Pennant Walters

GLANLLYNFI GARTH WIND FARM

Draft Environmental Statement

Appendix 10B - Water Framework Directive Assessment

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PUBLIC

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1. Introduction

1.1 Background

1.1.1 WSP UK Ltd, hereafter referred to as WSP, has been commissioned by Pennant Walters Ltd (the 'Applicant') to undertake a Water Framework Directive (WFD) assessment to support a planning application for the construction, operation and decommissioning of the proposed Glanllynfi Garth Wind Farm (herein referred to as the 'Proposed Development').

1.1.2 The Proposed Development comprises the construction, operation and decommissioning of a wind farm of up to eight wind turbines, with a maximum blade tip height of 180 m, on land to the east of Maesteg in South Wales. The Proposed Development is arranged across two land parcels, referred to as the Northern Array (Mynydd Pwll-yr-lwrch) and the Southern Array (Moel Cynhordy / Mynydd Moelgella).

1.2 Study Area

1.2.1 The Study Area used for undertaking the WFD assessment is defined as the Development Site plus a 1 km buffer for surface water bodies and groundwater bodies.

1.2.2 Watercourses and WFD water bodies within the Study Area have been identified and mapped (refer to **Annex A**), with corresponding WFD classification data on those water bodies screened in within **Section 3 - Stage 1: WFD Screening** provided in **Annex B**.

1.2.3 The following water bodies are located within the Study Area and considered in this WFD assessment:

Surface Water Bodies

- Afan - headwaters to confluence with Corrwg (GB110058026120) which lies in the Afan Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Afon Cynon - source to conf Aman R (GB109057033110) which lies in the Cynon Operational Catchment, the South East Valleys Management Catchment, and the Severn Basin District;
- Afon Rhondda Fach - source to conf Rhondda R (GB109057027210) which lies in the Rhondda Operational Catchment, the South East Valleys Management Catchment, and the Severn Basin District;
- Clydach Brook - HW to conf with River Neath (GB110058026380) which lies in the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Corrwg - headwaters to confluence with Afan (GB110058026150) which lies in the Afan Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Garw - headwaters to confluence with Ogmore (GB110058026320) which lies in the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;

- Llynfi - headwaters to Lletty Brongu STW (GB110058026331) which lies in the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332) which lies in the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Neath - conf with Nedd Fechan and Mellte to TL (GB110058032430) which lies in the Neath Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Ogwr Fawr - headwaters to confluence with Ogmore (GB110058026340) which lies in the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District;
- Rhondda R - source to conf Afon Rhondda Fach (GB109057027200) which lies in the Rhondda Operational Catchment, the South East Valleys Management Catchment, and the Severn Basin District; and
- Sychryd - headwaters to confluence with Mellte (GB110058032320) which lies in the Neath Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District.

Groundwater Bodies

- SE Valleys Carboniferous Coal Measures (GB40902G201900) which lies in the SE Valleys Carboniferous Coal Measures Operational Catchment, the South East Valleys GW Management Catchment, and the Severn Basin District; and
- Swansea Carboniferous Coal Measures (GB41002G201000) which lies in the Swansea Carboniferous Coal Measures Operational Catchment, the Tawe to Cadoxton GW Management Catchment, and the Western Wales Basin District.

1.3 Description of the Proposed Development

1.3.1 The Proposed Development comprises the construction, operation and eventual decommissioning of up to eight wind turbines and associated infrastructure. Construction is anticipated to take approximately 22 months and will include turbine foundations, crane pads, temporary construction compounds and site offices, underground cabling, substations and transformer housing, new and upgraded access tracks, and overhead line connections to agreed points of connection with National Grid Electricity Distribution (NGED). Following commissioning, the Proposed Development is anticipated to operate for approximately 30 years before being decommissioned, with decommissioning works anticipated to take approximately six months. In accordance with the EIA Scoping Direction, decommissioning is considered at a high level within this assessment; however, no detailed decommissioning methodology has been defined at this stage.

1.3.2 The Proposed Development is located predominantly within Bridgend County Borough Council, with the Forestry access track traversing Rhondda Cynon Taf County Borough Council and Neath Port Talbot County Borough Council administrative areas.

1.3.3 Elements of the Proposed Development pertinent to the WFD assessment include:

Construction Phase (approximately 22 months)

- Construction of turbine foundations, crane pads and associated hardstanding;
- Construction and upgrading of access tracks;

- Installation of underground cabling and electrical infrastructure (assumed to comprise open-cut trench excavation, cable laying and backfilling as a worst-case scenario);
- Construction of substations and transformer housing;
- Installation of overhead line connections to NGED points of connection;
- Temporary construction compounds and site offices; and
- Construction activities including site clearance, earthworks and temporary drainage measures.

Operational Phase (approximately 30 years)

- Operation and maintenance of wind turbines and associated infrastructure;
- Operation of substations, transformer housing and electrical infrastructure;
- Operation and maintenance of access tracks;
- Operation of permanent drainage infrastructure; and
- Operation of overhead line connections.

Decommissioning Phase (approximately 6 months)

- Removal of turbines and above-ground infrastructure;
- Removal of substations, transformer housing and associated electrical equipment;
- Decommissioning-related vehicle movements and crane activities;
- Temporary compounds required for decommissioning works; and
- Restoration of disturbed areas.

1.3.4 The construction and upgrading of the Forestry Access Tracks, including any associated watercourse crossings, have been considered as part of the WFD screening assessment at a high level based on the currently available design information. However, at this stage, the extent and specification of these elements are not fully defined. As such, potential impacts will be subject to further WFD assessment at the detailed design stage once sufficient information becomes available. This will ensure that any interactions with surface water features are appropriately assessed and that mitigation measures are refined, as necessary, to maintain compliance with WFD objectives and avoid deterioration in water body status.

1.4 Background to the WFD

1.4.1 An assessment of potential impacts arising from works and 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) (HM Government, 2017)[1]. For groundwater, an assessment of potential impacts of activities affecting groundwater bodies is required under The Groundwater (Water Framework Directive) (England) Direction 2016 (HM Government, 2016)[2]. Compliance with WFD legislation is

[1] HM Government (2017) Water Environment (Water Framework Directive) Regulations 2017 [Online]. Available at: https://www.legislation.gov.uk/uksi/2017/407/contents (Accessed:30/06/2026)
[2] HM Government (2016) Groundwater (Water Framework Directive) (England) Direction 2016 [Online]. Available at: https://www.gov.uk/government/publications/the-groundwater-water-framework-directive-england-direction-2016 (Accessed: 30/06/2026)

required to support the planning and subsequent consenting of the Proposed Development.

1.4.2 The WFD assessment will be undertaken in accordance with relevant Natural Resources Wales (NRW) guidance[3] and, where applicable, recognise CEN/ISO standards as referenced within Annex V of the Water Framework Directive (Directive 2000/60/EC) (European Union, 2000)[4].

1.4.3 The WFD aims to protect and enhance the water environment, prevent deterioration in water body status, and support the achievement of Good Ecological Status (GES) or Good Ecological Potential (GEP), alongside Good Chemical Status, where applicable. Ecological Status or Potential is determined through assessment of biological, physico-chemical and hydromorphological quality elements.

1.4.4 This assessment establishes baseline conditions within the Study Area, evaluates the potential impacts of the Proposed Development, and assesses compliance with WFD objectives. GES reflects conditions with only slight deviation from natural or near-natural characteristics, while GEP applies to artificial or heavily modified water bodies (HMWBs), recognising physical constraints but requiring ecological and chemical quality to be protected and enhanced as far as practicable.

1.4.5 The WFD sets a number of environmental objectives, including:

- Prevent deterioration in the status of all water bodies;
- Protect, enhance and restore surface water bodies with the aim of achieving GES and good surface water chemical status, subject to applicable target dates set by NRW;
- Achieve GEP and good chemical status for artificial or HMWB, recognising their modified characteristics and uses;
- Allow for alternative objectives where achieving GES or GEP is technically infeasible or disproportionately costly, including extended deadlines or less stringent objectives where justified;
- Comply with objectives and standards for WFD Protected Areas within the Study Area; and
- Reduce pollution from priority substances and progressively cease or phase out discharges, emissions and losses of priority hazardous substances.

[3] Natural Resources Wales (2026) Complying with the Water Framework Directive Regulations 2017: screening, scoping and detailed assessment [Online]. Available at: Natural Resources Wales / Complying with the Water Framework Directive Regulations 2017: screening, scoping and detailed assessment (Accessed 22/07/2026)
[4] European Union (2000) Water Framework Directive (Directive 2000/60/EC) [Online]. Available at: https://eur-lex.europa.eu/eli/dir/2000/60/oj/eng (Accessed: 30/06/2026)

2. Methodology

2.1 Data Collection

Desk Study

2.1.1 A desk-based study was carried out to inform the WFD assessment. This involved reviewing available information for the Study Area to establish baseline conditions for relevant water bodies. The following data sources were used to inform the desk study:

- Geology and soil mapping (British Geological Survey, 2026; Cranfield University, 2026)[5,6];
- WFD status, classification and objectives from Water Watch Wales (WWW) (Natural Resources Wales, 2026)[7];
- National River Flow Archive (UK Centre for Ecology and Hydrology, 2026)[8,9];
- Water Quality Archive (Natural Resources Wales, 2026)[10];
- Data Map Wales LiDAR Viewer (Natural Resources Wales, 2026)[11];
- Historical mapping from the National Library of Scotland archive (National Library of Scotland, 2026)[12];
- Amber Atlas Barrier Mapping (Amber International, 2026)[13];
- MAGIC Maps (Department for Environment, Food and Rural Affairs, 2026)[14];
- DataMapWales (Welsh Government, 2026)[15]; and

[5] British Geological Survey (2026) Geoindex [Online]. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.7771506.1572189385.1782808206-146387397.1782808206 (Accessed: 30/06/2026)
[6] Cranfield University (2026) Soilscapes Viewer [Online]. Available at: https://www.landis.org.uk/soilscapes/ (Accessed: 30/06/2026)
[7] Natural Resources Wales (2026) Water Watch Wales [Online]. Available at: https://waterwatchwales-nrw.hub.arcgis.com/ (Accessed: 30/06/2026)
[8] UK Centre for Ecology and Hydrology (2026) 58005 – Ogmore at Brynmenyn National River Flow Archive [Online]. Available at: https://nrfa.ceh.ac.uk/data/station/spatial/58005 (Accessed: 30/06/2026)
[9] UK Centre for Ecology and Hydrology (2026) 58007 - Llynfi at Coytrahen [Online]. National River Flow Archive. Available at: https://nrfa.ceh.ac.uk/data/station/info/58007 (Accessed: 30/06/2026)
[10] Natural Resources Wales (2026) NRW Water Quality Archive [Online]. Available at: https://datamap.gov.wales/layers/geonode:nrw_water_quality_archive_stations (Accessed: 30/06/2026)
[11] Natural Resources Wales (2026) Data Map Wales LiDAR Viewer [Online]. Available at: https://datamap.gov.wales/maps/lidar-viewer/ (Accessed: 30/06/2026)
[12] National Library of Scotland (2026) Side by side georeferenced map viewer [Online]. Available at: https://maps.nls.uk/geo/explore/side-by-side/#zoom=5.0&lat=56.00000&lon=-4.00000&layers=1&right=ESRIWorld (Accessed: 30/06/2026)
[13] Amber International (2026) Amber Barrier Atlas [Online]. Available at: https://amber.international/european-barrier-atlas/ (Accessed: 30/06/2026)
[14] Department for Environment, Food and Rural Affairs (2026) Magic Map [Online]. Available at: https://magic.defra.gov.uk/MagicMap.html (Accessed: 30/06/2026)
[15] Welsh Government (Llywodraeth Cymru) (2026) Data Map Wales [Online]. Available at: https://datamap.gov.wales/ (Accessed: 22/07/2026)

- NBN Atlas Wales (National Biodiveristy Network, 2026)[16].

2.2 WFD Assessment Process

2.2.1 The WFD assessment methodology applied is based on guidance provided in Planning Inspectorate Advice Note 18: The Water Framework Directive (HM Government, 2025)[17]. This guidance outlines a three-stage process to WFD assessment comprising screening, scoping and impact assessment.

Stage 1: Screening

2.2.2 Screening is undertaken to identify activities associated with the Proposed Development which have the potential to result in deterioration of a water body or prevent the achievement of its WFD objectives. Screening identifies those activities that require progression to the scoping stage, as well as those that can be screened out where no likely significant effect on WFD receptors is anticipated.

Stage 2: Scoping

2.2.3 Scoping is undertaken to identify risks to WFD receptors arising from the Proposed Development, considering the relevant WFD water bodies and associated quality elements (including status, objectives and supporting parameters) during the Construction, Operational and Decommissioning Stages. Potential risks to hydromorphology, biology (including habitats and fish), physico-chemical water quality, WFD Protected Areas and Invasive Non-Native Species (INNS) are considered.

2.2.4 For construction and decommissioning activities, effects are not considered to result in deterioration where it can be demonstrated that any impacts are temporary, limited in spatial extent, and that the affected water body is able to recover within a short timeframe without the need for intervention or restoration measures.

2.2.5 The scoping stage identifies those receptors and WFD quality elements that require progression to Stage 3 (impact assessment).

Stage 3: Impact Assessment

2.2.6 An impact assessment is undertaken for each receptor identified as being at risk of deterioration or non-compliance with WFD objectives, as defined within the relevant River Basin Management Plan. The assessment considers the potential effects of the Proposed Development on WFD status and objectives, considering embedded mitigation and design measures.

2.2.7 Where the potential for deterioration of a water body or failure to meet WFD objectives is identified, and this cannot be avoided through mitigation, the Proposed Development is considered in the context of Article 4.7 of the WFD, which provides a framework for assessing exceptions to WFD objectives where specific criteria are met.

[16] National Biodiveristy Network (2026) NBN Atlas Wales [Online]. Available at: https://nbn.org.uk/ (Accessed: 22/07/2026)
[17] HM Government (2025) Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive [Online]. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive (Accessed: 30/06/2026)

3. Stage 1: WFD Screening

3.1.1 The purpose of the WFD screening stage is to identify the extent to which the Proposed Development may pose a risk to the water environment and thereby affect the status of WFD water bodies or the ability to achieve their WFD objectives. A plan showing the WFD water bodies within and adjacent to the Study Area is provided in **Annex A**.

3.2 Screening of Surface Water Bodies

3.2.1 The Northern and Southern Array of the Proposed Development are situated within the following water bodies:

- Garw - headwaters to confluence with Ogmore (GB110058026320);
- Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and
- Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).

3.2.2 These water bodies are therefore, identified as having the potential to be directly impacted by the Proposed Development, due to activities that may interact with the local water environment. On this basis, these water bodies have been screened in for further assessment.

3.2.3 The following water bodies are all intersected by the access routes of the Proposed Development:

- Afan - headwaters to confluence with Corrwg (GB110058026120);
- Clydach Brook - HW to conf with River Neath (GB110058026380);
- Corrwg - headwaters to confluence with Afan (GB110058026150);
- Neath - conf with Nedd Fechan and Mellte to TL (GB110058032430);
- Rhondda R - source to conf Afon Rhondda Fach (GB109057027200); and
- Sychryd - headwaters to confluence with Mellte (GB110058032320).

3.2.4 At this stage, sufficient design information is not available to assess the potential effects associated with upgrades required for the Forestry Access Track (to facilitate abnormal load deliveries), including the extent, location, construction requirements and any interactions with watercourses. Consequently, the potential impacts of these works on the identified WFD water bodies cannot currently be assessed and are therefore not considered further within this report. Once detailed design information becomes available, any proposed access track upgrades for the Forestry Access Track and associated watercourse interactions will be assessed separately as part of the final ESto determine whether further WFD assessment is required.

3.2.5 The following water bodies are located within the Study Area but do not intersect with the Proposed Development or its associated infrastructure:

- Afon Cynon - source to conf Aman R (GB109057033110);
- Afon Rhondda Fach - source to conf Rhondda R (GB109057027210); and
- Ogwr Fawr - headwaters to confluence with Ogmore (GB110058026340).

3.2.6 These water bodies are situated in areas associated with access routes, as opposed to the Northern and Southern Arrays. However, they are not hydraulically connected to the Proposed Development, and there is no plausible pathway through which construction or operational activities could affect their WFD status. On this basis, these water bodies have been screened out of further assessment.

3.3 Screening of Groundwater Bodies

3.3.1 The Swansea Carboniferous Coal Measures (GB41002G201000) Groundwater Body is situated beneath the vast majority of the Proposed Development, including both the Northern and Southern Arrays and associated infrastructure. Therefore, construction and operational activities, including excavation, earthworks, and potential changes to recharge and runoff pathways, have the potential to interact with groundwater within this body. As such, a plausible pathway for impact on groundwater quality or quantity at the water body scale cannot be excluded at this stage. On this basis, this groundwater body has been screened in for further assessment.

3.3.2 The SE Valleys Carboniferous Coal Measures (GB40902G201900) Groundwater Body is intersected by a small section of the Proposed Development associated with access infrastructure along the eastern extent of the Proposed Development. However, the interaction with this groundwater body is limited in spatial extent and is restricted to superficial works. There is no requirement for deep excavation, dewatering, or activities that would affect groundwater levels or quality at the water body scale. As such, any effects would be highly localised and would not influence groundwater body status. On this basis, no plausible pathway for impact at the groundwater body scale has been identified, and this groundwater body has been screened out of further assessment.

3.4 Screening of Protected Areas

3.4.1 No Protected Areas are situated within the Study Area. The following Protected Area designations have been reviewed as part of the WFD Screening Assessment:

- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);
- Ramsar Sites;
- Drinking Water Protected Areas;
- Drinking Water Safeguard Zones (Surface Water and Groundwater);
- Source Protection Zones (SPZs) (Zone I, II and III);
- Nitrate Vulnerable Zones (NVZs) (Surface Water and Groundwater);
- Urban Waste Water Treatment Directive (UWWTD) Sensitive Areas;
- Bathing Waters; and
- Shellfish Waters.

3.5 Screening of Activities

3.5.1 The screening conclusions for surface water and groundwater impacts are presented in **Table 3-1** and **Table 3-2** below. In addition, **Annex A** presents figures showing the

Northern and Southern Arrays of the Proposed Development in relation to nearby watercourses and WFD water bodies, providing context for **Table 3-1**.

3.5.2 In the absence of a defined decommissioning methodology, decommissioning impacts are considered at a high level only and are anticipated to be broadly comparable to construction activities, in that they are likely to involve infrastructure removal and ground disturbance; however, the precise nature, extent and duration of these works are not yet defined and may differ. Nevertheless, as decommissioning activities are expected to be similar in nature to, and no greater than, those assessed for the construction phase, the assessment presented within this report is considered sufficiently robust to inform the EIA and identify the likely significant effects on WFD receptors.

