]. Available at: https://www.legislation.gov.uk/eudr/2000/60/annex/V

hydromorphological quality elements. This WFD assessment aims to establish the baseline conditions, evaluate potential impacts of the Project and assess compliance against WFD objectives.

1.5.3. The overarching objective of the WFD is for surface water bodies to attain overall 'Good Ecological Status' (GES) or 'Good Ecological Potential' (GEP). GES refers to situations where the ecological characteristics show only a slight deviation from natural/near-natural conditions. In such a situation, the biological, chemical, physico-chemical and hydromorphological conditions are associated with limited or no human pressure. Artificial and heavily modified water bodies have a target to achieve GEP, which recognises their important uses, whilst ensuring the quality elements are protected as far as possible.

1.5.4. The WFD sets several objectives including:

- Prevention of deterioration in the status of surface waters and groundwater;
- Achievement of objectives and standards for Protected Areas;
- Aim to achieve 'Good' status for all water bodies by 2015. Where this is not possible and subject to the criteria set out in the WFD Regulations, aim to achieve 'Good' status by 2021 or 2027 or set a less stringent objective;
- Aim to achieve 'Good' ecological potential and 'Good' surface water chemical status for heavily modified water bodies and artificial water bodies;
- Reversal of any significant and sustained upward trends in pollutant concentrations in groundwater;
- Cessation of discharges of priority hazardous substances into surface waters;
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants. Where is it considered either technically infeasible or disproportionately expensive to achieve GES or GEP by the set target date, alternative objectives have been set for the water body, such as a target to achieve 'Moderate' status;
- Comply with objectives and standards for protected areas, where relevant; and,
- Reduce pollution from priority substances and cease discharges, emissions and losses of priority hazardous substances.

1.5.5. Where a new modification, change in activity or change to a structure on a water body is proposed, a WFD assessment needs to consider whether the proposed alteration would cause deterioration in the Ecological Status or Potential of any water body. For heavily modified/artificial water bodies, proposed new modifications, or changes to activities or structures, may also result in WFD mitigation measures or actions, set to help a water body achieve GES/GEP, being ineffective. This could result in the water body failing to meet GES/GEP. Where a WFD assessment concludes that deterioration or failure to achieve GES/GEP may occur, a Regulation 19 assessment would be required, which makes provision for deterioration of status provided that certain stringent conditions are met.

# 2 METHODOLOGY

## 2.1 DATA COLLECTION

### DESK STUDY

2.1.1. A desk-based study was carried out to inform the WFD screening and scoping assessment, reviewing the existing information of the Project and study area to develop a baseline for the catchments, watercourses and surrounding areas. The following data sources were used for the desk study:

- Geology and soil maps[4];
- Current aerial photography and satellite imagery[5];
- Water Watch Wales[6];
- National Biodiversity Network (NBN) atlas - Wales INNS Portal (NBN, 2024)[7];
- NRW Water Quality Archive[8];
- Historical maps UK archive[9];
- Nature on the Map for designated areas, habitats and species, and landscape data[10];
- Hydrological data[11];
- WFD status and objectives from the River Basin Management Plan for Cycle 3 data[12];
- NRW Data Map Wales[13];
- NRW Data Map Wales Freshwater Fish Surveys[14];
- NRW Data Map Wales Freshwater River Macroinvertebrates[15]; and,
- NRW Data Map Wales Freshwater River Macrophytes[16].
- NRW Data Map Wales Freshwater Phytobenthos – Diatoms[17]

[4] British Geological Survey (2025) Geoindex [Online]. Available at: GeoIndex - British Geological Survey
[5] Bing Maps (2025) Online Mapping [Online]. Available at: Bing Maps - Directions, trip planning, traffic cameras & more
[6] Natural Resources Wales (2025) Water Watch Wales [Online]. Available at: Water Watch Wales
[7] National Biodiversity Network (NBN) atlas (2025); Wales INNS portal [Online]. Available at: NBN Atlas Wales INNS portal
[8] Natural Resources Wales (2025) NRW Water Quality Archive [Online]. Available at: NRW Water Quality Archive | DataMapWales
[9] National Library of Scotland (2025) Side by side mapping [Online]. Available at: Side by side georeferenced maps viewer - Map images - National Library of Scotland
[10] Magic Maps (2025) Interactive Mapping [Online]. Available at: Magic Map Application
[11] UK Centre for Ecology and Hydrology [Online]. Available at: National River Flow Archive | National River Flow Archive
[12] Natural Resources Wales (2025) River Basin Management Plans [Online]. Available at: Natural Resources Wales / River basin management plans
[13] Natural Resources Wales (2025) Data Map Wales [Online]. Available at: https://datamap.gov.wales/maps/lidar-viewer/view#/
[14] Natural Resources Wales (2025) Data Map Wales Freshwater Fish Surveys [Online]. Available at: https://datamap.gov.wales/layergroups/geonode:nrw_freshwater_fish_surveys
[15] Natural Resources Wales (2025) Data Map Wales Freshwater River Macroinvertebrates [Online]. Available at: https://datamap.gov.wales/layergroups/geonode:nrw_river_macroinvertebrates
[16] Natural Resources Wales (2025) Data Map Wales Freshwater River Macrophytes [Online]. Available at: https://datamap.gov.wales/layers/geonode:nrw_river_macrophyte
[17] Natural Resources Wales (2025) Data Map Wales Freshwater Phytobenthos – Diatoms [Online]. Available at: https://datamap.gov.wales/layergroups/geonode:nrw_freshwater_diatom_survey

## 2.2 WFD ASSESSMENT PROCESS

2.2.1. The assessment methodology used here is based on guidance provided by the Planning Inspectorate Advice Note: The Water Framework Directive[18]. This guidance outlines a three-stage process to WFD assessment: screening, scoping, and impact assessment.

### STAGE 1: SCREENING

2.2.2. Screening is required to identify activities which have the potential to result in the deterioration of a water body or fail to comply with the objectives of that water body. Screening also serves to identify those proposed activities (e.g., proposed construction methods) that are required to be taken through to scoping, and those activities that are unlikely to result in the deterioration of the water body.

### STAGE 2: SCOPING

2.2.3. Scoping is required to identify risks to receptors from a project's activities, based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each water body). Potential risks to hydromorphology, biology (habitats and fish), water quality, WFD protected areas, and invasive non-native species should be assessed. The scoping stage identifies which elements need to be carried forward to Stage 3.

2.2.4. The scoping stage has included an assessment of relevant construction mitigation and embedded design mitigation. An assessment is then made of the potential residual risk of deterioration at the WFD water body scale that may require additional mitigation and therefore, a detailed impact assessment.

### STAGE 3: IMPACT ASSESSMENT

2.2.5. A detailed WFD impact assessment is carried out for each receptor identified as being at risk in terms of potential deterioration or non-compliance with its specific objectives as set out in the River Basin Management Plan as a result of the project. Where the potential for deterioration of water bodies is identified, and it is not possible to mitigate the impacts to a level where deterioration can be avoided, the project would need to be assessed in the context of Regulation 19 of the WFD Regulations.

## 2.3 LIMITATIONS AND ASSUMPTIONS

2.3.1. A site visit was not undertaken to inform the WFD assessment. As such, the assessment of surface water features and geomorphological conditions has been based solely on desk-based sources (where available). Given the nature of the activities associated with the Project, this is considered a proportionate approach to the assessment of potential effects to WFD water bodies.

2.3.2. It is assumed that a detailed **Construction Environmental Management Plan (CEMP)** will be developed by the Construction Contractor in accordance with the **Outline Construction Environmental Management Plan (OCEMP) (Appendix 4A)**.

[18] HM Government (2025) Nationally Significant Infrastructure Projects: Advise on the Water Framework Directive [Online]. Available at: Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive - GOV.UK

## 2.4 ERODIBLE CORRIDOR SCREENING

2.4.1. Erodible corridor analysis has been undertaken on several watercourses due to their historical lateral variability, with the aim of assessing potential future channel migration and ensuring that such movement does not pose a risk to the proposed infrastructure during the operational phase. This has been assessed using satellite imagery[5], historic mapping[9], lidar[19] data and topography mapping[5]. The watercourses of which erodible corridor screening was undertaken on are as follows:

- Nant Sychbant: Watercourse Crossing - Within the Llynfi – headwaters to Lletty Brongu Water Body;
- Nant y Ffyllon: OHL pole sets - Within the Llynfi – headwaters to Lletty Brongu Water Body; and,
- Nant y Castell: OHL pole sets – Within the Llynfi – Lletty Brongu STW to conf with Ogmore Water Body.

# 3 BASELINE CONDITIONS

## 3.1 FFRWD WYLLT - HEADWATERS TO TIDAL LIMIT WATER BODY (GB110058026100)

### WFD STATUS

3.1.1. Ffrwd Wyllt - Headwaters to Tidal Limit Water Body (GB110058026100) could potentially be impacted by the Project. A summary of the status of the water body is provided below and the latest classification data is provided in **Annex B**.

3.1.2. Ffrwd Wyllt - Headwaters to Tidal Limit Water Body is a river water body and is currently performing at 'Moderate' ecological status and has a chemical status of 'High'. The water body is designated as heavily modified due to navigation including ports (see **Annex C**), while the 'Reasons for Not Achieving Good' are largely related to physical modification, point source pollution and diffuse source pollution.

3.1.3. The water body is targeted to achieve 'Good' ecological status by 2027 and a 'High' chemical status by 2027.

### CATCHMENT CHARACTERISTICS

3.1.4. The Project lies to the east of the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body catchment. The overhead and underground cable lines are not directly situated within this water body catchment, but this water body is within the Study Area of the Project. A review of Natural Resources Wales Lidar data[19] showed that elevations present within the Project vary between 370 mAOD and 0 mAOD. This gives the river a steep longitudinal gradient, where highland river characteristics and morphology are common.

3.1.5. From a review of the catchment information on the UK Soil Observatory[20] the land use comprises neutral grassland, improved grassland, acid grassland, arable and horticultural, broadleaved woodland, coniferous woodland, heather and suburban.

3.1.6. Ffrwd Wyllt river itself is not gauged, and neither are any of its tributaries[21]. The Natural Resources Water Watch Wales[6] shows that the Ffrwd Wyllt Water Body catchment has an area of 25.46 km$^2$ and a main water body length of 3.9 km. The water body flows from north-east to south-west with the upstream extent near the village of Bryn and the downstream extent near Port Talbot where it enters the Docks.

3.1.7. A review of Natural Resources Wales Lidar data[19] was carried out to assess the ground elevation of the water body. This review showed that the north-east of the catchment near Pen Disgwylfa had the greatest elevation at approximately 370 mAOD, while near Port Talbot elevations were approximately 0 mAOD.

[19] Natural Resources Wales (2025) Data Map Wales [Online]. Available at: https://datamap.gov.wales/maps/lidar-viewer/view#/
[20] British Geological Society (2025) UK Soil Observatory: Land Cover Map [Online]. Available at: https://mapapps2.bgs.ac.uk/ukso/home.html
[21] UK Centre for Ecology and Hydrology (2025) National River Flow Archive [Online]. Available at: Search data | National River Flow Archive

## CATCHMENT GEOLOGY AND SOILS

### Solid Geology

3.1.8. The Study Area includes the South Wales Upper Coal Measures and South Wales Middle Coal Measures formations, which are part of the South Wales Coal Measures Group and the Pennant Sandstone Formation (and differentiated members below), which is part of the Warwickshire Group.

3.1.9. The solid geology underlying the Ffrwd Wyllt - Headwaters to Tidal Limit water body, west of the Project, includes the South Wales Upper Coal Measures Formation (mudstone, siltstone and sandstone), the South Wales Middle Coal Measures Formation (mudstone, siltstone and sandstone) and the Llynfi Member (mudstone, siltstone and sandstone) and Rhondda Member (mudstone, siltstone and sandstone) of the Pennant Sandstone Formation. This area of bedrock geology is uniformly designated as a Secondary A aquifer, even though the area is highly deformed leading often to multiple juxtaposed geological formations.

### Superficial Geology

3.1.10. The superficial geology underlying the Ffrwd Wyllt - Headwaters to Tidal Limit water body, west of the Project, is predominantly Devensian Till (diamicton) (unsorted lithology i.e. varying widely in size and shape) with minor Peat deposits. The till is designated as a Secondary (undifferentiated) aquifer and the peat is designated as Unproductive.

### Soils

3.1.11. The Ffrwd Wyllt - Headwaters to Tidal Limit water body is located on slowly permeable wet and very acid upland soils with a peaty surface.

## CATCHMENT HYDROLOGY

3.1.12. Several watercourses are present within the Project's Study Area. Although the Ffrwd Wyllt is the only main river in the Ffrwd Wyllt – Headwaters to Tidal Limit Water Body catchment, it does not lie within the Study Area.

3.1.13. The following ordinary watercourses are located within the Study Area:

- Tributaries of Nant Drysiog; and,
- Nant Cwmfarteg (and its tributaries).

3.1.14. A map of the watercourses potentially impacted by the Project is provided **in Annex A (Figure 10A.1).**

## HISTORICAL CHANNEL CHANGE

3.1.15. Historic mapping[9] from 1900 indicates that most of the watercourses located within the Ffrwd Wyllt – Headwaters to Tidal Limit Water Body appear to have undergone little to no change since records began. A portion of the Nant Drysiog tributary does not appear to be mapped in the earliest archived mapping. This is likely due to limitations in the accuracy and resolution of historic mapping or because the scale and intended purpose of those maps did not require the inclusion of smaller, ephemeral, or less prominent water features.

## BASELINE CHARACTERISTICS AGAINST WFD SURFACE WATER QUALITY ELEMENTS

### Hydromorphology Quality Elements

#### Quantity and Dynamics of Flow

3.1.16. Ffrwd Wyllt exhibits variable flow characteristics influenced by its steep, forested catchment and urban influences. The flow is generally continuous along the main channel, although smaller tributaries can exhibit intermittent flow during dry periods. Flow dynamics along the river are influenced by local topography and land use, with upstream areas characterised by faster, more turbulent flow over steeper gradients, while lower reaches show slower, smoother flow patterns[22]. The headwaters are dendritic in planform with artificial drainage channels largely restricted to furrows associated with tree planting. River Habitat Survey online data suggested that the diversity and naturalness of channel features was 'Very High' through the Habitat Quality Assessment Class[25] (NGR: SS 80057 90733), suggesting that the catchment may also be typical of this relatively high-quality fluvial environment.

#### Connection to Groundwater

3.1.17. The Ffrwd Wyllt exhibits a dynamic interaction with the local groundwater system, due to its mixed geology including, glacial till superficial deposits, coal measures, sandstones, and mudstones. Areas with glacial till and mudstone tend to have reduced permeability which limits baseflow. The Ffrwd Wyllt itself flows across glacial till for much of its course within the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body and therefore, this largely constrains its baseflow contribution.

3.1.18. In contrast, where bedrock sandstones or fractured coal measures dominate, groundwater inputs contribute more significantly to baseflow, especially during dry periods, helping to maintain perennial flow.

3.1.19. The catchment's Base Flow Index (BFI) is approximately 0.43, suggesting that just under half of the streamflow is derived from stored sources like groundwater[35]. This reflects a moderate contribution of groundwater to the river's flow and highlights the influence of the catchment's variable geology.

#### River Continuity

3.1.20. The Ffrwd Wyllt maintains a generally continuous flow throughout its course with few physical barriers. Eleven anthropogenic pressures have been mapped within the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body[23], all of which appear to be culverts, although some have not been classified in the dataset in terms of anthropogenic pressure type. These are not expected to significantly disrupt continuity but may cause localised disruptions during low flow conditions. One of these 11 is located within the study area on the Tributary of Nant Drysiog 1 (NGR: SS 83804 92953) and appears to allow a track to cross the watercourse, with its soffit level of the culvert is considered to be approximately 0.5 m above the bed. No major man-made obstructions such as large dams or weirs have been identified from desktop studies that would significantly disrupt longitudinal connectivity.

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[22] Natural Power (2022) Y Bryn Wind Farm [Online]. Available at: Y Bryn ES Chapter 10 - Hydrology, Geology and Hydrogeological Assessment (REPORT - 1260374 - 1 - F) - 1.DOCX

[23] Amber International (2025) European Barrier Atlas [Online]. Available at: https://amber.international/european-barrier-atlas/

### River Width and Depth Variation

3.1.21. The Ffrwd Wyllt exhibits moderate variation in both width and depth along its length, influenced by natural geomorphological processes and surrounding land use. Widths typically range from approximately 2 to 6 metres in the main channel, with occasional wider sections at meanders or floodplain expansions. Depth varies between 0.08 m and 0.48 m under normal flow conditions (with 0.95 m during peak flow conditions), with deeper pools forming in bends and shallower riffles observed in straighter sections[24].

### Structure and Substrate of the River Bed

3.1.22. The Ffrwd Wyllt displays a bed substrate composition characteristic of upland and semi-upland streams in Wales. Regional survey data indicates the riverbed is composed primarily of gravel and cobble, with occasional patches of coarse sand and silt in slower-flowing sections or areas with depositional tendencies[25].

3.1.23. In some reaches, bedrock outcrops and large boulders are visible, particularly where the river descends steeply or is confined by valley sides. Fine sediments are generally minimal due to moderate-to-high gradient and frequent flushing flows[25].

### Structure of Riparian Zone

3.1.24. The riparian zone along the Ffrwd Wyllt typically consists of narrow to moderately wide buffer strips of semi-natural vegetation, including tall grasses, scattered shrubs, and occasional mature broadleaf trees. Land use adjacent to the channel is predominantly improved pasture and rough grazing, with some sections influenced by nearby infrastructure.

3.1.25. Banks are generally stable, though signs of moderate trampling and poaching by livestock are visible in parts of the lower reaches, potentially affecting vegetation structure and bank cohesion. In the more natural headwater areas, the riparian zone supports better-developed vegetation mosaics and tree cover, providing valuable shading, habitat continuity, and allochthonous input (e.g., leaf litter and woody debris) to the river system.

3.1.26. The Natural Resources Wales River Habitat Survey (RHS)[26] data from nearby reaches classifies much of the riparian corridor as substantially modified, but still supporting intermittent natural riparian features. This includes sections where fencing and livestock exclusion efforts have led to recovering riparian vegetation structure.

[24] River Levels (2025) Ffrwdwyllt at Tailbach [Online]. Available at: Ffrwdwyllt at Taibach :: the UK River Levels Website
[25] River Restoration Centre (2025) River Habitat Survey Map [Online]. Available at: River Habitat Survey Map | the River Restoration Centre
[26] Natural Resources Wales (2020) River Habitat Survey [Online]. Available at: https://metadata.naturalresources.wales/geonetwork/srv/eng/catalog.search#/metadata/NRW_DS116339

### Physico-chemical quality elements

3.1.27. The NRW Water Quality archive was reviewed to assess the current conditions and classifications for the following relevant WFD elements[8]. No freshwater quality monitoring points are situated within the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body catchment that are within the study area between 2010-present day. However, one sampling location is present between 2020-present day within the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body catchment but approximately 6 km downstream of the Study Area. Therefore, the following physico-chemical quality element information will be based off of this.

3.1.28. This sampling station is FFRWDWLLT - TAIBACH R.B A48 and has a station number of S11001 (National Grid Reference (NGR): SS7724488929). This has been sampled 24 times from the 22/04/21 to 31/03/25 and these samples will have been used to derive the following highest, lowest and average results.

#### Thermal Conditions

3.1.29. In Cycle 3, the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High' for temperatures. The water temperature readings at 'FT A48' showed that the highest temperature recorded was 15.8 °C in July 2022, with 6.3 °C in January 2023 the lowest and 11.18 °C the average.

#### Oxygenation conditions

3.1.30. In Cycle 3, the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High' for dissolved oxygen. 109.1 % was the highest dissolved oxygen saturation recorded in March 2025, the lowest dissolved oxygen saturation recorded was 95.8 % in March 2022, with an average of 101 % dissolved oxygen saturation.

#### Acidification status

3.1.31. In Cycle 3, the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High' for pH. 8.64 was the highest pH reading (recorded in March 2023), while 7.45 pH was recorded in May 2021 and was the lowest reading. The average of these samples was 7.94 pH.

#### Nutrient conditions

3.1.32. In Cycle 3, the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High' for phosphate. Note that the following readings refer to Orthophosphate, reactive as P. The highest orthophosphate value was 0.113 mg/l in November 2024, while the lowest orthophosphate value was < 0.004 mg/l on 13 separate occasions. The average value was approximately 0.013 mg/l.

3.1.33. In Cycle 3, the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High' for ammonia. Note that the following readings refer to Ammoniacal Nitrogen as N. The highest ammonia value 0.09 mg/l in November 2024, while the lowest ammonia value was < 0.005 mg/l on 5 separate occasions. The average value was approximately 0.014 mg/l.

#### Specific Pollutants

3.1.34. In Cycle 3, the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High' for all specific pollutants. There is data for the following specific pollutant elements within the NRW Water Quality Archive[8]:

- All readings for arsenic (dissolved) are < 1 ug/l.

- The highest reading of copper (dissolved) was 2.3 ug/l in May 2021, with the lowest < 1 ug/l on 6 separate occasions. The average value was approximately 1.24 ug/l.
- The highest reading of iron (dissolved) was 186 ug/l in October 2021, with the lowest 77 ug/l in June 2021. The average value was 111.9 ug/l.
- The highest reading of manganese (dissolved) was 40.5 ug/l in April 2021, with the lowest 10 ug/l in August and September 2021. The average value was 22.09 ug/l.
- The highest reading of zinc (dissolved) was 19.2 ug/l in December 2021, with the lowest < 5 ug/l on 5 separate occasions. The average was approximately 7.86 ug/l.

**Biological Quality Elements**

### Fish

3.1.35. An assessment of the fish biological quality element for the Ffrwd Wyllt headwaters to tidal limit shows that this water body achieved Good status in Interim Cycle 3 (2024)[13].

3.1.36. Two NRW fish monitoring locations are present within the water body, with a further four located on tributaries to the Ffrwd Wyllt river. However, only three monitoring locations have been subject to survey within the last ten years[14].

3.1.37. The most recent survey on the Ffrwd Wyllt river occurred in September 2019 at National Grid Reference (NGR) SS 77500 89500, approximately 7.3 km downstream (southwest) of the red line boundary (RLB). One species was identified during a single catch electric fishing survey, brown trout (*Salmo trutta*). Brown trout are designated as a Species of Principal Importance (SPI) under the Environment (Wales) Act 2016 (section 7)[27]; are on the UK list of Priority Habitats and Species[28], and are on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (2010) as Least Concern[29].

3.1.38. Further surveys were carried out in August 2019 at NGR SS 80000 90500 approximately 4.7 km downstream (southwest) of the RLB on the Nant Cwmfarteg tributary and in July 2019 at NGR SS 81600 92196 approximately 2.0 km downstream (west) of the RLB on the Ffrwd Wyllt river. Both surveys adopted a single catch electric fishing surveys, with brown trout being the only species recorded.

3.1.39. The above surveys were also undertaken at the same sites in 2015 between July – August with brown trout being the only species observed.

3.1.40. No non-native invasive species (INNS) were identified within this waterbody during the surveys or recorded in the NBN atlas Wales INNS portal search of the Ffrwd Wyllt river.

### Invertebrates

3.1.41. The Ffrwd Wyllt headwaters to tidal limit water body macroinvertebrate quality element was assessed as High in 2024 (Interim Cycle 3)[13].

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[27] Welsh Government (2025) Environment (Wales) Act 2016 [Online]. Available at https://www.gov.wales/sites/default/files/publications/2023-01/list-living-organisms-principal-importance-purpose-maintaining-enhancing-biodiversity-wales.pdf

[28] JNCC (2025). UK BAP Priority Species [Online]. Available at https://jncc.gov.uk/our-work/uk-bap-priority-species/

[29] IUCN Red List (2025). The IUCN Red List of Threatened Species *Salmo trutta* [Online]. Available at https://www.iucnredlist.org/fr/species/19861/58301467

3.1.42. Three NRW macroinvertebrate monitoring locations on the Ffrwd Wyllt -headwaters to Tidal Limit water body have been sampled within the last ten years[15]

3.1.43. The most recent survey on the Ffrwd Wyllt river occurred in March 2024 at NGR SS 77288 88966, approximately 8.0 km downstream (southwest) of the RLB. During surveys in March 2024, 35 aquatic macroinvertebrate species were recorded. The most abundant were those species belonging to the Baetidae family, specifically *Baetis rhodani/atlanticus,* often referred to as blue-winged olives with 75 individuals recorded. No protected or notable species were identified. The Community Conservation Index (CCI) score for the aquatic macroinvertebrate community identified at the sampling point, was 13.3, which represents an aquatic macroinvertebrate community of fairly high conservation value.

3.1.44. The same three locations were sampled for macroinvertebrates in April and November 2021. During the April 2021 survey, 36 aquatic macroinvertebrate species were recorded. Of these, the most abundant taxa within the sample were the family of midges Orthocladiinae, and *B. rhodani/atlanticus* (with 198 and 89 individuals, respectively). No notable or protected species were identified within the sample. The CCI score was 10.75, which represents an aquatic macroinvertebrate community of fairly high conservation value. During the November 2021 survey, 41 aquatic macroinvertebrate species were recorded. Of these the most abundant within the sample were *B,rhodani*. No notable or protected species were identified within the sample. The CCI score, 12.09, indicates an aquatic macroinvertebrate community of fairly high conservation value.

3.1.45. Aquatic macroinvertebrate surveys were carried out on the Ffrwd Wyllt river in February 2016 at 2 sites located approximately 5 km downstream (west) of the RLB (NGR SS 79818 90573 (Site 182505) and NGR SS 79901 90557 (Site 182551)). At site 182505, 28 aquatic macroinvertebrate species were recorded. The most abundant species were the genus of black fly (*Simuliidae*) with 89 individuals and olive upright nymph (*Rhithrogena semicolorata*) with 85 individuals. The CCI score, was 12.33, which represents an aquatic macroinvertebrate community of fairly high conservation value. At site 182551, 23 aquatic macroinvertebrate species were recorded. The most abundant species recorded were *R. semicolorata* with 89 individuals. No notable or protected species were identified within the sample. The CCI score, was 10.67, which represents an aquatic macroinvertebrate community of fairly high conservation value.