Table 3-1 WFD Screening of Activities and Potential Impacts for Surface Water Bodies

WFD Water Body Catchment	Activity	Description	Potential Impacts	Screening Outcome	
				Construction	Operation
• **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** • **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Turbine foundations and associated infrastructure	Excavation, construction and operational presence of turbine foundations, crane pads and associated hardstanding areas, including placement of concrete and compacted materials.	Construction: • Fine sediment and pollution risk; • Physical disturbance / alteration to natural bed and/or banks; • Bankside erosion and impacts on riparian habitats; • Loss of aquatic, marginal and/or riparian habitats; • Alteration to flows, water quantity and/or quality; and • Alteration to sediment input, transport and/or deposition. Operation: • Not applicable, as the presence of turbine foundations, crane pads and associated hardstanding areas during the operation phase would not result in ongoing interactions with surface water receptors.	In	Out
• **Llynfi - headwaters to Lletty Brongu STW (GB110058026331).**	Installation and operation of underground cabling and electrical infrastructure	Installation and operation of buried electrical cables and associated infrastructure within trenches across the Proposed Development, including excavation, cable laying and backfilling. In the absence of detailed construction information, installation of underground cabling has been assumed to require excavation via open-cut trenching as a reasonable worst-case scenario for the purposes of this assessment.	Construction: • Physical disturbance / alteration to natural bed and/or banks; • Fine sediment and pollution risk; • Alteration to sediment input, transport and/or deposition; • Alteration to flows, water quantity and/or quality; • Noise and vibration; • Loss of aquatic, marginal and/or riparian habitats; and • Bankside erosion and impacts on riparian habitats. Operation: • No likely impacts during operation, as the buried electrical cables and associated infrastructure would be installed below ground and would not result in ongoing disturbance to surface water receptors following completion of construction.	In	Out
• **Garw - headwaters to confluence with Ogmore (GB110058026320);** • **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and**	General construction-phase activities	General construction activities including vegetation clearance, soil stripping, excavation, ground re-profiling, implementation of temporary drainage measures, construction of substations and	Construction: • Fine sediment and pollution risk; • Alteration to flows, water quantity and/or quality; and • Noise and vibration.	In	Out

WFD Water Body Catchment	Activity	Description	Potential Impacts	Screening Outcome	
				Construction	Operation
• **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		transformer housing, establishment and use of temporary construction compounds and site offices, and the storage, handling and use of fuels, oils and other construction materials.	Operation: • No likely impacts during operation, as no direct interaction with watercourses is proposed and surface water runoff would be appropriately managed.		
• **Llynfi - headwaters to Lletty Brongu STW (GB110058026331).**	Overhead line connections to NGED points of connection	Installation and operation of overhead line connections, including poles and conductors, to link the Proposed Development to existing electricity distribution infrastructure.	Construction: • Physical disturbance / alteration to natural bed and/or banks; • Fine sediment and pollution risk; • Alteration to sediment input, transport and/or deposition; • Loss of aquatic, marginal and/or riparian habitats; and • Noise and vibration. Operation: • No likely impacts during operation, as overhead lines and poles do not interact directly with watercourses and do not alter flow, sediment processes, habitat or connectivity.	In	Out
• **Garw - headwaters to confluence with Ogmore (GB110058026320);** • **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** • **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Installation and operation of permanent and temporary drainage infrastructure	Installation and operation of drainage systems such as ditches, drains, attenuation features and surface water management measures to control runoff during construction and operation.	Construction: • Physical disturbance / alteration to natural bed and/or banks; • Fine sediment and pollution risk; • Alteration to flows, water quantity and/or quality; • Alteration to sediment input, transport and/or deposition; • Loss of aquatic, marginal and/or riparian habitats; and • Bankside erosion and impacts on riparian habitats. Operation: • Alteration to flows, water quantity and/or quality; and • Alteration to sediment input, transport and/or deposition.	In	In
• **Garw - headwaters to confluence with Ogmore (GB110058026320);**	Temporary dewatering and groundwater control	Localised removal or control of groundwater to facilitate construction activities, such as	Construction: • Alteration to flows, water quantity and/or quality;	In	Out

WFD Water Body Catchment	Activity	Description	Potential Impacts	Screening Outcome	
				Construction	Operation
• **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** • **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		excavations for foundations and infrastructure.	• Fine sediment and pollution risk; • Alteration to sediment input, transport and/or deposition; and • Loss of aquatic, marginal and/or riparian habitats. Operation: • Not applicable, as this is a temporary construction phase activity with no ongoing interaction with surface water receptors.		
• **Garw - headwaters to confluence with Ogmore (GB110058026320);** • **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** • **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Turbines, substations and electrical infrastructure (including permanent infrastructure footprint)	Routine operation and maintenance, and continued presence, of wind turbines, substations and electrical infrastructure, including periodic inspection, maintenance and repair activities.	Construction: • Construction impacts are assessed under General construction-phase activities. Operation: • Alteration to flows, water quantity and/or quality.	Out	In

Table 3-2 - WFD Screening of Activities and Potential Impacts for Swansea Carboniferous Coal Measures (GB41002G201000) Groundwater Body

Activity	Description	Potential Impacts	Screening Outcome	
			Construction	Operation
Construction of turbine foundations, crane pads and associated hardstanding;	Excavation, construction and operational presence of turbine foundations, crane pads and associated hardstanding areas, including placement of concrete and compacted materials.	Construction: ● Mobilisation of contaminated sediments during excavation works entering the aquifer; ● Fuel and chemical spillages from plant and machinery ● Dewatering and lowering of groundwater levels during excavation. Operation: ● Loss of infiltration area	In	In
Installation of underground cabling and electrical infrastructure;	Installation and operation of buried electrical cables and associated infrastructure within trenches across the Proposed Development, including excavation, cable laying and backfilling.	Construction: ● At this stage, no specific details have been provided regarding the number, type, location or design of watercourse crossings, including whether these would be temporary or permanent; ● Where crossings interact directly with watercourses, there is a clear pathway for impacts to WFD water bodies; ● Further information will be required at the detailed design stage to confirm the extent of works and any potential interaction with watercourses; and ● Accordingly, this activity is not considered further within the WFD scoping assessment at this stage and will be revisited as part of the detailed design process, should interactions with watercourses be identified. Operation: ● Crossings, where permanent, may result in ongoing interaction with watercourses, however in the absence of defined design, potential impacts are conservatively assumed and will be confirmed at detailed design stage; and Accordingly, this activity is not considered further within the WFD scoping assessment at this stage and will be revisited as part of the detailed design process, should interactions with watercourses be identified.	Out	Out

Activity	Description	Potential Impacts	Screening Outcome	
			Construction	Operation
Construction of substations and transformer housing;	Construction and operation of substations including transformer housing. For construction this involves earthworks, foundations, building structures and installation of electrical equipment.	Construction: • Mobilisation of contaminated sediments during excavation works entering the aquifer; • Fuel and chemical spillages from plant and machinery • Dewatering and lowering of groundwater levels during excavation, earthworks and foundation works. Operation: • Not applicable, as this is a temporary construction phase activity with no ongoing interaction with groundwater receptors.	In	Out
Overhead line connections to National Grid Electricity Distribution (NGED) points of connection;	Installation and operation of overhead line connections, including poles and conductors, to link the Proposed Development to existing electricity distribution infrastructure.	Construction: • Mobilisation of contaminated sediments during excavation works entering the aquifer; • Fuel and chemical spillages from plant and machinery • Dewatering and lowering of groundwater levels during excavation. Operation: • Not applicable, as this is a temporary construction phase activity.	In	Out
Temporary construction compounds and site offices; and	Establishment and use of temporary construction compounds and site offices, including areas for plant, materials storage and workforce facilities.	Construction: • Mobilisation of contaminated sediments during excavation works entering the aquifer; • Fuel and chemical spillages from plant and machinery. Operation: • Not applicable, as this is a temporary construction phase activity with no ongoing interaction with groundwater receptors.	In	Out
General construction-phase activities	General construction activities including vegetation clearance, soil stripping, excavation, ground re-profiling and implementation of temporary drainage measures.	Construction: • Mobilisation of contaminated sediments during excavation works entering the aquifer; • Fuel and chemical spillages from plant and machinery	In	Out

Activity	Description	Potential Impacts	Screening Outcome	
			Construction	Operation
		• Dewatering and lowering of groundwater levels during excavation. Operation: • Not applicable, as this is a temporary construction phase activity.		
Installation and operation of permanent and temporary drainage infrastructure	Installation and operation of drainage systems such as ditches, drains, attenuation features and surface water management measures to control runoff during construction and operation.	Construction: • Mobilisation of contaminated sediments during excavation works entering the aquifer; • Fuel and chemical spillages from plant and machinery • Dewatering and lowering of groundwater levels during excavation. Operation: • Not applicable, as this is a temporary construction phase activity.	In	Out
Temporary dewatering and groundwater control	Localised removal or control of groundwater to facilitate construction activities, such as excavations for foundations and infrastructure.	Construction: • Mobilisation of contaminated sediments during excavation works entering the aquifer; • Fuel and chemical spillages from plant and machinery • Dewatering and lowering of groundwater levels during excavation. Operation: • Not applicable, as this is a temporary construction phase activity.	In	Out
Storage and use of fuels and oils	Storage, handling and use of fuels, oils and other materials required for construction activities, including refuelling and maintenance of plant and equipment.	Construction: • Fuel and chemical spillages from plant and machinery Operation: • Not applicable, as this is a temporary construction phase activity with no ongoing interaction with surface water receptors.	In	Out
Operation and maintenance of turbines and associated infrastructure	Routine operation of wind turbines and associated infrastructure, including periodic inspection, maintenance and repair activities	Construction: • Not applicable, as this is an operational phase activity.	Out	Out

Activity	Description	Potential Impacts	Screening Outcome	
			Construction	Operation
		Operation: • No potential impacts to groundwater		
Operational vehicle movements on access tracks	Use of access tracks for routine maintenance activities, including use of crossings such as culverts or bridges where tracks intersected watercourses.	Construction: • Not applicable, as this is an operational phase activity. Operation: • No potential impacts to groundwater	Out	Out
Operation of substations and electrical infrastructure	Operation of substations and associated electrical infrastructure, including control systems and equipment housed within permanent structures.	Construction: • Not applicable, as this is an operational phase activity. Operation: • No potential impacts to groundwater	Out	Out

4. Baseline Conditions

4.1 Garw - headwaters to confluence with Ogmore (GB110058026320) WFD Water Body

WFD Status

4.1.1 Garw - headwaters to confluence with Ogmore (GB110058026320) Water Body could be impacted by the Proposed Development. A summary of the status of the water body is provided below, and the latest classification is provided in **Annex B**. Garw - headwaters to confluence with Ogmore Water Body is a river water body and is currently performing at 'moderate' ecological potential and has a chemical status of 'High'. The water body is designated as a HMWB due to physical modification, while there are no reasons available on NRW WWW for not achieving good (RNAG)[7]. The associated HMWB WFD mitigation measures can be seen in **Annex C**. Garw - headwaters to confluence with Ogmore Water Body is situated within the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District. The water body has an ecological potential objective of 'Moderate' by 2027, while no chemical status objective is available.

Catchment Characteristics

4.1.2 The Proposed Development lies within the Garw - headwaters to confluence with Ogmore Water Body catchment, but does not directly cross the water body itself. The catchment is characterised by a pronounced southerly gradient, with ground levels decreasing from approximately 540 mAOD to around 53 mAOD.

4.1.3 Land use within the Garw - headwaters to confluence with Ogmore Water Body catchment is predominantly rural and strongly influenced by agricultural activity. Urban development within the catchment is limited to the villages of Blaengarw, Pontycymer, Pont-y-rhyl, Llangeinor and Brynmenyn. The drainage network also receives inputs from isolated farmsteads and minor infrastructure dispersed throughout the wider catchment.

4.1.4 Garw - headwaters to confluence with Ogmore Water Body is not gauged, and neither are its tributaries (UK Centre for Ecology and Hydrology, 2026)[8]. The water body has a catchment area of approximately 23.30 km^2 and a WFD water body length of approximately 11.78 km. The river flows approximately in a southerly direction.

Catchment Geology and Soils

Solid Geology

4.1.5 The Garw - headwaters to confluence with Ogmore Water Body catchment is underlain by South Wales Middle Coal Measures Formation (Mudstone, siltstone and sandstone), South Wales Upper Coal Measures Formation (Mudstone, siltstone and sandstone), (Llynfi Member-Mudstone), siltstone and sandstone, (Llynfi Member-Sandstone), (Rhondda Member-Sandstone), (Rhondda Member-Mudstone, siltstone and sandstone), Hughes Member (Sandstone) and Hughes Member (Mudstone, siltstone and sandstone). All of these lithologies are classified as Secondary A aquifers (British Geological Survey, 2026)[5].

Superficial Geology

4.1.6 The Garw - headwaters to confluence with Ogmore Water Body catchment is predominantly void of superficial deposits. Where present the catchment is underlain by Devensian glacial till (diamicton), alluvium (clay, silt, sand and gravel) and peat (British Geological Survey, 2026)[5]. Alluvium is classed as a Secondary A Aquifer, the Devensian glacial till is classified as a Secondary (undifferentiated) aquifer, while peat is classified as Unproductive (British Geological Survey, 2026)[5].

Soils

4.1.7 In the Garw - headwaters to confluence with Ogmore Water Body catchment, soils are a mix of very acidic loamy upland soils with a wet peaty surface, Freely draining acid loamy soils over rock and Slowly permeable wet very acid upland soils with a peaty surface (Cranfield University, 2026)[6].

Catchment Hydrology

4.1.8 Afon Garw is the only main river watercourse situated within the Study Area which is approximately 650 m from the Proposed Development at its closest point. Several ordinary watercourses are also present within the Study Area and include Nant Cwm-du, Garw Fechan, Nant Llwyncria, Nant Cwm-gwyn and Nant Gwinau. In addition, several unnamed ordinary watercourses are present. Nant Cwm-du is the only watercourse crossed by the Proposed Development, specifically, where an existing access track will be utilised to access the Southern Array. The location of this existing crossing is at SS 88942 90978.

Historical Channel Change

4.1.9 Afon Garw, Nant Cwm-du, Garw Fechan, Nant Llwyncria, Nant Cwm-gwyn and Nant Gwinau are all present on the earliest available archived historical mapping (National Library of Scotland, 2026)[12]. Changes from the archived historical mapping to the present day are minimal, with artificial straightening likely occurring prior to the earliest archived mapping. This is clearly evident with the Afon Garw, which is straightened adjacent to the A4064 while in the Study Area north of Pont-y-rhyl.

4.1.10 Garw Fechan represents an exception to the otherwise straightened channel morphology, exhibiting a meandering planform in both historic and contemporary mapping. The position of these meanders differs slightly between mapping sources, indicating active lateral channel migration. The watercourse is though located approximately 400 m from the Proposed Development at its closest point.

Baseline Characteristics Against Surface Water Quality Elements

Hydromorphology Quality Elements

Quantity and Dynamics of Flow

4.1.11 Flow conditions within the Afon Garw and its tributary, the Garw Fechan, are indicative of a variable, but generally moderate to low-energy upland river system. Site-specific observations from Google Street View imagery (Google, 2026)[18] suggest that, during

[18] Google (2026) Google Maps [Online]. Available at: https://www.google.co.uk/maps/ (Accessed: 30/06/2026)

lower flow conditions (March 2011 imagery), the watercourses are relatively shallow (typically <0.5 m depth) with slow-flowing to gently rippled surfaces, reflecting the presence of coarse bed material (pebble to cobble) and limited flow energy.

4.1.12 However, evidence of geomorphic activity, including localised bank erosion and undercutting within the Garw Fechan (SS 90483 89730), indicates that flows periodically increase in magnitude and are sufficient to mobilise sediments and erode natural banks. This suggests a responsive flow regime with variability between low and higher flow conditions.

4.1.13 Further downstream on the Afon Garw (SS 90563 89453), imagery from December indicates comparatively deeper water and increased flow, although the difference in conditions is likely influenced by seasonal variation.

Connection to Groundwater

4.1.14 The Study Area within the Garw - headwaters to confluence with Ogmore Water Body catchment are largely underlain by a combination of Secondary A bedrock aquifers, and Secondary (undifferentiated) superficial deposits (British Geological Survey, 2026)[5]. These geological conditions indicate the potential for moderate groundwater–surface water interaction, particularly where more permeable sandstone units and alluvial deposits are present.

4.1.15 At a local scale, the presence of alluvium within the valley floor is likely to facilitate some hydraulic connectivity between the watercourses and the shallow groundwater system. However, the dominance of cohesive glacial till and less permeable mudstone units is likely to limit groundwater contributions in places.

4.1.16 At a larger catchment scale in a similar hydrogeological setting, the BFI of 0.49 (UK Centre for Ecology and Hydrology, 2026)[8] indicates a moderate contribution of groundwater to river flows, suggesting a mixed hydrological regime influenced by both groundwater inputs and direct runoff.

4.1.17 Observations from Streetview imagery indicate shallow channel depths and responsive flow conditions, suggesting limited baseflow support during dry periods, with flows more strongly influenced by direct runoff and seasonal rainfall.

River Continuity

4.1.18 The Study Area within the Garw - headwaters to confluence with Ogmore Water Body catchment is locally modified by a small number of in-channel and over-channel structures which have the potential to influence river continuity. These comprise a road bridge at Beech Road located approximately 35 m downstream of the Garw Fechan confluence (SS 90486 89736), a further road bridge over the Afon Garw (SS 90518 89701), and the Garw Valley Railway crossing (SS 90558 89447).

4.1.19 Based on available imagery (Google, 2026)[18], these structures do not appear to form complete barriers to flow or longitudinal connectivity; however, they introduce localised physical modifications to the channel. In particular, the railway crossing includes an abutment which protrudes into the channel from the left bank, with an associated artificial bar formation on the right bank. These features are likely to alter local flow pathways and sediment transport processes, resulting in minor, localised disruption to continuity.

4.1.20 In addition to longitudinal continuity, connectivity between the Afon Garw and its adjacent floodplain varies throughout the Study Area. Whilst some reaches remain connected to the surrounding floodplain, localised constraints to lateral connectivity are present where bridges, transport infrastructure and associated modifications influence the channel

corridor. Consequently, floodplain connectivity is considered to be variable across the Study Area, with both connected and locally modified reaches present.

River Width and Depth Variation

4.1.21 The Garw Fechan is a narrow tributary, typically approximately 1 to 1.5 m in width, while the Afon Garw is wider, with channel widths generally in the order of 4 to 5 m at observable locations, including beneath the Garw Valley Railway crossing and at a nearby road bridge (SS 90518 89701). Smaller tributaries, such as Nant Cwm-gwyn, are approximately 1 m in width and appear relatively incised, based on aerial imagery.

4.1.22 Dense riparian tree cover along much of the watercourses limits direct observation of channel geometry; therefore, width estimates are informed by a combination of aerial mapping and localised Street View imagery. Where visible, channel widths appear relatively consistent along the Afon Garw, with minor local variation associated with in-channel features and structures.

4.1.23 Depth is generally shallow under low flow conditions, with observed depths typically less than 0.5 m within the Afon Garw and the Garw Fechan based on March 2011 imagery, whereby the bed is visible (Google, 2026)[18]. However, deeper conditions are evident in downstream sections and during winter (December 2021 imagery), indicating seasonal variation in depth and discharge. An example of this is at Garw Valley Railway crossing where the Afon Garw appears noticeably deeper on Streetview (Google, 2026)[18].

Structure and Substrate of the River Bed

4.1.24 The riverbeds of the Afon Garw and its tributaries comprise a mixed substrate, with visible sediment fractions ranging from pebble to cobble size based on site-specific imagery (Google, 2026)[18]. Finer sediments are also expected to be present within the bed matrix and in lower energy depositional areas, although these are less readily identifiable from available imagery.

4.1.25 Localised depositional features are evident, including mid-channel and marginal bars, such as a bar associated with the Garw Valley Railway crossing and an additional bar within the Garw Fechan. These features contain a range of sediment sizes, from finer material to coarse fractions, and are often poorly sorted, reflecting variable flow conditions and episodic sediment transport. In places, artificial modification of the channel margins, including boulder placement along banks, influences local substrate characteristics and sediment dynamics.

Structure of the Riparian Zone

4.1.26 The riparian zone of the Afon Garw and its tributaries is characterised by a mix of woodland, scrub and grassland, with vegetation arranged in both continuous and semi-continuous belts along the channel margins. Tree cover is locally extensive, with sections of the Garw Fechan supporting riparian zones of up to approximately 30 m in width, comprising predominantly coniferous woodland.

4.1.27 In other areas, particularly where watercourses are adjacent to grassland, the riparian zone is narrower and composed of herbaceous vegetation and low shrubs. For example, sections of the Garw Fechan exhibit riparian zones only a few metres wide along one bank, reflecting local variation in land use and channel confinement.

4.1.28 Along the Afon Garw, the riparian zone is locally influenced by urbanisation and infrastructure, resulting in modified or reduced riparian margins in places.

Physico-chemical Quality Elements

4.1.29 The NRW Water Quality Archive was reviewed to assess the current conditions and classifications for the following relevant WFD physico-chemical quality elements (Natural Resources Wales, 2026)[10].

4.1.30 No freshwater river quality monitoring points are situated within the Garw - headwaters to confluence with Ogmore Water Body catchment that are within the Study Area. However, the R Garw at Brynmenyn R.B (S13027) monitoring location is situated approximately 5 km downstream of the Study Area at SS9066684782. This site is sampled monthly and occasionally twice a month, with the latest sampling occurrence at the time of writing in June 2026. The ten most recent samples for this monitoring point are between October 2025 and June 2026 and are averaged and summarised in **Table 4-1** below.

Specific Pollutants

4.1.31 In Cycle 3 (2021), the Garw - headwaters to confluence with Ogmore Water Body was classified as “not assessed” for Specific Pollutants.

Chemical Quality Elements

Priority Hazardous Substances and Priority Substances

4.1.32 In Cycle 3 (2021), the Garw - headwaters to confluence with Ogmore Water Body was classified as “not assessed” for both Priority Hazardous Substances and Priority Substances.

Table 4-1– NRW water quality monitoring data for Garw - headwaters to confluence with Ogmore Water Body.

Determinands	WFD Classification (Cycle 3, 2021)	R Garw at Brynmenyn R.B (S13027)		
		Highest	Average*	Lowest
Acid Neutralising Capacity	Not Assessed	Not Assessed**		
Ammonia: Ammonical Nitrogen as N (mg/l)	High	0.04 (February 2026)	0.02	<0.005 (October 2025 and May 2026)
Biochemical Oxygen Demand (BOD): 5 Day ATU (mg/l)	Not Assessed	1.32 (March 2026)	1.14	<1.00 (January, April and May 2026)
Oxygenation Conditions: Dissolved oxygen concentration (%)	High	107.5 (February 2026)	103.93	98.1 (November 2025)
Phosphate: Orthophosphate as P (mg/l)	High	0.015 (February 2026)	0.006	<0.004 (Four occurrences)
Thermal Conditions: Temperature (°C)	High	14.40 (June 2026)	10.34	7.70 (February 2026)
Acidification Status: pH	High	7.91 (May 2026)	7.60	7.25 (December 2025)

*Average values calculated using Limit of Detection (LOD) where values are recorded as less than the LOD.

** Acid Neutralising Capacity (ANC) is a composite physico-chemical quality element derived from multiple supporting determinands and is not reported as a standalone classified quality element. As such, no direct classification is available.

Biological Quality Elements

Fish

4.1.33 In Cycle 3 (2021), the Garw – headwaters to confluence with Ogmore Water Body was classified as “Good” for Fish.

4.1.34 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; the fish assemblage comprised European minnow (Phoxinus phoxinus), brown trout (Salmo trutta), Atlantic salmon (Salmo salar), lampreys (Lampetra spp.), bullhead (Cottus perifretum) and European eel (Anguilla anguilla). This assemblage is characteristic of well-connected, well-oxygenated river systems and includes several species of high conservation importance in Wales.

Macroinvertebrates

4.1.35 In Cycle 3 (2021), the Garw – headwaters to confluence with Ogmore Water Body was classified as “High” for Invertebrates.

4.1.36 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years in the Garw – headwaters to confluence with Ogmore; The aquatic invertebrate assemblage was dominated by a diverse range of odonates, mayflies, stoneflies, caddisflies and aquatic beetles characteristic of clean, well-oxygenated river habitats. Dragonflies and damselflies included the golden-ringed dragonfly (*Cordulegaster boltonii*), emperor dragonfly (*Anax imperator*), azure damselfly (*Coenagrion puella*), large red damselfly (*Pyrrhosoma nymphula*), blue-tailed damselfly (*Ischnura elegans*), common blue damselfly (*Enallagma cyathigerum*), southern hawker (*Aeshna cyanea*), beautiful demoiselle (*Calopteryx virgo*), broad-bodied chaser (*Libellula depressa*), four-spotted chaser (*Libellula quadrimaculata*), keeled skimmer (*Orthetrum coerulescens*) and common darter (*Sympetrum striolatum*). Mayflies comprised *Baetis scambus*, large dark olive (*Baetis rhodani/atlanticus*), blue-winged olive (*Serratella ignita*), March brown (*Rhithrogena semicolorata*), olive upright mayflies (*Ecdyonurus* spp.), *Electrogena* spp., angler’s curse (*Caenis rivulorum*) and green drake (*Ephemera danica*). Stoneflies included *Perlodes mortoni*, needle stoneflies (*Leuctra* spp.), common forest stoneflies (*Nemoura* spp.), *Nemurella pictetii*, *Amphinemura sulcicollis*, yellow sally (*Isoperla grammatica*) and yellow sally stonefly (*Siphonoperla torrentium*). Caddisflies were well represented by *Silo pallipes* (sedge case-maker), *Agapetus* spp. (saddle-case caddisflies), green sedge (*Rhyacophila dorsalis*), net-spinning caddisfly (*Hydropsyche siltalai*), silken sedge (*Sericostoma personatum*), orange-spotted sedge (*Odontocerum albicorne*) and scaly-winged sedge (*Lepidostoma hirtum*). Aquatic beetles included the bronze water beetle (*Elmis aenea*), riffle beetles (*Limnius volckmari*, *Esolus parallelepipedus* and *Oulimnius* spp.).

Macrophytes

4.1.37 In Cycle 3 (2021), the Garw – headwaters to confluence with Ogmore Water Body was not assessed for Macrophytes

4.1.38 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; *Fontinalis antipyretica* (Greater Water-moss).

INNS

4.1.39 A search of the NBN Atlas identified the presence of the following invasive species within the water body in the past 10 years; Impatiens glandulifera (Himalayan balsam), Fallopia japonica (Japanese knotweed) and Lysichiton americanus (American skunk-cabbage).

4.2 Llynfi - headwaters to Lletty Brongu STW (GB110058026331) WFD Water Body

WFD Status

4.2.1 Llynfi - headwaters to Lletty Brongu STW (GB110058026331) WFD Water Body could be impacted by the Proposed Development. A summary of the status of the water body is provided below, and the latest classification is provided in **Annex B**. 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 is not designated as artificial or heavily modified, while the reasons for not achieving good are due to point source pollution from sewage discharge. Llynfi - headwaters to Lletty Brongu STW is situated within the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District. The water body was targeted to achieve 'Moderate' ecological status by 2027, while no chemical status objective is available.

Catchment Characteristics

4.2.2 The Proposed Development lies within the Llynfi - headwaters to Lletty Brongu STW Water Body catchment but does not directly cross the water body itself. The catchment is characterised by a pronounced southerly gradient, with ground levels decreasing from approximately 555 mAOD to around 75 mAOD.

4.2.3 Land use within the Llynfi - headwaters to Lletty Brongu STW Water Body catchment is predominantly rural and strongly influenced by agricultural activity. Urban development within the catchment is limited to the villages of Carau, Nantyffyllon, Garth, Cwmfellin and Llangynwyd, The drainage network also receives inputs from isolated farmsteads and minor infrastructure dispersed throughout the wider catchment.

4.2.4 Llynfi - headwaters to Lletty Brongu STW Water Body is not gauged, and neither are its tributaries (UK Centre for Ecology and Hydrology, 2026)[8]. The water body has a catchment area of approximately 32.96 km^2 and a WFD water body length of approximately 18.44 km. The river flows approximately in a southerly direction.

Catchment Geology and Soils

Solid Geology

4.2.5 The Llynfi - headwaters to Lletty Brongu STW water body catchment is underlain by South Wales Middle Coal Measures Formation (Mudstone, siltstone and sandstone), South Wales Middle Coal Measures Formation (Sandstone), South Wales Upper Coal Measures Formation (Mudstone, siltstone and sandstone), Hughes Member (Sandstone), Brithdir Member (Mudstone, siltstone and sandstone), Brithdir Member (Sandstone), Rhondda Member (Sandstone), Rhondda Member-Mudstone (siltstone and sandstone), and Llynfi Member-Mudstone (siltstone and sandstone). All of these lithologies are classified as Secondary A aquifers (British Geological Survey, 2026)[5].

Superficial Geology

4.2.6 The Llynfi - headwaters to Lletty Brongu STW water body catchment is predominantly void of superficial deposits. Where present the catchment is underlain by Devensian

glacial till (diamicton), alluvium (clay, silt, sand and gravel) and peat (British Geological Survey, 2026)[5]. Alluvium is classed as a Secondary A Aquifer, the Devensian glacial till is classified as a Secondary (undifferentiated) aquifer, while peat is classified as Unproductive (British Geological Survey, 2026)[5].

Soils

4.2.7 In the Llynfi - headwaters to Lletty Brongu STW water body catchment, soils are a mix of very acidic loamy upland soils with a wet peaty surface, freely draining acid loamy soils over rock, slowly permeable wet very acid upland soils with a peaty surface, and freely draining floodplain soils (Cranfield University, 2026)[6].

Catchment Hydrology

4.2.8 The River Llynfi is the only main river watercourse situated within the Llynfi - headwaters to Lletty Brongu STW Water Body and is situated approximately 100 m downstream of the Study Area at its closest point. Several ordinary watercourses are also present within the Study Area and include River Llynfi (where it is designated as an ordinary watercourse instead of a main river), Nant Gwyn Bach, Nant Cwm-du and Nant y Fforest. In addition, several unnamed ordinary watercourses are present. Nant Gwyn Bach and two unnamed tributaries of Nant Cwm-du are crossed by the Proposed Development, specifically within the Northern Array. These two tributaries are located approximately 40 m from the two eastern most turbines within the Northern Array. These tributaries are not visible on available aerial imagery and show no discernible channel form or evidence of defined planform (e.g. meandering), and are therefore assumed to represent small, potentially ephemeral drainage features or headwater channels (Google, 2026; National Library of Scotland, 2026)[12,18]. As such, they are likely to exhibit limited flow permanence and geomorphological complexity relative to the main watercourse.

Historical Channel Change

4.2.9 River Llynfi, Nant Gwyn Bach, Nant Cwm-du and Nant y Fforest are all present on the earliest available archived historical mapping (National Library of Scotland, 2026)[12]. Changes from the archived historical mapping to the present day are minimal, with artificial straightening occurring both prior to the earliest archived mapping and since this mapping (e.g. Nant Gwyn Bach, Nant Cwm-du and River Llynfi).

4.2.10 In addition, the River Llynfi and Nant Gwyn Bach exhibit a meandering planform in both historic and contemporary mapping. The position of these meanders differs slightly between mapping sources, indicating active lateral channel migration. Note, that this active lateral channel migration is within the Study Area but not within the Proposed Development itself.

4.2.11 The minor, unnamed tributaries of Nant Cwm-du identified within the northern array are represented on historic mapping (National Library of Scotland, 2026)[12], however they are not discernible on available aerial imagery (Google, 2026)[18]. No defined channel form or planform features (e.g. meandering or lateral migration) are evident from the available evidence. This indicates that these features are likely to represent small, stable headwater drainage features with limited geomorphological activity and minimal potential for lateral channel movement over time.

Baseline Characteristics Against Surface Water Quality Elements

Hydromorphology Quality Elements

Quantity and Dynamics of Flow

4.2.12 Flow conditions within the River Llynfi and its tributaries (including Nant Gwyn Bach and Nant Cwm-du) are indicative of a variable, but generally low to moderate energy upland river system. Site-specific observations from aerial and Street View imagery (Google, 2026)[18] suggest relatively narrow channels (typically 1–3 m wide) with localised sinuosity and evidence of active geomorphic processes. Within Nant Gwyn Bach, upstream of SS 85845 94048, the channel displays variable sinuosity, with increased planform complexity approximately 700 m downstream of the Proposed Development at SS 86340 94106, where minor erosion and deposition features are evident. This indicates that flows are sufficient to periodically mobilise sediments despite generally low flow depths.

4.2.13 At SS 85845 94048, Nant Gwyn Bach appears incised with no visible surface water under vegetated conditions (June 2011 imagery), although Amber Atlas mapping (Amber International, 2026)[13] indicates the watercourse is culverted at this location and continues in a straightened, culverted alignment for approximately 200 m prior to its confluence with the River Llynfi.

4.2.14 The River Llynfi itself exhibits a more developed meandering planform throughout the Study Area, with evidence of erosion on outer bends and deposition on inner bends observed from aerial imagery (Google, 2026)[18], alongside the presence of in-channel bars on both meander bends and straighter reaches. The presence of mapped dams and weirs (Amber International, 2026)[13], in addition to a crossing by an unnamed unmetalled track, suggests localised regulation and interruption of flow continuity.

4.2.15 Nant Cwm-du (including its tributary, Nant y Fforest) is heavily vegetated and not clearly visible in available imagery; however, the dense riparian tree cover and limited visibility suggest a relatively shaded, confined channel likely to exhibit low to moderate flows. The crossing at Cwm Du Viaduct (SS 87430 89328) represents a local structure within the channel corridor.

Connection to Groundwater

4.2.16 The Study Area within the Llynfi – headwaters to Lletty Brongu STW Water Body catchment is underlain by a combination of Secondary A bedrock aquifers and Secondary A and Secondary (undifferentiated) superficial deposits (British Geological Survey, 2026)[5]. The bedrock geology are all classified as Secondary A aquifers, indicating the potential for groundwater storage and throughflow within fractured and weathered zones.

4.2.17 Superficial deposits include Devensian glacial till, alluvium, alluvial fan deposits and peat (British Geological Survey, 2026)[5]. The alluvial and alluvial fan deposits (sand and gravel) are likely to be comparatively permeable and therefore facilitate localised groundwater–surface water interaction. In contrast, the widespread presence of glacial till (diamicton), with typically low permeability, is likely to restrict infiltration in places, limiting hydraulic connectivity. Peat deposits are classified as unproductive and are unlikely to contribute significantly to groundwater – surface water interactions.

River Continuity

4.2.18 The Study Area within the Llynfi – headwaters to Lletty Brongu STW Water Body catchment is locally modified by a number of in-channel and over-channel structures

which have the potential to influence river continuity. These include culverted sections of Nant Gwyn Bach at SS 85845 94048. Additional structures are present within the River Llynfi, including mapped dams and weirs (Amber International, 2026)[13], as well as a crossing by an unnamed unmetalled track. These features are likely to introduce localised modifications to flow continuity and sediment processes, although based on available aerial imagery (Google, 2026)[18], the channel retains a meandering planform with active erosion and deposition.

4.2.19 Nant Cwm-du is also affected by infrastructure within the Study Area, including Cwm Du Viaduct at SS 87430 89328 and a culverted crossing at SS 87699 91949. While the extent of modification is not fully discernible due to dense riparian vegetation cover (Google, 2026)[18], the presence of culverted sections is likely to locally disrupt longitudinal connectivity and modify flow pathways.

4.2.20 In addition to longitudinal continuity, connectivity between watercourses and their adjacent floodplains varies across the Study Area. Whilst localised constraints to lateral connectivity are associated with culverts, crossings and other infrastructure, many reaches appear to retain a natural connection with the surrounding floodplain.

River Width and Depth Variation

4.2.21 The watercourses within the Study Area exhibit relatively narrow channel widths with localised variation associated with planform and in-channel processes. Nant Gwyn Bach is typically narrow, with channel widths in the order of 1 to 2 m, and displays some localised variability in width associated with sinuous sections, particularly around SS 86340 94106 where minor erosion and deposition features are present (Google, 2026)[18].

4.2.22 The River Llynfi is comparatively wider, with channel widths generally in the order of 1 to 3 m within the Study Area, increasing towards its downstream extent. Aerial imagery (Google, 2026)[18] indicates localised widening and narrowing associated with meander bends, with deposition occurring on inner bends and erosion on outer bends. The presence of in-channel bars, both along meanders and straighter reaches, further contributes to spatial variation in channel width.

4.2.23 Nant Cwm-du and its tributary, Nant y Fforest, are heavily obscured by dense riparian vegetation, limiting direct observation of channel geometry (Google, 2026)[18]. However, the confined nature of the valley and extensive tree cover suggest relatively narrow channel widths with limited lateral adjustment.

4.2.24 No direct information on channel depth is available from the reviewed sources; however, the relatively small channel widths, upland setting and observed geomorphic activity suggest generally shallow depths under normal flow conditions, with potential for increased depth during higher flow events.

Structure and Substrate of the River Bed

4.2.25 Site-specific observations from aerial imagery (Google, 2026)[18] indicate the presence of depositional features, including in-channel and marginal bars within the River Llynfi, which are associated with both meander bends and straighter channel sections. These depositional features suggest a heterogeneous substrate, likely comprising a range of sediment sizes from finer material in low-energy depositional zones to coarser fractions in higher energy areas.

4.2.26 Within Nant Gwyn Bach, localised erosion and deposition observed around SS 86340 94106 (Google, 2026)[18] indicate active sediment transport processes and the presence of a similarly mixed substrate.

4.2.27 Nant Cwm-du and its tributary, Nant y Fforest, are largely obscured by dense riparian vegetation, limiting direct observation of bed substrate (Google, 2026)[18]. However, the confined channel form and upland setting suggest substrates are likely to be relatively coarse, with local variability influenced by flow conditions and channel morphology.

Structure of the Riparian Zone

4.2.28 The riparian zone within the Study Area is characterised by a predominantly natural mosaic of woodland, scrub and unmanaged grassland, with vegetation arranged in both continuous and semi-continuous belts along the channel margins. Along Nant Gwyn Bach, the riparian zone is generally well-developed, with semi-continuous to continuous tree cover, particularly along the right bank. This is complemented by the presence of shrubs and unmanaged grassland, forming a diverse and relatively wide riparian corridor. Further downstream, while the density of tree cover reduces, the riparian zone remains natural and unmanaged, becoming more dominated by shrubs and grassland rather than representing any form of agricultural or urban modification.

4.2.29 The River Llynfi exhibits a similar riparian structure, with woodland, scrub and grassland present along the channel margins. Tree cover is locally extensive, again more prominent along the right bank, although generally less dense than that observed along Nant Gwyn Bach. In these areas, shrubs and unmanaged grassland are more prevalent, contributing to a semi-continuous riparian corridor with good structural diversity.

4.2.30 Nant Cwm-du and its tributary, Nant y Fforest, are characterised by dense riparian vegetation, with extensive tree cover that obscures much of the channel in available imagery (Google, 2026)[18]. This suggests a well-established, wide and continuous riparian zone, likely providing strong shading and bank stability.

Physico-chemical Quality Elements

4.2.31 The NRW Water Quality Archive was reviewed to assess the current conditions and classifications for the following relevant WFD physico-chemical quality elements (Natural Resources Wales, 2026)[10].

4.2.32 No freshwater river quality monitoring points are situated within the Llynfi - headwaters to Lletty Brongu STW Water Body catchment that are within the Study Area. However, the Nant Cedfyw at Betws Rd Shwt (S70066) monitoring location is situated approximately 1.3 km downstream of the Study Area at SS8925086970. The ten most recent samples for this monitoring point are between January 2024 and April 2026, and are averaged and summarised in **Table 4-2** below.

Specific Pollutants

4.2.33 In Cycle 3 (2021), the Llynfi - headwaters to Lletty Brongu STW Water Body was classified as “not assessed” for Specific Pollutants.

Chemical Quality Elements

Priority Hazardous Substances and Priority Substances

4.2.34 In Cycle 3 (2021), the Llynfi - headwaters to Lletty Brongu STW Water Body was classified as “not assessed” for both Priority Hazardous Substances and Priority Substances.

Determinands	WFD Classification (Cycle 3, 2021)	Nant Cedfyw at Betws Rd Shwt (S70066)		
		Highest	Average*	Lowest
Acid Neutralising Capacity	High	Not Assessed**		
Ammonia: Ammonical Nitrogen as N (mg/l)	High	0.124 (March 2024)	0.026	0.0053 (October 2025)
Biochemical Oxygen Demand (BOD): 5 Day ATU (mg/l)	High	Not Assessed		
Oxygenation Conditions: Dissolved oxygen concentration (%)	High	108.8 (September 2024)	96.81	84.5 (November 2024)
Phosphate: Orthophosphate as P (mg/l)	High	0.014 (March 2024)	0.005	<0.004 (Eight occurrences)
Thermal Conditions: Temperature (°C)	High	14.40 (August 2025)	10.31	6.60 (January 2024)
Acidification Status: pH	High	7.73 (April 2025)	7.18	6.68 (January 2026)

Table 4-2 – NRW water quality monitoring data for the Llynfi - headwaters to Lletty Brongu STW Water Body.

*Average values calculated using Limit of Detection (LOD) where values are recorded as less than the LOD.

** Acid Neutralising Capacity (ANC) is a composite physico-chemical quality element derived from multiple supporting determinands and is not reported as a standalone classified quality element. As such, no direct classification is available.

Biological Quality Elements

Fish

4.2.35 In Cycle 3 (2021), the Llynfi - headwaters to Lletty Brongu STW Water Body was classified as “Moderate” for Fish.

4.2.36 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; The fish species assemblage was comprised of Atlantic salmon (*Salmo salar*), European eel (*Anguilla anguilla*), brown trout (*Salmo trutta*), stone loach (*Barbatula barbatula*), bullhead (*Cottus perifretum*), lampreys (Petromyzontidae) and European minnow (*Phoxinus phoxinus*). These species are characteristic of well-oxygenated river systems and include several taxa of high conservation importance. Atlantic salmon (*Salmo salar*), brown trout (*Salmo trutta*), bullhead (*Cottus perifretum*) and stone loach (*Barbatula barbatula*) are typically associated with flowing waters containing coarse substrates suitable for spawning, feeding and refuge, whilst European minnow (*Phoxinus phoxinus*) is a widespread shoaling species often occurring in a variety of lotic habitats. Lampreys (Petromyzontidae) are also indicative of good habitat connectivity and suitable sediment conditions for larval development.