### Macrophytes and phytobenthos

3.1.46. The macrophyte and phytobenthos WFD biological quality combined element was classified as High in the Ffrwd Wyllt - Headwaters to Tidal Limit water body during Cycle 3[13]. The individual sub-elements were also classified as High.

3.1.47. Two macrophyte monitoring locations are present within the Ffrwd Wyllt headwaters to tidal limit water body, both downstream of the RLB. Only one monitoring location has been sampled in the last ten years, the results from the most recent survey are described below[16].

3.1.48. The Goytre Mill monitoring location is situated at NGR SS 78189 89740 approximately 6.8 km (west) downstream of the RLB. During the June 2024 survey, 15 macrophyte species were observed. The aquatic moss species, long-beaked water feathermoss (*Platyhypnidium riparioides*) recorded the greatest percentage cover (2.5–5 %). No legally protected, INNS or otherwise notable species were recorded at the site during the survey.

3.1.49. One diatom monitoring location is present within the Ffrwd Wyllt headwaters to tidal limit water body, downstream of the RLB. The monitoring location is situated at NGR SS 77288 88966 approximately

8.2 km (southwest) downstream of the RLB[17]. During the September 2024 survey, 34 diatom species were observed. The most abundant diatom species were *Navicula lanceolata* that is found in both fresh and brackish water with 76 valve counts.

**Invasive Non-Native Species**

3.1.50. Two INNS, including the New Zealand mud snail (Potamopyrgus antipodarum) was recorded within the Ffrwd Wyllt headwaters to tidal limit water body catchment area from the above macroinvertebrate surveys[15]. Although this species is now widespread in the UK and is considered naturalised. Additionally, the tadpole bladder snail (*Physella gyrina*) was also recorded within the Ffrwd Wyllt headwaters to tidal limit water body catchment area from the NBN Wales INNS portal[7].

**Chemical Quality Elements**

**Priority Substances**

3.1.51. In Cycle 3 (2022), priority hazardous substances status for the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High', with the following elements all classified as 'High': 1,2-dichloroethane, Benzene, Dichloromethane, Lead and Its Compounds, Nickel and Its Compounds, Trichloromethane and Carbon Tetrachloride. All readings for lead (dissolved) are < 2 ug/l[8]. For nickel (dissolved), the highest reading was 2.55 ug/l in May 2021, with the lowest reading of 1.10 ug/l in August 2021. The average value was 1.85 ug/l.

**Priority Hazardous Substances**

3.1.52. In Cycle 3, priority substances status for Ffrwd Wyllt - Headwaters to Tidal Limit Water Body was classified as 'High', with 'cadmium and its compounds' also classified as 'High'. All readings for cadmium (dissolved) are < 1 ug/l[8].

3.1.53.

## 3.2 AFAN - CONF WITH CORRWG TO CONFLUENCE WITH PELENNA WATER BODY (GB110058026130)

### WFD STATUS

3.2.1. Afan - Conf with Corrwg to Confluence with Pelenna Water Body (GB110058026130) could potentially be impacted by the Project. A summary of the status of the water body is provided below and the latest classification data is provided in **Annex B**.

3.2.2. Afan - Conf with Corrwg to Confluence with Pelenna Water Body is a river water body and is currently performing at a 'Moderate' ecological status and has a chemical status of 'High'. The water body has a natural hydromorphological designation. The 'Reasons for Not Achieving Good' are largely related to physical modification and point source pollution.

3.2.3. The water body is targeted to achieve 'Good' ecological status by 2027 and a 'High' chemical status by 2027.

### CATCHMENT CHARACTERISTICS

3.2.4. The Project lies to the south-east of the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body catchment. Natural Resources Wales LiDAR data indicate that elevations within the catchment range from approximately 350 mAOD in the upper reaches to near sea level (0 mAOD) downstream close to the confluence with the Pelenna River[19].

3.2.5. A review of land use data from the UK Soil Observatory[20] shows a varied mosaic including improved and neutral grasslands, broadleaved and coniferous woodland, upland heath, and agricultural land[20].

3.2.6. The Afan - Confluence with Corrwg to Confluence with Pelenna Water Body is not currently gauged for flow, nor are its tributaries. According to Natural Resources Wales Water Watch Wales, the water body has a catchment area of approximately 20.68 km² and a main river length of approximately 3.6 km [6].The river flows predominantly in a south-westerly direction, with the upstream extent near Cymer and the downstream extent at its confluence with the Pelenna River.

## CATCHMENT GEOLOGY AND SOILS

### Solid Geology

3.2.7. The Study Area includes the South Wales Upper Coal Measures and South Wales Middle Coal Measures formations, which are part of the South Wales Coal Measures Group and the Pennant Sandstone Formation, which is part of the Warwickshire Group.

3.2.8. The solid geology underlying the Afan - Confluence with Corrwg to Confluence with Pelenna water body and the Project includes the Llynfi Member (mudstone, siltstone and sandstone) and Rhondda Member (mudstone, siltstone and sandstone) of the Pennant Sandstone Formation. This area of bedrock geology is uniformly designated as a Secondary A aquifer.

### Superficial Geology

3.2.9. The superficial geology underlying the Afan - Confluence with Corrwg to Confluence with Pelenna water body and the Project is Devensian Till (diamicton) (unsorted lithology i.e. varying widely in size and shape). The till is designated as a Secondary (undifferentiated) aquifer.

### Soils

3.2.10. The Afan - Confluence with Corrwg to Confluence with Pelenna water body is located on very acid and loamy upland soils with a wet, peaty surface.

## CATCHMENT HYDROLOGY

3.2.11. There are several watercourses within the Study Area of the Project. The only main river within the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body catchment is that of the Afan, however this is not situated within the Study Area.

3.2.12. The following ordinary watercourses are located within the Study Area:

- Blaen Nant;
- Nany Tryfal;
- Nant Cynon (and its tributaries); and,
- Nant yr Hwyaid.

3.2.13. A map of the watercourses potentially impacted by the Project is provided **in Annex A (Figure 10A.1).**

## HISTORICAL CHANNEL CHANGE

3.2.14. Historic mapping[9] from approximately 1900 indicates that most of the watercourses located within the Afan – Confluence with Corrwg to Confluence with Pelenna Water Body appear to have undergone little to no change since records began. Some of these ordinary watercourses do not

appear on the earliest archived maps. This is likely due to limitations in the accuracy and resolution of historic mapping, or because the scale and intended purpose of those maps did not require the inclusion of smaller, ephemeral, or less prominent water features.

## BASELINE CHARACTERISTICS AGAINST WFD SURFACE WATER QUALITY ELEMENTS

### Hydromorphology Quality Elements

#### Quantity and Dynamics of Flow

3.2.15. The Afan Water Body, including tributaries such as Nant Tryfal and Blaen Nant, generally maintains natural flow regimes typical of upland rivers in the region. However, flow variability can be influenced by historic mining legacy and land use changes within the catchment. Some flow modifications from drainage works and minor abstraction exist but overall, the flow quantity and seasonal dynamics appear to remain largely unaltered.

#### Connection to Groundwater

3.2.16. Within the Afan - Confluence with Corrwg to Confluence with Pelenna catchment, groundwater plays a key role in sustaining base flows, particularly during dry spells.

3.2.17. Superficial deposits are largely composed of glacial till in the vicinity of key tributaries such as Nant yr Hwyaid, Blaent Nant and Nant Tryfal, which limits baseflow contributions due to the low permeability of this geology. However, the catchment's underlying bedrock geology is dominated by Carboniferous sandstones, whereby its high permeability zones allow groundwater recharge and flow. This is specifically the case for the River Afan, where superficial deposits are less prominent.

3.2.18. Historical coal mining in the catchment has significantly influenced groundwater pathways. Mining subsidence and dewatering have disrupted natural groundwater flow, causing some areas to experience lowered water tables and changes in baseflow contributions to surface waters. This has led to spatial variability in groundwater–surface water connectivity across the catchment.

#### River Continuity

3.2.19. The Afan Water Body from the Confluence with Corrwg to the Confluence with Pelenna contains several anthropogenic pressures that disrupt longitudinal river continuity. These include historical weirs and culverts, primarily linked to past industrial and mining activities within the catchment. 92 anthropogenic pressures were identified at desk study within the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body[2323]. Out of these, five anthropogenic pressures are located within the study area, four of which are classified as fords while one is a culvert. The fords are located on Blaen Nant and Nany Tryfal, while the culvert is located on a tributary of Nant Cynon. Blaen Nant was almost dried up at the ford (NGR: SS 83866 95064) when the anthropogenic pressure information was recorded in August 2019, so it is likely an ephemeral feature[23].

#### River Width and Depth Variation

3.2.20. Within the Afan catchment, the natural variability in river width and depth has been altered in several locations due to historical modifications. Past mining, urban development, and flood defence measures have resulted in channel straightening, embankments, and culverting that reduce the natural heterogeneity of the river channel.

3.2.21. These changes have led to more uniform channel dimensions in some stretches, limiting the natural formation of pools, riffles, and meanders that are key for dynamic river processes. However, in less modified sections, particularly upstream near the Confluence with Corrwg, more natural variability in channel morphology remains. The reduction in channel complexity affects sediment transport and flow dynamics, with some areas showing signs of localised sediment build-up or erosion.

### Structure and Substrate of the River Bed

3.2.22. The river bed in the Afan catchment exhibits a varied substrate composition consisting primarily of gravels, cobbles, and finer sediments in slower-flowing reaches. This natural heterogeneity supports channel diversity and influences flow patterns.

3.2.23. Anthropogenic influences such as historical mining activity and urban development have led to localised modifications of the river bed. These include artificial bank reinforcements and channel straightening, which have reduced substrate diversity in certain stretches.

3.2.24. In the Afan water body, sections near confluences tend to have coarser substrates due to increased flow energy, while downstream reaches accumulate finer sediments.

### Structure of Riparian Zone

3.2.25. The riparian zone along the Afan water body and its tributaries exhibits a mix of semi-natural and modified habitats. In upper reaches, the riparian vegetation is predominantly composed of broadleaved trees, shrubs, and wetland plants, providing good bank stability and buffering against runoff.

3.2.26. However, in lower sections and areas adjacent to agricultural or urban development, riparian zones have been impacted by channel modifications, embankments, and invasive species. Such alterations have reduced vegetation diversity and continuity, compromising the natural functions of the riparian corridor, including sediment retention and flood attenuation.

3.2.27. The riparian zone varies along the catchment, but generally, it tends to be narrow to moderately wide, especially in areas where agricultural or urban pressures are present. In more natural stretches, the vegetation is denser and more continuous, forming effective buffer strips of typically 5 to 10 metres in width. However, in some sections near settlements or where land is intensively managed, the riparian strip can be reduced or fragmented leading to less dense vegetation cover.

### Physico-chemical quality elements

3.2.28. The NRW Water Quality archive was reviewed to assess the current conditions and classifications for the following relevant WFD elements[8]. No freshwater quality monitoring points are situated within the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body catchment that are within the study area between 2010-present day. However, one sampling location is present between 2020-present day within the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body catchment but approximately 4 km downstream of the Study Area. Therefore, the following physico-chemical quality element information will be based off of this.

3.2.29. This sampling station is R AFAN AT DANYBONT R.B P-R-Y-F and has a station number of S11005 (National Grid Reference (NGR): SS7960094140). This has been sampled 25 times from the 22/01/20 to 07/04/25 and these samples will have been used to derive the following highest, lowest and average results.

### Thermal Conditions

3.2.30. In Cycle 3, the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as 'High' for temperatures. The water temperature readings showed that the highest temperature recorded was 16.8 °C in July 2021, with 5.1 °C in January 2023 the lowest and 10.77 °C the average.

### Oxygenation conditions

3.2.31. In Cycle 3, the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as 'High' for dissolved oxygen. 111.1 % was the highest dissolved oxygen saturation recorded in April 2021, the lowest dissolved oxygen saturation recorded was 91.4 % in April 2024, with an average of 101.6 % dissolved oxygen saturation.

### Acidification status

**3.2.32.** In Cycle 3, the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as 'High' for pH. 8.17 was the highest pH reading (recorded in February 2020), while 7.13 pH was recorded in October 2022 and was the lowest reading. The average of these samples was 7.73 pH.

### Nutrient conditions

3.2.33. In Cycle 3, the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as 'High' for phosphate. Note that the following readings refer to Orthophosphate, reactive as P. The highest orthophosphate value was 0.022 mg/l in October 2022, while the lowest orthophosphate value was < 0.004 mg/l on 13 separate occasions. The average value was approximately 0.067 mg/l.

3.2.34. In Cycle 3, the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as 'High' for ammonia. Note that the following readings refer to Ammoniacal Nitrogen as N. The highest ammonia value 0.016 mg/l in August 2022, while the lowest ammonia value was < 0.005 mg/l on 7 separate occasions. The average value was approximately 0.007 mg/l.

### Specific Pollutants

3.2.35. In Cycle 3, the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as 'High' for all specific pollutants. There is data for the following specific pollutant elements within the NRW Water Quality Archive[8]:

- All readings for arsenic (dissolved) are < 1 ug/l.
- The highest reading of copper (dissolved) was 1.14 ug/l in December 2020, with the lowest < 1 ug/l on 7 separate occasions. The average value was approximately 1.02 ug/l.
- The highest reading of iron (dissolved) was 174 ug/l in December 2020, with the lowest 43.7 ug/l in September 2020. The average value was 69.6 ug/l.
- The highest reading of manganese (dissolved) was 23.5 ug/l in January 2020, with the lowest 10 ug/l in August and September 2021. The average value was 16.2 ug/l.
- The highest reading of zinc (dissolved) was 7.4 ug/l in December 2020, with the lowest < 5 ug/l on 4 separate occasions. The average was approximately 5.69 ug/l.

### Biological Quality Elements

#### Fish

3.2.36. The Afan - confluence with Corrwg to confluence with Pelenna water body was assessed as Moderate status for the fish sub-element in Interim Cycle 3[13].

3.2.37. Fish population data from fifteen NRW fish monitoring locations within the water body was retrieved from NRW Freshwater Fish Surveys Data Map Wales[14]. Of these, only two have been subject to survey within the last ten years. The most recent survey on the River Pelenna occurred in July 2019 at NGR SS 79621 94129, approximately 4.8 km downstream (northwest) of the RLB. Two species were identified during a single catch electric fishing survey; brown trout and Atlantic salmon (*Salmo salar*). Atlantic salmon are designated a Schedule 4 species under the Conservation of Habitats and Species Regulations (2010), they are a SPI in Wales under the Environment (Wales) Act 2016 (section 7)[27], they are listed on the UK list of Priority Habitats and Species[28], and listed under the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (2010) of Least Concern[29].

3.2.38. Further surveys were carried out in July 2019 and August 2015 at NGR SS 84823 96366 approximately 1.4 km upstream (northeast) downstream of the RLB at the confluence of the Gwenffrwd tributary and the River Pelenna. A single catch depletion electric fishing survey was undertaken on both occasions, with brown trout being the only species recorded in 2019, and brown trout and Atlantic salmon recorded in 2015.

3.2.39. No INNS were identified during in the waterbody the surveys or observed in the NBN atlas Wales INNS portal search of the River Pelenna.

#### Invertebrates

3.2.40. The Afan - confluence with Corrwg to confluence with Pelenna water body macroinvertebrate sub element was assessed as High in 2024 (Interim Cycle 3)[13].

3.2.41. Three NRW macroinvertebrate monitoring locations are presented within the water body. All of which have been subject to survey within the last ten years[15].

3.2.42. The most recent surveys were undertaken in April and November 2021 at NGR SS 79614 94134, approximately 4.6 km downstream (west) of the RLB. During the spring April 2021 survey, 40 aquatic macroinvertebrate species were recorded. The most abundance species being the aquatic nymph olive upright (R. semicolorata), and the blue-winged olive mayflies (Ephemerellidae) with 622 and 610 individuals recorded, respectively. No notable or protected species were identified within the sample. The CCI score, was 10.26, which represents an aquatic macroinvertebrate community of fairly high conservation value. During the surveys in November 2021, 38 aquatic macroinvertebrate species were recorded. The most abundant species being the aquatic nymph olive upright with 263 individuals recorded. No protected or notable species were identified. The CCI score, was 13.05, which represents an aquatic macroinvertebrate community of fairly high conservation value.

3.2.43. Two further aquatic macroinvertebrate surveys were carried out in January 2016 at NGR SS 84518 97311 (Nant Cregan upstream confluence with Nant Troed Y Rhiw) approximately 3.3 km (north) of the RLB, and at NGR SS 84823 96368 (Nant Cregan upstream confluence with The Afan) approximately 2.3 km (north) of the RLB. The sampling location at the upstream confluence with Nant Troed Y Rhiw, recorded eight aquatic macroinvertebrate species. The most abundant species

were the stoneflies Amphinemura sulcicollis with 16 individuals recorded. No protected or notable species were identified. The CCI score was 15.00, which represents an aquatic macroinvertebrate community of fairly high conservation value. The sampling location at the upstream confluence with The Afan, recorded 18 aquatic macroinvertebrates species. The most abundant species were the blue-winged olive mayflies (Ephemerellidae) with 22 individuals. No protected or notable species were identified. The CCI score was 11.54, which represents an aquatic macroinvertebrate community of fairly high conservation value.

#### Macrophytes and phytobenthos

3.2.44. The macrophyte and phytobenthos WFD biological quality combined element was classified as High in the Afan - confluence with Corrwg to confluence with Pelenna water body during Interim Cycle 3[13]. The individual sub-elements were also classified as High.

3.2.45. Three macrophyte monitoring locations are present with all three sampled in the last ten years. The upstream B4281 Pontrhydyfen location is situated approximately 4.6 km (north) downstream of the RLB[16]. During the July 2022 survey, 19 macrophyte species were recorded. The aquatic moss species greater water-moss (*Fontinalis antipyretica*), alpine water-moss (*Fontinalis squamosa*) and the long-beaked water feathermoss (*P. riparioides*) recorded the greatest percentage cover (1-2.5 %). No legally protected, or otherwise notable species were recorded at the site during the survey. One INNS macrophyte was recorded during this survey.

3.2.46. One diatom monitoring location is present at NGR SS7961494134 approximately 4.6 km (north) of the RLB. During the April 2024 survey, 24 diatom species were observed. The most abundant diatom species were *Achnanthidium eutrophilum* with 137 counts. During the September 2024 survey, 21 diatom species were observed. The most abundant diatom species was *Achnanthidium minutissimum* with 295 valves counted.

### Invasive Non-Native Species

3.2.47. One INNS, the New Zealand mud snail (*P. antipodarum*) was from the above macroinvertebrate surveys[15]. Additionally, during the aquatic macrophyte surveys the flowering plant *Mimulus* spp. (Monkeyflower) which is listed as a non-native invasive plant in the UK was also recorded.

### Chemical Quality Elements

#### Priority Substances

3.2.48. In Cycle 3 (2022), priority hazardous substances status for the Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as ‘High’, with the following elements all classified as ‘High’: 1,2-dichloroethane, Benzene, Dichloromethane, Dichlorvos, Lead and Its Compounds, Nickel and Its Compounds, Octylphenol, Pentachlorophenol, Trichloromethane, Aldrin, Dieldrin, Endrin and Isodrin, and Carbon Tetrachloride. All readings for lead (dissolved) are < 2 ug/l[8]. For nickel (dissolved), the highest reading was 1.79 ug/l in December 2020, with the lowest reading of 1 ug/l in August and September 2020. The average value was 1.33 ug/l.

#### Priority Hazardous Substances

3.2.49. In Cycle 3, priority substances status for Afan - Confluence with Corrwg to Confluence with Pelenna Water Body was classified as ‘High’, with Cadmium and its compounds, Endolsulfan, Hexachlorocyclohexane and Nonylphenol also classified as ‘High’. All readings for Cadmium and its

compounds (dissolved) and Endosulfan A are < 0.1 ug/l, while all Endosulfan B readings are 2.5 ug/l and 4-Nonylphenol Branched was always 0/03 ug/l[8].

## 3.3 KENFIG – HEADWATER TO TIDAL WATER BODY (GB110058026170)

### WFD STATUS

3.3.1. Kenfig – Headwater to Tidal Water Body (GB110058026170) could potentially be impacted by the Project. A summary of the status of the water body is provided below and the latest classification data is provided in **Annex B**.

3.3.2. Kenfig – Headwater to Tidal Water Body is a river water body and is currently performing at 'Moderate' ecological status and has a chemical status of 'High'. The water body has a natural hydromorphological designation. The 'Reasons for Not Achieving Good' are limited to one for surface water abstraction.

3.3.3. The water body is targeted to achieve 'Good' ecological status by 2027 and a 'High' chemical status by 2027.

### CATCHMENT CHARACTERISTICS

3.3.4. The Project lies to the north of the Kenfig – Headwater to Tidal Water Body (GB110058026170). Elevations within the catchment vary from approximately 200 mAOD in the upper reaches to near sea level at the tidal limit near Kenfig Pool (SS 79675 81565). This range supports a combination of upland stream characteristics transitioning to lowland, tidal-influenced river sections

3.3.5. A review of land use data from the UK Soil Observatory[20] shows land use is predominantly rural with extensive areas of agricultural land, improved grasslands and pockets of broadleaved and coniferous woodland. Small areas of urban development such as Pyle and Porthcawl are located within the catchment.

3.3.6. The Kenfig – Headwater to Tidal Water Body is not currently gauged for flow, nor are its tributaries. According to NRW Water Watch Wales, the catchment covers an area of approximately 29.53 km² with a main river length of around 45.64 km [6]. The river system flows generally westwards, discharging into the Bristol Channel at Kenfig Pool.

### CATCHMENT GEOLOGY AND SOILS

#### Solid Geology

3.3.7. The Study Area includes the South Wales Upper Coal Measures and South Wales Middle Coal Measures formations, which are part of the South Wales Coal Measures Group and the Pennant Sandstone Formation, which is part of the Warwickshire Group.

3.3.8. The solid geology underlying the Kenfig – Headwater to Tidal water body includes the Rhondda Member (sandstone) and the Brithdir Member (sandstone) of the Pennant Sandstone Formation. This area of bedrock geology is uniformly designated as a Secondary A aquifer.

#### Superficial Geology

3.3.9. The superficial geology underlying the Kenfig – Headwater to Tidal water body is predominantly Devensian Till (diamicton) (unsorted lithology i.e. varying widely in size and shape), although this is not mapped for the section of the water body within the Study Area. The till is designated as a Secondary (undifferentiated) aquifer.

### Soils

3.3.10. The Kenfig – Headwater to Tidal water body is located on freely draining acid loamy soils over rock.

## CATCHMENT HYDROLOGY

3.3.11. There are several watercourses within the Study Area of the Project. The only main river within the Kenfig – Headwater to Tidal Water Body catchment is that of the Kenfig (also known in Welsh as the Afon Cynffig). However, the Kenfig is only designated a main river approximately 3 km downstream of the Study Area.

3.3.12. The following ordinary watercourses are located within the Study Area:

- Kenfig; and,
- Nant Craigyraber.

3.3.13. A map of the watercourses potentially impacted by the Project is provided **in Annex A (Figure 10A.1)**.

## HISTORICAL CHANNEL CHANGE

Historic mapping from approximately 1900 indicates that several reaches of the River Kenfig have been artificially straightened since records began[9]. This modification is likely linked to agricultural practices, particularly as these changes are more prevalent near the river's headwaters than closer to its confluence with the Nant Craigyraber. In contrast, the Nant Craigyraber appears to have experienced minimal anthropogenic alteration. However, minor natural changes in its sinuosity have occurred over this time period., suggesting subtle geomorphological evolution over time.

## BASELINE CHARACTERISTICS AGAINST WFD SURFACE WATER QUALITY ELEMENTS

### Hydromorphology Quality Elements

#### Quantity and Dynamics of Flow

3.3.14. The Kenfig waterbody experiences natural flow variability driven by regional rainfall patterns typical of the South Wales coast. Peak flows respond rapidly to rainfall events due to the catchment's relatively steep topography and limited flow regulation infrastructure.

3.3.15. Localised abstraction for agriculture and minor water management structures on tributaries like Nant Craigyraber may influence flow dynamics during low flow periods. This was specifically indicated on the Nant Craigyraber in online data from a River Habitat Survey where the Habitat Quality Assessment Class was ‘Very Low’ (NGR: SS 85576 84607) indicating channel features and their complexity were minimal[25].

#### Connection to Groundwater

3.3.16. The Kenfig catchment lies predominantly on glacial till and Carboniferous geology, which provides a relatively low-permeability base across much of the waterbody. As a result, the hydrological connectivity between surface waters and groundwater is generally limited. However, there are localised zones particularly in valley bottoms and near peatland or wetland areas where groundwater contributions to baseflow are more apparent. In these areas, shallow groundwater tables may sustain flow during dry periods especially in upper sections of the main river and tributaries like Nant Craigyraber.

3.3.17. Overall, the connection to groundwater in the Kenfig catchment can be described as moderate to weak, with most flow derived from surface runoff but with occasional seasonal support from shallow groundwater inputs.

### River Continuity

3.3.18. The Kenfig – Headwater to Tidal Water Body demonstrates a generally unimpeded longitudinal profile, with no major dams and weirs that would significantly disrupt the natural flow of water or sediment transport. Twenty-four anthropogenic pressures are situated within this WFD water body, although none of which are within the Study Area[2323]. They appear to be largely minor structures such as small bridges, farm access culverts, or road crossings exist, particularly on tributaries like the Nant Craigyraber, but these are sufficiently sized to avoid severe hydromorphological disruption.

### River Width and Depth Variation

3.3.19. The Kenfig – Headwater to Tidal Water Body exhibits relatively limited variation in width and depth along much of its course. LiDAR-based surface models available through NRW suggest that the river has a narrow cross-section in its headwaters, gradually widening downstream toward its lower reaches[19]. However, this transition is generally uniform and lacks significant morphological diversity such as deep pools or wide glides that would indicate substantial hydromorphological complexity.