Macroinvertebrates

4.2.37 In Cycle 3 (2021), the Llynfi - headwaters to Lletty Brongu STW Water Body was classified as “High” for Invertebrates.

4.2.38 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; the species assemblage found comprised a range of pollution-sensitive aquatic invertebrates characteristic of clean, well-oxygenated running waters. Mayflies included the torrent olive (*Ecdyonurus torrentis*), March brown (*Rhithrogena semicolorata*) and blue-winged olive (*Serratella ignita*), whilst stoneflies were represented by yellow sally (*Isoperla grammatica*) and yellow sally stonefly (*Siphonoperla torrentium*). Caddisflies included saddle-case caddisfly (*Agapetus fuscipes*), saddle-case caddisfly (*Glossosoma intermedium*), green sedge (*Rhyacophila dorsalis*), silken sedge (*Sericostoma personatum*) and net-spinning caddisfly (*Hydropsyche siltalai*). Aquatic beetles comprised the bronze water beetle (*Elmis aenea*) and riffle beetles (*Limnius volckmari* and *Esolus parallelepipedus*), which are typically associated with coarse substrates in flowing water. Odonata were represented by the golden-ringed dragonfly (*Cordulegaster boltonii*), azure damselfly (*Coenagrion puella*) and large red damselfly (*Pyrrhosoma nymphula*).

Macrophytes

4.2.39 In Cycle 3 (2021), the Llynfi - headwaters to Lletty Brongu STW Water Body was classified as “Good” for Macrophytes.

4.2.40 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; Bryophytes and algae recorded included *Fontinalis antipyretica* (Greater Water-moss), *Brachythecium rivulare* (River Feather-moss), *Leptodictyum riparium* (Knee-length Moss), *Cladophora glomerata* (Blanket Weed), *Rhizoclonium hieroglyphicum* (a filamentous green alga), *Chiloscyphus polyanthos* (River Crestwort), *Rhynchostegium riparioides* (Long-beaked Water Feather-moss), *Hygroamblystegium fluviatile* (Stream Feather-moss), *Schistidium rivulare* (Water Grimmia), *Scapania undulata* (Water Earwort), Zygnematalean algae (conjugating green algae), *Fissidens* spp. (Pocket-mosses), *Conocephalum* spp. (Great Scented Liverworts) and *Pellia endiviifolia* (Endive Pellia).

4.3 Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332) WFD Water Body

WFD Status

4.3.1 Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332) WFD Water Body could be impacted by the Proposed Development. A summary of the status of the water body is provided below, and the latest classification is provided in **Annex B**. 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 is not designated as artificial or heavily modified, while there are no RNAGs on NRW WWW (Natural Resources Wales, 2026)[7]. Llynfi - Lletty Brongu STW to conf with Ogmore is situated within the Ogmore Operational Catchment, the Tawe to Cadoxton Management Catchment, and the Western Wales Basin District. The water body was targeted to achieve 'Good' ecological status by 2027 and 'High' chemical status by 2027.

Catchment Characteristics

4.3.2 The Proposed Development lies within the Llynfi - Lletty Brongu STW to conf with Ogmore Water Body catchment and directly crosses the water body itself to the south of the Proposed Development. The catchment is characterised by a pronounced southerly gradient, with ground levels decreasing from approximately 350 mAOD to around 40 mAOD.

4.3.3 Land use within the Llynfi - Lletty Brongu STW to conf with Ogmore Water Body catchment is predominantly rural and strongly influenced by agricultural activity. Urban development within the catchment is limited to the villages of Bettws, Coytrahen and Tondu. The drainage network also receives inputs from isolated farmsteads and minor infrastructure dispersed throughout the wider catchment.

4.3.4 Llynfi - Lletty Brongu STW to conf with Ogmore Water Body was gauged up until 2024, approximately 2.5 km downstream of the Study Area at 58007 - Llynfi at Coytrahen (National Grid Reference: SS890854) (UK Centre for Ecology and Hydrology, 2026)[9]. Mean recorded flow is 2.451 m^3/s, with Q95 0.369 m^3/s, Q50 1.482 m^3/s and Q10 5.668 m^3/s. The base flow index (BFI) is 0.45 with the flow regime described as being influenced by industrial/agricultural abstraction with some effluent returns (UK Centre for Ecology and Hydrology, 2026)[9].

4.3.5 The water body has a catchment area of approximately 20.54 km^2 and a WFD water body length of approximately 14.31 km. The river flows approximately in a southerly direction.

Catchment Geology and Soils

Solid Geology

4.3.6 The Llynfi - Lletty Brongu STW to conf with Ogmore water body catchment is underlain by South Wales Lower Coal Measures Formation (Mudstone, siltstone and sandstone), South Wales Middle Coal Measures Formation (Mudstone, siltstone and sandstone),South Wales Middle Coal Measures Formation (Sandstone),South Wales Upper Coal Measures Formation (Mudstone, siltstone and sandstone), Llynfi Member (Sandstone), Llynfi Member (Mudstone, siltstone and sandstone), Rhondda Member

(Mudstone, siltstone and sandstone), Rhondda Member (Sandstone), Brithdir Member (Sandstone), Brithdir Member (Mudstone, siltstone and sandstone),Hughes Member (Sandstone), and Hughes Member (Mudstone, siltstone and sandstone) All of these lithologies are classified as Secondary A aquifers (British Geological Survey, 2026)[5].

Superficial Geology

4.3.7 The Llynfi - Lletty Brongu STW to conf with Ogmore water body catchment is predominantly void of superficial deposits. Where present the catchment is underlain by Devensian glacial till (diamicton), alluvium (clay, silt, sand and gravel), alluvial fan deposits (sand and gravel) and peat (British Geological Survey, 2026)[5]. Alluvium and alluvial fan deposits are classed as a Secondary A Aquifers, the Devensian glacial till is classified as a Secondary (undifferentiated) aquifer, while peat is classified as Unproductive (British Geological Survey, 2026)[5].

Soils

4.3.8 In the Llynfi - Lletty Brongu STW to conf with Ogmore water body catchment, soils are a mix of very acidic loamy upland soils with a wet peaty surface, freely draining acid loamy soils over rock, slowly permeable wet very acid upland soils with a peaty surface, and freely draining floodplain soils (Cranfield University, 2026)[6].

Catchment Hydrology

4.3.9 Nant Cedfyw is the only named watercourse situated within the Study Area that is also situated within the Llynfi - Lletty Brongu STW to conf with Ogmore Water Body catchment. It is classified as both a WFD Water Body and an ordinary watercourse. In addition, several unnamed ordinary watercourses are present. Nant Cedfyw and one of its tributaries are situated within the Proposed Development. Note that Nant Cedfyw is only classified as a WFD Water Body where it runs parallel to the southern boundary of the Southern Array for approximately 160 m.

Historical Channel Change

4.3.10 Nant Cedfyw is present on the earliest available archived historical mapping (National Library of Scotland, 2026)[12]. Changes from the archived historical mapping to the present day are minimal, with artificial straightening occurring both prior to the earliest archived mapping and since this mapping. In addition, the Nant Cedfyw exhibits a meandering planform in both historic and contemporary mapping. The position of these meanders differs slightly between mapping sources, indicating active lateral channel migration. Note, that this active lateral channel migration is within the Study Area but not within the Proposed Development itself.

Baseline Characteristics Against Surface Water Quality Elements

Hydromorphology Quality Elements

Quantity and Dynamics of Flow

4.3.11 Site-specific observations from aerial and Street View imagery (Google, 2026)[18] indicate that tributaries such as Nant Cedfyw are relatively narrow (typically 0.5 to 1.5 m wide) with locally sinuous planforms and evidence of active geomorphic processes.

4.3.12 At SS 88975 88397, where the Moel Gilau road crosses Nant Cedfyw, a culverted section is present. Street View imagery (November 2022) shows comparatively deeper water immediately downstream of the culvert, likely associated with localised scour at the outfall, while a visibly rippled water surface suggests moderate flow velocities under these conditions. Bank erosion and undercutting are evident at this location, with exposed tree roots indicating that flows are periodically of sufficient magnitude to mobilise sediments and erode channel margins.

4.3.13 Further observations from seasonal imagery indicate marked variability in flow conditions. During summer periods, the watercourse appears more turbid, with murky, fine sediment-laden flows and extensive vegetation cover obscuring the channel. These characteristics suggest a hydrological regime strongly influenced by surface runoff with limited baseflow input. In contrast, higher flows observed in winter imagery indicate increased flow depth and velocity, highlighting a responsive system subject to seasonal variation.

4.3.14 Downstream reaches of Nant Cedfyw are largely obscured by dense riparian vegetation; however, available mapping indicates a sinuous channel form, suggesting continued variability in flow pathways and localised hydraulic diversity.

Connection to Groundwater

4.3.15 The Study Area within the Llynfi – Lletty Brongu STW to confluence with Ogmore Water Body catchment is underlain by a combination of Secondary A bedrock aquifers and Secondary A and Secondary (undifferentiated) superficial deposits (British Geological Survey, 2026)[5]. The bedrock are all classified as Secondary A aquifers, indicating the potential for groundwater storage and throughflow within fractured and weathered zones.

4.3.16 Superficial deposits within the Study Area are limited to Devensian glacial till (diamicton) and alluvium (British Geological Survey, 2026)[5]. The glacial till deposits are typically of low permeability reducing infiltration. These deposits locally limit hydraulic connectivity between groundwater and surface water systems.

4.3.17 At a catchment scale, the BFI of 0.45 (UK Centre for Ecology and Hydrology, 2026)[9] indicates a moderate contribution of groundwater to river flows, suggesting a mixed hydrological regime influenced by both groundwater inputs and direct runoff.

River Continuity

4.3.18 The Study Area within the Llynfi – Lletty Brongu STW to confluence with the River Ogmore Water Body catchment is relatively natural in terms of influence from river continuity. Within the Study Area, this is primarily associated with a culverted crossing of Nant Cedfyw at SS 88975 88397, where the Moel Gilau road crosses the watercourse.

4.3.19 Based on available Street View imagery (Google, 2026)[18], this culvert is likely to represent a localised modification to longitudinal connectivity, with evidence of scour and deeper water immediately downstream of the structure suggesting alteration to natural flow and sediment transport processes. While the culvert may locally disrupt continuity, particularly for sediment movement and aquatic ecology, it does not appear to form a complete barrier to flow.

4.3.20 No additional in-channel or over-channel structures are identified within the Study (Amber International, 2026)[13], and although further downstream features may influence continuity within the wider water body, these are outside the Study Area.

4.3.21 In addition to longitudinal continuity, connectivity between watercourses and their adjacent floodplains is considered to be generally maintained throughout the Study Area. The limited extent of identified infrastructure and absence of extensive channel modifications

suggest that lateral connectivity remains largely intact, allowing interaction between channels and adjacent floodplain areas during appropriate flow conditions.

River Width and Depth Variation

4.3.22 The watercourses within the Study Area exhibit relatively narrow channel widths with localised variation associated with planform, channel features and infrastructure. Nant Cedfyw is typically narrow, with channel widths in the order of approximately 0.5 to 1.5 m based on aerial imagery (Google, 2026)[18]. Although much of the channel is obscured by dense riparian vegetation, available mapping indicates a sinuous planform downstream, suggesting localised variability in channel width associated with bends and in-channel processes.

4.3.23 At SS 88975 88397, where the Moel Gilau road crosses Nant Cedfyw, the channel is locally modified by a culvert. Street View imagery (Google, 2026)[18] suggests some localised variation in channel form at this location, with evidence of scour and a slightly expanded wetted area immediately downstream, likely associated with increased flow energy at the culvert outfall.

4.3.24 Dense riparian tree cover along much of Nant Cedfyw and its downstream reaches limits direct observation of channel geometry; therefore, width estimates are informed by a combination of aerial mapping and localised Street View imagery. Where visible, channel widths appear relatively consistent overall, with localised adjustments driven by erosion, deposition and the presence of infrastructure.

4.3.25 No direct information on channel depth is available from the reviewed sources. However, seasonal imagery (Google, 2026)[18] indicates variability in flow conditions, with comparatively deeper and faster-flowing water during wetter periods and shallower, slower and more turbid conditions during summer. This suggests generally shallow depths under typical flow conditions, with increases in depth and velocity during higher flow events.

Structure and Substrate of the River Bed

4.3.26 The riverbed of Nant Cedfyw within the Study Area is inferred to comprise a mixed and variable substrate, reflecting local flow conditions and active geomorphic processes. Site-specific observations from Street View imagery at SS 88975 88397 (Google, 2026)[18] indicate that the channel bed is dominated by finer sediments (likely silts and clays), particularly under lower flow conditions where the water appears turbid and sediment-laden. However, coarser material, including pebbles and gravels, is also visible, suggesting a heterogeneous substrate.

4.3.27 At this location, localised scour downstream of the culverted crossing is evident, with deeper water and exposed bed features indicating increased flow energy and sediment transport capacity immediately below the structure. This suggests episodic mobilisation and redistribution of sediment, resulting in variability in bed structure and substrate composition.

4.3.28 Further upstream and downstream, much of Nant Cedfyw is obscured by dense riparian vegetation (Google, 2026)[18], limiting direct observation of bed conditions. However, the sinuous planform indicated by mapping and the presence of bank erosion and undercutting imply ongoing sediment transport processes and a correspondingly mixed substrate.

Structure of the Riparian Zone

4.3.29 The riparian zone within the Study Area is characterised by a predominantly natural mosaic of scrub and unmanaged grassland, with vegetation arranged in broadly continuous to semi-continuous belts along the channel margins. Within the Proposed Development Boundary along Nant Cedfyw, the riparian corridor is relatively narrow and less densely wooded, comprising primarily shrubs and unmanaged grassland, with limited tree cover. Vegetation is more developed along the left bank, although both banks are generally characterised by natural, unmodified riparian conditions, with no evidence of agricultural encroachment or active management.

4.3.30 Outside of the Proposed Development Boundary, the riparian zone becomes more well-developed, with extensive deciduous tree cover present along both banks. In these downstream areas, the riparian corridor widens considerably, reaching widths of up to approximately 30 m in places, forming a continuous and well-established riparian woodland. This transition reflects increased structural complexity and connectivity, with greater shading potential and enhanced bank stability.

Physico-chemical Quality Elements

4.3.31 The NRW Water Quality Archive was reviewed to assess the current conditions and classifications for the following relevant WFD physico-chemical quality elements (Natural Resources Wales, 2026)[10].

4.3.32 Although one freshwater river quality monitoring point is situated within the Lletty Brongu STW to conf with Ogmore Water Body catchment that is within the Study Area, it has not been sampled since 2012 and that was just for Cypermethrin (Nant Cwm-Du near Blaencwmdu (S70002)). However, the Nant Cwmdu-R.B at Tylers Arms (S70007) monitoring location is approximately 0.3km downstream of the Study Area at SS8731089096.

4.3.33 The ten most recent samples for this monitoring point are between April 2016 and January 2017, and are averaged and summarised in **Table 4-3** below. Note that no data has been collected from watercourses in the Lletty Brongu STW to conf with Ogmore Water Body since 2017.

Specific Pollutants

4.3.34 In Cycle 3 (2021), the Lletty Brongu STW to conf with Ogmore Water Body catchment was classified as ‘High’ with the status details listed below:

- High: Arsenic, Copper, Iron, Manganese and Zinc.

Chemical Quality Elements

Priority Hazardous Substances

4.3.35 In Cycle 3 (2021), priority hazardous substances for the Lletty Brongu STW to conf with Ogmore Water Body catchment were classified as ‘High’, with the status details listed below:

- ‘High’: Cadmium and Nonylphenol.

Priority Substances

4.3.36 In Cycle 3 (2021), priority substances for Lletty Brongu STW to conf with Ogmore Water Body catchment were classified as 'High', with the status details listed below:

- 'High': Lead, Nickel and Periphyton chlorophyll-a.

Table 4-3– NRW water quality monitoring data for the Lletty Brongu STW to conf with Ogmore Water Body.

Determinands	WFD Classification (Cycle 3, 2021)	Nant Cwmdu-R.B at Tylers Arms (S70007)		
		Highest	Average*	Lowest
Acid Neutralising Capacity	High	Not Assessed**		
Ammonia: Ammonical Nitrogen as N (mg/l)	High	All ten samples between April 2016 and January 2017 were recorded as <0.03 mg/l.		
Biochemical Oxygen Demand (BOD): 5 Day ATU (mg/l)	High	Not Assessed		
Oxygenation Conditions: Dissolved oxygen concentration (%)	High	122.2 (July 2016)	103.57	92.6 (January 2017)
Phosphate: Orthophosphate as P (mg/l)	High	All ten samples between April 2016 and January 2017 were recorded as <0.02 mg/l.		
Thermal Conditions: Temperature (°C)	High	15.84 (August 2016)	10.93	7.6 (April 2016)
Acidification Status: pH	High	7.97 (May 2016)	7.63	7.05 (August 2016)

*Average values calculated using Limit of Detection (LOD) where values are recorded as less than the LOD.

** Acid Neutralising Capacity (ANC) is a composite physico-chemical quality element derived from multiple supporting determinands and is not reported as a standalone classified quality element. As such, no direct classification is available.

Biological Quality Elements

Fish

4.3.37 In Cycle 3 (2021), the Llynfi – Lletty Brongu STW to confluence with Ogmore Water Body was classified as “High” for Fish.

4.3.38 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; *Phoxinus phoxinus (*minnow*), Salmo trutta (*brown trout*), Cottus perifretum (*bullhead*), and Barbatula barbatula (*stone loach*).* These species are characteristic of well-oxygenated rivers and streams, with brown trout, bullhead and stone loach typically associated with coarse substrates and flowing water.

Macroinvertebrates

4.3.39 In Cycle 3 (2021), the Llynfi – Lletty Brongu STW to confluence with Ogmore Water Body was classified as “High” for Invertebrates.

4.3.40 A search of the NBN Atlas identified the presence of the following species within the water body in the past 10 years; Mayflies included the torrent olive (*Ecdyonurus torrentis*), March brown (*Rhithrogena semicolorata*) and blue-winged olive (*Serratella ignita*), whilst stoneflies were represented by yellow sally (*Isoperla grammatica*) and yellow sally stonefly (*Siphonoperla torrentium*). Caddisflies included saddle-case caddisfly (*Agapetus fuscipes*), saddle-case caddisfly (*Glossosoma intermedium*), green sedge (*Rhyacophila dorsalis*), silken sedge (*Sericostoma personatum*) and net-spinning caddisfly (*Hydropsyche siltalai*). Aquatic beetles comprised the bronze water beetle (*Elmis aenea*) and riffle beetles (*Limnius volckmari* and *Esolus parallelepipedus*), which are typically associated with coarse substrates in flowing water. Odonata were represented by the golden-ringed dragonfly (*Cordulegaster boltonii*) and azure damselfly (*Coenagrion puella*). The assemblage comprised a range of pollution-sensitive aquatic invertebrates characteristic of clean, well-oxygenated running waters.

Macrophytes

4.3.41 In Cycle 3 (2021), the Llynfi – Lletty Brongu STW to confluence with Ogmore Water Body was classified as “Good” for Macrophytes.

4.3.42 No notable macrophytes were identified from a search of the NBN Atlas in the past 10 years.

5. Stage 2: WFD Scoping

5.1.1 The WFD Scoping Stage identifies potential risks to receptors due to the Proposed Development and determines if a detailed WFD impact assessment is required. Where no residual risk is identified with embedded mitigation in place, no further impact assessment is required.

5.1.2 Potential impacts, embedded mitigation and residual risks have been identified, and the outcomes are presented in **Table 5-1** to **Table 5-3**. A mitigation reference is provided in the tables below and a brief description of the proposed mitigation, with the full description of these mitigation measures provided in **Annex D**. Embedded mitigation measures, including standard pollution prevention controls, good construction practice and implementation of an outline drainage strategy, would be incorporated into the design and construction of the Proposed Development. These measures would be implemented via the Construction Environmental Management Plan (CEMP), which will be secured by a planning condition.

5.1.3 Where there is potential for a residual impact at the water body scale, after proposed mitigation is in place, that may result in deterioration or prevent the WFD water body from achieving its status objectives, the assessment will be carried forward to a Stage 3 impact assessment.

5.1.4 As outlined in **Section 3.4 (Screening of Activities)**, decommissioning has been considered at a high level in the absence of defined methods within **Table 5-1**. Where relevant, decommissioning activities (e.g. infrastructure removal and site reinstatement) are considered to give rise to similar types of impact pathways to those identified during construction; however, the exact nature and extent of these activities remain uncertain.

5.1.5 Within **Table 5-1 (Construction)** and **Table 5-2 (Operation),** the WFD Water Body Catchment column identifies the WFD water bodies relevant to each impact pathway being assessed. The applicability of individual water bodies to each activity is presented in **Table 3-1**. As not all activities have the potential to affect all screened-in water bodies, the water body or water bodies identified within **Tables 5-1** and **5-2** reflect the relevant activity-impact pathway combinations carried forward from the screening assessment.

5.1.6 In addition, within **Table 5-1** and **Table 5-2**, only those WFD Quality Elements considered relevant to the impact pathway being assessed have been selected. The full suite of WFD Quality Elements considered within this assessment is presented below.

Biological Quality Elements:

- Fish;
- Macroinvertebrates; and
- Macrophytes.

Physico-chemical Quality Elements:

- Thermal Conditions;
- Oxygenation Conditions;
- Nutrient Conditions;
- Acidification Status; and

- Salinity.

Hydromorphology Quality Elements:

- Quantity and Dynamics of Flow;
- Connection to Groundwater;
- River Continuity;
- River Width and Depth Variation;
- Structure and Substrate of the River Bed; and
- Structure of the Riparian Zone.

5.1.7 Within **Table 5-3**, the WFD Quality Element Potentially Impacted identifies elements which may impact the status of the WFD groundwater body for both the construction and operational phases. The scoping include quantitative and chemical elements as follows:

Quantitative:

- Quantitative;
- Water balance;
- GWDTE's (Groundwater Dependent Terrestrial Ecosystems);
- Dependent surface water bodies; and
- Quantitative saline intrusion.

Chemical:

- Drinking water protected area;
- GWDTE's (Groundwater Dependent Terrestrial Ecosystems);
- Dependent surface water bodies; and
- saline intrusion.

5.2 Construction Scoping – Surface Water

Table 5-1 - WFD Scoping of the potential construction impacts from the Proposed Development against WFD quality elements for all WFD Water Bodies

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
Biological Quality Elements					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Fish, Macroinvertebrates and Macrophytes	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Fine sediment and pollution risk** Construction activities associated with the Proposed Development may result in increased mobilisation and deposition of fine sediment within nearby watercourses, which can lead to the smothering of bed substrates and associated fish, macroinvertebrates and macrophytes. In addition, accidental release of fuels, oils or other contaminants has the potential to alter the chemical composition of receiving waters, resulting in localised changes to pH, which could impact associated fish, macrophytes and macroinvertebrates. Furthermore, surface runoff and sediment mobilisation may increase the transport of nutrients to watercourses, potentially leading to localised enrichment and changes in nutrient concentrations, impacting biological communities.	The following procedures will be implemented to mitigate: • **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**); and • **C-WFD-05** – Standard good construction practice, including measures to minimise disturbance to channel margins, control plant movements, and reinstate disturbed watercourse crossings, bed material and banks (refer to **Table D-1**). With measures to control sediment mobilisation, runoff and pollution risk in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Fish, Macroinvertebrates and Macrophytes	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Loss of aquatic, marginal and/or riparian habitats** Construction activities associated with the Proposed Development may result in the loss or degradation of aquatic, marginal and riparian habitats where vegetation is removed and ground conditions are disturbed during excavation and infrastructure installation. This may lead to a reduction in the extent and structural complexity of riparian vegetation adjacent to watercourses. The loss or modification of riparian habitats may reduce bank stability and the natural buffering capacity of the riparian zone, thereby affecting the structure of the riparian zone and its role in supporting ecological function.	The following procedures will be implemented to mitigate the effects of loss or degradation of aquatic, marginal and riparian habitats: ▪ **C-WFD-06** – Standard good construction practice, including measures to minimise vegetation clearance, reduce disturbance near watercourses and reinstate affected habitats (refer to **Table D-1**). With measures to limit habitat disturbance, retain existing vegetation where practicable and reinstate affected areas in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Fish, Macroinvertebrates and Macrophytes	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Alteration to flows, water quantity and/or quality** Construction activities associated with the Proposed Development have the potential to alter natural flow pathways and local water quantity through changes to drainage patterns, runoff rates and temporary dewatering. Such changes may affect aquatic communities by modifying habitat availability and suitability for fish, macroinvertebrates and macrophytes. Reduced flows can decrease water depth, velocity and connectivity, potentially restricting fish movement, reducing spawning and refuge habitat, and altering the composition of macroinvertebrate communities. Changes in flow regime may	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **C-WFD-02** – Standard good construction practice, including surface water management, controlled discharge measures and temporary flow management at watercourse crossings, where required (refer to **Table D-1**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the Construction Phase, and given the	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
			also influence aeration processes, resulting in reduced dissolved oxygen concentrations that could adversely affect fish and oxygen-sensitive invertebrate species. Alterations to flow and channel shading, including vegetation clearance, may increase solar exposure and water temperatures, causing thermal stress to fish and favouring shifts in macrophyte and macroinvertebrate assemblages. Furthermore, changes in flow and runoff pathways may influence the mobilisation and delivery of nutrients to watercourses, potentially leading to localised changes in nutrient concentrations that could affect macrophyte growth and alter the ecological balance of aquatic habitats supporting fish and macroinvertebrates.	temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320).**	INNS	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Transfer and establishment of INNS.** Existing INNS pressures within the Garw - headwaters to confluence with Ogmore may be exacerbated by the movement of machinery around the Proposed Development.	The following procedures will be implemented to mitigate the spread of INNS: • **C-WFD-07**: Site-specific INNS Management Plan to be prepared and implemented, including INNS survey before works, treatment of any identified stands and post-works monitoring; and • **C-WFD-08**: Implement Check-Clean-Dry biosecurity protocols on all plant, PPE and materials. The implementation of these measures will minimise the potential for the introduction or spread of INNS during construction. As a result, no measurable deterioration in biological quality elements is anticipated and the potential	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
				effect is not expected to result in deterioration of WFD status or compromise the achievement of the water body objectives.	
Physico-chemical Quality Elements					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Oxygenation Conditions; ▪ Acidification Status; and ▪ Nutrient Conditions.	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Fine sediment and pollution risk** Construction activities associated with the Proposed Development may result in increased mobilisation and deposition of fine sediment within nearby watercourses, which can lead to the smothering of bed substrates and clogging of interstitial spaces, thereby reducing oxygen exchange between surface water and underlying sediments and adversely affecting dissolved oxygen concentrations. In addition, accidental release of fuels, oils or other contaminants has the potential to alter the chemical composition of receiving waters, resulting in localised changes to pH and therefore acidification status. Furthermore, surface runoff and sediment mobilisation may increase the transport of nutrients to watercourses, potentially leading to localised enrichment and changes in nutrient concentrations.	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ▪ **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**); and ▪ **C-WFD-05** – Standard good construction practice, including measures to minimise disturbance to channel margins, control plant movements, and reinstate disturbed watercourse crossings, bed material and banks (refer to **Table D-1**). With measures to control sediment mobilisation, runoff and pollution risk in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Oxygenation Conditions; ▪ Thermal Conditions; and ▪ Nutrient Conditions.	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Alteration to flows, water quantity and/or quality** Construction activities associated with the Proposed Development have the potential to alter natural flow pathways and local water quantity through changes to drainage patterns, runoff rates and temporary dewatering, which may influence the physical and chemical characteristics of receiving watercourses. Changes in flow regime and reduced water volumes can affect aeration processes, potentially leading to changes in dissolved oxygen concentrations and therefore affecting oxygenation conditions. Alterations to flow and channel shading, including vegetation clearance, may also influence thermal conditions by increasing solar exposure and resulting in elevated water temperatures. Furthermore, changes in flow and runoff pathways may affect the mobilisation and delivery of nutrients to watercourses, potentially resulting in localised changes in nutrient concentrations.	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **C-WFD-02 –** Standard good construction practice, including surface water management, controlled discharge measures and temporary flow management at watercourse crossings, where required (refer to **Table D-1**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW**	▪ Oxygenation Conditions.	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities;	**Alteration to sediment input, transport and/or deposition** Construction activities associated with the Proposed Development may alter natural sediment input, transport and deposition processes within receiving watercourses, resulting in increased delivery and accumulation of fine sediments. The deposition of fine sediments can lead to the smothering of bed substrates and clogging of interstitial spaces, reducing	The following procedures will be implemented to mitigate the effects of altered sediment input, transport and deposition: ▪ **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**); and	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
(GB110058026331); and ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	permeability and limiting oxygen exchange between surface water and underlying sediments, which may adversely affect dissolved oxygen concentrations and therefore oxygenation conditions.	▪ **C-WFD-03** – Standard good construction practice, including measures to limit sediment mobilisation and control surface water runoff (refer to **Table D-1**). With measures to control sediment mobilisation and runoff in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Oxygenation Conditions; and ▪ Nutrient Conditions.	▪ Installation of underground cabling and electrical infrastructure; and ▪ Installation of permanent and temporary drainage infrastructure.	**Bankside erosion and impacts on riparian habitats** Construction activities associated with the Proposed Development may result in localised bankside erosion and degradation of riparian habitats, leading to increased mobilisation of fine sediment into adjacent watercourses. Elevated sediment inputs can result in the smothering of bed substrates and clogging of interstitial spaces, thereby reducing oxygen exchange between surface water and underlying sediments and adversely affecting dissolved oxygen concentrations, with implications for oxygenation conditions. In addition, the disturbance and loss of riparian vegetation may reduce the natural buffering capacity of the riparian zone, increasing the potential for nutrient mobilisation and transport to watercourses, which may lead to localised changes in nutrient concentrations.	The following procedures will be implemented to mitigate the effects of bankside erosion and associated impacts on riparian habitats: ▪ **C-WFD-04** – Standard good construction practice, including measures to retain riparian vegetation, control runoff and stabilise disturbed banks (refer to **Table D-1**); and ▪ **C-WFD-05** – Standard good construction practice, including measures to minimise disturbance to channel margins, control plant movements, and reinstate disturbed watercourse crossings, bed material and banks (refer to **Table D-1**). With measures to manage runoff, minimise vegetation disturbance and stabilise bankside areas in place during	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
				the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	
Hydromorphological Quality Elements					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ River Width and Depth Variation; and ▪ Structure and Substrate of the River Bed.	▪ Turbine foundation construction, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Fine sediment and pollution risk** Construction activities associated with the Proposed Development may result in the mobilisation and deposition of fine sediments within receiving watercourses, leading to changes in bed composition and substrate characteristics. The accumulation of fine sediments can alter the structure and substrate of the river bed, reducing heterogeneity and infilling coarser material, which may result in a more uniform bed composition. In addition, changes in sediment transport and deposition can influence channel morphology, including localised alterations to river width and depth through processes such as bed aggradation or lateral sediment accumulation.	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ▪ **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**); and ▪ **C-WFD-03** – Standard good construction practice, including measures to limit sediment mobilisation and control surface water runoff (refer to **Table D-1**). With measures to control sediment mobilisation, runoff and pollution risk in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ River Width and Depth Variation; Structure and Substrate of the River Bed; and ▪ Structure of the Riparian Zone.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ Overhead line connections; and ▪ Installation of permanent and temporary drainage infrastructure.	**Physical disturbance / alteration to natural bed and/or banks** Construction activities associated with the Proposed Development may result in direct or indirect physical disturbance to channel beds and banks where works are undertaken within or in proximity to watercourses, including the installation of underground cabling via open-cut trenching where required. This may lead to localised modification of channel form and substrate composition through excavation, sediment mobilisation, transport and deposition, resulting in reduced substrate heterogeneity and changes to bed conditions. In addition, increased runoff or modified drainage pathways may contribute to localised bank erosion or instability, influencing river width and depth. Disturbance to adjacent bankside areas may also affect the structure of the riparian zone, including the removal or modification of riparian vegetation and marginal habitats.	The following procedures will be implemented to mitigate the effects of physical disturbance to channel bed and banks: ▪ **C-WFD-04** – Standard good construction practice, including measures to retain riparian vegetation, control runoff and stabilise disturbed banks (refer to **Table D-1**); and ▪ **C-WFD-05** – Standard good construction practice, including measures to minimise disturbance to channel margins, control plant movements, and reinstate disturbed watercourse crossings, bed material and banks (refer to **Table D-1**). With measures to limit disturbance in proximity to watercourses in place during the Construction Phase and given the temporary and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to**	▪ Quantity and Dynamics of Flow; ▪ River Continuity; ▪ River Width and Depth	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities;	**Alteration to flows, water quantity and/or quality** Construction activities associated with the Proposed Development may result in changes to natural flow pathways and local water quantity through alterations to drainage patterns, runoff rates and temporary dewatering. Where underground cabling crosses a watercourse via open-cut	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **C-WFD-02 –** Standard good construction practice, including surface water management, controlled discharge measures and	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
▪ **Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Variation; and ▪ Connection to Groundwater.	▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	trenching, temporary obstruction or diversion of flow may also be required during construction, resulting in short-term alterations to flow patterns, water levels and channel hydraulics in the vicinity of the crossing. These changes may influence the quantity and dynamics of flow within receiving watercourses, including modifications to the timing and distribution of flows. Localised changes in flow inputs may also influence river width and depth variation, particularly where runoff pathways are altered or concentrated. In addition, temporary dewatering and drainage activities may affect the hydrological regime, including potential interactions with shallow groundwater, which may influence the connection between surface water and groundwater systems.	temporary flow management at watercourse crossings, where required (refer to **Table D-1**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore**	▪ River Width and Depth Variation; and ▪ Structure and Substrate of the River Bed.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ Overhead line connections; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Alteration to sediment input, transport and/or deposition** Construction activities associated with the Proposed Development may alter natural sediment input, transport and deposition processes within receiving watercourses through the mobilisation of sediments and changes to runoff pathways. Increased sediment delivery to watercourses may result in localised deposition and changes to bed composition, including the reduction in substrate heterogeneity, thereby affecting the structure and substrate of the river bed. In addition, changes in sediment dynamics may influence channel morphology, including localised alterations to river width and depth through processes	The following procedures will be implemented to mitigate the effects of altered sediment input, transport and deposition: ▪ **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**); and ▪ **C-WFD-03** – Standard good construction practice, including measures to limit sediment mobilisation and control surface water runoff (refer to **Table D-1**).	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
(GB110058026332).			such as bed aggradation or lateral sediment accumulation.	With measures to control sediment mobilisation and runoff in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ River Width and Depth Variation; Structure and Substrate of the River Bed; and ▪ Structure of the Riparian Zone.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ Overhead line connections; and ▪ Installation of permanent and temporary drainage infrastructure.	**Bankside erosion and impacts on riparian habitats** Construction activities associated with the Proposed Development may result in localised bankside erosion and degradation of riparian habitats where vegetation is removed and natural ground conditions are altered. Disturbance of soils and changes to surface runoff pathways may increase the potential for localised erosion and sediment mobilisation, which can subsequently be transferred to adjacent watercourses. This may lead to changes in the structure and substrate of the river bed through sediment deposition and modification of bed composition. In addition, erosion and instability of banks may result in localised alterations to river width and depth, affecting channel morphology. The loss or degradation of riparian vegetation may also reduce bank stability and alter the structure of the riparian zone, thereby influencing geomorphological processes and channel form.	The following procedures will be implemented to mitigate the effects of bankside erosion and associated impacts on riparian habitats: ▪ **C-WFD-04** – Standard good construction practice, including measures to retain riparian vegetation, control runoff and stabilise disturbed banks (refer to **Table D-1**). With measures to manage runoff, minimise vegetation disturbance and stabilise bankside areas in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Structure of the Riparian Zone.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ Overhead line connections; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Loss of aquatic, marginal and/or riparian habitats** Construction activities associated with the Proposed Development may result in the loss or degradation of aquatic, marginal and riparian habitats where vegetation is removed and ground conditions are disturbed during excavation and infrastructure installation. This may lead to a reduction in the extent and structural complexity of riparian vegetation adjacent to watercourses. The loss or modification of riparian habitats may reduce bank stability and the natural buffering capacity of the riparian zone, thereby affecting the structure of the riparian zone and its role in supporting geomorphological and ecological function.	The following procedures will be implemented to mitigate the effects of loss or degradation of aquatic, marginal and riparian habitats: ▪ **C-WFD-06** – Standard good construction practice, including measures to minimise vegetation clearance, reduce disturbance near watercourses and reinstate affected habitats (refer to **Table D-1**). With measures to limit habitat disturbance, retain existing vegetation where practicable and reinstate affected areas in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
Specific Pollutants					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and**	▪ Specific Pollutants.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Overhead line connections;	**Fine sediment and pollution risk** Construction activities associated with the Proposed Development may result in the mobilisation and transfer of fine sediments and potential contaminants to receiving watercourses through surface runoff and disturbance of soils and materials. This may increase the risk of introducing or mobilising specific pollutants, including metals such as arsenic, copper, iron, manganese and zinc. These substances may be associated with soils, construction	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ▪ **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**). With measures to control sediment mobilisation, runoff and pollution risk in	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	materials or accidental releases (e.g. fuels and oils), and can be transported to watercourses via overland flow or drainage pathways. The introduction or remobilisation of such pollutants has the potential to affect water quality and lead to deterioration in status where concentrations increase above baseline conditions.	place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Specific Pollutants.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Alteration to flows, water quantity and/or quality** Construction activities associated with the Proposed Development may result in changes to natural flow pathways and local water quantity through alterations to drainage patterns, runoff rates and temporary dewatering, which may influence the transport and dilution of contaminants within receiving watercourses. These changes may affect the mobilisation, concentration and dispersion of specific pollutants, including metals such as arsenic, copper, iron, manganese and zinc. Reduced dilution capacity or localised concentration of flows may lead to increased pollutant concentrations, whilst altered runoff pathways may facilitate the transport of contaminants, including those associated with fuels and oils or disturbed soils, to surface water receptors. This has the potential to affect water quality and contribute to deterioration in WFD status where concentrations increase above baseline conditions.	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **C-WFD-02 –** Standard good construction practice, including surface water management, controlled discharge measures and temporary flow management at watercourse crossings, where required (refer to **Table D-1**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
Chemical Quality Elements (Priority Hazardous Substances and Priority Substances)					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Priority Hazardous Substances; and ▪ Priority Substances.	▪ Turbine foundations, access ways and associated infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ Installation of underground cabling and electrical infrastructure; ▪ General construction-phase activities; ▪ Overhead line connections; ▪ Installation of permanent and temporary drainage infrastructure; and ▪ Temporary dewatering and groundwater control.	**Fine sediment and pollution risk** Construction activities associated with the Proposed Development may result in the mobilisation and transfer of fine sediments and potential contaminants to receiving watercourses through surface runoff and disturbance of soils and materials. This may increase the risk of introducing or remobilising priority substances and priority hazardous substances, including cadmium, nonylphenol, lead and nickel. These substances may be associated with soils, construction materials or accidental releases (e.g. fuels and oils), and can be transported to watercourses via overland flow or drainage pathways. In addition, elevated concentrations of such contaminants may influence biological indicators such as periphyton chlorophyll-a through changes in water quality. The introduction or remobilisation of these substances has the potential to affect water quality and contribute to deterioration in WFD status where concentrations increase above baseline conditions.	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ▪ **C-WFD-01** – Standard good construction practice, including pollution prevention and surface water management measures (refer to **Table D-1**). With measures to control sediment mobilisation, runoff and pollution risk in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to**	▪ Priority Hazardous Substances; and ▪ Priority Substances.	▪ Turbine foundations, access ways and associated infrastructure; ▪ General construction-phase activities; ▪ Installation of permanent and temporary drainage infrastructure; and	**Alteration to flows, water quantity and/or quality** Construction activities associated with the Proposed Development may result in changes to natural flow pathways and local water quantity through alterations to drainage patterns, runoff rates and temporary dewatering, which may	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **C-WFD-02 –** Standard good construction practice, including surface water management, controlled	**N**

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
Lletty Brongu STW (GB110058026331); and ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		▪ Temporary dewatering and groundwater control.	influence the transport and dilution of contaminants within receiving watercourses. These changes may affect the mobilisation, concentration and dispersion of priority substances and priority hazardous substances, including cadmium, nonylphenol, lead and nickel. Reduced dilution capacity or localised concentration of flows may lead to elevated concentrations of these substances, whilst altered runoff pathways may facilitate their transport to surface water receptors, including those associated with disturbed soils and accidental releases of fuels and oils. In addition, changes in water quality may influence biological indicators such as periphyton chlorophyll-a. Overall, this has the potential to affect water quality and contribute to deterioration in WFD status where concentrations increase above baseline conditions.	discharge measures and temporary flow management at watercourse crossings, where required (refer to **Table D-1**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the Construction Phase, and given the temporary, localised and indirect nature of the potential impacts, no deterioration is anticipated at the water body scale.	