3.3.20. Channel modification is minimal across most of the waterbody, although some straightening and narrowing may occur near transport corridors or agricultural land particularly in proximity to culverts and small bridges. These human-made structures tend to constrain channel width and may influence local depth through bed scouring.

### Structure and Substrate of the River Bed

3.3.21. The river bed structure across the Kenfig catchment exhibits a moderately diverse composition that reflects its upland-to-lowland gradient. In the upper sections coarse substrates such as gravels and cobbles dominate, particularly in steeper gradients. These materials are largely derived from underlying sandstone geology and natural erosion of upland soils.

3.3.22. As the river descends into flatter terrain finer materials such as silts and sands become more prevalent, particularly in depositional zones near the middle and lower reaches of the water body catchment. These sediment patterns indicate a natural longitudinal zonation, albeit with some modifications due to historical land drainage, bank modification, and sediment delivery from surrounding land.

3.3.23. While the catchment lacks large-scale hydromorphological alteration, smaller-scale pressures (such as historical channel straightening and bank reinforcement in agricultural zones) have influenced sediment transport and local substrate heterogeneity.

### Structure of Riparian Zone

3.3.24. The riparian zone along the Kenfig waterbody is generally narrow, especially in its mid to lower reaches where agricultural land and semi-urban development are adjacent to the channel. Analysis of aerial imagery suggests that riparian vegetation tends to be more intact in upper headwater areas where woodland corridors persist and provide bank stability.

3.3.25. In contrast, downstream sections of the main channel often exhibit fragmented riparian strips dominated by grasses and low shrub species with reduced structural diversity and limited buffer

width. This is especially apparent in areas adjacent to improved pasture and roads, where mechanical bank reinforcement and grazing pressure constrain riparian development.

**Physico-chemical quality elements**

3.3.26. The NRW Water Quality archive was reviewed to assess the current conditions and classifications for the following relevant WFD elements[8]. No freshwater quality monitoring points are situated within the Kenfig – Headwater to Tidal Water Body catchment that are within the study area between 2010-present day. However, several sampling locations are present between 2010-2019 within the Kenfig – Headwater to Tidal Water Body catchment. Two of which are relevant to the Kenfig – Headwater to Tidal Water Body catchment which are downstream on the River Kenfig and Nant Craigyraber/Nant Fadog (both approximately 3-4 km downstream. Therefore, the following physico-chemical quality element information will be based off of these monitoring locations.

3.3.27. The sampling stations are as follows:

- River Kenfig: R KENFIG -CROWN RD KENFIG HILL (Station number ID: 12007), NGR: SS8413083590. This has been sampled 60 times from the 11/01/10 to 08/10/14.
- Nant Craigyraber/Nant Fadog: NANT FADOG @ CULVERT (Station number ID: S70531), NGR: SS8565085420. This has been sampled 11 times from the 08/07/11 to 06/06/12.
  These samples will have been used to derive the following highest, lowest and average results (**Table 4-1**).

**Table 3-1 – Kenfig – Headwater to Tidal Water Body physico-chemical quality element data from the NRW Water Quality Archive**

| Sampling Location | Parameter | Thermal Conditions – Temperature (°C) | Oxygenation Conditions – Dissolved oxygen saturation (%) | Acidification Status - pH | Nutrient conditions | | Specific Pollutants | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Phosphate – Orthophosphate, reactive as P (mg/l) | Ammonia – Ammoniacal Nitrogen as N (mg/l) | Copper (Dissolved) (ug/l) | Iron (Dissolved) (ug/l) | Manganese (Dissolved) (ug/l) | Zinc (Dissolved) (ug/l) |
| **Not Applicable** | **WFD Cycle 3 Status** | High | Good | High | High | High | High | High | High | High |
| **River Kenfig** | **Highest** | 15.0 °C (July 2010) | 127.0 % (July 2012) | 8.67 (June 2010) | 0.259 mg/l (March 2012) | 0.428 mg/l (October 2010) | 5.32 µg/l (October 2010) | 407 µg/l (November 2010)* | 365 µg/l (October 2011)** | 89.7 µg/l (October 2010) |
| | **Lowest** | 4.49 °C (January 2010) | 82.4 % (March 2010) | 7.05 (October 2010) | <0.02 mg/l (33 instances) | <0.030 mg/l (33 occasions) | < 1.00 µg/l (Multiple months in 2010) | 30 µg/l (January & February 2010) | 10 µg/l (August 2011) | 9.5 µg/l (August 2010) |
| | **Average** | 10.37 °C | 99.8 % | 7.79 | ~0.032 mg/l | ~0.068 mg/l | ~1.65 µg/l | 118.9 µg/l | 53.1 µg/l | 26.6 µg/l |
| **Nant Craigyraber/Nant Fadog** | **Highest** | 14.2 °C (September 2011) | 104.9 % (July 2011) | 7.4 pH (January 2012) | Not recorded | Not recorded | Not recorded | 3,670 µg/l (November 2011)* | 967 µg/l (November 2011)** | Not recorded |
| | **Lowest** | 6.14 °C (January 2012) | 87.9 % (August 2011) | 6.57 pH (June 2012) | Not recorded | Not recorded | Not recorded | 46.5 µg/l (January 2012) | 63.8 µg/l (April 2012) | Not recorded |
| | **Average** | 11.61 °C | 95.5 % | 6.87 pH | Not recorded | Not recorded | Not recorded | 1,388.5 µg/l | 345.7 µg/l | Not recorded |

* The iron concentration spikes significantly exceeds the UK[30] and WHO[31] drinking water guideline of 200 µg/l. While iron is not typically harmful at these levels, excessive amounts can affect water quality, leading to discoloration, metallic taste, and potential staining of surfaces. Such a sharp increase may indicate a temporary contamination event, runoff from iron-rich soils, or disturbances in sediment releasing iron into the water column. The zinc concentration spike on the River Kenfig of 89.7 µg/l recorded in October 2010 is also notably higher than surrounding months, and its timing suggests a possible connection to the iron spike of 407 µg/l in November 2010 given they can originate from similar sources.

** The manganese concentration spikes are significantly above the UK[30] and WHO[32] drinking water guideline of 50 µg/l. While manganese is an essential nutrient, excessive levels can impact water quality, leading to discoloration, metallic taste, and staining of surfaces. At more than seven times the recommended limit, this surge may indicate a temporary contamination event, seasonal runoff, or changes in water chemistry that mobilised manganese from sediment.

[30] Drinking Water Inspectorate (2025) Drinking Water Standards and Regulations [Online]. Available at: Drinking Water Standards and Regulations - Drinking Water Inspectorate
[31] World Health Organisation (2003) Iron in Drinking-water [Online]. Available at: Microsoft Word - GDWQ.2ndEdit.Iron.doc
[32] World Health Organisation (2021) Manganese in drinking-water [Online]. Available at: Manganese in drinking-water

### Biological Quality Elements

#### Fish

3.3.28. The fish biological quality element for the Kenfig – headwater to tidal waterbody shows that this water body was assessed at Moderate status in Interim Cycle 3[13]. Two NRW fish monitoring locations are present with the most recent survey on the River Kenfig in August 2012 at NGR SS 80679 82915, approximately 8 km downstream (southwest) downstream, of the RLB[13]. Six species were identified during a single catch depletion electric fishing survey, river lamprey (*Lampetra fluviatilis*), stone loach (*Barbatula barbatula*), bullhead (*Cottus gobio*), three-spined stickleback (*Gasterosteus aculeatus*), minnow (*Phoxinus Phoxinus*), European flounder (*Platichthys flesus*).

3.3.29. River lamprey are designated an Annex II species under the Conservation of Habitats and Species Regulations (2010), an Annex III species of the Bern Convention, are listed as a SPI in Wales under the Environment (Wales) Act 2016 (section 7)[27], are listed on the UK list of Priority Habitats and Species[28], and listed under the IUCN Red List of Threatened Species (2010) as Near Threatened[29]. Bullhead are protected under Annex II of the Habitats Directive.

3.3.30. No non-native invasive species (INNS) were identified in the waterbody during the surveys or observed in the NBN atlas Wales INNS portal search of the River Kenfig.

#### Invertebrates

3.3.31. The Kenfig – headwater to tidal water body macroinvertebrate quality element was assessed as High in 2024 Interim Cycle 3[13].

3.3.32. Ten NRW macroinvertebrate monitoring locations are present, with the most recent in April and October 2021 at NGR SS 82576 83123, approximately 5 km (south) of the RLB[13]. During the spring April 2021 survey, 34 aquatic macroinvertebrate species were recorded. The most abundant species were the blue-winged olive mayflies (Ephemerellidae) with 456 individuals recorded. No notable or protected species were identified within the sample. The CCI score was 8.95, which represents an aquatic macroinvertebrate community of moderate conservation value.

3.3.33. During the surveys in October 2021, 26 aquatic macroinvertebrate species were recorded. The most abundant were the stonefly belonging to the family *Leuctridae* (*Leuctra fusca*) and the beetle (*Limnius volckmari*), belonging to the family *Elmidae* with 66 and 46 individuals, respectively. The CCI score was 6.67, which represents an aquatic macroinvertebrate community of moderate conservation value. No notable or protected species were identified within the sample. One INNS macroinvertebrate was recorded during these surveys.

#### Macrophytes and phytobenthos

3.3.34. The macrophyte and phytobenthos WFD biological quality combined element was classified as Good in the Kenfig – headwater to tidal water body during Interim Cycle 3[13]. Individually, the macrophyte sub-element was classified as High, and phytobenthos as Good.

3.3.35. The most recent macrophyte survey on the River Kenfig occurred in July 2022 at NGR SS 82576 83123, approximately 11 km (southwest) downstream of the RLB[13]. During the July 2022 survey, 17 macrophyte species were recorded. The aquatic moss species lesser pocket moss (*Fissidens bryoides*) and the plant species Kneiff's feathermoss (*Leptodictyum riparium*) recorded the greatest percentage cover (0.1-1 %). No legally protected or otherwise notable species were recorded at the site during the survey. Two INNS macrophyte species were recorded during this survey.

3.3.36. Two diatom monitoring location are present within the Kenfig – headwater to tidal water body, however only one monitoring location has been surveyed within the last ten years. The monitoring location is situated at NGR SS 79614 94134 approximately 4.2 km (northwest) of the RLB[17]. During the April 2024 survey, 22 diatom species were observed. The most abundant diatom species were *Gomphonema pumilum* with 112 valves counted. During the September 2024 survey, 21 diatom species were observed. The most abundant diatom species were *Cocconeis placentula var. euglypta* with 70 valves counted.

**Invasive Non-Native Species**

3.3.37. One INNS, the New Zealand mud snail (*P. antipodarum*) was recorded during macroinvertebrate surveys[15]. From the macrophyte surveys, two INNS were recorded; Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*). Both are listed under the Invasive Alien Species (Enforcement and Permitting) Order 2019[36] and Schedule 9 of the Wildlife and Countryside Act 1981[37] which makes it an offence to release or allow their spread in the wild.

**Chemical Quality Elements**

**Priority Substances**

3.3.38. In Cycle 3 (2022), priority hazardous substances status for the Kenfig – Headwater to Tidal Water Body was classified as 'High', with the following elements all classified as 'High': 1,2-dichloroethane, Benzene, Dichloromethane, Lead and Its Compounds, Nickel and Its Compounds, Trichloromethane, Aldrin, Dieldrin, Endrin and Isodrin, and Carbon Tetrachloride.

**Priority Hazardous Substances**

3.3.39. In Cycle 3, priority substances status for the Kenfig – Headwater to Tidal Water Body was classified as 'High', with Cadmium and its compounds, Endolsulfan, Hexachlorocyclohexane and Nonylphenol also classified as 'High'.

## 3.4 LLYNFI - HEADWATERS TO LLETTY BRONGU STW WATER BODY (GB110058026331)

### WFD STATUS

3.4.1. Llynfi - Headwaters To Lletty Brongu STW Water Body (GB110058026331) could potentially be impacted by the Project. A summary of the status of the water body is provided below and the latest classification data is provided in **Annex B**.

3.4.2. Llynfi - Headwaters To Lletty Brongu STW Water Body is a river water body and is currently performing at 'Moderate' ecological status and has a chemical status of High. The water body has a natural hydromorphological designation. The 'Reasons for Not Achieving Good' are largely related to diffuse source and point source pollution.

3.4.3. The water body is targeted to achieve 'Good' ecological status by 2027 and a 'High' chemical status by 2027.

### CATCHMENT CHARACTERISTICS

3.4.4. The Project lies to the west of the Llynfi - Headwaters To Lletty Brongu STW Water Body (GB110058026331). Elevations within the catchment vary from approximately 555 mAOD at Mynydd Caerau to approximately 60m before at Lletty Brongu STW. This elevation range supports a progression from steep, upland stream environments, characterised by rapid flow and rocky substrates to shallower gradient, meandering downstream river sections.

3.4.5. A review of land use data from the UK Soil Observatory[20] shows that land use within the Llynfi – Headwaters to Lletty Brongu STW catchment is predominantly rural with extensive areas of agricultural land and improved grasslands. Woodlands, primarily broadleaved with some coniferous stands, occur in the upland and valley areas.

3.4.6. The Llynfi – Headwaters to Lletty Brongu STW Water Body is not currently gauged for flow, nor are its tributaries. According to NRW Water Watch Wales, the catchment covers an area of approximately 32.9 km² with a main river length of around 39.0 km [6]. The river system flows generally southwards, discharging into the River Ogmore at Aberkenfig.

### CATCHMENT GEOLOGY AND SOILS

#### Solid Geology

3.4.7. The Study Area includes the South Wales Upper Coal Measures and South Wales Middle Coal Measures formations, which are part of the South Wales Coal Measures Group and the Pennant Sandstone Formation (and differentiated members below), which is part of the Warwickshire Group.

3.4.8. The solid geology underlying the Llynfi - Headwaters to Lletty Brongu STW water body and the Project includes the South Wales Upper Coal Measures Formation (mudstone, siltstone and sandstone), the South Wales Middle Coal Measures Formation (mudstone, siltstone and sandstone), the Llynfi Member (mudstone, siltstone and sandstone), the Rhondda Member (mudstone, siltstone and sandstone), the Hughes Member (sandstone) and the Brithdir Member (mudstone, siltstone and sandstone). This area of bedrock geology is uniformly designated as a Secondary A aquifer, even though the area is highly deformed, leading often to multiple juxtaposed geological formations.

### Superficial Geology

3.4.9. The superficial geology underlying the Llynfi - Headwaters to Lletty Brongu STW water body and the Project includes (in order of abundance) Devensian Till (diamicton) (unsorted lithology i.e. varying widely in size and shape), Alluvium (clay, silt, sand and gravel), Alluvial Fan Deposits (sand and gravel) and minor Peat deposits. The till is designated as a Secondary (undifferentiated) aquifer, the Alluvium and Alluvial Fan Deposits as Secondary A and the Peat is Unproductive.

### Soils

3.4.10. The Llynfi - Headwaters to Lletty Brongu STW water body is located on freely draining acid loamy soils over rock and slowly permeable wet and very acid upland soils with a peaty surface. The developed areas around Maesteg and Nantyffyllon, along the A4063 road are unclassified, likely due to stripping of soils.

## CATCHMENT HYDROLOGY

3.4.11. There are several watercourses within the Study Area of the Project. The only main river within the Llynfi - Headwaters To Lletty Brongu STW Water Body catchment is that of the Llynfi (also known in Welsh as the Afon Cynffig). This is situated within the Study Area from the village of Caerau to the town of Maesteg.

3.4.12. The following ordinary watercourses are also located within the Study Area:

- Nant Cwmcerwyn;
- Nant Goblyn (and its tributaries);
- Nant Gwyn Bach;
- Nant Lluest-wen (and its tributaries);
- Nant Sychbant (and its tributaries);
- Nant y Cerdin (and its tributaries);
- Nant y Crynwydd; and,
- Nant y Ffyllon.

3.4.13. A map of the watercourses potentially impacted by the Project is provided **in Annex A (Figure 10A.1).**

## HISTORICAL CHANNEL CHANGE

3.4.14. Historic mapping[8] from approximately 1900 indicates that several reaches of the River Llynfi have been artificially straightened since records began. This modification is likely linked to urbanisation, particularly as these changes are more prevalent near infrastructure within the town of Maesteg. In contrast, the ordinary watercourses appear to have experienced negligible change over the same time period.

3.4.15. An erodible corridor assessment was carried out on Nant y Ffyllon and Nant Sychbant within the Llynfi - Headwaters To Lletty Brongu STW Water Body. It was found that lateral adjustment of these watercourses was minimal, with the former confined within steep topography, while the latter on flatter topography but still experiencing negligible historical channel migration. Therefore, no erodible corridor was determined.

## BASELINE CHARACTERISTICS AGAINST WFD SURFACE WATER QUALITY ELEMENTS

### Hydromorphology Quality Elements

#### Quantity and Dynamics of Flow

3.4.16. The headwaters of the Llynfi - Headwaters To Lletty Brongu STW Water Body exhibits a dynamic flow regime characteristic of upland rivers in Wales. Flow hydraulics are influenced by seasonal rainfall patterns, with rapid responses to precipitation events leading to increased discharge and flow velocities. These variations play a crucial role in shaping the river's geomorphology, affecting sediment transport and channel morphology.

3.4.17. Particularly through the urban area of Maesteg, flow quantity and dynamics are altered due to urbanisation. Increased impervious surfaces—such as roads, roofs, and pavements—limit infiltration, causing quicker and larger volumes of surface runoff during rainfall events. This is highlighted by a hydromorphological impact ratio of 'high' from online River Habitat Survey data, suggesting that the Llynfi watercourse has been substantially altered[33].

3.4.18. Hydrological data from the Natural Resources Wales (NRW) flow gauge at Maesteg (Station ID: 4107) (NGR: SS8611690947) is located approximately 8 km upstream of Coytrahen[34]. The typical range of river levels at this station is between 0.20 m and 0.63 m, with these levels being recorded for 90% of the time since monitoring began. The highest recorded level is 1.23 m, observed on 12th August 2001. This indicates that for the vast majority of monitoring, the river maintains moderate flow levels.

#### Connection to Groundwater

3.4.19. The Llynfi catchment exhibits a moderate level of connectivity between surface water and groundwater systems influenced by the underlying geology and soil permeability. The catchment's Carboniferous Coal Measures, glacial till superficial deposits and associated sandstones provide variable permeability, allowing for some groundwater-surface water interaction, particularly in the upland headwaters and tributaries.

3.4.20. NRW's groundwater vulnerability maps[35] and monitoring data indicate that groundwater levels generally respond to precipitation inputs, contributing baseflow to the river during drier periods.

3.4.21. However, due to urbanisation and historical mining activities within the catchment, some areas may experience altered groundwater flow paths or reduced connectivity, potentially affecting flow regimes locally.

[33] River Restoration Centre (2025) River Habitat Survey Map [Online]. Available at: River Habitat Survey Map | the River Restoration Centre
[34] Natural Resources Wales (2025) Llynfi at Maesteg [Online]. Available at: Llynfi at Maesteg - River levels, rainfall and sea data
[35] Natural Resources Wales (2018) Groundwater Vulnerability [Online]. Available at: NRW Data Discovery | metadata NRW_DS120494

### River Continuity

3.4.22. The Llynfi - Headwaters To Lletty Brongu STW Water Body maintains poor longitudinal connectivity, with 68 anthropogenic pressures, which are largely culverts, identified within the catchment, 20 of which are located within the Study Area[23]. These structures can locally affect sediment transport and flow continuity, potentially influencing geomorphological processes and aquatic habitats. The Habitat Modification Class of the River Habitat Survey online data gave a 'Severely modified' designation[25] which supports the idea of the Llynfi - Headwaters To Lletty Brongu STW Water Body being heavily impacted by anthropogenic alterations that fragment river continuity and disrupt natural fluvial processes.

### River Width and Depth Variation

3.4.23. The Llynfi catchment displays moderate natural variability in channel width and depth within its upper and less-urbanised reaches. The river's cross-sectional profiles vary in response to local geology and flow hydraulics, with sections of deeper pools and shallower riffles present. Depth variation is often linked to sediment deposition and erosion processes, influenced by seasonal flow fluctuations typical in the catchment. This is the case on River Habitat Survey online data of Nant Sychbant (a tributary of the Llynfi) (NGR: SS 84289 90354) where it was designated a 'High' Habitat Quality Assessment Class[25].

3.4.24. Urbanisation within the Llynfi catchment, particularly as the river passes through Maesteg, has influenced river width and depth variation primarily through channel modification and flood management measures. The natural variability of the channel is often reduced due to bank reinforcement, channel straightening, and culverting to accommodate urban infrastructure. A 'Very low' designation within online River Habitat Survey data of Llynfi (NGR: SS 85530 91078)[25] indicates that the diversity and naturalness of channel features such as bars, pools and riffles is severely reduced, resulting in a homogenised channel form with limited hydraulic complexity and altered sediment transport dynamics.

### Structure and Substrate of the River Bed

3.4.25. The structure and substrate of the river bed within the upper Llynfi - Headwaters To Lletty Brongu STW Water Body exhibits a mix of coarse gravels, cobbles, and finer sediments. The bed morphology shows signs of moderate incision in certain reaches, with riffle-pool sequences present.

3.4.26. This, however, is not the case in urbanised sections near Maesteg, where sediment input is constrained by channelisation and reinforced banks[25]. These modifications interrupt natural sediment transport processes, resulting in the accumulation of relatively coarse substrates and a lack of finer sediments typically found in more natural reaches.

### Structure of Riparian Zone

3.4.27. The riparian zone along the Llynfi Water Body is characterised by a mixture of natural and semi-natural vegetation interspersed with areas impacted by urban development, particularly near Maesteg. Riparian vegetation density varies, with some reaches showing well-established native trees and shrubs providing good bank stability and shade. However, urban and agricultural pressures have led to fragmentation in some sections, reducing the overall continuity and width of the riparian buffer.

3.4.28. River Habitat Survey data from online resources described the riparian quality index as 'Low' for the Llynfi (NGR: SS 85530 91078) indicating that the riverbanks at this location are likely degraded, with limited natural vegetation and reduced habitat diversity.

**Physico-chemical quality elements**

3.4.29. The NRW Water Quality archive was reviewed to assess the current conditions and classifications for the following relevant WFD elements[8]. No freshwater quality monitoring points are situated within the Llynfi - Headwaters To Lletty Brongu STW Water Body catchment that are within the study area between 2010-present day while also providing sufficient data for the quality elements of interest. However, one sampling location is present between 2010-2019 within the Llynfi - Headwaters To Lletty Brongu STW Water Body catchment but approximately 1 km downstream of the Study Area. Therefore, the following physico-chemical quality element information will be based off of this.

3.4.30. This sampling station is LLYNFI-EWENNY ROAD BR. MAESTEG and has a station number of S7009 (NGR: SS8611690945). This has been sampled 38 times from the 04/01/10 to 03/12/12 and these samples will have been used to derive the following highest, lowest and average results. While this dataset covers the period from 2010 to 2012 and is not the most recent, it remains highly relevant due to its comprehensive coverage of physico-chemical elements. More recent data does not provide the same level of detail for these parameters, making this dataset the most suitable for establishing baseline conditions, analysing historical trends, and assessing long-term environmental changes.

**Thermal Conditions**

3.4.31. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was classified as 'High' for temperatures. The water temperature readings showed that the highest temperature recorded was 18.1 °C in August 2012, with 3.19 °C in January 2010 the lowest and 10.8 °C the average.

**Oxygenation conditions**

3.4.32. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was classified as 'High' for dissolved oxygen. 124.5 % was the highest dissolved oxygen saturation recorded in July 2012, the lowest dissolved oxygen saturation recorded was 79.2 % in April 2011, with an average of 98.2 % dissolved oxygen saturation.

**Acidification status**

3.4.33. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was classified as 'High' for pH. 8.6 was the highest pH reading (recorded in July 2010), while 7.05 pH was recorded in February 2010 and was the lowest reading. The average of these samples was 8.05 pH.

**Nutrient conditions**

3.4.34. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was classified as 'High' for phosphate. Note that the following readings refer to Orthophosphate, reactive as P. The highest orthophosphate value was 0.058 mg/l in February 2011, while the lowest orthophosphate value was < < 0.02 mg/l on 26 separate occasions. The average value was approximately 0.024 mg/l.

3.4.35. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was classified as 'High' for ammonia. Note that the following readings refer to Ammoniacal Nitrogen as N. The highest ammonia value 0.122 mg/l in August 2012, while the lowest ammonia value was < 0.03 mg/l on 26 separate occasions. The average value was approximately 0.039 mg/l.

### Specific Pollutants

3.4.36. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was not assessed for specific pollutants. However, there is data for the following specific pollutant elements within the NRW Water Quality Archive[8]:

- The highest reading of copper (dissolved) was 2.49 ug/l in June 2010, with the lowest < 1 ug/l on 2 separate occasions. The average value was approximately 1.73 ug/l.
- The highest reading of zinc (dissolved) was 45.4 ug/l in October 2010, with the lowest 5.3 ug/l in March 2010. The average was approximately 11.8 ug/l.

## Biological Quality Elements

### Fish

3.4.37. The fish biological quality element for the Llynfi - Headwaters to Lletty Brongu STW waterbody was assessed at Moderate status in Interim Cycle 3[13]. Nine NRW fish monitoring locations are present, with one surveyed within the last ten years. The most recent survey on the River Llynfi occurred in July 2023 at NGR SS 85300 93000, located within the RLB.

3.4.38. Two species were identified during a single catch depletion electric fishing survey, European eel (*Anguilla Anguilla*) and brown trout. European eel are protected under The Eels (England and Wales) Regulations 2009, eels are designated as a SPI in Wales under the Environment (Wales) Act 2016 (section 7)[27]. Eels are on the UK list of Priority Habitats and Species[28], and listed under the IUCN Red List of Threatened Species (2010) as Critically Endangered[29].

3.4.39. No non-native invasive species (INNS) were identified within the waterbody during the surveys or observed in the NBN atlas Wales INNS portal search of the River Llynfi.