5.3 Operation Scoping – Surface Water

Table 5-2 - WFD Scoping of the potential operational impacts from the Proposed Development against WFD quality elements for all WFD Water Bodies

WFD Water Body Catchment	WFD Quality Element Potentially Impacted	Relevant Activities	Potential Impacts	Embedded Mitigation	Likely Adverse Residual Risk (Y/N)
Biological Quality Elements					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	Fish, Invertebrates and Macrophytes	▪ Operation of permanent and temporary drainage infrastructure; and ▪ Turbines, substations and electrical infrastructure (including permanent infrastructure footprint).	**Alteration to flows, water quantity and/or quality** Operation and the presence of the Proposed Development have the potential to result in localised alterations to flow pathways and water quantity through changes to runoff routing, discharge rates and drainage patterns. These changes may influence the biological characteristics of receiving watercourses, including fish, aquatic macroinvertebrates and macrophytes.	The following procedures will be implemented to mitigate the effects of: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management, discharge control, watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the operational phase and given the negligible and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
Physico-chemical Quality Elements					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW**	▪ Oxygenation Conditions; ▪ Thermal Conditions; and ▪ Nutrient Conditions.	▪ Installation and operation of permanent and temporary drainage infrastructure; and	**Alteration to flows, water quantity and/or quality** Operation and the presence of the Proposed Development have the potential to result in localised alterations to flow pathways and water quantity through changes to runoff routing, discharge rates and drainage patterns. These changes may influence the physical and chemical characteristics of receiving watercourses, including	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management,	**N**

(GB110058026331); and ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		▪ Turbines, substations and electrical infrastructure (including permanent infrastructure footprint).	modifications to flow regime which can affect aeration processes and therefore oxygenation conditions. In addition, changes to channel shading associated with vegetation clearance may influence thermal conditions by increasing solar exposure, whilst altered runoff pathways may affect the mobilisation and delivery of nutrients to watercourses, potentially resulting in localised changes in nutrient concentrations.	discharge control, watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the operational phase and given the negligible and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Oxygenation Conditions.	▪ Installation and operation of permanent and temporary drainage infrastructure.	**Alteration to sediment input, transport and/or deposition** Operation of permanent and temporary drainage infrastructure associated with the Proposed Development has the potential to alter sediment input, transport and deposition processes within receiving watercourses through changes to runoff pathways and discharge characteristics. This may result in the localised delivery and accumulation of fine sediments within the channel. The deposition of fine sediments can lead to the smothering of bed substrates and clogging of interstitial spaces, reducing permeability and limiting oxygen exchange between surface water and underlying sediments, which may adversely affect dissolved oxygen concentrations and therefore influence oxygenation conditions.	The following procedures will be implemented to mitigate the effects of altered sediment input, transport and deposition: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management, discharge control, watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to control sediment mobilisation, runoff and sediment delivery in place during the operational phase and given the negligible and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**

Hydromorphological Quality Elements

▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Quantity and Dynamics of Flow; ▪ River Width and Depth Variation; and ▪ Connection to Groundwater.	▪ Installation and operation of permanent and temporary drainage infrastructure; and ▪ Turbines, substations and electrical infrastructure (including permanent infrastructure footprint).	**Alteration to flows, water quantity and/or quality** Operation and the presence of the Proposed Development have the potential to result in localised alterations to flow pathways and water quantity through changes to runoff routing, discharge rates and drainage patterns. These changes may influence the quantity and dynamics of flow within receiving watercourses, including the timing and distribution of flows. Localised changes in flow inputs may also influence river width and depth variation where flows are altered or concentrated. In addition, drainage and runoff management may affect shallow groundwater interactions, with the potential to influence the connectivity between surface water and groundwater systems.	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management, discharge control, watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the operational phase and given the negligible and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ River Width and Depth Variation; and ▪ Structure and Substrate of the River Bed.	▪ Installation and operation of permanent and temporary drainage infrastructure.	**Alteration to sediment input, transport and/or deposition** Operation of permanent and temporary drainage infrastructure associated with the Proposed Development have the potential to alter sediment input, transport and deposition processes within receiving watercourses through changes to runoff pathways and discharge characteristics. These changes may result in the localised delivery and accumulation of fine sediments within the channel, leading to modification of bed substrate composition and a reduction in substrate heterogeneity. In addition, altered sediment dynamics may influence channel morphology, including localised changes to river width and depth variation through processes such as bed aggradation or marginal sediment deposition.	The following procedures will be implemented to mitigate the effects of altered sediment input, transport and deposition: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management, discharge control, watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to control sediment mobilisation, runoff and sediment delivery in place during the operational phase and given the negligible and	**N**

				localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	
Specific Pollutants					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW (GB110058026331); and** ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**	▪ Specific Pollutants.	▪ Installation and operation of permanent and temporary drainage infrastructure; and ▪ Turbines, substations and electrical infrastructure (including permanent infrastructure footprint).	**Alteration to flows, water quantity and/or quality** Operation and the presence of the Proposed Development have the potential to influence surface water pathways and local flow conditions through changes to runoff routing, discharge characteristics and drainage patterns. These changes may affect the transport, dilution and dispersion of specific pollutants, including metals such as arsenic, copper, iron, manganese and zinc, which may be mobilised from soils, infrastructure or operational activities. Altered flow conditions may result in localised concentration or redistribution of these substances within receiving watercourses, with the potential to influence water quality where concentrations increase above baseline conditions.	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management, discharge control, watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the operational phase and given the negligible and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	**N**
Chemical Quality Elements (Priority Hazardous Substances and Priority Substances)					
▪ **Garw - headwaters to confluence with Ogmore (GB110058026320);** ▪ **Llynfi - headwaters to Lletty Brongu STW**	▪ Priority Hazardous Substances; and ▪ Priority Substances.	▪ Installation and operation of permanent and temporary drainage infrastructure; and ▪ Turbines, substations	**Alteration to flows, water quantity and/or quality** Operation and the presence of the Proposed Development has the potential to influence surface water pathways and local flow conditions through changes to runoff routing, discharge characteristics and drainage patterns. These changes may affect the transport, dilution and dispersion of priority substances and priority hazardous substances,	The following procedures will be implemented to mitigate the effects of altered flow regime, water quantity and water quality: ▪ **O-WFD-01 –** Standard good operational practice, including surface water and sediment management, discharge control,	**N**

(GB110058026331); and ▪ **Llynfi - Lletty Brongu STW to conf with Ogmore (GB110058026332).**		and electrical infrastructure (including permanent infrastructure footprint).	including cadmium, nonylphenol, lead and nickel, which may be mobilised from soils, infrastructure or operational activities. Altered flow conditions may result in localised concentration or redistribution of these substances within receiving watercourses, with the potential to affect water quality where concentrations increase above baseline conditions.	watercourse reinstatement and pollution prevention measures (refer to **Table D-2**). With measures to manage surface water runoff, drainage pathways and discharge rates in place during the operational phase and given the negligible and localised nature of the potential impacts, no deterioration is anticipated at the water body scale.	

5.4 Construction and Operation Scoping – Groundwater

Table 5-3 - WFD Scoping of the potential construction and operational impacts from the Proposed Development against WFD Swansea Carboniferous Coal Measures (GB41002G201000)

WFD Quality Element Potentially Impacted	Construction	Operation	Embedded Mitigation	Residual Risk Y/N
Quantitative				
Quantitative	No significant intrusive works into WFD groundwater body proposed which could require long-term dewatering. At this stage, no specific details have been provided regarding excavation and dewatering works, however, typical foundation depths for onshore windfarm installations are between 2 and 4m. Therefore, excavations up to 4m are expected for constructing the wind farm foundations. Excavations associated with open-cut trenching for the construction of foundations have the potential to intercept groundwater (dependent on the water table depth), which could require dewatering and discharge. The abstraction of water due to dewatering will be temporary and on a local scale only, assessed as an insignificant impact on the quantitative status of the water body.	No intrusive works into WFD groundwater body proposed during the operational phase and therefore no activities that may impact the quantitative status of the water body.	N/A	N
Water Balance	No significant intrusive works into WFD groundwater body proposed which could require long-term dewatering. At this stage, no specific details have been provided regarding excavation and dewatering works, however, typical foundation depths for onshore windfarm installations are between 2 and 4m. Therefore excavations up to 4m are expected for constructing the wind farm foundations.	No intrusive works into WFD groundwater body proposed during the operational phase and therefore no activities that may impact the quantitative status of the water body. The area of additional hardstanding surfaces relating to the wind farm which results in less infiltration is relatively small compared to the overall catchment area. Therefore, there won't be a significant impact on the water balance of the water body.	N/A	N

WFD Quality Element Potentially Impacted	Construction	Operation	Embedded Mitigation	Residual Risk Y/N
	Excavations associated with open-cut trenching for the construction of foundations 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. Lowering of the water table with dewatering will be temporary and on a local scale only, assessed as an insignificant impact on the water balance of the water body.			
GWDTE's (Groundwater Dependent Terrestrial Ecosystems)	The only identified GWTDE is the Cwm Du Woodlands SSSI, located approximately 0.9km west of the site boundary. At this stage, no specific details have been provided regarding excavation and dewatering works, however, typical foundation depths for onshore windfarm installations are between 2 and 4m. Lowering of the water table via dewatering will be temporary and on a local scale only. Therefore, the potential for temporary dewatering is not expected to impact the GWTDE.	No intrusive works into WFD groundwater body proposed during the operational phase and therefore no activities that may impact the Cwm Du Woodlands SSSI with respect to groundwater influence.	N/A	N
Dependent Surface Water Bodies	No significant intrusive works into WFD groundwater body proposed which could require long-term dewatering. At this stage, no specific details have been provided regarding excavation and dewatering works, however, typical foundation depths for onshore windfarm installations are between 2 and 4m. Therefore, excavations up to 4m are expected for constructing the wind farm foundations.	No intrusive works into WFD groundwater body proposed during the operational phase and therefore no activities that may impact surface water bodies with respect to groundwater influence.	N/A	N

WFD Quality Element Potentially Impacted	Construction	Operation	Embedded Mitigation	Residual Risk Y/N
	The closest water body is approximately 0.25km from a site boundary and the area of dewatering is expected to be relatively small. Therefore, any potential impact on surface water bodies would be insignificant. The National River Flow Archive (NRFA) indicate the Base Flow Index of watercourses in the catchment is approximately 0.48 (UK Centre for Ecology and Hydrology, 2026; UK Centre for Ecology and Hydrology 2026)[8,9] (i.e. groundwater makes up 48% or river flow). Lowering of the water table via dewatering will be temporary and on a local scale only. Additionally, the local watercourses get less than 50% of their flow from groundwater therefore there will not be a significant impact on dependent surface water bodies.			
Quantitative saline intrusion	No significant intrusive works into WFD groundwater body proposed which could require long-term dewatering. Excavation works are approximately 12.4 km from the coast and therefore no saline intrusion expected.	No intrusive works into WFD groundwater body proposed during the operational phase. Additionally, the site is approximately 12.4 km from the coast and therefore no saline intrusion expected.	N/A	N
Chemical				
Drinking water protected area	Excavation works and operational vehicle movements associated with routine maintenance activities have the potential to result in localised mobilisation of fine sediment into the groundwater. This runoff may facilitate the transport of specific pollutants, including metals such as arsenic, copper, iron, manganese and zinc, which may be associated with disturbed soils, vehicle emissions or	No long-term operational activities which may result in deterioration of the groundwater quality and therefore not impacts to the drinking water protected area.	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ■ **O-WFD-01** – Standard good operational practice to mitigate fine sediment and pollution risk, including pollution prevention and surface water management measures (refer to **Table D-2**).	N

WFD Quality Element Potentially Impacted	Construction	Operation	Embedded Mitigation	Residual Risk Y/N
	material residues. Pollution could also include release of hydrocarbons with refuelling of plant, which could potentially enter the groundwater if unattended. These substances may leach into the groundwater and has the potential to result in localised changes in water quality where concentrations increase above baseline conditions and potentially impact the chemical status of the aquifer locally.		▪ **O-WFD-02** – Standard good operational practice to mitigate alteration to flows, water quantity and/or quality, including surface water management, discharge control and pollution prevention measures (refer to **Table D-2**). With measures to control sediment mobilisation, runoff and pollution risk in place during the construction phase, and given the negligible, localised and intermittent nature of the potential impacts, no deterioration is anticipated at the water body scale.	
GWTDEs	The only identified GWTDE is the Cwm Du Woodlands SSSI, located approximately 0.9km west of the site boundary. Excavation works and operational vehicle movements associated with routine maintenance activities have the potential to result in localised mobilisation of fine sediment into the groundwater. This runoff may facilitate the transport of specific pollutants, including metals such as arsenic, copper, iron, manganese and zinc, which may be associated with disturbed soils, vehicle emissions or material residues. Pollution could also include release of hydrocarbons with refuelling of plant, which could potentially enter the groundwater if unattended Under certain hydrogeological conditions (e.g. flow direction) the contaminants may travel through the groundwater system to the Cwm Du Woodlands SSSI resulting in potential impacts to the groundwater quality and therefore the ecosystem.	No long-term operational activities which may result in deterioration of the groundwater quality and therefore not impacts to the Cwm Du Woodlands SSSI is expected.	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ▪ **O-WFD-01** – Standard good operational practice to mitigate fine sediment and pollution risk, including pollution prevention and surface water management measures (refer to **Table D-2**). ▪ **O-WFD-02** – Standard good operational practice to mitigate alteration to flows, water quantity and/or quality, including surface water management, discharge control and pollution prevention measures (refer to **Table D-2**). With measures to control sediment mobilisation, runoff and pollution risk in place during the construction phase, and given the negligible, localised and intermittent nature of the potential impacts, no deterioration is anticipated at the water body scale	N

WFD Quality Element Potentially Impacted	Construction	Operation	Embedded Mitigation	Residual Risk Y/N
	Due to the distance from the site, travel time rates of contaminants through a groundwater system and natural processes (e.g. dispersion, dilution, biodegradation etc.), there is not expected to be significant impacts on the Cwm Du Woodlands SSSI.			
Dependent surface water bodies	Excavation works and operational vehicle movements associated with routine maintenance activities have the potential to result in localised mobilisation of fine sediment into the groundwater. This runoff may facilitate the transport of specific pollutants, including metals such as arsenic, copper, iron, manganese and zinc, which may be associated with disturbed soils, vehicle emissions or material residues. Pollution could also include release of hydrocarbons with refuelling of plant, which could potentially enter the groundwater if unattended These substances may be conveyed to nearby watercourses via groundwater flow pathways, with the potential to result in localised changes in water quality where concentrations increase above baseline conditions.	No long-term operational activities which may result in deterioration of the groundwater quality and therefore not impacts to surface water bodies is expected.	The following procedures will be implemented to mitigate the effects of fine sediment mobilisation and pollution: ■ **O-WFD-01** – Standard good operational practice to mitigate fine sediment and pollution risk, including pollution prevention and surface water management measures (refer to **Table D-2**). ■ **O-WFD-02** – Standard good operational practice to mitigate alteration to flows, water quantity and/or quality, including surface water management, discharge control and pollution prevention measures (refer to **Table D-2**). With measures to control sediment mobilisation, runoff and pollution risk in place during the construction phase, and given the negligible, localised and intermittent nature of the potential impacts, no deterioration is anticipated at the water body scale	N
Saline intrusion	No significant intrusive works into WFD groundwater body proposed which could require long-term dewatering. Excavation works are approximately 12.4 km from the coast and therefore no saline intrusion is expected and no impact to the groundwater quality expected.	No intrusive works into WFD groundwater body proposed during the operational phase. Additionally, the site is approximately 12.4 km from the coast and therefore no saline intrusion is expected and no impact to the groundwater quality expected.	N/A	N

5.5 WFD Scoping Summary

Construction

5.5.1 No residual effects have been identified during the Construction Stage for surface water or groundwater WFD water bodies with the embedded mitigation measures in place.

5.5.2 The construction phase of the Proposed Development is characterised by temporary, localised and indirect impacts associated with activities such as site clearance, earthworks, infrastructure installation and drainage works. These activities have the potential to influence sediment mobilisation, flow pathways, water quality and riparian habitats in proximity to watercourses.

5.5.3 The embedded mitigation measures described within **Annex D (Table D-1)** are considered sufficient to manage potential risks to the water and aquatic environment, including those associated with sediment mobilisation, pollution, surface water runoff and habitat disturbance.

5.5.4 With these measures in place, no deterioration in the status of any WFD quality elements, or of overall WFD status, is anticipated at the water body scale. Accordingly, no further detailed WFD impact assessment or additional site-specific mitigation is required for the Construction Stage.

Operation

5.5.5 No residual effects have been identified during the Operational Stage for surface water or groundwater WFD water bodies with the embedded mitigation measures in place.

5.5.6 The Operational Stage of the Proposed Development is characterised by negligible, localised and continuous or permanent but spatially limited impacts associated with the presence of infrastructure, including drainage features, turbine foundations, substations and associated impermeable surfaces, which have the potential to influence runoff pathways and local flow conditions.

5.5.7 The embedded mitigation measures described within **Annex D (Table D-2)** are considered sufficient to manage potential risks to the water and aquatic environment, including those associated with changes to flow pathways, sediment processes and riparian habitats.

5.5.8 With these measures in place, no deterioration in the status of any WFD quality elements, or of overall WFD status, is anticipated at the water body scale. Accordingly, no further detailed WFD impact assessment or additional site-specific mitigation is required for the Operational Stage.

Decommissioning

5.5.9 No residual effects are anticipated during the Decommissioning Stage. Where decommissioning activities are required, these would be undertaken in accordance with standard good practice and equivalent mitigation measures to those applied during the Construction Phase.

5.5.10 Given the temporary, localised and controlled nature of such activities, no deterioration in WFD quality elements or overall WFD status is anticipated.

5.6 Review of Mitigation Measures to Deliver WFD Objectives

5.6.1 The Garw – headwaters to confluence with the River Ogmore (GB110058026320) Water Body is designated as a HMWB. Hence, WFD mitigation measures are set to assist this water body in achieving its WFD status objectives. **Annex C** lists the WFD Mitigation Measures in full while **Table 5-3** highlights the key mitigation measures and their relation to the Proposed Development.

5.6.2 **Annex C** indicates that a number of measures are identified as 'not applicable', reflecting the limited relevance of certain interventions to the physical characteristics and management requirements of the Garw – headwaters to confluence with the River Ogmore Water Body. Of the remaining measures, the majority are currently identified as 'not in place – not yet identified', indicating that opportunities for ecological and hydromorphological improvement have not yet been implemented or defined at the water body scale. Only a limited number of measures are currently recorded as 'in place', specifically flood bunds and maintenance activities to prevent sediment transfer. This baseline position indicates that there remains potential for future delivery of mitigation measures to support GEP. The following review therefore considers whether the Proposed Development would prevent or constrain the implementation of these measures (**Table 5-4**).

Table 5-4 – Review of whether the Proposed Development will impact upon the mitigation measures to deliver WFD objectives of the Garw – headwaters to confluence with the River Ogmore (GB110058026320) Water Body. Note that all of the designation reasons or uses are flood protection and urbanisation for all mitigation measures.