### Invertebrates

3.4.40. The Llynfi - Headwaters to Lletty Brongu STW water body macroinvertebrate quality element was assessed as High in 2024 Interim Cycle 3[13].

3.4.41. There are thirteen NRW macroinvertebrate monitoring locations, with the most recent survey at NGR SS 87731 88325, approximately 1 km (east) downstream from the RLB, in April and October 2014. No locations have been sampled in the last 10 years, the most recent survey was undertaken during the spring April 2014, 47 aquatic macroinvertebrate species were recorded. The most abundant species were the amphipod freshwater/river shrimp (*Gammarus pulex/fossarum agg.*) with 359 individuals recorded. No notable or protected species were identified within the sample. The CCI score was 17.78, which represents an aquatic macroinvertebrate community of high value. During the surveys in October 2014, 35 aquatic macroinvertebrate species were recorded. The most abundant again were the amphipod freshwater/river shrimp (*G. pulex/fossarum agg.*) with 533 individuals recorded. No notable or protected species were identified within the sample. The CCI score was 11.85, which represents an aquatic macroinvertebrate community of fairly high conservation value. Two INNS macroinvertebrates were recorded during these surveys.

### Macrophytes and phytobenthos

3.4.42. The macrophyte and phytobenthos WFD biological quality combined element was classified as Good in the Kenfig – headwater to tidal water body during Interim Cycle 3[13]. Individually, the macrophyte sub-element was classified as High, and phytobenthos as Good.

3.4.43. The most recent macrophyte survey on the River Kenfig occurred in July 2022 at NGR SS 82576 83123, approximately 11 km (southwest) downstream of the RLB[13]. During the July 2022 survey, 17 macrophyte species were recorded. The aquatic moss species lesser pocket moss (Fissidens bryoides) and the plant species Kneiff's feathermoss (Leptodictyum riparium) recorded the greatest percentage cover (0.1-1 %). No legally protected or otherwise notable species were recorded at the site during the survey. Two INNS macrophyte species were recorded during this survey.

3.4.44. Two diatom monitoring location are present within the Kenfig – headwater to tidal water body, however only one monitoring location has been surveyed within the last ten years. The monitoring location is situated at NGR SS 79614 94134 approximately 4.2 km (northwest) of the RLB[13]. During the April 2024 survey, 22 diatom species were observed. The most abundant diatom species were Gomphonema pumilum with 112 valves counted. During the September 2024 survey, 21 diatom species were observed. The most abundant diatom species were Cocconeis placentula var. euglypta with 70 valves counted.

**Invasive Non-Native Species**

3.4.45. One INNS, the New Zealand mud snail (P. antipodarum) was recorded during macroinvertebrate surveys[15]. From the macrophyte surveys, two INNS were recorded; Himalayan balsam (Impatiens glandulifera) and Japanese knotweed (Fallopia japonica). Both are listed under the Invasive Alien Species (Enforcement and Permitting) Order 201936 and Schedule 9 of the Wildlife and Countryside Act 198137 which makes it an offence to release or allow their spread in the wild.

**Chemical Quality Elements**

**Priority Substances**

3.4.46. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was not assessed for priority substances.

**Priority Hazardous Substances**

3.4.47. In Cycle 3, the Llynfi - Headwaters To Lletty Brongu STW Water Body was not assessed for priority hazardous substances.

[36] UK Government (2019) The Invasive Alien Species (Enforcement and Permitting) Order 2019 [Online]. Available at https://www.legislation.gov.uk/uksi/2019/527/contents
[37] UK Government (2025) Wildlife and Countryside Act 1981 Schedule 9 [Online]. Available at https://www.legislation.gov.uk/ukpga/1981/69/schedule/9

## 3.5 LLYNFI - LLETTY BRONGU STW TO CONF WITH OGMORE WATER BODY (GB110058026332)

### WFD STATUS

3.5.1. Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body (GB110058026332) could potentially be impacted by the Project. A summary of the status of the water body is provided below and the latest classification data is provided in **Annex B**.

3.5.2. Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body is a river water body and is currently performing at 'Moderate' ecological status and has a chemical status of High. The water body has a natural hydromorphological designation. The 'Reasons for Not Achieving Good' are due to point source pollution from sewage discharge.

3.5.3. The water body is targeted to achieve 'Good' ecological status by 2027 and a 'High' chemical status by 2027.

### CATCHMENT CHARACTERISTICS

*3.5.4.* The Project lies to the west of the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body. Elevations within the catchment vary from approximately 310 mAOD at Waun Y Gilfach to approximately 45 mAOD before at Coytrahen. This elevation range supports a transition from moderately steep, mid-catchment river environments—characterised by relatively fast flows and incised channels—to broader, lowland sections with more gradual gradients. These lower reaches tend to exhibit increased channel meandering, floodplain development, and more depositional features.

3.5.5. A review of land use data from the UK Soil Observatory[20] shows that land use within the Llynfi – Lletty Brongu STW to Confluence with Ogmore Water Body is predominantly rural, characterised by agricultural land, improved grasslands, and scattered areas of broadleaved woodland. Urban development is limited, with the only urban area of significant size being Coytrahen.

3.5.6. The Llynfi – Lletty Brongu STW to Confluence with Ogmore Water Body is gauged for flow at Coytrahen (Station ID: 58007 – Llynfi at Coytrahen, NGR: SS890854), providing continuous hydrometric data since 1970[38]. The water body covers a catchment area of approximately 20.5 km², with a main river length of around 36.6 km [6]. The River Llynfi flows generally southwards through Coytrahen, before joining the River Ogmore just north of Aberkenfig.

### CATCHMENT GEOLOGY AND SOILS

#### Solid Geology

3.5.7. The Study Area includes the South Wales Upper Coal Measures and South Wales Middle Coal Measures formations, which are part of the South Wales Coal Measures Group and the Pennant Sandstone Formation, which is part of the Warwickshire Group.

3.5.8. The solid geology underlying the Llynfi - Lletty Brongu STW to Conf with Ogmore water body and the Project includes the Hughes Member (mudstone, siltstone and sandstone) and the Brithdir

[38] Natural Resources Wales (2025) Llynfi at Coytrahen [Online]. Available at: Llynfi at Coytrahen - River levels, rainfall and sea data

Member (mudstone, siltstone and sandstone) of the Pennant Sandstone Formation. This area of bedrock geology is uniformly designated as a Secondary A aquifer.

**Superficial Geology**

3.5.9. The superficial geology underlying the Llynfi - Lletty Brongu STW to Conf with Ogmore water body and the Project is Devensian Till (diamicton) (unsorted lithology i.e. varying widely in size and shape). The till is designated as a Secondary (undifferentiated) aquifer.

**Soils**

3.5.10. The Llynfi - Lletty Brongu STW to Conf with Ogmore water body is located on freely draining acid loamy soils over rock and slowly permeable wet and very acid upland soils with a peaty surface.

## CATCHMENT HYDROLOGY

3.5.11. There are several ordinary watercourses within the Study Area of the Project:

- Nant Bryncynan (and its tributaries);
- Nant y Castell (and its tributaries); and,
- Nant y Gadlys (and its tributaries).

3.5.12. A map of the watercourses potentially impacted by the Project is provided **in Annex A (Figure 10A.1)**.

## HISTORICAL CHANNEL CHANGE

3.5.13. Historic mapping[8] from approximately 1900 indicates that Nant Bryncynan, Nant y Castell and Nant y Gadlys appear to have experienced negligible change from both an anthropogenic and natural geomorphological viewpoint. Note that, the River Llynfi itself is not presented within the Study Area within the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body catchment and is therefore not assessed for historical channel change.

3.5.14. An erodible corridor assessment was carried out on Nant y Castell within the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body. It was found that lateral adjustment of Nant Y Castell was minimal, with its planform confined within steep topography. Therefore, no erodible corridor was determined.

## BASELINE CHARACTERISTICS AGAINST WFD SURFACE WATER QUALITY ELEMENTS

**Hydromorphology Quality Elements**

**Quantity and Dynamics of Flow**

3.5.15. The Llynfi catchment between Lletty Brongu STW and its confluence with the Ogmore exhibits flow dynamics influenced by both natural and urban processes. Urbanisation in the upstream WFD water body catchment (Llynfi - Headwaters to Lletty Brongu STW Water Body) alters the timing and magnitude of flows through increased surface runoff and reduced infiltration leading to increased rates of erosion of sinuous bends and hence, increased sediment transport.

3.5.16. Despite these influences, the river section maintains a relatively natural flow regime in terms of overall volume, with no significant flow regulation structures. This is indicated by the River Habitat Survey Hydromorphological Impact Ratio designation of 'Moderate'[25] (NGR: SS 88807 86629).

### Connection to Groundwater

3.5.17. The hydrological connectivity between surface water and groundwater is generally intact, supporting baseflow contributions that sustain river flows during dry periods. The catchment's underlying geology, characterised by Carboniferous sandstones and mudstones, exhibits moderate permeability, allowing groundwater to interact with the river system. Base flow index is that of 0.45 according to Station 58007 – Llynfi at Coytrahen[39].

3.5.18. Groundwater vulnerability mapping by NRW indicates areas of variable recharge potential, with some urbanised zones exhibiting reduced infiltration due to impervious surfaces[40]. However, tributaries within this section help maintain groundwater-surface water exchange where less urbanised soils and riparian zones exist.

3.5.19. No significant artificial disconnections or groundwater abstractions are known to adversely affect this interaction within the water body.

### River Continuity

3.5.20. The Llynfi River maintains generally good longitudinal connectivity. However, eleven minor anthropogenic pressures have been identified[23]. These include culverts and road crossings that can locally impede sediment transport and flow continuity. Notably, Nant y Castell contains two culverts within the Study Area which that may affect sediment movement and the natural river continuum. While these anthropogenic pressures are not of a scale to cause major fragmentation, they may contribute to localised habitat modification and altered hydromorphological processes.

### River Width and Depth Variation

3.5.21. The Llynfi River section downstream of Lletty Brongu STW demonstrates moderate natural variability in width and depth. The channel widens and narrows in response to local geomorphology and man-made structures such as minor weirs and culverts. Natural pools and riffles are present but are intermittently interrupted by these anthropogenic pressures. Some channel modifications, including bank reinforcement and channel straightening, have reduced lateral connectivity and channel complexity in places limiting the natural range of width and depth variations. Overall, the reach retains its morphological heterogeneity, which is reflected by a River Habitat Survey Habitat Quality Assessment Class of 'Very High'[23].

### Structure and Substrate of the River Bed

3.5.22. The riverbed substrate is a mix of gravel, cobbles, and finer sediments However, sediment transport is occasionally impeded by small anthropogenic pressures such as culverts and weirs leading to localised sediment accumulation upstream and scouring downstream. Urban runoff and historical land uses contribute to sediment loading and altered substrate composition in some sections, which can reduce habitat quality. Overall, substrate conditions are variable, with opportunities to improve natural sediment dynamics by mitigating anthropogenic pressure effects.

[39] National River Flow Archive (2025) Station 58007 – Llynfi at Coytrahen [Online]. Available at: NRFA station mean flow data for 58007 - Llynfi at Coytrahen
[40] Natural Resources Wales (2018) Groundwater Vulnerability [Online]. Available at: Groundwater Vulnerability (2018)

### Structure of Riparian Zone

3.5.23. The riparian zone along this stretch of the Llynfi exhibits a patchy structure. In less urbanised or agricultural reaches, riparian vegetation includes native shrubs, grasses, and some mature trees providing bank stability, shading, and habitat complexity. Conversely urban areas, albeit limited within this catchment, show fragmented riparian corridors due to development and land use pressures with sections replaced by hard engineering or informal paths.

**Physico-chemical quality elements**

3.5.24. The NRW Water Quality archive was reviewed to assess the current conditions and classifications for the following relevant WFD elements[8]. No freshwater quality monitoring points are situated within the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body catchment that are within the study area between 2010-present day while also providing sufficient data for the quality elements of interest. However, one sampling location is present between 2010-2019 within the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body catchment but approximately 3 km downstream of the Study Area. Therefore, the following physico-chemical quality element information will be based off of this.

3.5.25. This sampling station is NANT GADLYS AT A4063 R.B and has a station number of S13104 (NGR: SS8700087950). This has been sampled 65 times from the 15/01/10 to 08/10/14 and these samples will have been used to derive the following highest, lowest and average results. While this dataset covers the period from 2010 to 2014 and is not the most recent, it remains highly relevant due to its comprehensive coverage of physico-chemical elements. In addition, this sampling station is situated downstream of the Project on the Nant y Gadlys, allowing us to assess both the Nant y Gadlys and the Nant y Castell which flows into it. The other sampling sites assesses the River Llynfi which is already covered sufficiently in the Physico-chemical quality elements section of Llynfi – headwaters to Lletty Brongu STW Water Body.

### Thermal Conditions

3.5.26. In Cycle 3, the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as ‘High’ for temperatures. The water temperature readings showed that the highest temperature recorded was 15.2 °C in July 2013, with 3.44 °C in January 2010 the lowest and 10.3 °C the average.

### Oxygenation conditions

3.5.27. In Cycle 3, the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as ‘High’ for dissolved oxygen. 123.5 % was the highest dissolved oxygen saturation recorded in July 2012, the lowest dissolved oxygen saturation recorded was 84 % in October 2012, with an average of 98.3 % dissolved oxygen saturation.

### Acidification status

3.5.28. In Cycle 3, the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as ‘High’ for pH. 8.3 was the highest pH reading (recorded in March 2013), while 7.01 pH was recorded in November 2012 and was the lowest reading. The average of these samples was 7.72 pH.

### Nutrient conditions

3.5.29. In Cycle 3, the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as poor for phosphate. Note that the following readings refer to Orthophosphate, reactive as P. The highest orthophosphate value was 0.213 mg/l in November 2011, while the lowest orthophosphate value was < < 0.02 mg/l on 66 separate occasions. The average value was approximately 0.021 mg/l.

3.5.30. In Cycle 3, the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as 'High' for ammonia. Note that the following readings refer to Ammoniacal Nitrogen as N. The highest ammonia value 0.081 mg/l in January 2010, while the lowest ammonia value was < 0.03 mg/l on 58 separate occasions. The average value was approximately 0.032 mg/l.

### Specific Pollutants

3.5.31. In Cycle 3, the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as 'High' for specific pollutants. There is data for the following specific pollutant elements within the NRW Water Quality Archive[8]:

- The highest reading of copper (dissolved) was 1.01 ug/l in June 2010, with the lowest < 1 ug/l on 11 separate occasions. The average value was approximately 1 ug/l.
- The highest reading of zinc (dissolved) was 16.8 ug/l in January 2010, with the lowest 5.0 ug/l in April and May 2010. The average was approximately 9.1 ug/l.

**Biological Quality Elements**

### Fish

3.5.32. The fish biological quality element for the Llynfi - Lletty Brongu STW to conf with Ogmore waterbody was assessed as High status in Interim Cycle 3[13].

3.5.33. Six NRW fish monitoring locations are present with the most recent survey[14] on the River Llynfi in July 2016 at NGR SS 89570 84840, located 2.5 km (southeast) downstream from the RLB. One species, brown trout, was identified during a single catch depletion electric fishing survey. No INNS were identified in the waterbody during the surveys or observed in the NBN atlas Wales INNS portal search of the River Llynfi.

### Invertebrates

3.5.34. The Llynfi - Lletty Brongu STW to conf with Ogmore water body macroinvertebrate quality element was assessed as High in 2024 Interim Cycle 3[13].

3.5.35. Eleven NRW macroinvertebrate monitoring locations are present, with the most recent survey[15] in May and October 2024 at NGR SS 88818 86607, located approximately 3.5 km (southeast) downstream from the RLB. During the spring survey in May 2024, 36 aquatic macroinvertebrate species were recorded. The most abundant taxa recorded belongs to spiny crawler mayflies (*Ephemerellidae*) with 356 individuals recorded. No notable or protected species were identified within the sample. The CCI score was 8.56, which represents an aquatic macroinvertebrate community of moderate value. During the autumn surveys in October 2024, 19 aquatic macroinvertebrate species were recorded. The most abundant taxa were the amphipod freshwater/river shrimp (*G. pulex/fossarum agg.*) with 224 individuals recorded. No notable or protected species were identified within the sample. The CCI score was 22.73, which represents an aquatic macroinvertebrate community of very high conservation value. One INNS macroinvertebrate was recorded during these surveys.

### Macrophytes

3.5.36. The macrophyte and phytobenthos WFD biological quality combined element was classified as Good in the Llynfi - Lletty Brongu STW to conf with Ogmore water body during Interim Cycle 3[13]. The macrophyte WFD biological quality sub-element was classified as High, whilst the phytobenthos WFD biological quality sub-element was classified as Good during Interim Cycle 3[13].

3.5.37. Four macrophyte monitoring location are present within Llynfi - Lletty Brongu STW to conf with Ogmore water body. One monitoring location has been sampled in the last ten years, the results from the most recent survey are described below[16].

3.5.38. The most recent macrophyte was in June 2024 at NGR SS 88818 86607, located approximately 3.5 km (southeast) from the RLB. During the survey, 18 macrophytes species were recorded. The St Winifrid's Moss Liverwort (*Chiloscyphus polyanthos*) recorded the greatest percentage cover (1-2.5 %). No legally protected or otherwise notable species were recorded at the site during the survey. Two INNS macrophytes were recorded during these surveys.

3.5.39. Six diatom monitoring location are present within the Llynfi - Lletty Brongu STW to conf with Ogmore water body, however only one monitoring location has been sampled in the last ten years, the results from the most recent survey are described below[17].

3.5.40. The most recent diatom survey on the River Llynfi occurred in October 2024 at NGR SS 88818 86607, located within the RLB. During the October 2024 survey, 41 diatom species were observed. The most abundant diatom species were *Navicula gregaria* with 65 valves counted.

### Invasive Non-Native Species

3.5.41. One aquatic macroinvertebrate INNS, the New Zealand mud snail (*P. antipodarum*) was recorded within the Llynfi - Lletty Brongu STW to conf with Ogmore water body catchment area[15]. From the macrophyte surveys, both Himalayan balsam (*I. glandulifera*) and Japanese knotweed (*F. japonica*) were recorded[16].

## 3.5.42. Chemical Quality Elements

### Priority Substances

3.5.43. In Cycle 3 (2022), priority hazardous substances status for the Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as 'High', with the following elements all classified as 'High': Lead and Its Compounds, Nickel and Its Compounds and Pentachlorophenol.

### Priority Hazardous Substances

3.5.44. In Cycle 3, priority substances status for Llynfi - Lletty Brongu STW to Conf with Ogmore Water Body was classified as 'High', with Cadmium and its compounds and Nonylphenol also classified as 'High'.

# 4 STAGE 1: WFD SCREENING

## 4.1 SCREENING OF SURFACE WATER BODIES

4.1.1. The following Surface water WFD Waterbodies would be directly impacted by the Project due to a range of activities that would interact with the local watercourse network within the aforementioned catchments:

- The Ffrwd Wyllt - headwaters to tidal limit (GB110058026100);
- Afan - conf with Corrwg to confluence with Pelenna (GB110058026130);
- Kenfig - headwaters to tidal (GB110058026170);
- Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and,
- Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).

4.1.2. Therefore, these water bodies are screened in for further assessment. A map of the WFD water bodies potentially impacted by the Project is provided in Annex A (**Figure 10A.2**).

4.1.3. The Nant Cwm Philip - headwaters to conf with Kenfig (GB110058026190) Water Body is present within the Study Area, however the area of which contains no watercourses of both ordinary and main river designation. Therefore, this has been **screened out** of further assessment on the basis that significant effects are not anticipated.

4.1.4. The downstream Water Framework Directive (WFD) water bodies are limited to just Afan - confluence with Pelenna to tidal limit (GB110058026110). This is located at a distance of approximately 4.5 km downstream of the study area. All other downstream water bodies are located beyond a 5 km buffer. Given the nature and limited extent of the proposed activities coupled with the separation distance between the works and the downstream water bodies, no impacts are anticipated. As such, these downstream water bodies have been **screened out** of further assessment.

4.1.5. The Upstream WFD Surface Water bodies include Afan - conf with Corrwg to confluence with Pelenna (GB110058026130) and Corrwg - headwaters to confluence with Afan (GB110058026150). These would be upstream of the Proposed Project, which does not propose any significant infrastructure on the surface that would impact these water bodies. Given these water bodies are upstream of the proposed works, impacts during construction would be limited, temporary and localised. Therefore, these water bodies are **screened out** of further assessment.

## 4.2 SCREENING OF GROUNDWATER BODIES

4.2.1. The groundwater body that underlies the Project is the Swansea Carboniferous Coal Measures (GB41002G201000) (**Figure 10A.3**). Activities relating to the construction and operation of the Proposed Project have been considered in terms of their potential impacts on this groundwater body. Due to the range of activities that could interact with the groundwater body, the water body has been screened in for further assessment. The current WFD classification is presented in **Annex B**, **Table B-6**.

4.2.2. Based on the BGS groundwater vulnerability maps[41], vulnerability varies from medium to high for the Secondary A bedrock aquifer within the Site Area. The high classification is predominantly south of

[41] British Geological Survey (2025) Geoindex [Online]. Available at: GeoIndex - British Geological Survey

Maesteg, where bedrock is near surface. Bedrock groundwater is expected to have some interaction with the surface at these locations.

4.2.3. Historical mapping[42] shows that groundwater could be close to the surface across the Study Area based on the concentration of springs. The Phase 1 Ground Investigation Desk Study will provide further information of expected depth to the groundwater table (as outlined in **Chapter 10: Water Resources and Flood Risk**).

## 4.3 SCREENING OF PROTECTED AREAS

4.3.1. The following protected areas have been investigated as per the NRW guidance[43]:

- Drinking Water Protected Areas (Surface and Ground);
- Shellfish waters;
- Bathing waters;
- Saline Intrusion;
- Nutrient sensitive areas:
  - Nitrate Vulnerable Zones or Polluted Waters (designated under the Nitrates Directive)
  - Sensitive Areas (designated under the Urban Waste Water Treatment Directive);
- Water dependent:
  - Special Areas of Conservation (SAC);
  - Special Protection Areas (SPA); and,
  - Ramsar sites.

4.3.2. None of the above protected areas are located within the 1 km buffer of the Project, and therefore, none are screened in for further assessment.

4.3.3. Groundwater Dependent Terrestrial Ecosystems (GWDTE) are commonly associated with designated areas (SAC, SPA and Ramsar Wetlands) and have therefore not been included as receptors in this assessment.

4.3.4. There are no Source Protection Zones (SPZs) within the Study Area. However, there are two licensed abstractions within the 1 km buffer, which relate to a single borehole and a surface water impoundment, owned by the Maesteg Golf Club and utilised for irrigation13. The borehole has an abstraction limit of 45.5 m3/day but only pumped 1.6 m3/day on average for 2023 and did not operate in 2024, due to not being required. The depth of the drilled borehole is unknown; it is also unknown whether the borehole targets either the bedrock or superficial aquifer. The borehole is 210 m from the planned open cut trench, so has been considered as a receptor for the purposes of scoping. Based on small abstraction volumes, the pressure on the groundwater body is not significant. The impoundment is within a tributary upstream of the Nant Sychbant watercourse. It is unlikely to be impacted by any dewatering, as it is located upstream from the Nant Sychbant trenched crossing to the southeast and 380 m from the open cut trench to the northeast.

[42] National Library of Scotland (2025) Side by Side Maps [Online]. Available at: Side by side georeferenced maps viewer - Map images - National Library of Scotland
[43] Natural Resources Wales (2023) Complying with the Water Framework Directive Regulations 2017: how to assess and appraise projects and activities: Operational Guidance Note 072.

## 4.4 SCREENING OF ACTIVITIES

4.4.1. The Project comprises the key activities listed below, and the screening process is presented in **Table 4-1** (Surface water bodies) and **Table 3-2** (Groundwater body) whereby high-level potential impacts are identified. Note, that they are further described in the scoping stage in Section 5.

4.4.2. Those activities screened in for further assessment in **Table 4-1 and Table 4-2** are carried forward to Stage 2: scoping. Those activities screened out of further assessment are not considered further.