Measure Tier 1	Measure Tier 2	Review of Mitigation Measures to deliver WFD objectives
Working with physical form and function	Remove obsolete structure; Remove or soften hard bank; Preserve or restore habitats; In-channel morph diversity; Re-opening culverts; Alter culvert channel bed; Flood bunds; Set-back embankments.	The Proposed Development is not anticipated to result in any permanent modification to the physical form or function of the Garw – headwaters to confluence with the River Ogmore WFD water body. No channel realignment, bank modification, culverting works or removal of existing structures are proposed within the main river channel. Furthermore, no permanent modifications to the headwater watercourses within or adjacent to the Proposed Development are proposed, and no works are currently anticipated that would alter their channel form, continuity or hydrological function. Embedded mitigation measures, including standard good construction practice and surface water management, will ensure that any indirect effects (e.g. sediment mobilisation or runoff) are localised, temporary and reversible. While the potential for additional temporary or permanent watercourse crossings cannot be fully excluded prior to detailed design, any such works would be designed in accordance with embedded mitigation measures to

		avoid or minimise impacts to channel morphology, flow processes and connectivity. Therefore, the Proposed Development will not compromise the future delivery of mitigation measures relating to habitat restoration, morphological diversity or reconnection within the water body. Accordingly, the Proposed Development is not expected to prevent or constrain the implementation of these mitigation measures required to achieve GEP.
Structural modification	Fish passes; Reduce fish entrainment; Enhance ecology; Changes to locks.	No structural modifications to the Afon Garw or associated infrastructure are proposed as part of the Proposed Development. There are no new barriers, impoundments or channel modifications that would affect ecological connectivity or condition. As such, the Proposed Development will not influence the potential for future structural improvements, including ecological enhancement or modification of existing structures. The implementation of embedded mitigation measures ensures that no long-term physical or ecological constraints are introduced, and therefore, the Proposed Development will not prevent the delivery of mitigation measures required to support GEP.
Operations and maintenance	Selective vegetation control; Vegetation control; Vegetation control timing; Invasive species techniques; Retain habitats; Sediment management strategy; Maintenance – prevent sediment transfer; Maintenance – minimise habitat impact; Water level management.	The Proposed Development will not introduce any new operational activities within the main river channel that would alter existing maintenance practices or sediment management regimes within the Garw WFD water body. Operational activities are limited to routine maintenance and use of existing access tracks, and embedded mitigation measures (including drainage design, pollution prevention and sediment control) will ensure that sediment transfer and habitat disturbance are minimised. Given the absence of direct interaction with the main river channel and the implementation of standard good practice measures, the Proposed Development will not constrain or conflict with existing or future sediment management strategies or habitat retention measures. Accordingly, the Proposed Development will not prevent the implementation of operational or maintenance-related mitigation measures required to support WFD objectives.
Water Management	Align and attenuate flow.	The Proposed Development does not include any engineered flow control structures, channel realignment or water management infrastructure that would alter the natural alignment, attenuation or regulation of flows

		within the Garw – headwaters to confluence with the River Ogmore WFD water body. Surface water runoff generated during construction and operation will be managed through embedded mitigation measures, including the implementation of appropriate drainage design, attenuation and controlled discharge, to maintain existing runoff pathways and avoid adverse changes to flow regime at the water body scale. As no direct modification to flow processes is proposed, and any changes to runoff are localised and controlled, the Proposed Development will not prevent or constrain the implementation of mitigation measures relating to flow alignment and attenuation. Accordingly, the Proposed Development is not expected to affect the ability of this water body to achieve its WFD objectives in relation to water management.
Education	Educate landowners.	The Proposed Development has no influence on land management practices at the wider catchment scale and does not restrict opportunities for engagement, education or awareness measures with landowners. Therefore, the Proposed Development will not prevent the implementation of education-based mitigation measures associated with improving water body condition.

6. Conclusion

6.1.1 This WFD screening and scoping assessment, prepared by WSP on behalf of the Applicant, evaluates the potential impacts of the Proposed Glanllynfi Garth Wind Farm on relevant surface water and groundwater bodies and determines whether further detailed assessment is required to demonstrate compliance with the Water Framework Directive.

6.1.2 The assessment identifies that potential impacts associated with the Proposed Development during the Construction, Operational and Decommissioning Stages are temporary, localised and/or controlled through the implementation of embedded mitigation measures. These measures, including standard good construction and operational practice, pollution prevention controls and surface water management, are considered sufficient to manage risks to the water environment. As such, no deterioration in WFD quality elements or overall WFD water body status is anticipated. Accordingly, no further detailed WFD impact assessment or additional mitigation is required to demonstrate WFD compliance.

6.1.3 At the current stage of design, detailed decommissioning methodologies have not been defined; however, decommissioning activities are anticipated to be broadly comparable to construction activities and would be undertaken in accordance with equivalent mitigation measures. Given the temporary, localised and controlled nature of such activities, no deterioration in WFD quality elements or overall WFD status is anticipated.

6.1.4 At this stage, detailed information regarding the extent, type and location of watercourse crossings (temporary and/or permanent) and access track upgrades is not fully defined. Where such features are required, they will be subject to further assessment at the detailed design stage, once sufficient information becomes available, and designed in accordance with embedded mitigation measures and relevant regulatory requirements. This will ensure that any interaction with watercourses is avoided or minimised, and that there is no deterioration in WFD quality elements or overall water body status, or constraints on the delivery of measures required to achieve WFD objectives.

6.1.5 In addition, the review of mitigation measures for the Garw – headwaters to confluence with the River Ogmore Heavily Modified Water Body demonstrates that the Proposed Development will not prevent or constrain the implementation of measures required to achieve Good Ecological Potential.

6.1.6 In conclusion, with embedded mitigation measures in place, no adverse impacts are expected on WFD water bodies, and the Proposed Glanllynfi Garth Wind Farm is considered compliant with WFD requirements.

Annex A
Figures

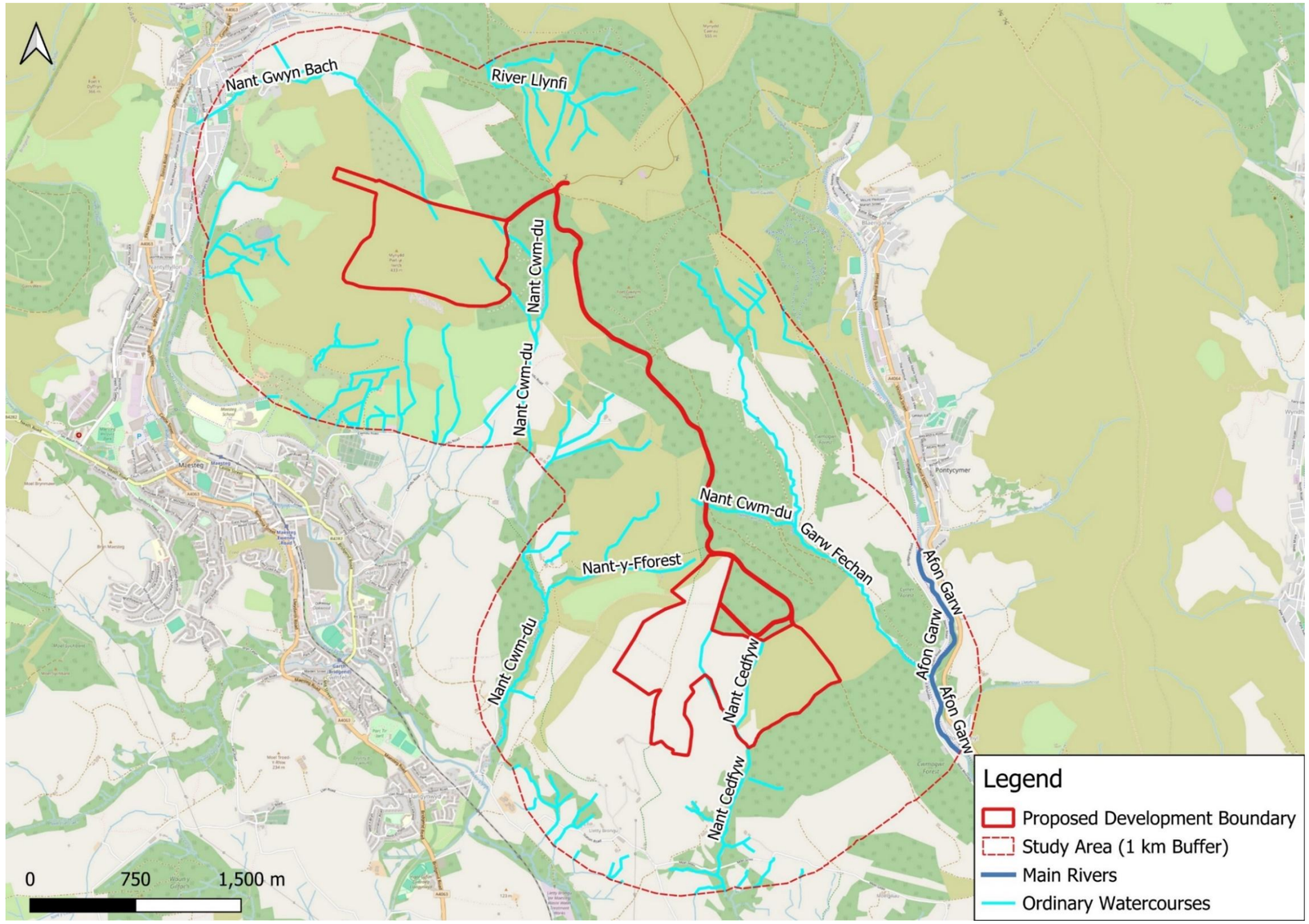

Figure A-1 - Watercourses within and adjacent to the Proposed Development. The figure presents the ordinary watercourses located within the Study Area relevant to the current stage of the WFD assessment and therefore applies a reduced Proposed Development Boundary and corresponding Study Area to focus on these features only. Potential interactions associated with access tracks and any temporary or permanent watercourse crossings are subject to ongoing design development and will be considered separately as part of a future WFD assessment, where required once detailed design information becomes available. Should further assessment of access tracks or watercourse crossings be required, an additional figure showing watercourses across the full Study Area will be prepared to support that assessment.

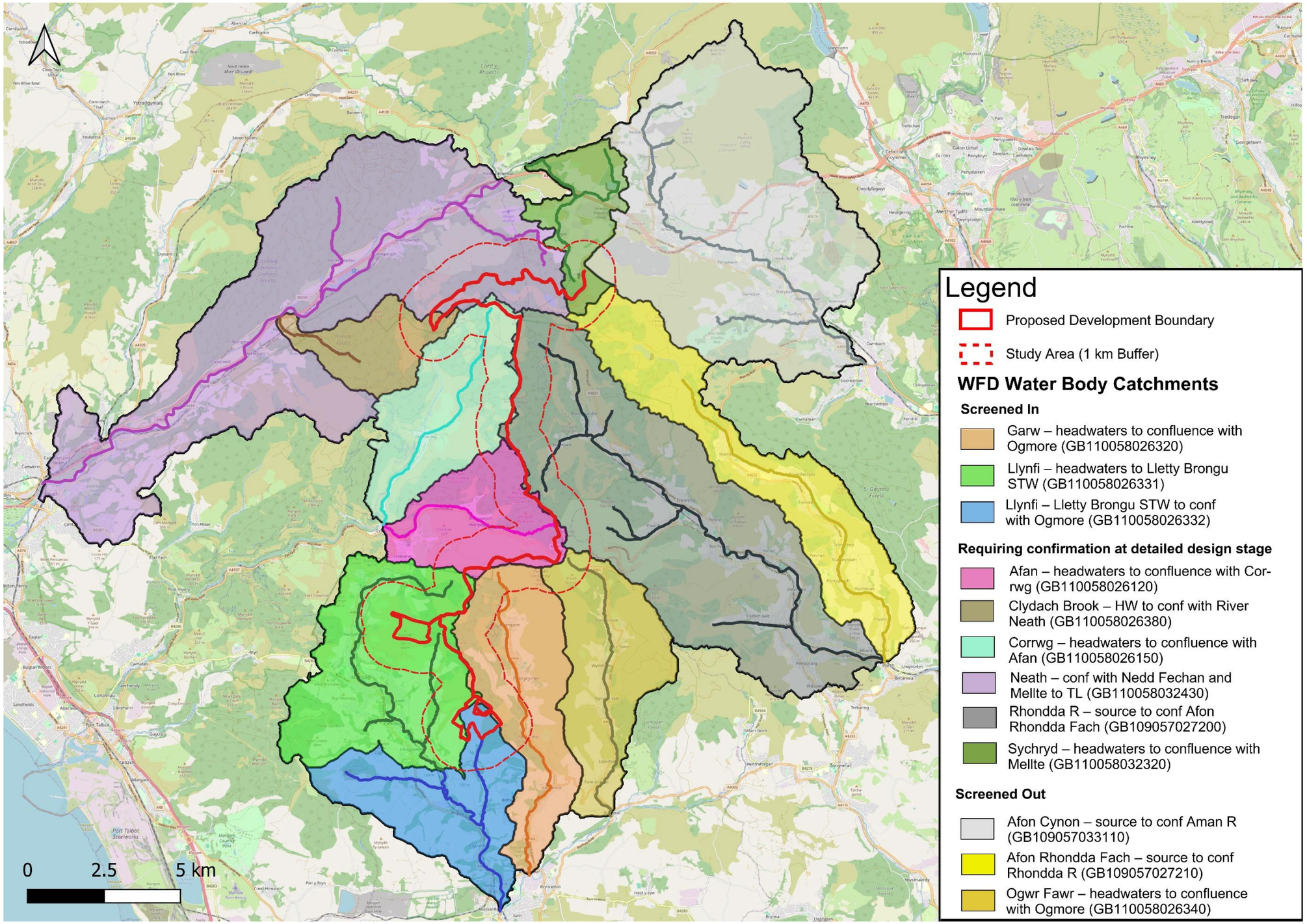

Figure A-2 - WFD Surface Water Bodies and Water Body Catchments within the Study Area of the Proposed Development

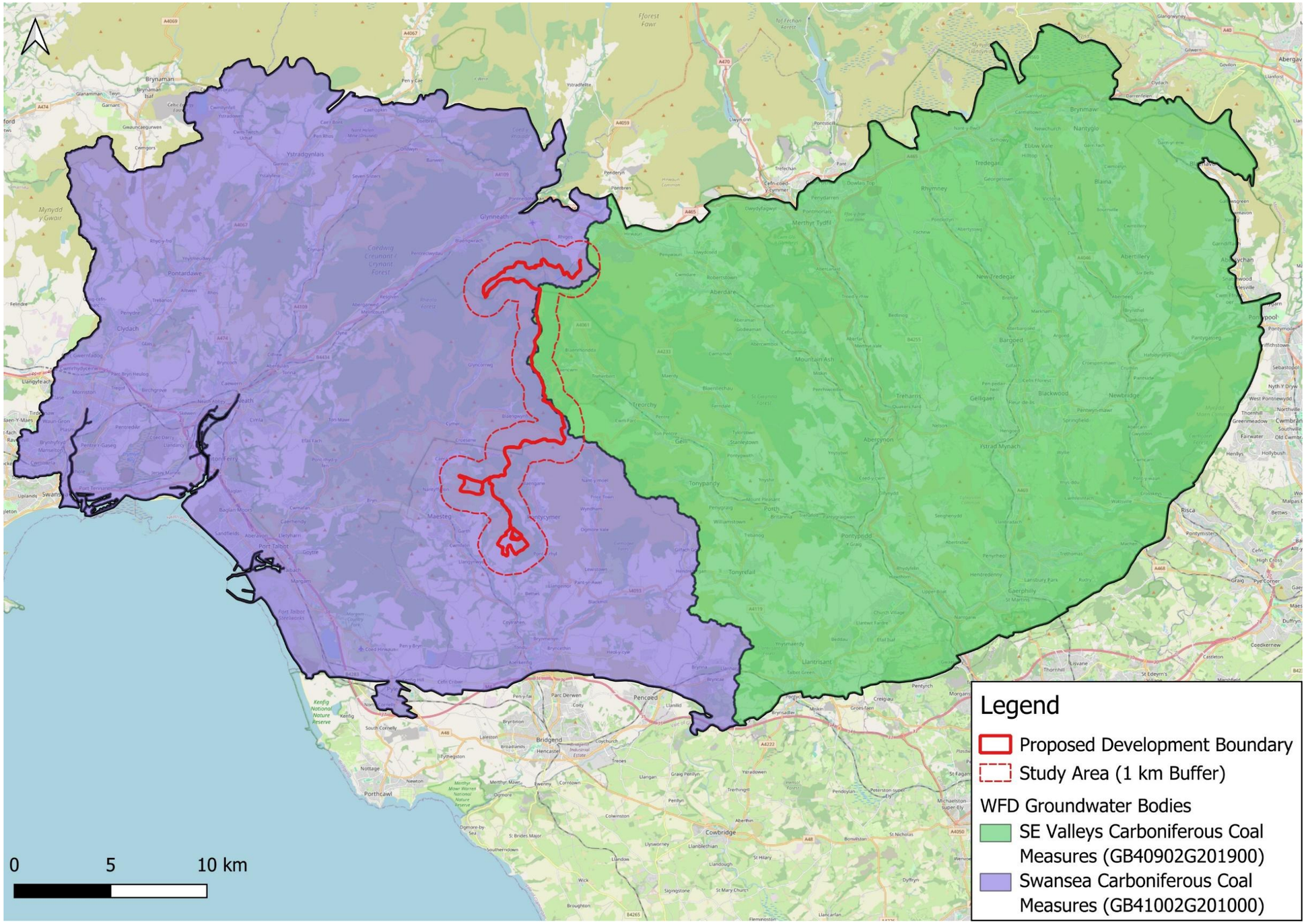

Figure A-3 - WFD Groundwater Bodies and Protected Areas within the Study Area of the Proposed Development

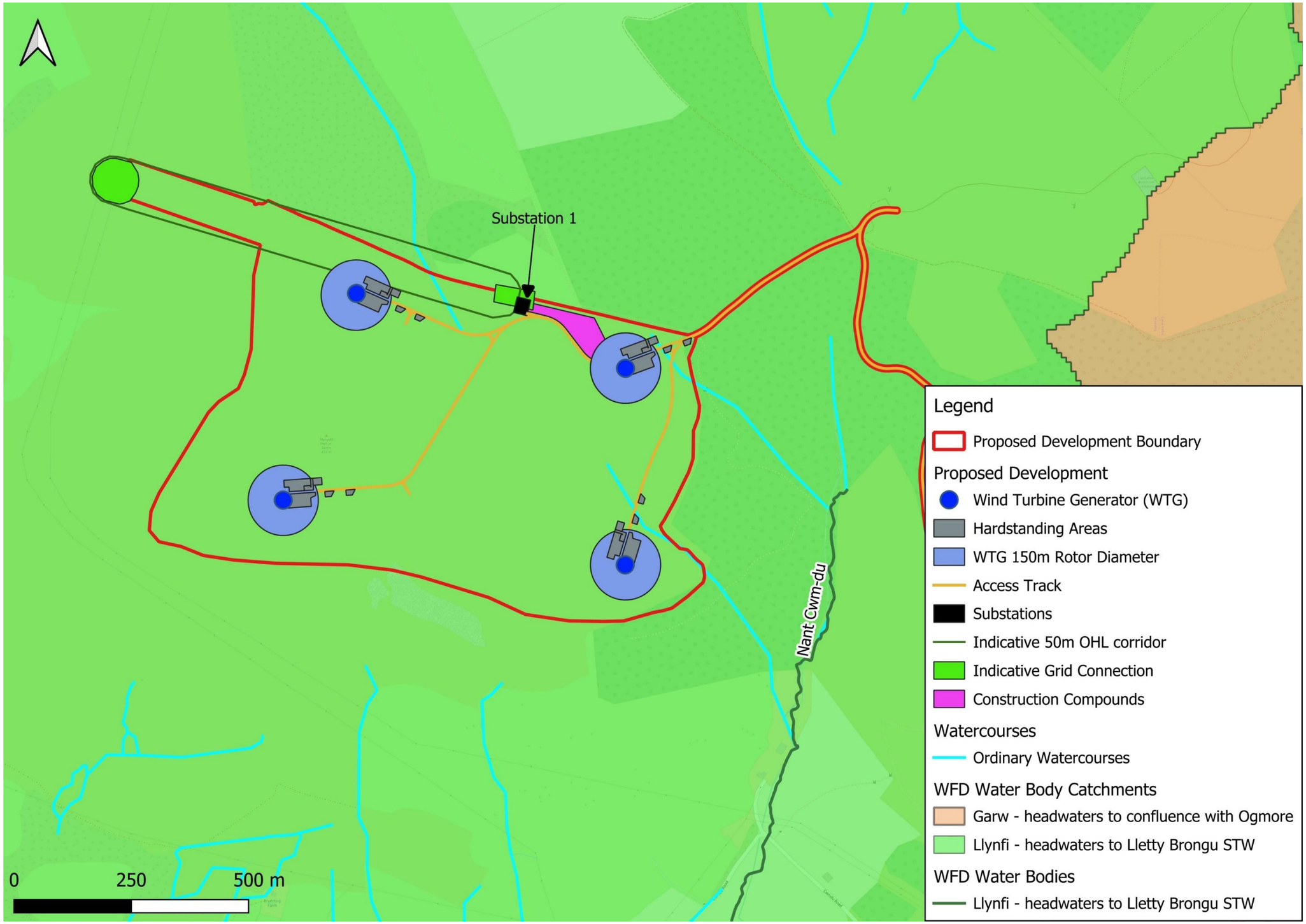

Figure A-4 - Northern Array Proposed Development in relation to Watercourses and WFD Water Bodies.