**Table 4-1 – WFD Screening of Activities and Potential Impacts for Surface Water Bodies**

| Activity | Description | Potential Impacts | Screening Outcome | | |
|---|---|---|---|---|---|
| | | | Surface Water Body | Construction | Operation |
| Overhead Lines pole sets | Minor excavations for pole installation using pre-cast kicking blocks; no concrete required. This will involve micro-siting which is the process of fine-tuning the exact location of infrastructure. The Project has a micro-siting allowance of 10 m. | Construction:<br>▪ Noise and vibration;<br>▪ Alteration to flows, water quantity and/or quality;<br>▪ Alteration to sediment input, transport and deposition (including pollution risk);<br>▪ Loss of marginal, aquatic and riparian habitat; and<br>▪ Loss of morphological diversity and habitat.<br>Operation:<br>▪ Loss of lateral connectivity/continuity;<br>▪ Loss/alteration to the Riparian Zone;<br>▪ Alteration to flows, water quantity and/or quality; and | Ffrwd Wyllt – headwaters to tidal limit (GB110058026100) | **Out -** The OHL is not present within these water bodies. | **Out** – The OHL is not present within these water bodies. |
| | | | Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130) | **In** | **In** |
| | | | Kenfig – headwaters to tidal (GB110058026170) | | |
| | | | Llynfi – headwaters to Lletty Brongu STW (GB110058026331) | | |
| | | | Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | | |

| Activity | Description | Potential Impacts | Screening Outcome | | |
|---|---|---|---|---|---|
| | | | Surface Water Body | Construction | Operation |
| | | ▪ Alteration to sediment input, transport and deposition (including pollution risk).<br>▪ | | | |
| Cable Trench (UGC Route Section) | Open-cut trench up to 1.5 m deep, ducts laid in sand and backfilled with original material; joint bays every ~500 m. | Construction:<br>▪ Noise and vibration;<br>▪ Alteration to flows, water quantity and/or quality;<br>▪ Alteration to sediment input, transport and deposition (including pollution risk);<br>▪ Loss of marginal, aquatic and riparian habitat; and<br>▪ Loss of morphological diversity and habitat.<br><br>Operation:<br>▪ Loss of lateral connectivity/continuity; and<br>▪ Loss/alteration to the Riparian Zone. | Llynfi – headwaters to Lletty Brongu STW (GB110058026331) | **In** | **In** |
| | | | Ffrwd Wyllt – headwaters to tidal limit (GB110058026100) | **Out** – The UGC is not present within these water bodies. | **Out** – The UGC is not present within these water bodies. |
| | | | Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130) | | |
| | | | Kenfig – headwaters to tidal (GB110058026170) | | |
| | | | Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | | |
| Temporary construction compound | 20x20m area situated at approximately | Construction:<br>▪ Noise and vibration; | Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130) | **In** | **Out** |

| Activity | Description | Potential Impacts | Screening Outcome | | |
|---|---|---|---|---|---|
| | | | Surface Water Body | Construction | Operation |
| | (E) 283826 (N) 193954 for storage and welfare; poles moved on day of use to minimise disruption (**Figure 10A.1**). | ▪ Alteration to flows, water quantity and/or quality; and<br>▪ Alteration to sediment input, transport and deposition (including pollution risk).<br><br>Operation:<br>Not applicable as this is temporary infrastructure. | Llynfi – headwaters to Lletty Brongu STW (GB110058026331) | | |
| | | | Ffrwd Wyllt – headwaters to tidal limit (GB110058026100) | **Out –** The temporary construction compounds are situated over 1 km in terms of hydrological connectivity from these WFD water bodies. | **Out** |
| | | | Kenfig – headwaters to tidal (GB110058026170) | | |
| | | | Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | | |
| Open cut watercourse crossings | For the underground route, Open cut trenching is required on Nant Sychbant watercourses within the wider Llynfi - headwaters to Lletty Brongu | Construction:<br>▪ Noise and vibration;<br>▪ Alteration to flows, water quantity and/or quality;<br>▪ Alterations to shading;<br>▪ Transfer and establishment of Invasive Non-native Species (INNS);<br>▪ Alteration to natural bed and/or bank; | Llynfi – headwaters to Lletty Brongu STW (GB110058026331) | **In** | **Out** |
| | | | Ffrwd Wyllt – headwaters to tidal limit (GB110058026100) | **Out –** There are no watercourses which require | **Out** |

| Activity | Description | Potential Impacts | Screening Outcome | | |
|---|---|---|---|---|---|
| | | | Surface Water Body | Construction | Operation |
| | STW WFD catchment. | ▪ Alteration to sediment input, transport and deposition (including pollution risk);<br>▪ Loss of marginal, aquatic and riparian habitat;<br>▪ Loss of lateral connectivity/continuity; and<br>▪ Loss of morphological diversity and habitat.<br><br>Operation:<br>Open cut watercourse crossings will be reinstated to baseline conditions. | Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130) | crossing within these water bodies | |
| | | | Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | | |
| | | | Kenfig – headwaters to tidal (GB110058026170) | | |
| Site Access | Access via existing highway and consented wind farm tracks; no new tracks or culverts; use of geo-grid matting. However, the use of these existing access | Construction:<br>▪ Noise and vibration; and<br>▪ Alteration to sediment input, transport and deposition (including pollution risk).<br><br>Operation:<br>Site access is only temporary and will be reinstated to baseline conditions. | Ffrwd Wyllt – headwaters to tidal limit (GB110058026100) | **In** | **Out** |
| | | | Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130) | | |
| | | | Kenfig – headwaters to tidal (GB110058026170) | | |

| Activity | Description | Potential Impacts | Screening Outcome | | |
|---|---|---|---|---|---|
| | | | Surface Water Body | Construction | Operation |
| | tracks, will still lead to potential impacts. | | Llynfi – headwaters to Lletty Brongu STW (GB110058026331) | | |
| | | | Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | | |
| Decommissioning | Not proposed – infrastructure will remain in situ to reduce environmental disturbance. | Decommissioning:<br>As the infrastructure (both underground and overground) will remain in situ (as it has potential to become integrated into the Distribution Network Operator's wider distribution network), there will be no potential impacts, such that this activity can be screened out from further assessment. | **All WFD Water bodies**:<br>Decommissioning: Out | | |

**Table 4-2 - WFD Screening of Activities and Potential Impacts for Groundwater Bodies**

| Activity | Description | Potential Impacts | Screening Outcome | |
|---|---|---|---|---|
| | | | Construction | Operation |
| Construction of the Overhead Lines (OHL) pole sets | Minor excavations for pole installation using pre-cast kicking blocks; no concrete required. This will involve micro-siting which is the process of fine-tuning the exact location of infrastructure. The Project has a micro-siting allowance of 10 m. | Construction:<br>▪ Disruption to aquifer flow should excavations reach groundwater levels.<br>▪ Alteration to groundwater quality as there is potential for a localised pollution pathway into groundwater.<br>▪ Alteration to sediment input from excavation activities.<br>▪ Release of existing pollution to the wider environment through the disturbance of contaminated soils.<br>Operation:<br>▪ Alteration to groundwater quantity and quality, with potential for enhanced contamination pathway where OHL pole foundations are emplaced. | **In** | **In** |
| Cable Trench (UGC Route Section) | Open-cut trench up to 1.5 m deep, ducts laid in sand and backfilled with original material; joint bays every ~500 m, up to 2 m deep. | Construction:<br>▪ Alteration to groundwater quantity:<br>• Should excavations reach groundwater levels (either within the bedrock or superficial aquifer), there is a potential requirement for groundwater dewatering and discharge, which will temporarily impact groundwater levels and disrupt aquifer flow.<br>▪ Alteration to groundwater quality with pollution from HGVs/construction plant or construction processes.<br>▪ Release of existing pollution to the wider environment through the disturbance of contaminated soils.<br>▪ Potential for flood risk due if dewatering occurs at times of high flow in receiving water courses.<br>Operation: | **In** | **Out** |

| Activity | Description | Potential Impacts | Screening Outcome | |
|---|---|---|---|---|
| | | | Construction | Operation |
| | | Infrastructure will be buried, and surface will be reinstated to baseline conditions. There will be no groundwater quantity or quality impacts to the groundwater body during the Operation Stage. | | |
| Temporary construction compound | 20x20m area situated at approximately (E) 283826 (N) 193954 for storage and welfare; poles moved on day of use to minimise disruption. | Construction:<br>▪ Temporary compounds will not intercept groundwater. Therefore, the groundwater body is screened out.<br><br>Operation:<br>Not applicable as this is temporary infrastructure. | **Out** | **Out** |
| Open cut watercourse crossings | Open cut crossings using the isolated trench technique where a temporary dam and flume/pipe are constructed so that the flow can continue while providing a dry working area. Required at Nant Sychbant watercourse | Construction:<br>▪ Alteration to groundwater quantity:<br>• Excavations may intercept a superficial aquifer, potentially resulting in requirement for groundwater dewatering and discharge, which will temporarily impact groundwater levels. Interception of a superficial aquifer is more likely at the river crossing based on BGS mapping.<br>• Flume/pipe will potentially reduce recharge to groundwater within area of trench.<br>▪ Alteration to groundwater quality with potential for pollution from HGVs/construction plant or construction processes.<br>▪ Release of existing pollution to the wider environment through the disturbance of contaminated soils.<br>▪ Potential for flood risk due if dewatering occurs at times of high flow in receiving water courses | **In** | **Out** |

| Activity | Description | Potential Impacts | Screening Outcome | |
|---|---|---|---|---|
| | | | Construction | Operation |
| | | Operation:<br>Open cut watercourse crossings will be reinstated to baseline conditions. There will be no groundwater quantity or quality impacts to the groundwater body during the Operation Stage. | | |
| Site Access | Access via existing highway and consented wind farm tracks; no new tracks or culverts; use of geo-grid matting. However, the use of these existing access tracks, will still lead to potential impacts. | Construction:<br>▪ Alteration to groundwater quality with potential for pollution from HGVs/construction plant using access tracks.<br><br>Operation:<br>Site access is only temporary and will be reinstated to baseline conditions. | **In** | **Out** |
| Decommissioning | Not proposed – infrastructure will remain in situ to reduce environmental disturbance. | Decommissioning:<br>As the infrastructure will remain in situ, there will be no potential impacts, such that this activity can be screened out from further assessment. | **All WFD Water bodies**:<br>Decommissioning: Out | |

# 5 WFD SCOPING

## 5.1 WFD SCOPING ASSESSMENT

5.1.1. The WFD scoping stage identifies potential risks to receptors due to the Project. The scoping determines whether there is a risk of deterioration and WFD non-compliance at the water body scale, and therefore, whether a detailed impact assessment and additional mitigation is required.

5.1.2. The potential impacts of the Project identified at the screening stage have been assessed against the WFD quality elements for both the construction and operation phases. Mitigation for potential construction and operation impacts have been identified and reported in **Table 5-1** and **Table 5-2** respectively for the surface water bodies and **Table 5-3** for construction impacts for the groundwater body. Construction and embedded mitigation are described, and a mitigation reference code has been allocated and cross-referenced subsequently to avoid repetition of text. At first mention (per table i.e. **Tables 5-1 to 5-3**), the mitigation measure is described in full, while any following occurrence simply references the mitigation reference code. A full list of this embedded mitigation is provided in **Annex D**. Further details of the construction mitigation will be provided by the appointed Contractor at the detailed design stage.

5.1.3. This WFD assessment process has been used to inform design and to incorporate embedded mitigation to neutralise potential impacts to WFD quality elements and WFD status. Full lists of the WFD quality elements and latest classifications are presented in **Annex B**, with **Tables B-1 to B-5** for Surface Water bodies and **Table B-6** for Groundwater bodies. Only quality elements specific to the Project are included in scoping **Tables 5-1 to 5-3**.

5.1.4. An assessment is then made to determine whether there will be any residual impacts at the WFD water body scale. Where there is potential for a residual impact at the water body scale, with construction and embedded mitigation in place, that may result in deterioration or prevent the WFD water body from achieving its status objectives, then a detailed impact assessment and potential additional mitigation would be required.

**Table 5-1 – WFD Scoping of the potential construction impacts from the Project against WFD quality elements for all WFD River Water Bodies**

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| **Hydromorphological Quality Elements** | | | | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Quantity and Dynamics of Flow<br>River Depth and Width Variation<br>Structure and Substrate of the River Bed<br>Structure of the Riparian Zone | **Loss of morphological diversity and habitat**<br>A reduction of morphological diversity and habitats will impact several elements of hydromorphology. Any changes to the marginal/riparian zone will directly impact the riparian zone structure.<br>The construction of the open cut crossings through a temporary dam technique may require short term over pumping or fluming of the watercourse to maintain flow connectivity. This would temporarily alter the quantity and dynamics of the flow. During construction, localised sections of the bed and banks of the watercourse could be impacted by the trenched crossing. This could create localised effects on the river depth and width at the areas of the trenched crossing due to the excavation of material. This process would also impact the structure and substrate of the river bed.<br>OHL pole sets, cable trenches and riparian vegetation clearance will also directly impact morphological diversity and habitats. In particular, the clearance of riparian vegetation can lead to localised increases in in fine sediment input, which can alter the structure & substrate of the river bed, alter the river depth and width variation and consequently affect the quantity and dynamics of flow through changes to bedforms, cross section and potentially increased runoff rates during the construction phase. Riparian vegetation clearance will also have localised impacts to the structure of the riparian zone. | **Loss of morphological diversity and habitat**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the loss of marginal, aquatic and riparian habitat:<br>▪ **WFD-C-EMM-1:** Working areas, where possible will not be within 9 m of watercourses. Where this is not possible, approaches will follow relevant best-practice and guidance, for example Guidance for Pollution Prevention 1 and 5[44];<br>▪ **WFD-C-EMM-2:** Micro-siting for OHL pole sets to minimize vegetation loss, reduce risks of pollution, and protect aquatic habitats; and<br>▪ **WFD-C-EMM-4:** The Environmental Manager shall carry out daily visual inspections of all watercourses, drainage outfalls, and pumping activities, particularly during periods of inclement weather.<br>With measures to manage loss of morphological diversity and habitat in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | N |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170)<br>▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | River Depth and Width Variation<br>Structure and Substrate of the River Bed<br>Structure of the Riparian Zone | **Loss of lateral connectivity/continuity**<br>The temporary overpumping or fluming put in place during open cut crossings could impact the connectivity. An alteration to river depth and width variation will occur but only minimally and at a local-scale adjacent to the open cut crossings. In addition, the over-pumping and open cut crossing will not exactly mimic the natural flow of a watercourse and may cause sediment to undergo a net-transportation or net-deposition relative to the watercourse's natural conditions.<br>The position of the OHL pole sets and watercourse crossing led to their being an erodible corridor analysis being undertaken on several watercourses to assess their historical lateral variability relative to the proposed activities. Nant Sychbant is the ordinary | **Loss of lateral connectivity/continuity**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the loss of lateral connectivity/continuity:<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-3:** Any crossing of a watercourse for open cut trenching will require consent from the relevant authority. In addition, any required discharge to or abstraction from surface water or groundwater resources may require prior consent from NRW in accordance with the relevant permitting and abstraction regulations; and<br>▪ **WFD-C-EMM-4.** | N |

[44] Net Regulations (2025) Guidance for Pollution Prevention (GPP) documents [Online]. Available at: Guidance for Pollution Prevention (GPP) documents | NetRegs | Environmental guidance for your business in Northern Ireland & Scotland

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| | | watercourse whereby the watercourse crossing is proposed, while OHL pole sets are situated nearby to Nant y Ffyllon and Nant y Castell.<br><br>It was found that these watercourses were either incised into steep topography, resulting in confined watercourses with minimal potential for lateral migration, or that historic evidence indicated limited lateral movement. Therefore, the establishment of an erodible corridor is not required for the Project. | In addition, it is recommended that the OHL pole sets and corresponding kicking blocks are situated as far as possible from watercourses, specifically Nant y Ffyllon and Nant y Castell to reduce the potential impact to their lateral connectivity. This can be achieved through micrositing, which is embedded within the Project's design.<br><br>With measures to manage loss of lateral connectivity/continuity in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Quantity and Dynamics of Flow<br><br>River Continuity<br><br>River Depth and Width Variation<br><br>Structure and Substrate of the River Bed<br><br>Structure of the Riparian Zone | **Alteration to flows, water quantity and/or quality**<br><br>The construction of the open cut crossings may require short term over pumping of the watercourse to maintain flow connectivity/river continuity. This will temporarily alter the quantity and dynamics of flow. During construction, localised sections of the bed and banks of the watercourse could be impacted by the open cut crossing. This could create localised effects to the river depth and width at the areas of the open cut crossing due to the excavation of material. This process would also impact the structure and substrate of the river bed.<br><br>Removal of riparian vegetation will impact the lateral connectivity of the watercourse. In addition, reducing or removing the riparian zone will have a negative feedback loop on that of the water quality. Riparian zones play a role in mitigating diffuse pollution, largely from agricultural settings, reducing the concentration and volume of diffuse pollution entering the river. Therefore, reducing the riparian presence may lead to increased diffuse pollution entering the water.<br><br>In addition, the construction activities associated with the installation of the OHL pole sets, cable trenches and construction compound may cause increased water quantity and alteration to flows, through increased runoff.<br><br>Given the size of the construction area relative to the size of the water bodies, any impact is expected to be temporary, localised and negligible at the water body scale. | **Alteration to flows, water quantity and/or quality**<br><br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to flows, water quantity and/or quality:<br><br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-2;**<br>▪ **WFD-C-EMM-5:** Chemicals and fuels to be stored in secure containers located away from watercourses or water bodies. Spill kits to be made available;<br>▪ **WFD-C-EMM-6:** Roads and hard surfaces will be kept clean, to prevent a build-up of mud and **sediment** that could contaminate surface water;<br>▪ **WFD-C-EMM-7**: Surface and foul drainage will be separated, stored on site and removed by a licensed contractor;<br>▪ **WFD-C-EMM-8**: No disposal of any liquids to surface water drains;<br>▪ **WFD-C-EMM-9:** Installation of silt traps and swales to trap silty water;<br>▪ **WFD-C-EMM-10:** Directing any drainage of fuel storage areas, via an oil interceptor, to contain any accidental spillage;<br>▪ **WFD-C-EMM-11:** Regular visual inspection of working areas and surface water management facilities for evidence of contamination from fuel or sediment, particularly following periods of heavy rainfall;<br>▪ **WFD-C-EMM-12**: Water quality monitoring will also be undertaken at agreed specified times during construction;<br>▪ **WFD-C-EMM-13**: The contractor will be responsible for identifying the source of the leakage or spillage and for rectifying the problem. The priority will be to stop the source of spillage and contain it from entering a sensitive receptor area. Once the source of the spillage has been identified, absorbent pads will be used as a barrier to any further contamination;<br>▪ **WFD-C-EMM-14:** Should a spill enter a drain, the route and outfall point should be quickly identified and if possible, the appropriate outlet valve shut off. If required, drains will be pumped out to remove contamination and remove the risk of environmental damage by it entering a watercourse or sewage treatment works;<br>▪ **WFD-C-EMM-15:** Should a spillage enter a sensitive receptor area and risk causing a pollution incident, NRW will be notified on its emergency pollution incident number. Records of all incidents will be maintained and made available for audit or inspection; and,<br>▪ **WFD-C-EMM-16:** Preventative and control measures will be implemented to comply with the Water Resources Act 1991, | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| | | | Environmental Protection Act 1990 and other associated regulations. These control measures will include:<br>• Designating a fuel and hazardous storage area within the site compound, with adequate bunds and impervious walls and floors to ensure containment, in the event of accidental spillage and to be sited at least 10m from any foul or surface drain where possible, at least 20m from any watercourses and away from areas at risk of flooding;<br>• Any tanks or drums will be stored in a secure container, where possible, to be kept locked when not in use; and,<br>• Utilising drip trays to collect leaks from fuel pumps or standing plant.<br><br>With measures to manage alteration to flows, water quantity and/or quality in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | |
| ▪ Llynfi – headwaters to Lletty Brongu STW | Quantity and Dynamics of Flow<br>Connection to Groundwater<br>River Depth and Width Variation<br>Structure and Substrate of the River Bed<br>Structure of the Riparian Zone | **Alteration to natural bed and/or bank**<br>The construction of the open cut crossings will require excavation of the channel, banks, and riparian zones. This could create localised effects to the river depth and width at the areas of the open cut crossing due to excavation of material. This process would also impact the structure and substrate of the river bed. Placing an impermeable artificial barrier will reduce the amount of groundwater able to enter the river, albeit having a highly localised effect. This may cause low flow events to be lower than normal. Furthermore, this artificial barrier can act to prevent surface water from entering the groundwater which is especially important during groundwater recharge.<br>Given the size of the construction area relative to the size of the water bodies, any impact is expected to be temporary, localised and negligible at the water body scale. | **Alteration to natural bed and/or bank**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to natural bed and/or bank:<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-4.**<br><br>With measures to manage alterations to natural bed and/or bank in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | N |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>Llynfi – Lletty Brongu STW to confluence with Ogmore | Quantity and Dynamics of Flow<br>River Depth and Width Variation<br>Structure and Substrate of the River Bed | **Alteration to sediment input, transport and deposition (including pollution risk)**<br>During construction there is a temporary risk of increased sediment entering the watercourse. This would increase the turbidity of the watercourse. Increased sediment loading could impact the dynamics of flow by increasing the potential of watercourse bed scour or sediment deposition. This could indirectly impact the river depth and width. Given the shallow gradients and existing low flows within the potentially impacted watercourses, sediment deposition will likely occur which could also impact the structure and substrate of the river bed.<br>Excess sediment that is not transported during higher flows can also reduce channel cross-sectional area, which may have an adverse impact on channel conveyance. | **Alteration to sediment input, transport and deposition (including pollution risk)**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to sediment input, transport and deposition (including pollution risk):<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-2;**<br>▪ **WFD-C-EMM-5;**<br>▪ **WFD-C-EMM-6;**<br>▪ **WFD-C-EMM-7;**<br>▪ **WFD-C-EMM-8;**<br>▪ **WFD-C-EMM-9;**<br>▪ **WFD-C-EMM-10;**<br>▪ **WFD-C-EMM-11;** | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| | | | ▪ **WFD-C-EMM-12;**<br>▪ **WFD-C-EMM-13;**<br>▪ **WFD-C-EMM-14;**<br>▪ **WFD-C-EMM-15;**<br>▪ **WFD-C-EMM-16.**<br><br>With measures to manage alteration to sediment input, transport and deposition (including pollution risk) in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | |
| **Biological and Physico-chemical Quality Elements** | | | | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Macrophytes and Phytobenthos<br>Macroinvertebrates<br>Fish<br>Oxygenation Conditions<br>Nutrients Conditions | **Loss of marginal, aquatic and riparian habitat**<br>Temporary direct and indirect loss of sensitive fish and macroinvertebrate marginal and aquatic habitat may impact fish and macroinvertebrate populations as a result of construction activities, including open cut watercourse crossings, OHL pole sets, cable trenching temporary and riparian vegetation clearance.<br>Riparian vegetation clearance can potentially alter the physico-chemical and hydromorphological conditions of affected watercourses, which can negatively impact the quality and availability of morphological diversity and habitat for aquatic species. Loss of habitat/morphological diversity has the potential to reduce the diversity of aquatic species, as well as the abundance of sensitive or protected/notable aquatic species within watercourses. Any changes to the structure of the riparian zone could affect foraging habitat and refugia for fish and other aquatic species. This is because riparian vegetation provides shade which helps regulate water temperature, increases dissolved oxygen through photosynthesis, and these areas intercept nutrients to avoid loading which can potentially cause eutrophication. | **Loss of marginal, aquatic and riparian habitat**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the loss of marginal, aquatic and riparian habitat:<br>▪ **WFD-C-EMM-1**;<br>▪ **WFD-C-EMM-2;** and,<br>▪ **WFD-C-EMM-21:** Reinstatement of riparian and in-channel habitat at watercourses, and vegetation clearance at watercourses kept to the minimum.<br><br>With measures to manage loss of marginal, aquatic and riparian habitat in place during the Construction Phase, and the short-term<br>temporary and localised nature, no deterioration is anticipated at the water body scale. | N |
| ▪ Llynfi – headwaters to Lletty Brongu STW | Fish<br>Macroinvertebrates<br>Macrophytes<br>Thermal Conditions<br>Oxygenation Conditions<br>Nutrient conditions | **Loss of lateral connectivity/continuity**<br>Habitat severance/fragmentation and barriers to fish migration, specifically European eel and brown trout, may occur where there is a requirement for the creation of dry-works areas through open cut crossings.<br><br>In addition, open-cut crossings can impact flow connectivity, and feedback negatively on biological and physico-chemical quality elements. Given that the structures only occupy a relatively small section of these watercourses, the impact will be minimal and localised.<br>Open cut watercourse crossings will be reinstated to baseline conditions. | **Loss of lateral connectivity/continuity**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the loss of lateral connectivity/continuity:<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-3;**<br>▪ **WFD-C-EMM-4:**<br>▪ **WFD-C-EMM-18:** Dewatering fish rescue plan, and 2 mm screen fitted to pumps to minimise the risk of fish and eel entrainment;<br>▪ **WFD-C-EMM-19:** Sensitivity (e.g. to noise and vibration) of those fish species present will be considered to ensure that appropriate construction methods can be implemented to minimise and avoid disturbance or avoidance behaviour;<br>▪ **WFD-C-EMM-20:** Where practicable, construction works will avoid works on watercourses during high flow events; and | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| | | | ▪ **WFD-C-EMM-21.**<br><br>With measures to manage the loss of lateral connectivity/continuity in place during the Construction Phase, and the short-term temporary and localised nature, no deterioration is anticipated at the water body scale. | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Macrophytes and Phytobenthos<br><br>Macroinvertebrates<br><br>Fish<br><br>Thermal Conditions<br><br>Oxygenation Conditions<br><br>Salinity<br><br>Acidification Status<br><br>Nutrient conditions | **Alteration to flows, water quantity and/or quality**<br><br>Alteration to flows, water quantity and/or quality could arise due to open-cut crossings, OHL pole sets, cable trenches, temporary construction compounds and riparian vegetation clearances.<br><br>These activities could result in adverse impacts to the ecological and physico-chemical conditions of the watercourse. Potential impacts include disruption to flows, increased runoff and associated increase in sediment and pollutant loading of discharged runoff.<br><br>Altered flows, whether increases or decreases, can impact fish, macrophytes and macroinvertebrates through changes in habitats. Fish, in particular, may be impacted by changes in access to areas of rivers, and food sources, and can also alter the energy expenditure needed to reach habitats, particularly for migratory fish such as European eel and brown trout.<br><br>A change in water quantity would have an impact on oxygen conditions. A reduction in water quantity would increase biological oxygen demand, while an increase in water quantity would decrease this. An increase in turbidity can lead to a reduction of sunlight reaching the channel bed, causing stratification and reducing the dispersion of dissolved oxygen with adverse effected on aquatic ecology receptor species.<br><br>Thermal, oxygen, salinity, acidification and nutrient conditions will all be impacted by any changes in water quality. These changes may include temperature fluctuations (reduced flow resulting in less dilution of heat sources); decreased dissolved oxygen levels (low water flow and increased temperatures) leading to hypoxia; freshwater input lowering salinity levels (impacting the distribution of saline tolerant species); lower flows resulting in greater concentrations of pollutants that contribute to acidification and eutrophication. | **Alteration to flows, water quantity and/or quality**<br><br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to flows, water quantity and/or quality:<br><br>▪ **WFD-C-EMM-1**;<br>▪ **WFD-C-EMM-2**;<br>▪ **WFD-C-EMM-4;**<br>▪ **WFD-C-EMM-5;**<br>▪ **WFD-C-EMM-6;**<br>▪ **WFD-C-EMM-7;**<br>▪ **WFD-C-EMM-8;**<br>▪ **WFD-C-EMM-9;**<br>▪ **WFD-C-EMM-10;**<br>▪ **WFD-C-EMM-11;**<br>▪ **WFD-C-EMM-12;**<br>▪ **WFD-C-EMM-13;**<br>▪ **WFD-C-EMM-14;**<br>▪ **WFD-C-EMM-15;**<br>▪ **WFD-C-EMM-16.**<br><br>With measures to manage alteration to flows, water quantity and/or quality in place during the Construction Phase, and the short-term temporary and localised nature, no deterioration is anticipated at the water body scale. | N |
| ▪ Llynfi – headwaters to Lletty Brongu STW | Macrophytes and Phytobenthos<br><br>Macroinvertebrates<br><br>Fish | **Alterations to shading**<br><br>Shading of watercourses helps to regulate water temperature to keep river and stream water cool. Any reduction in shading due to the proposed construction activities, in particular riparian vegetation clearance for enabling works for open cut watercourse | **Alterations to shading**<br><br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alterations to shading:<br><br>▪ **WFD-C-EMM-1**. | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| | Thermal Conditions<br>Oxygenation Conditions | crossings, could result in increased water temperature. Increases in water temperature may also affect oxygen conditions. As the water temperature increases, it can 'hold' less oxygen, hence increasing the biological oxygen demand (BOD) on any organisms within.<br>Increased light penetration may lead to an increase in the diversity of aquatic macrophytes, however, it may also lead to a greater chance of algal blooms. A reduction in riparian shading may also reduce areas of foraging habitat and refugia for fish and macroinvertebrates. | With measures to manage shading in place during the Construction Phase, and the short-term temporary and localised nature, no deterioration is anticipated at the<br>water body scale. | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Macrophytes and Phytobenthos<br>Macroinvertebrates<br>Fish<br>Thermal Conditions<br>Oxygenation Conditions<br>Salinity<br>Acidification Status<br>Nutrient conditions | **Alteration to sediment input, transport and deposition (including pollution risk)**<br>Pollution and sediment loading from construction activities has the potential to lead to a degradation in water quality. This could adversely impact the biological and physico-chemical quality elements within the WFD water bodies. Excess fine sediment can alter the physical habitat characteristics of the channel bed and adversely affect food and habitat availability for aquatic species.<br>Alteration to sediment input has the potential to effect physico-chemical elements. Any releases of construction associated pollutants and/or fine sediments into the watercourses may affect aquatic life resulting in direct and indirect mortality and/or injury.<br>Suspension of, and/or increased fine sediment input may result in turbidity and a reduction of sunlight reaching the channel bed, reduce dissolved oxygen and impact fish, macroinvertebrates and aquatic macrophytes.<br>Specifically, increased sediment loading could impact the following:<br>Degradation of spawning habitat, food sources and water quality;<br>Direct fish mortality with sediment affecting the gills of adult and juvenile fish, along with the smothering of fish eggs;<br>An increase in turbidity can lead to a reduction of sunlight reaching the channel bed, causing stratification and reducing the dispersion of dissolved oxygen with adverse effects on fish, macroinvertebrates and aquatic macrophytes;<br>Any release of construction-associated pollutants and/or fine sediments into the watercourses may be toxic to aquatic life resulting in direct and indirect morality and/or injury;<br>The structure and substrate of the riverbed could be impacted as existing bed sediment and features become smothered due to an increase in sedimentation through surface runoff, indirectly impacting sensitive life-cycle dependent habitats, flow refugia, and cover for aquatic receptors. | **Alteration to sediment input, transport and deposition (including pollution risk)**<br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to sediment input, transport and deposition (including pollution risk):<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-5;**<br>▪ **WFD-C-EMM-6;**<br>▪ **WFD-C-EMM-7;**<br>▪ **WFD-C-EMM-8;**<br>▪ **WFD-C-EMM-9;**<br>▪ **WFD-C-EMM-10;**<br>▪ **WFD-C-EMM-11;**<br>▪ **WFD-C-EMM-12;**<br>▪ **WFD-C-EMM-13;**<br>▪ **WFD-C-EMM-14;**<br>▪ **WFD-C-EMM-15;**<br>▪ **WFD-C-EMM-16.**<br>With measures to manage alteration to sediment input, transport and deposition (including pollution risk) in place during the Construction Phase, and the short term temporary and localised nature, no deterioration<br>is anticipated at the water body scale. | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Fish | **Noise and Vibration**<br>Disturbance to and/or dispersal of fish populations, such as brown trout or European eel, from in channel works areas due to increased noise and vibration impacts associated with construction activities, including open cut water crossing, cable trenching, OHL pole sets, temporary construction compound, and riparian vegetation clearance. These activities may disturb fish migration, spawning and embryo mortality. Noise and vibration can disrupt fish migration, prey and predator detection, reproduction and habitat selection. However, no salmonid spawning habitats are considered to be present. | **Noise and Vibration**<br>The following procedures will be implemented from the **Outline Construction Environmental Management Plan (OCEMP) (Appendix 4A)** to mitigate noise and vibration:<br>▪ **WFD-C-EMM-1:**<br>▪ **WFD-C-EMM-2:**<br>▪ **WFD-C-EMM-3**; and<br>▪ **WFD-C-EMM-19**.<br>With measures to manage noise and vibration during the Construction Phase, and the short-term temporary and localised nature of risk to fish migration, specifically European eel and brown trout, and lack of risk to spawning fish, no deterioration is anticipated at the water body scale. | N |
| ▪ Llynfi – headwaters to Lletty Brongu STW | Macrophytes and Phytobenthos<br>Macroinvertebrates<br>Fish | **Transfer and establishment of Invasive Non-native Species (INNS)**<br>The desk study identified aquatic INNS species and Himalayan, balsam, Japanese knotweed and Monkeyflower in watercourses and on the banks and floodplain hydrologically connected to the Red Line Boundary. Construction activities including trenched crossings have the potential to spread INNS, impacting native aquatic species of macroinvertebrates, fish and macrophytes. | **Transfer and establishment of Invasive Non-native Species (INNS)**<br>The following procedures will be implemented to mitigate the transfer and establishment of INNS:<br>▪ **WFD-C-EMM-17:** Preventative and control measures will be implemented to comply with the Wildlife and Countryside Act 1981 Schedule 9. This control measures include:<br>• Biosecurity measures; and<br>• Pre/post-construction INNS checks.<br>With measures to mitigate the transfer/establishment of INNS in place during the Construction Phase, and the short-term temporary and localised nature, no deterioration is anticipated at the water body scale. | N |
| ▪ Llynfi – headwaters to Lletty Brongu STW | Macrophytes and Phytobenthos<br>Macroinvertebrates<br>Fish | **Alteration to natural bed and/or bank**<br>Alteration to natural bed and/or bank through construction activities including open-cut crossings, trenches and riparian vegetation clearance have the potential to damage and/or fragment sensitive life stage dependent habitat types, flow refugia and cover for aquatic species, degradation of spawning habitat, food sources and overall water quality.<br>These construction activities may also cause direct and indirect impacts through localised loss and/or degradation of aquatic and riparian habitats. | **Alteration to natural bed and/or bank**<br>The following procedures will be implemented to mitigate the alteration to natural bed and/or back:<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-3;**<br>▪ **WFD-C-EMM-4;**<br>▪ **WFD-C-EMM-6;** and<br>▪ **WFD-C-EMM-11**.<br>With measures to manage alteration to natural bed and/or bank in place during Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | N |
| **Specific Pollutants** | | | | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit | Specific Pollutants | **Alteration to flows, water quantity and/or quality** | **Alteration to flows, water quantity and/or quality** | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| ▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | | Water quality changes may directly impact specific pollutants within the watercourse such as copper iron and zinc. For example, zinc can become toxic to freshwater organisms when concentrations are at a high level, with zinc also outcompeting other elements such as copper and calcium in biological and ecological processes.<br><br>Water quantity itself can impact upon water quality, in terms of the greater the volume of water, the lower the concentration of any one specific pollutant. Therefore, if the volume of water is reduced, the concentration of a pollutant is able to increase. Therefore, it is important that any alterations to water quantity (e.g. overpumping) is kept to a minimum. | The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to flows, water quantity and/or quality:<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-2;**<br>▪ **WFD-C-EMM-5;**<br>▪ **WFD-C-EMM-6;**<br>▪ **WFD-C-EMM-7;**<br>▪ **WFD-C-EMM-8;**<br>▪ **WFD-C-EMM-9;**<br>▪ **WFD-C-EMM-10;**<br>▪ **WFD-C-EMM-11;**<br>▪ **WFD-C-EMM-12;**<br>▪ **WFD-C-EMM-13;**<br>▪ **WFD-C-EMM-14;**<br>▪ **WFD-C-EMM-15;**<br>▪ **WFD-C-EMM-16.**<br><br>With measures to manage alteration to flows, water quantity and/or quality in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | |
| ▪ Ffrwd Wyllt – headwaters to tidal limit<br>▪ Afan – confluence with Corrwg to confluence with Pelenna<br>▪ Kenfig – headwaters to tidal<br>▪ Llynfi – headwaters to Lletty Brongu STW<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore | Specific Pollutants | **Alteration to sediment input, transport and deposition (including pollution risk)**<br><br>Any changes in pollution input and/or sediment input will directly impact specific pollutants within the watercourse such as copper iron and zinc. For example, zinc can become toxic to freshwater organisms when concentrations are at a high level, with zinc also outcompeting other elements such as copper and calcium in biological and ecological processes. | **Alteration to sediment input, transport and deposition (including pollution risk)**<br><br>The following procedures will be implemented from the **OCEMP (Appendix 4A)** to mitigate the effects of alteration to sediment input, transport and deposition (including pollution risk):<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-2;**<br>▪ **WFD-C-EMM-5;**<br>▪ **WFD-C-EMM-6;**<br>▪ **WFD-C-EMM-7;**<br>▪ **WFD-C-EMM-8;**<br>▪ **WFD-C-EMM-9;**<br>▪ **WFD-C-EMM-10;**<br>▪ **WFD-C-EMM-11;**<br>▪ **WFD-C-EMM-12;**<br>▪ **WFD-C-EMM-13;**<br>▪ **WFD-C-EMM-14;**<br>▪ **WFD-C-EMM-15;**<br>▪ **WFD-C-EMM-16.**<br><br>With measures to manage alteration to sediment input, transport and deposition (including pollution risk) in place during the Construction Phase, and the short term temporary and localised nature, no deterioration is anticipated at the water body scale. | N |