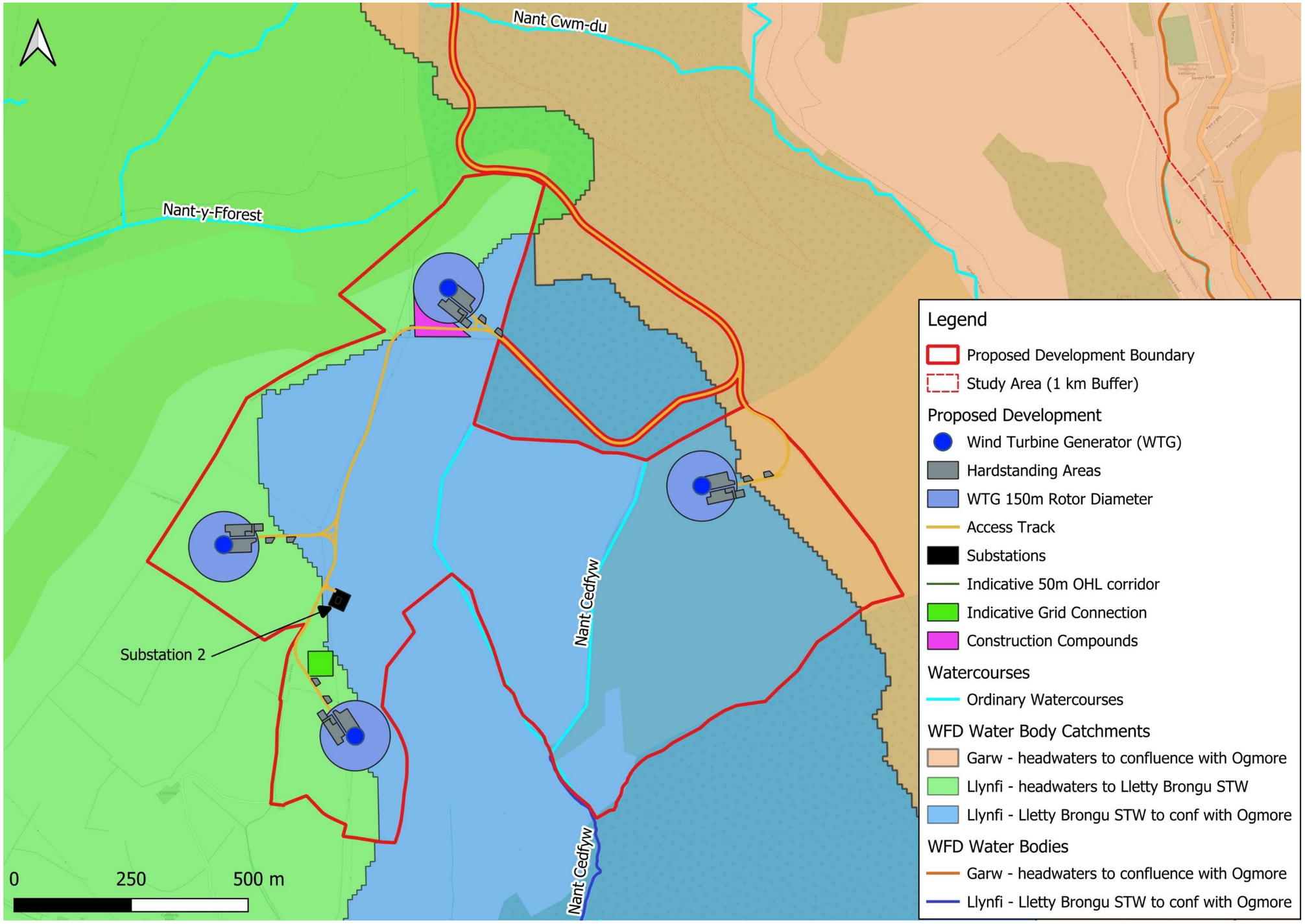

Figure A-5 - Southern Array Proposed Development in relation to Watercourses and WFD Water Bodies.

Annex B
WFD Water Body Data

Table B-1 – WFD Cycle 3 (2021) data for the Garw – headwaters to confluence with the River Ogmore (GB110058026320) Water Body

Water Body ID	GB110058026320
Water Body Name	Garw – headwaters to confluence with the River Ogmore
Water Body Type	River
Water Body Area	23.30 km^2
Hydromorphological Designation	Heavily Modified
Overall Ecological Status/ Potential	Moderate
Overall Ecological Status Objective	Moderate (By 2027)
Overall Biological Status	Good
Fish	Good
Invertebrates	High
Macrophyte	Not Assessed
Physico-chemical Quality Elements	High
Acid Neutralising Capacity	Not Assessed
Ammonia (Phys-Chem)	High
Dissolved oxygen	High
Phosphate	High
Temperature	High
pH	High

Hydromorphological Supporting Elements	Not High
Hydrological Regime	High
Morphology	Not Assessed
Specific pollutants	Not Assessed
Chemical	High
Overall Chemical Quality Element Status Objective	Not Assessed
Priority hazardous substances	Not Assessed
Priority substances	Not Assessed

Table B-2 – WFD Cycle 3 (2021) data for the 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	32.96 km^2
Hydromorphological Designation	Natural
Overall Ecological Status/ Potential	Moderate
Overall Ecological Status Objective	Moderate (By 2027)
Overall Biological Status	Moderate
Fish	Moderate
Invertebrates	High
Macrophyte and Phytobenthos	Good
Macrophyte Sub Element	High
Physico-chemical Quality Elements	High
Acid Neutralising Capacity	High
Ammonia (Phys-Chem)	High
Biological Oxygen Demand	High
Dissolved oxygen	High
Phosphate	High
Temperature	High
pH	High
Hydromorphological Supporting Elements	Not High
Hydrological Regime	Not High

Morphology	Not High
Specific pollutants	Not Assessed
Chemical	High
Overall Chemical Quality Element Status Objective	Not Assessed
Priority hazardous substances	Not Assessed
Priority substances	Not Assessed

Table B-3 – WFD Cycle 3 (2021) data for the Llynfi – Lletty Brongu STW to confluence with the River Ogmore (GB110058026332) Water Body

Water Body ID	GB110058026332
Water Body Name	Llynfi – Lletty Brongu STW to confluence with the River Ogmore
Water Body Type	River
Water Body Area	20.54 km^2
Hydromorphological Designation	Natural
Overall Ecological Status/ Potential	Moderate
Overall Ecological Status Objective	Good (By 2027)
Overall Biological Status	Good
Fish	High
Invertebrates	High
Macrophyte and Phytobenthos	Good
Macrophyte Sub Element	High
Physico-chemical Quality Elements	Moderate
Acid Neutralising Capacity	High
Ammonia (Phys-Chem)	High
Biological Oxygen Demand	High
Dissolved oxygen	High
Phosphate	Poor
Temperature	High
pH	High
Hydromorphological Supporting Elements	Not High
Hydrological Regime	Not High

Water Body ID	GB110058026332
Morphology	Not High
Specific pollutants	High
Arsenic	High
Copper	High
Iron	High
Manganese	High
Zinc	High
Chemical	High
Overall Chemical Quality Element Status Objective	High (By 2027)
Priority hazardous substances	High
Priority substances	High

Table B-4 – WFD Cycle 3 (2021) data for the Swansea Carboniferous Coal Measures (GB41002G201000)

Water Body ID	GB41002G201000
Water Body Name	Swansea Carboniferous Coal Measures
Water Body Type	Groundwater
Water Body Area	758.4km2
Hydromorphological Designation	Natural
River Basin District	Western Wales
Management Catchment	Tawe to Cadoxton GW
Operational Catchment	Swansea Carboniferous Coal Measures
Natural Resource Wales Area	South West Wales
Overall Water body Status	Poor
Driving Element	Chemical Dependent Surface Water Body Status
Groundwater quantitative tests	Good
Groundwater quantitative tests Confidence	Low
Quantitative Groundwater Dependent Terrestrial Ecosystems Test	Good
Quantitative Groundwater Dependent Terrestrial Ecosystems Test Confidence	Low
Quantitative Dependent Surface Water Body Status	Good
Quantitative Dependent Surface Water Body Status Confidence	High
Quantitative Saline Intrusion	Good
Quantitative Saline Intrusion Confidence	Low
Quantitative Water Balance	Good

Water Body ID	GB41002G201000
Quantitative Water Balance Confidence	High
Chemical Groundwater Tests	Poor
Chemical Groundwater Tests Confidence	High
Chemical Drinking Water Protected Area	Good
Chemical Drinking Water Protected Area Confidence	Low
General Chemical Test	Good
General Chemical Test Confidence	Low
Chemical Groundwater Dependent Terrestrial Ecosystems Test	Good
Chemical Groundwater Dependent Terrestrial Ecosystems Test Confidence	Low
Chemical Dependent Surface Water Body Status	Poor
Chemical Dependent Surface Water Body Status Confidence	High
Chemical Saline Intrusion	Good
Chemical Saline Intrusion Confidence	Low
Trend Assessment - Groundwater supporting element	High
Trend Assessment - Groundwater supporting element Confidence	Low

Annex C
WFD Mitigation Measures

Table C-1 – WFD Cycle 3 (2021) Heavily Modified Water Body Mitigation Measures for the Garw – headwaters to confluence with the River Ogmore (GB110058026320) Water Body. Note that all of the designation reasons or uses are flood protection and urbanisation for all mitigation measures.

Measure Tier 1	Measure Tier 2	Measure Status
Working with physical form and function	2. Remove obsolete structure	Not in place – not yet identified
	4. Remove or soften hard bank	Not in place – not yet identified
	5. Preserve or restore habitats	Not in place – not yet identified
	6. In-channel morph diversity	Not in place – not yet identified
	8. Re-opening culverts	Not applicable – not required in this water body
	9. Alter culvert channel bed	Not applicable – not required in this water body
	10. Flood bunds	In place
	11. Set-back embankments	Not applicable – not required in this water body
	12. Floodplain connectivity	Not in place – not yet identified
Structural modification	16. Fish passes	Not applicable – not required in this water body
	18. Reduce fish entrainment	Not applicable – not required in this water body
	19. Enhance ecology	Not in place – not yet identified
	20. Changes to locks etc	Not in place – not yet identified
Operations and maintenance	33. Selective vegetation control	Not applicable – not required in this water body
	34. Vegetation control	Not applicable – not required in this water body
	35. Vegetation control timing	Not applicable – not required in this water body
	36. Invasive species techniques	Not applicable – not required in this water body

	37. Retain habitats	Not in place – not yet identified
	38. Sediment management strategy	Not in place – not yet identified
	39. Maintenance – prevent sediment transfer	In place
	40, Maintenance – minimise habitat impact	Not in place – not yet identified
	41. Water level management	Not applicable – not required in this water body
Water Management	47. Align and attenuate flow	Not applicable – not required in this water body
Education	54. Educate landowners	Not in place – not yet identified

Annex D
Embedded Mitigation Measures

Embedded mitigation measures are assumed to be implemented through standard good construction practice, including the application of pollution prevention controls and surface water management measures. These measures would typically be secured through a CEMP and Surface Water Management Plan (SWMP) at detailed design stage. The key embedded mitigation measures relevant to the identified UK Technical Advisory Group (UKTAG) potential impacts are summarised in **Table D-1**.

Table D-1 – Mitigation measures to manage the potential construction phase risks to the Water Environment and WFD compliance.

Potential Impacts	Mitigation Code	Mitigation Measures
Fine sediment and pollution risk	C-WFD-01	▪ Minimisation of disturbance to soils and exposed ground, including limiting vegetation clearance, earthworks and plant movement in proximity to watercourses where practicable; ▪ Appropriate storage and management of materials, including locating stockpiles away from watercourses (typically ≥10 m) and protecting them (e.g. covering) to reduce sediment mobilisation; ▪ Implementation of surface water control measures, including temporary cut-off drains, silt fencing or similar, to prevent uncontrolled runoff and to intercept sediment-laden flows before discharge to the environment; ▪ Collection, treatment and controlled discharge of surface water runoff and dewatering effluent (e.g. use of settlement measures) to prevent sediment and contaminants entering watercourses; ▪ Progressive stabilisation of disturbed ground, including reinstatement, reseeding or surfacing of exposed areas as soon as practicable to reduce erosion risk; ▪ Provision of contained wheel washing facilities and defined site access arrangements to prevent the tracking of sediment onto hard surfaces and subsequent mobilisation; ▪ Implementation of pollution prevention measures, including spill kits on site, appropriate storage of fuels and hazardous substances within bunded areas, and refuelling within designated, controlled locations away from watercourses; ▪ Use of good site management practices, including regular maintenance of plant and equipment to prevent leaks, and designated areas for mixing and handling potentially contaminating materials (e.g. concrete); and ▪ Implementation of incident response procedures, including immediate containment and reporting of any pollution incidents in accordance with regulatory requirements.
Alteration to flows, water quantity and/or quality	C-WFD-02	▪ Implementation of standard pollution prevention and sediment control measures (as outlined in C-WFD-01) to reduce the risk of indirect effects on flow and water quality through sediment mobilisation; ▪ Management of surface water runoff through temporary drainage systems (e.g. cut-off drains, drainage channels and attenuation measures) to maintain existing runoff pathways, control flow rates and prevent localised increases in discharge to watercourses; ▪ Control of discharge volumes and rates from construction areas, including dewatering activities, to avoid sudden or excessive inputs to receiving watercourses which could alter natural flow regimes; ▪ Where underground cabling crosses a watercourse via open-cut trenching, temporary flow management measures (e.g. over-pumping, temporary diversions or fluming) would be implemented, as appropriate, to maintain downstream flows, minimise disruption to channel hydraulics and avoid localised flooding or flow obstruction during construction;

		■ Collection, treatment and controlled release of runoff and dewatering effluent to maintain water quality and avoid changes in the physical and chemical characteristics of receiving waters; ■ Design and management of temporary drainage and discharge locations to prevent concentration of flows and minimise localised erosion or flow pathway alteration; and ■ Compliance with relevant environmental permitting and regulatory requirements for any discharges or works affecting watercourses, where required.
Alteration to sediment input, transport and deposition	C-WFD-03	■ Minimisation of disturbance to exposed soils and reduction of working areas in proximity to watercourses to limit sediment mobilisation at source; ■ Implementation of sediment control measures (e.g. silt fencing, bunds or similar) where required to intercept and retain sediment-laden runoff before it reaches watercourses; ■ Limiting the removal of vegetation within the riparian corridor and retaining vegetated buffer zones wherever practicable to reduce erosion and sediment transport; ■ Management of construction activities, including movement of plant and machinery, to avoid the creation of preferential flow paths between disturbed ground and adjacent watercourses; and ■ Progressive stabilisation and reinstatement of disturbed areas, including reseeding or surfacing, to reduce ongoing erosion risk and restore natural sediment regimes.
Bankside erosion and impacts on riparian habitats	C-WFD-04	■ Limiting the removal of riparian vegetation and retaining vegetated buffer zones adjacent to watercourses wherever practicable to maintain bank stability and reduce erosion risk; ■ Controlling plant and machinery movements in proximity to watercourses to avoid disturbance to channel margins and reduce the risk of localised bank destabilisation; ■ Appropriate siting and management of temporary drainage outfalls and discharge locations to avoid erosion-prone areas and prevent localised scour or bank erosion; ■ Implementation of surface water runoff control measures (e.g. cut-off drains, drainage channels or similar) to prevent the concentration of flows that could exacerbate bankside erosion; and ■ Progressive stabilisation and reinstatement of disturbed bankside areas, including reseeding or planting where required, to reduce ongoing erosion risk.
Physical disturbance/ alteration to natural bed and or banks	C-WFD-05	■ Restricting vegetation clearance within the riparian corridor to the minimum required and retaining vegetated buffer zones adjacent to watercourses wherever practicable to support natural geomorphological processes and maintain channel stability; ■ Controlling plant and machinery movements in proximity to watercourses and minimising working areas adjacent to watercourses to avoid unnecessary disturbance to channel margins, reduce the potential for localised bank degradation, and minimise direct and indirect effects on channel form and sediment dynamics; ■ Appropriate siting and management of temporary drainage outfalls and discharge locations to avoid erosion-prone areas and minimise localised disturbance to banks; and ■ Reinstatement of any disturbed banks, bed material, watercourse crossings and adjacent areas to stable profiles and baseline conditions as far as practicable following construction, including implementation of appropriate stabilisation measures (e.g. reseeding or planting), to avoid long-term alteration to channel form or habitat diversity.

Loss of aquatic, marginal and riparian habitats	C-WFD-06	▪ Restricting vegetation clearance within and adjacent to watercourses to the minimum required and retaining aquatic, marginal and riparian habitats wherever practicable; ▪ Minimising the working footprint in proximity to watercourses to avoid unnecessary disturbance or loss of aquatic and marginal habitats; ▪ Progressive reinstatement of disturbed areas following construction, including re-establishment of marginal and riparian vegetation using appropriate native species; and ▪ Implementation of good construction practices to protect adjacent aquatic and marginal habitats from indirect impacts associated with sediment mobilisation and runoff.
INNS Management	C-WFD-07	▪ Site-specific INNS Management Plan to be prepared and implemented, including: pre-works INNS survey along the working corridor; treatment of any identified stands prior to works commencing; segregation of INNS-affected areas during works; post-works monitoring for two growing seasons; disposal of INNS-affected material to licensed facilities only.
Biosecurity	C-WFD-08	▪ Implement Check-Clean-Dry biosecurity protocols on all plant, PPE and materials entering and leaving the site. Cleaning stations to be established at site entrance/exit.

Embedded mitigation measures are assumed to be implemented through standard good operational practice, including the application of pollution prevention controls, surface water management measures and routine maintenance procedures. These measures would typically be embedded within the operational design of the Proposed Development and secured through operational management plans, maintenance schedules and environmental good practice. Compliance with these measures would be maintained through routine inspection, monitoring and maintenance of relevant infrastructure and systems throughout the operational phase. The key embedded mitigation measures relevant to the identified UKTAG potential impacts during operation are summarised in **Table D-2**.

Table D-2 – Mitigation measures to manage the potential operational phase risks to the Water Environment and WFD compliance.

Potential Impacts	Mitigation Code	Mitigation Measures
▪ **Alteration to flows, water quantity and/or quality; and** ▪ **Alteration to sediment input, transport and deposition**	O-WFD-01	▪ Surface water runoff would be managed through appropriately designed drainage systems to control discharge rates, volumes and sediment mobilisation, and to minimise changes to natural flow pathways; ▪ Measures would be implemented to intercept, retain and manage runoff and sediment prior to discharge to receiving watercourses; ▪ Surface water runoff and any collected drainage water would be subject to appropriate treatment, where required, prior to discharge to receiving watercourses to minimise the risk of sedimentation and deterioration in water quality; ▪ Drainage features and discharge locations would be appropriately sited and designed to avoid the concentration of flows, minimise localised erosion, and prevent the mobilisation or deposition of sediment within watercourses; ▪ Existing riparian vegetation, buffer zones and natural drainage features would be retained where practicable to support runoff filtration, sediment interception and regulation of flow pathways; ▪ Any watercourses temporarily disturbed during construction works would be reinstated to their baseline condition as far as practicable following completion of the works, including restoration of bed, bank and riparian features where required; ▪ Routine inspection and maintenance of drainage infrastructure would be undertaken to ensure continued performance and prevent adverse hydrological effects, sediment mobilisation, erosion or deposition during operation; and ▪ Refuelling and maintenance activities would be undertaken in designated areas away from watercourses where practicable, with appropriate spill prevention and response measures in place.