* Mitigation Reference Key: C – Construction; EMM – Embedded Mitigation Measure.

**Table 5-2 - WFD Scoping of the potential operation impacts from the Project against WFD quality elements for all WFD Water Bodies**

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| **Hydromorphological Quality Elements** | | | | |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170)<br>▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | Structure of the Riparian Zone | **Loss/alteration to the Riparian Zone**<br>Riparian vegetation is to be re-instated once construction of the OHL pole sets and watercourse crossing has finished. It is recognised that the reinstated vegetation will take time to establish and may not immediately reflect the structure and diversity of the original riparian habitat. Whilst reinstated vegetation establishes, bank top and bank faces may be susceptible to erosional processes resulting in fine sediment input to the watercourse. However, these impacts are short-term, temporary, and localised until the reinstated vegetation is fully established.<br>In addition, during the operation phase for OHL, tree cutting will take place. This will be limited, with only a small proportion of this tree cutting within proximity to watercourses. | The following procedures will be implemented as part of the design to mitigate the effects of loss/alteration to the Riparian Zone:<br>▪ **WFD-O-EMM-1:** During the operation phase for OHL, duties are limited to resilience tree cutting to retain clearance distances and regular inspection. Pole inspections will be carried out in line with company policies and procedures.<br>Impacts would be highly localised, temporary and negligible at the water body scale for the maturing period of the riparian vegetation. Impacts would be localised, negligible but throughout the duration of operation for maintenance described in **WFD-O-EMM-1** Therefore, no residual risk is associated with loss/alteration to the Riparian Zone at the water body scale. | N |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170)<br>▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | Quantity and Dynamics of Flow<br>River Depth and Width Variation<br>Structure and Substrate of the River Bed | **Loss of lateral connectivity/continuity**<br>As stated in the construction section above (**Table 5.1**), if the OHL pole sets are constructed too close to the Nant y Ffyllon and Nant y Castell watercourses, they could impact lateral connectivity.<br>If the recommendation to position the OHL pole sets as far as possible from watercourses (specifically Nant y Ffyllon and Nant y Castell) is followed (**Table 5.1**), the potential impact on their lateral connectivity is expected to be negligible. This is especially the case given that erodible corridor analysis found that these watercourses were either incised into steep topography, resulting in confined watercourses with minimal potential for lateral migration, or that historic evidence indicated limited lateral movement.<br>In particular, maintaining lateral connectivity helps sustain natural variations in flow patterns, river depth, and channel width, which are essential for sediment transport and floodplain recharge. | Situating the OHL pole sets and corresponding kicking blocks away from the watercourse at construction stage will act to reduce the impact through the operational phase.<br>In addition, each pole set has a relatively small footprint, while the vegetated land will help trap sediment and therefore, indirectly control flows.<br>Therefore, impacts would be negligible at the water body scale, such that there is no residual risk. | N |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170)<br>▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | Quantity and Dynamics of Flow<br>River Depth and Width Variation<br>Structure and Substrate of the River Bed | **Alteration to sediment input, transport and deposition (including pollution risk) *and* Alteration to flows, water quantity and/or quality**<br>The OHL pole sets and pre-cast kicking blocks may alter runoff as well as sediment input, transport, and deposition processes, with potential implications for river morphology. The presence of these structures can create localised changes in flow patterns, potentially leading to sediment accumulation or erosion around the pole sets and kicking blocks, which can alter the structure and substrate of the river bed. Operationally, such modifications may affect the quantity and dynamics of flow by changing velocity profiles and flow distribution, thereby impacting river depth and width variation. | The use of pre-cast kicking blocks (as an alternative to cast-in-place concrete foundations) reduces impacts to dynamics of flow and consequently keeps impacts to river geomorphology and sedimentation to a minimum.<br>The likelihood of alteration to hydromorphological elements is minimal due to best practices being followed in design, with the surface being restored as close to baseline conditions as possible. The material used in backfilling will be the same as that removed for the excavation. Therefore, throughout the | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| | | | operational phase, the above impacts will be minimised further.<br><br>No deterioration is anticipated at the water body scale due to the presence of OHL pole foundations. If there is any impact on the water body, it will be limited to the localised area covered by the foundations. | |
| **Biological and Physico-chemical Quality Elements** | | | | |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170)<br>▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | Macrophytes and Phytobenthos<br><br>Macroinvertebrates<br><br>Fish<br><br>Nutrient conditions | **Loss/alteration to the Riparian Zone**<br><br>Riparian vegetation is to be re-instated once construction of the OHL pole sets and watercourse crossing has finished. It is acknowledged that the reinstated vegetation will take time to establish and may not immediately reflect the structure and diversity of the original riparian habitat. Whilst reinstated vegetation establishes, bank top and bank faces may be susceptible to erosional processes resulting in fine sediment input to the watercourse. However, these impacts are short-term, temporary, and localised until the reinstated vegetation is fully established.<br><br>These, short-term, temporary and localised impacts include:<br>▪ Temporary reduction in nutrient uptake at the riparian interface, with increased runoff potentially carrying more nutrients into the watercourse;<br>▪ Increased turbidity and a reduction of light reaching the channel bed;<br>▪ Sediment smothering of eggs (if present) and gills of adult and juvenile fish; and<br>▪ Increased sedimentation which may reduce spawning habitat quality as well as degrading habitat for macroinvertebrates and macrophytes.<br><br>In addition, during the operation phase for OHL, tree cutting will take place. This will be limited, with only a small proportion of this tree cutting within proximity to watercourses. | The following procedures will be implemented as part of the design to mitigate the effects of loss/alteration to the Riparian Zone:<br>▪ **WFD-O-EMM-1**.<br><br>Impacts would be highly localised, temporary and negligible at the water body scale for the maturing period of the riparian vegetation. Impacts would be localised, negligible but throughout the duration of operation for maintenance described in **WFD-O-EMM-1** Therefore, no residual risk is associated with loss/alteration to the Riparian Zone at the water body scale. | N |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170)<br>▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | Macrophytes and Phytobenthos<br><br>Macroinvertebrates<br><br>Fish<br><br>Oxygenation Conditions<br><br>Nutrient conditions | **Loss of lateral connectivity/continuity**<br><br>As stated in the construction section above (**Table 5.1**), if the OHL pole sets are constructed too close to the Nant y Ffyllon and Nant y Castell watercourses, they could lead to an impact to that of lateral connectivity.<br><br>If the recommendation to position the OHL pole sets as far as possible from watercourses (specifically Nant y Ffyllon and Nant y Castell) is followed (**Table 5.1**), the potential impact on their lateral connectivity is expected to be negligible. This is especially the case given that erodible corridor analysis found that these watercourses were either incised into steep topography, resulting in confined watercourses with minimal potential for lateral migration, or that historic evidence indicated limited lateral movement.<br><br>Maintaining lateral connectivity is crucial for supporting riparian habitats, floodplain function, and species movement, and this measure significantly contributes to preserving these ecological processes. | Situating the OHL pole sets and corresponding kicking blocks away from the watercourse at construction stage will act to reduce the impact through the operational phase.<br><br>In addition, each pole set has a relatively small footprint, while the vegetated land will help trap sediment and therefore, indirectly control flows.<br><br>Therefore, impacts would be negligible at the water body scale, such that there is no residual risk | N |
| ▪ Afan – confluence with Corrwg to confluence with Pelenna (GB110058026130)<br>▪ Kenfig – headwaters to tidal (GB110058026170) | Macrophytes and Phytobenthos<br><br>Macroinvertebrates<br><br>Fish<br><br>Oxygenation Conditions | **Alteration to sediment input, transport and deposition (including pollution risk) *and* Alteration to flows, water quantity and/or quality**<br><br>The OHL pole sets and pre-cast kicking blocks may alter runoff as well as sediment input, transport, and deposition processes, with potential implications for river morphology. These changes may affect oxygenation conditions and nutrient dynamics by altering sediment retention and flow patterns, potentially impacting fish, macrophytes and phytobenthos communities sensitive to such changes. | The use of pre-cast kicking blocks (as an alternative to cast-in-place concrete foundations) reduces impacts to runoff and sedimentation and consequently keeps impacts to biological and physico-chemical quality elements to a minimum. | N |

| WFD Water Bodies | WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|---|
| ▪ Llynfi – headwaters to Lletty Brongu STW (GB110058026331)<br>▪ Llynfi – Lletty Brongu STW to confluence with Ogmore (GB110058026332) | Nutrient conditions | | The likelihood of alteration to biological and physico-chemical quality elements is minimal due to best practices being followed in design, with the surface being restored as close to baseline conditions as possible. The material used in backfilling will be the same as that removed for the excavation. Therefore, throughout the operational phase, the above impacts will be minimised further.<br>No deterioration is anticipated at the water body scale due to the presence of OHL pole foundations. If there is any impact on the water body, it will be limited to the localised area covered by the foundations. | |

* Mitigation Reference Key: O – Operation; EMM – Embedded Mitigation Measure.

**Table 5-3 - WFD Scoping of the potential construction impacts from the Project against WFD quality elements for the WFD Groundwater Body - Swansea Carboniferous Coal Measures**

| WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|
| **Construction** | | | |
| **Quantitative Quality Elements** | | | |
| Quantitative Dependent Surface Water Body Status<br>Quantitative Water Balance | **Alteration to groundwater quantity and flow**<br>Excavations for pole installations have the potential to temporarily disrupt groundwater flow paths, should excavations reach groundwater levels.<br>Excavations associated with open-cut trenching and open-cut river crossings have the potential to intercept groundwater (dependent on the water table depth), which could require dewatering and discharge. This is more likely at the open-cut river crossings. Dewatering will temporarily impact localised groundwater levels and flow.<br>Flume/pipe installations at open-cut river crossings may temporarily reduce localised recharge to groundwater within area of trench.<br>The lowering of the water table with dewatering will be temporary and on a local scale only, so won't have a significant impact on dependent surface water bodies or overall water balance. Any impact on the water table and water availability at the Maesteg Golf Course Borehole will only be temporary and insignificant. | The following procedures will be implemented from the OCEMP (Appendix 4A) to mitigate the effects of alteration to water quantity:<br>■ **WFD-C-EMM-1;**<br>■ **WFD-C-EMM-3.**<br>Although the construction phase may have minimal impacts on flows and water quantity they will be localised. Therefore, no deterioration is anticipated at the groundwater body scale. | N |
| Quantitative Dependent Surface Water Body Status<br>Quantitative Water Balance | **Potential for flood risk**<br>If dewatering is required for open-cut trenching and/or open-cut river crossings, and associated discharge to surface waters occurs at times of high flow in receiving water courses, there is higher flood risk. Flooding of downstream watercourses will temporarily impact the surface water body and water balance. | The following procedures will be implemented from the OCEMP (Appendix 4A) to mitigate the potential flood risk effects:<br>■ **WFD-C-EMM-3;**<br>■ **WFD-C-EMM-4;**<br>■ **WFD-C-EMM-20.**<br>With measures to manage flows and water quantity in place during the Construction Phase, and the short-term temporary and localised nature, no deterioration is anticipated at the groundwater body scale. | N |
| **Chemical Quality Elements** | | | |
| General Chemical Test<br>Chemical Dependent Surface Water Body Status<br>Trend Assessment | **Alteration to groundwater quality**<br>Excavations and removal of riparian vegetation associated with trenching, river crossings and OHL pole sets – have the potential for localised pollution pathway into groundwater.<br>Sources of pollution (which will alter groundwater quality) are from HGVs/construction plant movements or equipment used in construction processes of the open-cut trenches. Site access has the potential for pollution from increased vehicle movements, although there won't be any new tracks constructed.<br>Pollution could include release of hydrocarbons with refuelling of plant, which could potentially enter the groundwater if unattended.<br>Excavations associated with trenching, river crossings and OHL pole sets have potential release of existing pollution to the wider environment and underlying groundwater, through the disturbance of contaminated soils.<br>The pollution sources detailed above could impact the groundwater body quality, the receiving surface water body or create a declining trend if not | The following procedures will be implemented from the OCEMP (Appendix 4A) to mitigate the potential alteration to groundwater quality:<br>■ **WFD-C-EMM-2;**<br>■ **WFD-C-EMM-3;**<br>■ **WFD-C-EMM-4;**<br>■ **WFD-C-EMM-5;**<br>■ **WFD-C-EMM-6;**<br>■ **WFD-C-EMM-10;**<br>■ **WFD-C-EMM-11;**<br>■ **WFD-C-EMM-12;**<br>■ **WFD-C-EMM-13;**<br>■ **WFD-C-EMM-14;**<br>■ **WFD-C-EMM-15;**<br>■ **WFD-C-EMM-16.**<br>In addition, recommended mitigation measures from **Chapter 10: Water Resources and Flood Risk** are as follows: | N |

| WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|
| | managed. Pollution could also potentially impact the abstractions at the Maesteg Golf Course if not managed. | ▪ Routine mechanical maintenance of vehicles will be carried out off-site or in a suitable designated area of the site.<br>▪ Existing access tracks will be used to transport construction materials to and from the compound.<br>With measures to manage water quality in place during the Construction Phase, and the short-term temporary and localised nature, no deterioration is anticipated at the groundwater body scale. | |
| General Chemical Test<br>Chemical Dependent Surface Water Body Status<br>Trend Assessment | **Increased sediment input**<br>Clearing of land and excavations associated with the OHL pole sets, trenches and river crossings will have the potential to release sediment into the groundwater or surface water. This could lead to reduced quality with increased suspended solids and a declining trend if excavations continue to release sediment throughout construction. | The following procedures will be implemented from the OCEMP (Appendix 4A) to mitigate the potential sediment inputs:<br>▪ **WFD-C-EMM-6;**<br>▪ **WFD-C-EMM-9;**<br>▪ **WFD-C-EMM-11;**<br>▪ **WFD-C-EMM-12;**<br>▪ **WFD-C-EMM-20.**<br>In addition, a recommended mitigation measure from **Chapter 10: Water Resources and Flood Risk** are as follows:<br>▪ Any discharge of groundwater to receiving watercourses should be passed through appropriate treatment for sediment removal prior to discharge.<br>With measures to manage water quality in place during the Construction Phase, no deterioration is anticipated at the groundwater body scale. | N |
| General Chemical Test<br>Chemical Dependent Surface Water Body Status<br>Trend Assessment | **Release of existing pollution through disturbance of contaminated soils**<br>Excavations associated with the OHL pole sets, trenches and river crossings will have the potential to release existing pollution into the groundwater or surface water in the wider environment. This could lead to reduced quality of both surface and groundwater bodies and a declining trend if excavations continue to intercept contaminated soils throughout construction and pollution is not detected and managed. | The following procedures will be implemented from the OCEMP (Appendix 4A) to mitigate the potential release of existing pollution:<br>▪ **WFD-C-EMM-1;**<br>▪ **WFD-C-EMM-2;**<br>▪ **WFD-C-EMM-3;**<br>▪ **WFD-C-EMM-4;**<br>▪ **WFD-C-EMM-11;**<br>▪ **WFD-C-EMM-12.**<br>With measures to manage water quality in place during the Construction Phase, no deterioration is anticipated at the groundwater body scale. | N |

**Table 5-4 - WFD Scoping of the potential operational impacts from the Project against WFD quality elements for the WFD Groundwater Body - Swansea Carboniferous Coal Measures**

| WFD Quality Element Potentially Impacted | Potential Impact | Embedded Mitigation | Likely Adverse Residual Impact at the Waterbody Scale (Y/N) |
|---|---|---|---|
| **Quantitative Quality Elements** | | | |
| Quantitative Dependent Surface Water Body Status<br>Quantitative Water Balance | **Alteration to groundwater quantity**<br>OHL pole foundations - presence during the operational phase may lead to reduced groundwater recharge, due to a reduction in permeability because of the pre-cast kicking blocks. Therefore, this may lead to minor decreases in water quantity and alteration to flows. | The use of pre-cast kicking blocks (as an alternative to cast-in-place concrete foundations) reduces impacts like soil compaction, runoff changes, and vegetation clearance near pole bases, allowing alteration to flow and water quantity to be kept to a minimum.<br>The likelihood of alteration to groundwater quantity is minimal due to best practices being followed in design, with the surface being restored as close to baseline conditions as possible. The material used in backfilling will be the same as that removed for the excavation.<br>No deterioration is anticipated at the groundwater body scale due to the presence of OHL pole foundations. If there is any impact on the groundwater body, it will be limited to the small area covered by the foundations. | N |
| **Chemical Quality Elements** | | | |
| General Chemical Test<br>Chemical Dependent Surface Water Body Status<br>Trend Assessment | **Alteration to groundwater quality**<br>The OHL pole foundations have potential for a localised pollution pathway into groundwater if enhanced pathway created between foundations and backfilled material.<br>The likelihood of this is minimal due to best practices being followed in design, with the surface being restored as close to baseline conditions as possible. The material used in backfilling will be the same as that removed for the excavation. | The likelihood of alteration to groundwater quality is minimal due to best practices being followed in design, with the surface being restored as close to baseline conditions as possible. The material used in backfilling will be the same as that removed for the excavation.<br>No deterioration is anticipated at the groundwater body scale due to the presence of OHL pole foundations. If there is any impact on the groundwater body, it will be limited to the small area covered by the foundations. | N |

* Please note,  even though this mitigation measure is construction phase-related, it will have implications in the long-run and therefore, is applicable for the operation phase too.

## 5.2 WFD SCOPING SUMMARY

5.2.1. A summary of the WFD scoping for both Construction and Operation Stages is provided below.

5.2.2. Where no residual effect has been identified, with proposed mitigation in place, no further detailed WFD impact assessment is required. The proposed mitigation is considered sufficient to manage potential impacts during both construction and operation to ensure no deterioration in the status of WFD quality elements, or of overall WFD status. Consequently, no additional or site-specific mitigation is required to ensure WFD compliance.

### CONSTRUCTION

5.2.3. No residual effects have been identified with the proposed Construction Phase with mitigation in place for all of the WFD Surface Water and Groundwater WFD water bodies. The proposed mitigation is considered robust for managing the potential risks to the water and aquatic environment to ensure no deterioration in the status of WFD quality elements or overall WFD status. No additional assessment or specific mitigation is required.

### OPERATION

5.2.4. No residual effects have been identified during the Operation Phase for surface water and groundwater WFD water bodies with the proposed mitigation in place. The proposed mitigation is considered robust for managing the potential risks to the water and aquatic environment to ensure no deterioration in the status of WFD quality elements or overall WFD status.

### MITIGATION MEASURES COMPLIANCE ASSESSMENT

5.2.5. The Ffrwd Wyllt - Headwaters to Tidal Limit Water Body (GB110058026100) is classified as a heavily modified water body. Hence, WFD mitigation measures are set to assist these water bodies in achieving their WFD status objectives. Annex C lists the WFD Mitigation Measures in full as well as detailing a review of mitigation measures to deliver WFD objectives. The Project is due to have no permanent effect, either negative or positive on all WFD Mitigation Measures related to the Ffrwd Wyllt - Headwaters to Tidal Limit Water Body. In addition, the Project will not prevent the achievement of the WD Mitigation Measures set for the Ffrwd Wyllt – Headwaters to Tidal Limit Water Body.

# 6 CONCLUSION

6.1.1. This WFD screening and scoping assessment, prepared by WSP on behalf of the Applicant, evaluates potential impacts and determines whether further detailed assessment is needed to confirm the Foel Trawsnant Grid Connection Project compliance with WFD regulations.

6.1.2. The proposed mitigation measures are deemed sufficient to manage the potential risks to water and aquatic environments, ensuring there will be no deterioration in WFD quality elements or the overall WFD status during the Construction and Operation Stages. As such, no additional assessment or specific mitigation is required to demonstrate WFD compliance.

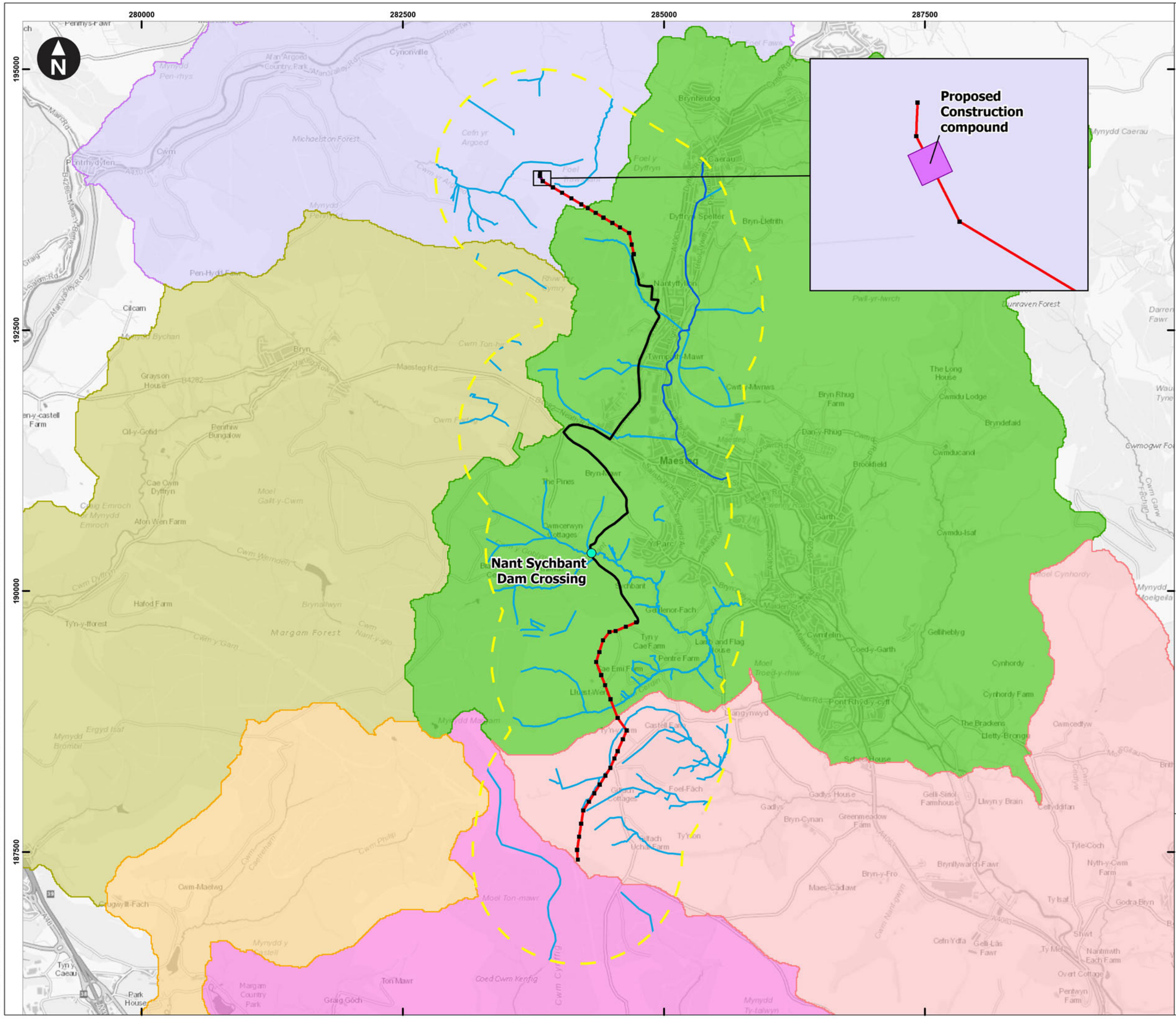
6.1.3. During decommissioning, the above and below ground pipeline will remain in situ, avoiding interaction with watercourses.

6.1.4. In conclusion, with embedded mitigation measures in place, no adverse impacts are expected, and the Foel Trawsnant Grid Connection Project is compliant with WFD Regulations.

# Annex A

## FIGURES

Public




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Environmental Statement
Appendix 10A - Water Framework Directive Assessment (WFD)

**Figure 10A.1**
**Watercourses (With Activities)**

**Page 1 of 5**

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283750

285000

195000

193750

192500

N

Blaen Nant

Tributary of Blaen Nant 1

Nant Tryfal

Nant yr Hwyaid

Proposed Construction compound

Tributary of River Afan

Cefn yr Argoed

Tributary of Nant Cynon 4

Nant Tryfal

Foel y Dyffryn

Foel Trawsnant

Caerau

Tributary of Nant Cynon 3

Nant Cynon

Tributary of Nant Cynon 2

Tributary of Nant Cynon 1

Nant Cynon

Nant Gwyn Bach

Tributary of Nant Cynon 1

Nant Cynon

Dyffryn

Spelter

A4063

Afon Llynfi / Llynfi River

River Llynfi

Tributary of Nant Drysiog 2

Tributary of Nant Drysiog 1

Nant y Fyllon

Rhiw Tor Cymry

Nant y Ffyllon

Nantyffyllon

Tributary of River Llyfi 1

Tributary of Nant Drysiog 3

Tributary of Nant Drysiog 4

Nant Drysiog

Cwm Ton-hir

Key

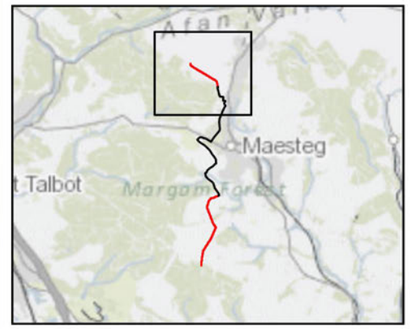
- Overhead Line
- Underground Cables
- 66kV Grid Connection Poles
- Proposed Construction Compound
- Study Area (1km Buffer)
- Watercourse Crossing

**WFD River Waterbody Catchment (Cycle 3)**

- Afan - Conf With Corrwg to Confluence With Pelenna (GB110058026130)
- Ffrwd Wyllt - Headwaters to Tidal Limit (GB110058026100)
- Kenfig - Headwaters to Tidal (GB110058026170)
- Llynfi - Headwaters to Lletty Brongu Stw (GB110058026331)
- Llynfi - Lletty Brongu Stw to Conf With Ogmore (GB110058026332)
- Nant Cwm Philip - Headwaters to Conf With Kenfig (GB110058026190)

**Watercourse**

- Main River
- Ordinary Watercourse




0 125 250 375 500 m

Scale at A3: 1:10,000

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Environmental Statement
Appendix 10A - Water Framework Directive Assessment (WFD)

**Figure 10.A1**
**Watercourses (With Activities)**



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283750

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N

Tributary of Nant Cynon 1

Nant Cynon

Tributary of Nant Drysiog 2

Tributary of Nant Drysiog 1

Nant y Fyllon

Tributary of River Llyfi 1

Tributary of Nant Drysiog 3

Tributary of Nant Drysiog 4

Tributary of Nant Drysiog 5

Tributary of River Llyfi 3

Tributary of River Llyfi 3

Tributary of River Llyfi 3

River Llynfi

Tributary of River Llyfi 2

Tributary of Nant Cwmfarteg 1

Nant Cwmfarteg

Nant Cwmfarteg

Nant y Crynwydd

Tributary of Nant Goblyn 3

Tributary of Nant Sychbant 2

Tributary of Nant Goblyn 3

Tributary of

Afon Llynfi / Llynfi River

Nantyffyllon

Maesteg

Talbot

Margam Forest

Bryn-Mawr

Cwm Ton-hir

Rhiw Tor Cymry

Nant y Ffyllon

Nant y Crynwydd

A4063

B4282

Key

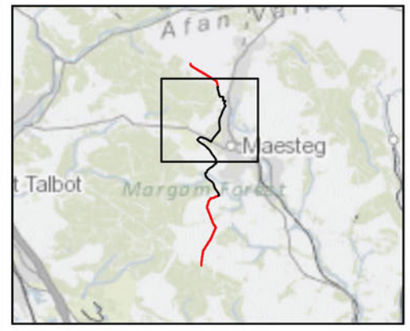
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- Llynfi - Lletty Brongu Stw to Conf With Ogmore (GB110058026332)
- Nant Cwm Philip - Headwaters to Conf With Kenfig (GB110058026190)

**Watercourse**

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- Ordinary Watercourse




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Scale at A3: 1:10,000

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**Figure 10.A1**
**Watercourses (With Activities)**



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190000

188750

N

Tributary of Nant Goblyn 2

Tributary of Nant Goblyn 3

Tributary of Nant Sychbant 2

Tributary of Nant Sychbant 2

Unnamed Ditch

Nant Goblyn

Nant Sychbant Dam Crossing

Tributary of Nant Sychbant 3

Tributary of Nant Sychbant 4

Nant Cwmcerwyn

Tributary of Nant Goblyn 1

Nant Sychbant

Tributary of Nant Sychbant 7

Tributary of Nant Sychbant 5

Tributary of Nant y Cerdin 1

Tributary of Nant Sychbant 6

Tributary of Nant Sychbant 1

Unnamed Ditch 3

Unnamed Ditch 2

Nant y Cerdin

Unnamed Ditch 4

Tributary of Nant Lluest-wen 6

Tributary of Nant Lluest-wen 7

Tributary of Nant Lluest-wen 10

Tributary of Nant Lluest-wen 4

Tributary of Nant Lluest-wen 1

Tributary of Nant Lluest-wen 3

Tributary of Nant Lluest-wen 5

Tributary of Nant Lluest-wen 8

Tributary of Nant Lluest-wen 9

Nant Lluest-wen

Tributary of Nant Lluest-wen 2

Nant Lluest-wen

Tributary of Nant Lluest-wen 1

Tributary of Nant y Castell 3

Nant y Castell

Unnamed Ditch 5

Tributary of Nant y Castell 8

Tributary of Nant y Castell 5

Tributary of Nant y Castell 4

Tributary of Nant y Castell 7

Nant y Castell

Tributary of Nant y Castell 6

Tributary of Nant y Castell 1

Kenfig

Nant y Gadlys

Tributary

Nant

Tributary

Key

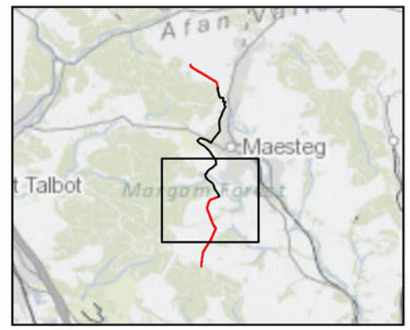
- Overhead Line
- Underground Cables
- 66kV Grid Connection Poles
- Proposed Construction Compound
- Study Area (1km Buffer)
- Watercourse Crossing

**WFD River Waterbody Catchment (Cycle 3)**

- Afan - Conf With Corrwg to Confluence With Pelenna (GB110058026130)
- Ffrwd Wyllt - Headwaters to Tidal Limit (GB110058026100)
- Kenfig - Headwaters to Tidal (GB110058026170)
- Llynfi - Headwaters to Lletty Brongu Stw (GB110058026331)
- Llynfi - Lletty Brongu Stw to Conf With Ogmore (GB110058026332)
- Nant Cwm Philip - Headwaters to Conf With Kenfig (GB110058026190)

**Watercourse**

- Main River
- Ordinary Watercourse




0 125 250 375 500 m

Scale at A3: 1:10,000

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Appendix 10A - Water Framework Directive Assessment (WFD)

**Figure 10.A1**
**Watercourses (With Activities)**



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283750
285000
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N
Nant Lluest-wen
Tributary of Nant Lluest-wen 1
Nant y Castell
Tributary of Nant y Castell 3
Unnamed Ditch 5
Tributary of Nant y Castell 8
Tributary of Nant y Castell 5
Tributary of Nant y Castell 4
Tributary of Nant y Castell 1
Kenfig
Nant y Gadlys
Tributary of Nant y Castell 6
Tributary of Nant y Gadlys 1
Tributary of Nant y Castell 9
Tributary of Nant y Castell 2
Tributary of Nant y Gadlys
Tributary of Nant y Gadlys 3
Tributary of Nant y Gadlys 4
Nant Bryncynan
Tributary of Nant Bryncynan 1
Nant Craigyrabe
Kenfig
Afon Cynffig
Coed Cwm Kenfig
Moel Ton-mawr
Gilfach Uchaf Farm
Foel-fâch
Gilfach Cottages

Key

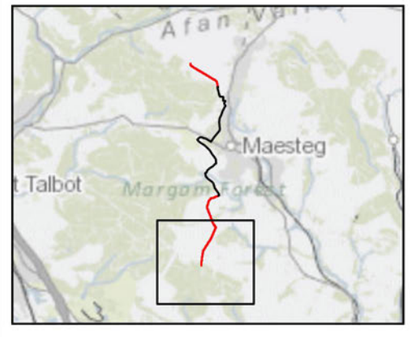
- Overhead Line
- Underground Cables
- 66kV Grid Connection Poles
- Proposed Construction Compound
- Study Area (1km Buffer)
- Watercourse Crossing

**WFD River Waterbody Catchment (Cycle 3)**

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- Llynfi - Lletty Brongu Stw to Conf With Ogmore (GB110058026332)
- Nant Cwm Philip - Headwaters to Conf With Kenfig (GB110058026190)

**Watercourse**

- Main River
- Ordinary Watercourse




0 125 250 375 500 m

Scale at A3: 1:10,000

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**Figure 10.A1**
**Watercourses (With Activities)**



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280000
282500
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287500
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190000
187500

Proposed Construction compound

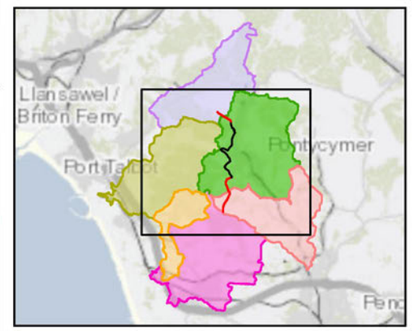
Nant Sychbant Dam Crossing

Key

- Overhead Line
- Underground Cables
- 66kV Grid Connection Poles
- Proposed Construction Compound
- Study Area (1km Buffer)
- Watercourse Crossing

**WFD River Waterbody Catchment (Cycle 3)**

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- Llynfi - Headwaters to Lletty Brongu Stw (GB110058026331)
- Llynfi - Lletty Brongu Stw to Conf With Ogmore (GB110058026332)
- Nant Cwm Philip - Headwaters to Conf With Kenfig (GB110058026190)




0 0.5 1 1.5 2 km

Scale at A3: 1:35,000

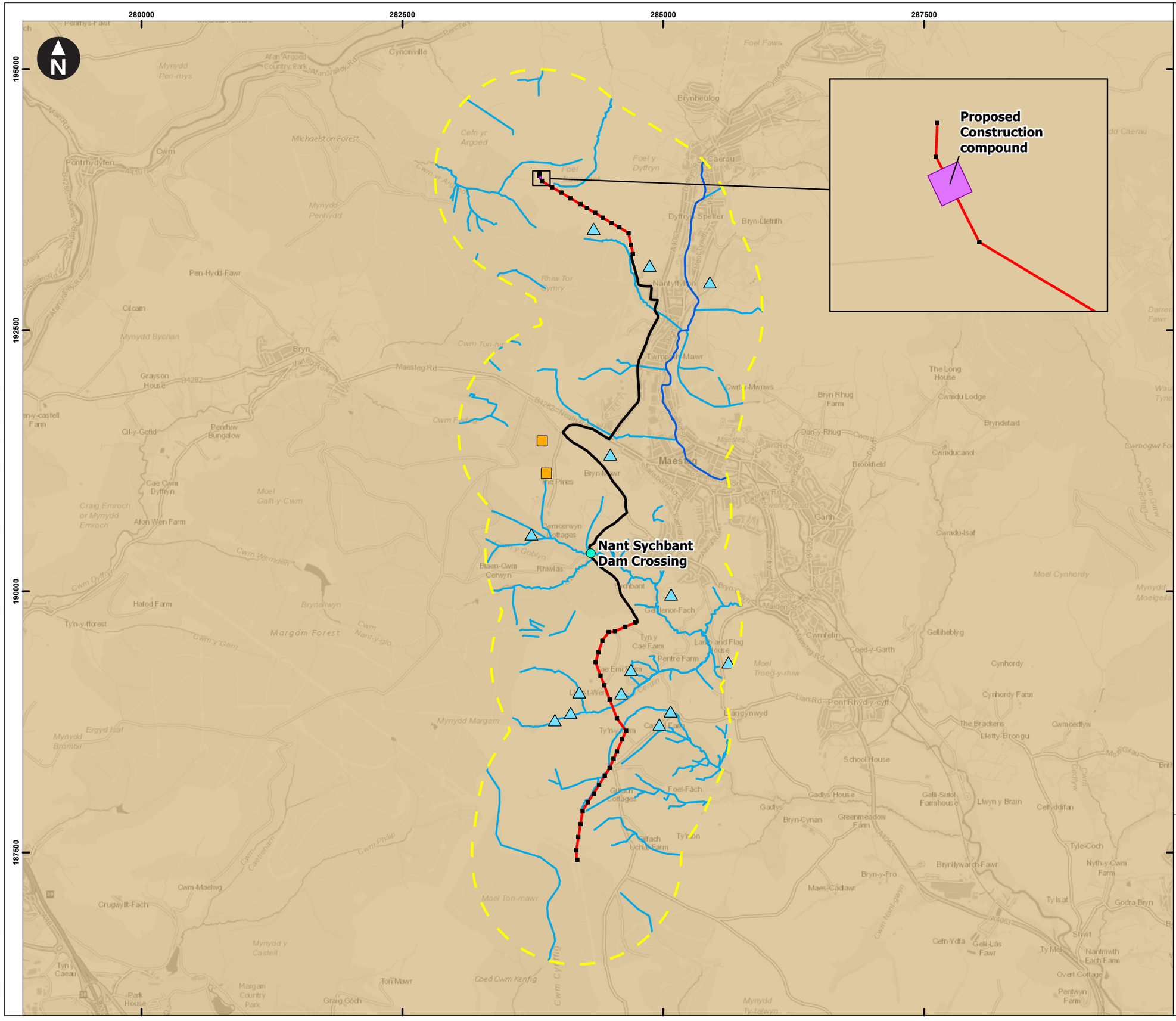
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Appendix 10A - Water Framework Directive Assessment (WFD)

**Figure 10A.2**
**Water Framework Directive (WFD) Surface Water Body Catchments**

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Appendix 10A - Water Framework Directive Assessment (WFD)

**Figure 10A.3**
**Water Framework Directive (WFD) Ground Water Body Catchments**

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# Annex B

## WFD WATER BODY DATA

Public

**Table B-1 – WFD Cycle 3 data for Ffrwd Wyllt - headwaters to tidal limit (GB110058026100) Water Body.**

| Water Body ID | GB110058026100 |
|---|---|
| Water Body Name | Ffrwd Wyllt - headwaters to tidal limit |
| Water Body Type | River |
| Water Body Area | 65.92 $km^2$ |
| Hydromorphological Designation | Heavily Modified |
| Current Overall Status/Potential | Moderate |
| Protected Area Designation | None |
| Overall Ecological Status/ Potential | Moderate |
| Overall Ecological Status Objective | Good by 2027 |
| Overall Biological Status | Good |
| Fish | Good |
| Invertebrates | High |
| Macrophytes and Phytobenthos Combined | High |
| Macrophytes Sub Element | High |
| Phytobenthos Sub Element | High |
| Physico-chemical Quality Elements | High |
| Acid Neutralising Capacity | High |
| Ammonia (Phys-Chem) | High |
| Dissolved oxygen | High |
| pH | High |
| Phosphate | High |
| Temperature | High |
| Specific pollutants | High |
| Arsenic | High |
| Copper | High |
| Iron | High |

| Water Body ID | GB110058026100 |
|---|---|
| Manganese | High |
| Zinc | High |
| Overall Chemical Status | High |
| Overall Chemical Quality Element Status Objective | High by 2027 |
| Priority Hazardous Substances | High |
| Cadmium and Its Compounds | High |
| Priority substances | High |
| 1,2-dichloroethane | High |
| Benzene | High |
| Dichloromethane | High |
| Lead and Its Compounds | High |
| Nickel and Its Compounds | High |
| Trichloromethane | High |
| Carbon Tetrachloride | High |
| Hydromorphological Supporting Elements | Moderate |
| Hydrological Regime | Moderate |
| Supporting elements (Surface Water) | Moderate |
| Mitigation Measures Assessment | Moderate |

**Table B-2 – WFD Cycle 3 data for Afan - conf with Corrwg to confluence with Pelenna (GB110058026130) Water Body.**

| Water Body ID | GB110058026130 |
|---|---|
| Water Body Name | Afan - conf with Corrwg to confluence with Pelenna |
| Water Body Type | River |
| Water Body Area | 20.68 $km^2$ |
| Hydromorphological Designation | Natural |
| Current Overall Status/Potential | Moderate |
| Protected Area Designation | None |
| Overall Ecological Status/ Potential | Moderate |
| Overall Ecological Status Objective | Good by 2027 |
| Overall Biological Status | Moderate |
| Fish | Moderate |
| Invertebrates | High |
| Macrophytes and Phytobenthos Combined | High |
| Macrophytes Sub Element | High |
| Phytobenthos Sub Element | High |
| Physico-chemical Quality Elements | High |
| Acid Neutralising Capacity | High |
| Ammonia (Phys-Chem) | High |
| Dissolved oxygen | High |
| pH | High |
| Phosphate | High |
| Temperature | High |
| Specific pollutants | High |
| 2,4-dichlorophenol | High |
| Arsenic | High |
| Copper | High |

| Water Body ID | GB110058026130 |
|---|---|
| Iron | High |
| Manganese | High |
| Phenol | High |
| Triclosan | High |
| Zinc | High |
| Overall Chemical Status | High |
| Overall Chemical Quality Element Status Objective | High by 2027 |
| Priority Hazardous Substances | High |
| Anthracene | High |
| Cadmium and Its Compounds | High |
| Endosulfan | High |
| Hexachlorocyclohexane | High |
| Nonylphenol | High |
| Priority substances | High |
| 1,2-dichloroethane | High |
| Benzene | High |
| Dichloromethane | High |
| Dichlorvos | High |
| Lead and Its Compounds | High |
| Nickel and Its Compounds | High |
| Octylphenol | High |
| Pentachlorophenol | High |
| Trichloromethane | High |
| Aldrin, Dieldrin, Endrin & Isodrin | High |
| Carbon Tetrachloride | High |
| Hydromorphological Supporting Elements | Not High |
| Hydrological Regime | High |

| Water Body ID | GB110058026130 |
|---|---|
| Morphology | Not High |

**Table B-3 – WFD Cycle 3 data for Kenfig - headwaters to tidal (GB110058026170) Water Body.**

| Water Body ID | GB110058026170 |
|---|---|
| Water Body Name | Kenfig - headwaters to tidal |
| Water Body Type | River |
| Water Body Area | 29.53 $km^2$ |
| Hydromorphological Designation | Natural |
| Current Overall Status/Potential | Moderate |
| Protected Area Designation | None |
| Overall Ecological Status/ Potential | Moderate |
| Overall Ecological Status Objective | Good by 2027 |
| Overall Biological Status | Moderate |
| Fish | Good |
| Invertebrates | High |
| Macrophytes and Phytobenthos Combined | Moderate |
| Macrophytes Sub Element | Moderate |
| Physico-chemical Quality Elements | Good |
| Acid Neutralising Capacity | High |
| Ammonia (Phys-Chem) | High |
| Dissolved oxygen | Good |
| pH | High |
| Phosphate | High |
| Temperature | High |
| Specific pollutants | High |
| Arsenic | High |
| Copper | High |
| Iron | High |

| Water Body ID | GB110058026170 |
|---|---|
| Manganese | High |
| Zinc | High |
| Overall Chemical Status | High |
| Overall Chemical Quality Element Status Objective | High by 2027 |
| Priority Hazardous Substances | High |
| Cadmium and Its Compounds | High |
| Endosulfan | High |
| Hexachlorocyclohexane | High |
| Nonylphenol | High |
| Priority substances | High |
| 1,2-dichloroethane | High |
| Benzene | High |
| Dichloromethane | High |
| Lead and Its Compounds | High |
| Nickel and Its Compounds | High |
| Trichloromethane | High |
| Aldrin, Dieldrin, Endrin & Isodrin | High |
| Carbon Tetrachloride | High |
| DDT Total | High |
| Hydromorphological Supporting Elements | Moderate |
| Hydrological Regime | Moderate |
| Morphology | Not High |

**Table B-4 - WFD Cycle 3 data for Llynfi - headwaters to Lletty Brongu STW (GB110058026331) Water Body.**

| Water Body ID | GB110058026331 |
|---|---|
| Water Body Name | Llynfi - headwaters to Lletty Brongu STW |
| Water Body Type | River |
| Water Body Area | 32.94 $km^2$ |
| Hydromorphological Designation | Natural |
| Current Overall Status/Potential | Moderate |
| Protected Area Designation | None |
| Overall Ecological Status/ Potential | Moderate |
| Overall Ecological Status Objective | Moderate by 2027 |
| Overall Biological Status | Moderate |
| Fish | Moderate |
| Invertebrates | High |
| Macrophytes and Phytobenthos Combined | Good |
| Macrophytes Sub Element | High |
| Phytobenthos Sub Element | Good |
| Physico-chemical Quality Elements | High |
| Acid Neutralising Capacity | High |
| Ammonia (Phys-Chem) | High |
| Dissolved oxygen | High |
| pH | High |
| Phosphate | High |
| Temperature | High |
| Specific pollutants | Not assessed |
| Overall Chemical Status | Not assessed |
| Overall Chemical Quality Element Status Objective | Not assessed |
| Priority Hazardous Substances | Not assessed |

| Water Body ID | GB110058026331 |
|---|---|
| Priority substances | Not assessed |
| Hydromorphological Supporting Elements | Not High |
| Hydrological Regime | Not High |
| Morphology | Not High |

**Table B-5 - WFD Cycle 3 data for Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332) Water Body.**

| Water Body ID | GB110058026332 |
|---|---|
| Water Body Name | Llynfi - Lletty Brongu STW to conf with Ogmore |
| Water Body Type | River |
| Water Body Area | 20.53 $km^2$ |
| Hydromorphological Designation | Natural |
| Current Overall Status/Potential | Moderate |
| Protected Area Designation | None |
| Overall Ecological Status/ Potential | Moderate |
| Overall Ecological Status Objective | Good by 2027 |
| Overall Biological Status | Good |
| Fish | High |
| Invertebrates | High |
| Macrophytes and Phytobenthos Combined | Good |
| Macrophytes Sub Element | High |
| Phytobenthos Sub Element | Good |
| Physico-chemical Quality Elements | Moderate |
| Acid Neutralising Capacity | High |
| Ammonia (Phys-Chem) | High |
| Dissolved oxygen | High |
| pH | High |
| Phosphate | Poor |
| Temperature | High |
| Specific pollutants | High |
| Arsenic | High |
| Copper | High |
| Iron | High |

| Water Body ID | GB110058026332 |
|---|---|
| Manganese | High |
| Zinc | High |
| Overall Chemical Status | High |
| Overall Chemical Quality Element Status Objective | High by 2027 |
| Priority Hazardous Substances | High |
| Cadmium and Its Compounds | High |
| Nonylphenol | High |
| Priority substances | High |
| Lead and Its Compounds | High |
| Nickel and Its Compounds | High |
| Pentachlorophenol | High |
| Hydromorphological Supporting Elements | Not High |
| Hydrological Regime | Not High |
| Morphology | Not High |

**Table B-6 - WFD Cycle 3 data for Swansea Carboniferous Coal Measures (GB41002G201000) water body.**

| Water Body ID | GB41002G201000 |
|---|---|
| Water Body Name | Swansea Carboniferous Coal Measures |
| Water Body Type | Groundwater |
| Water Body Area | 758.73 $km^2$ |
| Hydromorphological Designation | Natural |
| Quantitative GWDTEs test | Good |
| Quantitative Dependent Surface Water Body Status | Good |
| Quantitative Saline Intrusion | Good |
| Quantitative Water Balance | Good |
| **Overall Quantitative Objective** | Good by 2027 |
| Chemical Drinking Water Protected Area | Good |
| General Chemical Test | Good |
| Chemical GWDTEs test | Good |
| Chemical Dependent Surface Water Body Status | Poor |
| Chemical Saline Intrusion | Good |
| **Overall Chemical Objective** | Good by 2027 |
| Trend Assessment | High |
| **Trend Assessment Objective** | High by 2027 |

# Annex C

## WFD MITIGATION MEASURES

Public

**Table C-1 – Ffrwd Wyllt - headwaters to tidal limit Water Body (GB110058026100) WFD Mitigation Measures**

| Mitigation Measure Type | Mitigation Measure | Mitigation Measures Compliance Assessment |
|---|---|---|
| Structural Modification | 16. Fish passes | The Project is due to have no permanent effect, either negative or positive on structural modifications present within the Ffrwd Wyllt - headwaters to tidal limit water body.<br>No permanent barriers to fish passage will be constructed as part of this project, while ecology will neither be enhanced or diminished. There will be no impact to locks within this water body. |
| | 19. Enhance ecology | |
| | 20. Changes to locks etc | |
| Operations and maintenance | 21. Avoid the need to dredge | The Project is due to have no permanent effect, either negative or positive on operations and maintenance of the Ffrwd Wyllt - headwaters to tidal limit Water Body.<br>Any dredging-related mitigation measures will not be impacted by the Project given that the Project does not require dredging during any part of the construction or operation.<br>A noise and vibration management plan will be in place as part of the Project which will maintain disturbance management during OHL and UGC construction **(OCEMP (Appendix 4A) (Annex A - Outline Noise and Vibration Management Plan).**<br>Excavations have the potential to intercept groundwater (dependent on the water table depth), which could require dewatering and discharge. Dewatering will temporarily impact localised groundwater levels and flow. The lowering of the water table with dewatering will be temporary and on a local scale only, so won't have a significant impact on dependent surface water bodies or overall water balance. In addition, a vast majority of the excavations are not in proximity to the Ffrwd Wyllt - headwaters to tidal limit Water Body such that these impacts are further minimised.<br>Sediment-management and reduction of sediment resuspension mitigation measures will not be impacted. Sediment management plans including silt traps and swales to trap silty water (**WFD-C-EMM-9**) are in place during the Construction Stage of the Project, while Operational Stages are not anticipated to have |
| | 22. Dredging disposal strategy | |
| | 23. Reduce impact of dredging | |
| | 24. Reduce sediment resuspension | |
| | 25. Retime dredging or disposal | |
| | 26. Sediment management | |
| | 27. Dredge disposal site selection | |
| | 28. Manage disturbance | |
| | 32. Phased de-watering | |
| | 33. Selective vegetation control | |
| | 34. Vegetation control | |
| | 35. Vegetation control timing | |
| | 36. Invasive species techniques | |

| Mitigation Measure Type | Mitigation Measure | Mitigation Measures Compliance Assessment |
|---|---|---|
| | | any impact upon sediment. Vegetation control-related mitigation measures are being managed by Micro-siting for OHL pole sets to minimize vegetation loss (**WFD-C-EMM-2**).<br>Invasive Species Techniques will not be impacted due no watercourse crossings being present within the Ffrwd Wyllt - headwaters to tidal limit Water Body. In addition to this, a pre-works check up to four weeks prior to the commencement of the Project for INNS will be carried out. In the event that areas where INNS are present cannot be avoided, treatment and removal of INNS to be carried out by suitably certified contractors. Biosecurity measures, such as boot wash stations, will be implemented throughout construction to avoid the introduction or spread of INNS (**WFD-C-EMM-17**)**.** |
| Working with physical form and function | 4. Remove or soften hard bank | The Project is due to have no permanent effect, either negative or positive on changing physical form of the Ffrwd Wyllt - headwaters to tidal limit Water Body.<br>No removal of hard banks or bank rehabilitation will be carried out as part of the project.<br>No alterations to channel physical form are proposed within the Ffrwd Wyllt - headwaters to tidal limit Water Body. |
| | 5. Preserve or restore habitats | |
| | 6. In-channel morph diversity | |
| | 7. Bank rehabilitation | |
| Navigation | 49. Modify vessel design | The Project is due to have no permanent effect, either negative or positive on watercourse navigation of the Ffrwd Wyllt - headwaters to tidal limit Water Body. |
| | 50. Vessel Management | |
| | 51. Boats in central track | |
| Education | 52. Invasive species awareness | The Project is due to have no permanent effect, either negative or positive on watercourse education of the Ffrwd Wyllt - headwaters to tidal limit Water Body. |
| | 53. Boat wash awareness | |

*Note that the Designation Reasons/HM Use is Navigation including ports for every mitigation measure.
**Measure status is ‘Not in Place – Not Yet Identified’ for every mitigation measure too.

# Annex D

## EMBEDDED MITIGATION MEASURES

Public

**Table D-1 - Mitigation measures to manage the potential risks to the Water Environment and WFD compliance. Key: EMM stands for Embedded Mitigation Measure; C stands for Construction Phase; and O stands for Operation Phase.**

| Mitigation Reference | Description of mitigation measure | Potential Impacts to WFD Quality Element |
|---|---|---|
| **Construction** | | |
| WFD-C-EMM-1 | Working areas, where possible, will not be within 9m of watercourses. Where this is not possible, approaches will follow relevant best-practice and guidance, for example Guidance for Pollution Prevention 1 and 5. | Surface water:<br>■ Loss of morphological diversity and habitat;<br>■ Loss of lateral connectivity/continuity;<br>■ Alteration to flows, water quantity and/or quality;<br>■ Alteration to natural bed and/or bank;<br>■ Alteration to sediment input, transport and deposition (including pollution risk);<br>■ Loss of marginal, aquatic and riparian habitat;<br>■ Alterations to shading; and<br>■ Noise and Vibration.<br>Groundwater:<br>■ Alteration to groundwater quantity and flow; and<br>■ Release of existing pollution through disturbance of contaminated soils. |
| WFD-C-EMM-2 | Micro-siting for OHL pole sets to minimize vegetation loss, reduce risks of pollution, and protect aquatic habitats. | Surface water:<br>■ Loss of morphological diversity and habitat;<br>■ Alteration to sediment input, transport and deposition (including pollution risk);<br>■ Loss of marginal, aquatic and riparian habitat;<br>■ Alteration to flows, water quantity and/or quality; and<br>■ Noise and Vibration.<br>Groundwater:<br>■ Alteration to groundwater quality; and<br>■ Release of existing pollution through disturbance of contaminated soils. |
| WFD-C-EMM-3 | Any crossing of a watercourse for open cut trenching will require consent from the relevant authority. In addition, any required discharge to or abstraction from surface water or groundwater resources may require prior consent from NRW in accordance with the relevant permitting and abstraction regulations. | Surface water:<br>■ Loss of lateral connectivity/continuity; and<br>■ Noise and Vibration.<br>Groundwater:<br>■ Alteration to groundwater quantity and flow;<br>■ Potential for flood risk;<br>■ Alteration to groundwater quality;<br>■ Release of existing pollution through disturbance of contaminated soils; and<br>■ Alteration to natural bed and/or bank. |
| WFD-C-EMM-4 | The Environmental Manager shall carry out daily visual inspections of all watercourses, drainage outfalls, and pumping activities, particularly during periods of inclement weather. | Surface water:<br>■ Loss of morphological diversity and habitat;<br>■ Loss of lateral connectivity/continuity; |

| Mitigation Reference | Description of mitigation measure | Potential Impacts to WFD Quality Element |
|---|---|---|
| | | ▪ Alteration to natural bed and/or bank; and<br>▪ Alteration to flows, water quantity and/or quality.<br>Groundwater:<br>▪ Potential for flood risk;<br>▪ Alteration to groundwater quality; and<br>▪ Release of existing pollution through disturbance of contaminated soils. |
| WFD-C-EMM-5 | Chemicals and fuels to be stored in secure containers located away from watercourses or water bodies. Spill kits to be made available. | Surface water:<br>▪ Alteration to flows, water quantity and/or quality;<br>▪ Alteration to sediment input, transport and deposition (including pollution risk); and<br>▪ Loss of marginal, aquatic and riparian habitat.<br>Groundwater:<br>▪ Alteration to groundwater quality. |
| WFD-C-EMM-6 | Roads and hard surfaces will be kept clean, to prevent a build-up of mud and sediment that could contaminate surface water. | Surface water:<br>▪ Alteration to flows, water quantity and/or quality;<br>▪ Alteration to sediment input, transport and deposition (including pollution risk);<br>▪ Loss of marginal, aquatic and riparian habitat; and<br>▪ Alteration to natural bed and/or bank.<br>Groundwater:<br>▪ Alteration to groundwater quality;<br>▪ Increased sediment input. |
| WFD-C-EMM-7 | Surface and foul drainage will be separated, stored on site, and removed by a licensed contractor. | Surface water:<br>▪ Alteration to flows, water quantity and/or quality; and<br>▪ Alteration to sediment input, transport and deposition (including pollution risk). |
| WFD-C-EMM-8 | No disposal of any liquids to surface water drains. | Surface water:<br>▪ Alteration to flows, water quantity and/or quality; and<br>▪ Alteration to sediment input, transport and deposition (including pollution risk). |
| WFD-C-EMM-9 | Installation of silt traps and swales to trap silty water. | Surface water:<br>▪ Alteration to flows, water quantity and/or quality; and<br>▪ Alteration to sediment input, transport and deposition (including pollution risk).<br>Groundwater:<br>▪ Increased sediment input. |
| WFD-C-EMM-10 | Directing any drainage of fuel storage areas, via an oil interceptor, to contain any accidental spillage. | Surface water:<br>▪ Alteration to flows, water quantity and/or quality; and<br>▪ Alteration to sediment input, transport and deposition (including pollution risk). |

| Mitigation Reference | Description of mitigation measure | Potential Impacts to WFD Quality Element |
|---|---|---|
| | | Groundwater:<br>■ Alteration to groundwater quality. |
| WFD-C-EMM-11 | Regular visual inspection of working areas and surface water management facilities for evidence of contamination from fuel or sediment, particularly following periods of heavy rainfall. | Surface water:<br>■ Alteration to flows, water quantity and/or quality;<br>■ Alteration to sediment input, transport and deposition (including pollution risk); and<br>■ Alteration to natural bed and/or bank.<br>Groundwater:<br>■ Alteration to groundwater quality;<br>■ Increased sediment input; and<br>■ Release of existing pollution through disturbance of contaminated soils. |
| WFD-C-EMM-12 | Water quality monitoring will also be undertaken at agreed specified times during construction. | Surface water:<br>■ Alteration to flows, water quantity and/or quality; and<br>■ Alteration to sediment input, transport and deposition (including pollution risk).<br>Groundwater:<br>■ Alteration to groundwater quality;<br>■ Increased sediment input; and<br>■ Release of existing pollution through disturbance of contaminated soils. |
| WFD-C-EMM-13 | The contractor will be responsible for identifying the source of the leakage or spillage and for rectifying the problem. The priority will be to stop the source of spillage and contain it from entering a sensitive receptor area. Once the source of the spillage has been identified, absorbent pads will be used as a barrier to any further contamination. | Surface water:<br>■ Alteration to flows, water quantity and/or quality; and<br>■ Alteration to sediment input, transport and deposition (including pollution risk).<br>Groundwater:<br>■ Alteration to groundwater quality. |
| WFD-C-EMM-14 | Should a spill enter a drain, the route and outfall point should be quickly identified and if possible, the appropriate outlet valve shut off. If required, drains will be pumped out to remove contamination and remove the risk of environmental damage by it entering a watercourse or sewage treatment works. | Surface water:<br>■ Alteration to flows, water quantity and/or quality; and<br>■ Alteration to sediment input, transport and deposition (including pollution risk).<br>Groundwater:<br>■ Alteration to groundwater quality. |
| WFD-C-EMM-15 | Should a spillage enter a sensitive receptor area and risk causing a pollution incident, NRW will be notified on its emergency pollution incident number. Records of all incidents will be maintained and made available for audit or inspection. | Surface water:<br>■ Alteration to flows, water quantity and/or quality; and<br>■ Alteration to sediment input, transport and deposition (including pollution risk).<br>Groundwater:<br>■ Alteration to groundwater quality. |
| WFD-C-EMM-16 | Preventative and control measures will be implemented to comply with the Water Resources Act 1991, Environmental Protection Act 1990 and other associated regulations. These control measures include: | Surface water:<br>■ Alteration to flows, water quantity and/or quality; and |

| Mitigation Reference | Description of mitigation measure | Potential Impacts to WFD Quality Element |
|---|---|---|
| | ▪ Designating a fuel and hazardous storage area within the site compound, with adequate bunds and impervious walls and floors to ensure containment, sited at least 10m from any foul or surface drain where possible, at least 20m from any watercourses and away from areas at risk of flooding;<br>▪ Any tanks or drums will be stored in a secure container, to be kept locked when not in use; and,<br>▪ Utilising drip trays to collect leaks from fuel pumps or standing plant. | ▪ Alteration to sediment input, transport and deposition (including pollution risk).<br>Groundwater:<br>▪ Alteration to groundwater quality. |
| WFD-C-EMM-17 | Where INNS are located and within the construction corridor, the engagement of an INNS specialist will be sought whom will provide options for treatment and or removal in advance of construction. Any remaining stands of INNS will be subject to exclusion zones which will be clearly and physically demarcated and enforced around areas of invasive species to avoid spread or propagation. The extent of buffer will be determined by the species and in consultation with the ECoW. Biosecurity measures will be implemented during construction to prevent the spread of INNS<br>Mitigation measures to ensure the protection of species on site, prior to construction and during construction works and to stop the transfer/establishment of INNS will be implemented with the following control measures.<br>Biosecurity measures, such as boot wash stations, will be implemented throughout construction to avoid the introduction or spread of INNS.<br>Pre-work checks up to four weeks prior to the commencement of the Project for INNS should be carried out. In the event that areas where INNS are present cannot be avoided, treatment and removal of INNS to be carried out by suitably certified contractors. | Surface water:<br>▪ Transfer and establishment of Invasive Non-native Species (INNS). |
| WFD-C-EMM-18 | During any river dewatering and/or in-channel working, a fish rescue plan will be employed. Where areas are required to be temporarily dewatered to facilitate construction activities, fish will be removed under NRW consent and relocated before dewatering. Any environmental permit(s) shall be obtained and in place before the creation of a temporary dry channel. The construction of a temporary dry channel shall be undertaken by the mitigation measures contained within the Detailed CEMPs and any other relevant measures prescribed by granted permits from NRW. A pump may be required to divert flows during construction. Where this occurs, a 2 mm screen will be fitted on the transfer intake to minimise the risk of fish and eel entrainment. | Surface water:<br>▪ Loss of lateral connectivity/continuity. |
| WFD-C-EMM-19 | Sensitivity (e.g. to noise and vibration) of those fish species present will be considered to ensure that appropriate construction methods can be implemented to minimise and avoid disturbance or avoidance behaviour. | Surface water:<br>▪ Loss of lateral connectivity/continuity; and<br>▪ Noise and Vibration. |
| WFD-C-EMM-20 | Where practicable, construction works will avoid works on watercourses during high flow events to reduce the risk of fine sediment release, increased flood risk, and impacts to aquatic ecology. Where possible, the Construction Contractor will seek to target activities at or near watercourses during the drier summer months to reduce this risk. | Surface water:<br>▪ Loss of lateral connectivity/continuity.<br>Groundwater:<br>▪ Potential for flood risk; and<br>▪ Increased sediment input. |
| WFD-C-EMM-21 | Watercourses will be reinstated to mimic baseline conditions as far as practicable, including bank forms, in-channel features (such as riffles, pools, point bars etc), and morphological diversity. This includes the reinstatement of the vegetation assemblage and structure, using an appropriate species mix, within the riparian zone and in-channel. | Surface water:<br>▪ Loss of lateral connectivity/continuity; and<br>▪ Loss of marginal, aquatic and riparian habitat. |
| **Operation** | | |
| WFD-O-EMM-1 | During the operation phase for OHL, duties are limited to resilience tree cutting to retain clearance distances and regular inspection. Pole inspections will be carried out in line with company policies and procedures. | Surface water:<br>▪ Loss/alteration to the Riparian Zone. |

| Mitigation Reference | Description of mitigation measure | Potential Impacts to WFD Quality Element |
|---|---|---|
| | | |

# Annex E

## WATERCOURSES WITHIN WFD WATER BODY CATCHMENTS

Public

**Table E-1 – Watercourses within WFD River Water Body Catchments within the Project Study Area. Note that unless specifically stated with "(main river)" then each watercourse should be assumed to be an ordinary watercourse.**

| WFD River Water Body | Ffrwd Wyllt - headwaters to tidal limit (GB110058026100) | Afan - conf with Corrwg to confluence with Pelenna (GB110058026130) | Kenfig – Headwater to Tidal (GB110058026170) | Llynfi - headwaters to Lletty Brongu STW (GB110058026331) | | Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332) |
|---|---|---|---|---|---|---|
| Watercourses | Nant Cwmfarteg | Blaen Nant | Kenfig | Llynfi (Main River) | Tributary of Nant Lluest-wen 8 | Nant Bryncynan |
| | Tributary of Nant Cwmfarteg 1 | Nant Cynon | Nant Craigyrabe | Nant Cwmcerwyn | Tributary of Nant Lluest-wen 9 | Nant y Castell |
| | Tributary of Nant Drysiog 1 | Nany Tryfal | | Nant Goblyn | Tributary of Nant Lluest-wen 10 | Nant y Gadlys |
| | Tributary of Nant Drysiog 2 | Tributary of Blaen Nant 1 | | Nant Gwyn Bach | Tributary of Nant Sychbant 1 | Tributary of Nant Bryncynan 1 |
| | Tributary of Nant Drysiog 3 | Tributary of Nant Cynon 1 | | Nant Lluest-wen | Tributary of Nant Sychbant 2 | Tributary of Nant y Castell 1 |
| | Tributary of Nant Drysiog 4 | Tributary of Nant Cynon 2 | | Nant Sychbant | Tributary of Nant Sychbant 3 | Tributary of Nant y Castell 2 |
| | Tributary of Nant Drysiog 5 | Tributary of Nant Cynon 3 | | Nant y Cerdin | Tributary of Nant Sychbant 4 | Tributary of Nant y Castell 3 |
| | | Tributary of Nant Cynon 4 | | Nant y Crynwydd | Tributary of Nant Sychbant 5 | Tributary of Nant y Castell 4 |
| | | Tributary of River Afan 1 | | Nant y Ffyllon | Tributary of Nant Sychbant 6 | Tributary of Nant y Castell 5 |
| | | | | Tributary of Nant Goblyn 1 | Tributary of Nant Sychbant 7 | Tributary of Nant y Castell 6 |
| | | | | Tributary of Nant Goblyn 2 | Tributary of Nant y Cerdin 1 | Tributary of Nant y Castell 7 |
| | | | | Tributary of Nant Goblyn 3 | Tributary of River Llynfi 1 | Tributary of Nant y Castell 8 |
| | | | | Tributary of Nant Lluest-wen 1 | Tributary of River Llynfi 2 | Tributary of Nant y Castell 9 |
| | | | | Tributary of Nant Lluest-wen 2 | Tributary of River Llynfi 3 | Tributary of Nant y Gadlys 1 |
| | | | | Tributary of Nant Lluest-wen 3 | Unnamed Ditch 1 | Tributary of Nant y Gadlys 2 |
| | | | | Tributary of Nant Lluest-wen 4 | Unnamed Ditch 2 | Tributary of Nant y Gadlys 3 |
| | | | | Tributary of Nant Lluest-wen 5 | Unnamed Ditch 3 | Tributary of Nant y Gadlys 4 |
| | | | | Tributary of Nant Lluest-wen 6 | Unnamed Ditch 4 | Unnamed Ditch 5 |
| | | | | Tributary of Nant Lluest-wen 7 | | |



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