



Pennant Walters

GLANLLYNFI GARTH WIND FARM

Draft Environmental Statement

Chapter 10 - Water Environment



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10 Water Environment

10.1 Introduction

10.1.1. This chapter presents the assessment of the likely significant effects of the Proposed Development with respect to the water environment, including hydrology, flood risk and drainage. The assessment is based on information obtained to date. It should be read in conjunction with the project description provided in **Chapter 4: Development Description** and with respect to relevant parts of the following chapters:

- **Chapter 8: Biodiversity (Terrestrial);** and
- **Chapter 11: Ground Conditions.**

10.1.2. This chapter describes:

- the legislation, policy and technical guidance that has informed the assessment (**Section 10.2**);
- consultation and engagement that has been undertaken and how comments from consultees relating to the water environment have been addressed (**Section 10.3**);
- the methods used for baseline data gathering (**Section 10.4**);
- overall baseline (**Section 10.5**);
- embedded measures relevant to the water environment (**Section 10.6**);
- the scope of the assessment for the water environment (**Section 10.7**);
- the methods used for the assessment (**Section 10.8**);
- the assessment of water environment effects (**Section 10.9**);
- a summary of residual effects and additional mitigation measures (**Section 10.10**);
- an assessment of cumulative (inter-project) effects (**Section 10.11**);
- a summary of the significance conclusions (**Section 10.12**);
- an outline of further work to be undertaken for the Environmental Statement (ES) (**Section 10.13**).

Limitations and assumptions

10.1.3. The Draft ES has been produced to fulfil Pennant Walters's consultation duties and enable consultees to develop an informed view of the likely significant effects of the Proposed Development.

10.1.4. Baseline conditions have been established from historical data and current environmental information. The baseline reflects conditions at the time of assessment, with future changes considered separately in the future baseline.

10.1.5. The fieldwork followed standard 'reconnaissance' field methods in which watercourses were visited close to planned access routes.

- 10.1.6. The GWDTE Assessment (**Appendix 10C GWDTE Assessment**) is currently based on Phase 1 habitat data and is therefore considered high level and indicative in the absence of detailed National Vegetation Classification (NVC) survey data. Updated NVC classifications will be provided following completion of targeted NVC survey work as part of the final ES.
- 10.1.7. It is assumed that the design, construction and completed stages of the Proposed Development would satisfy minimum environmental standards, consistent with contemporary legislation, practice, and knowledge as outlined in **Section 10.2**.

10.2 Relevant legislation, planning policy and technical guidance

- 10.2.1. This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to the water environment. Further information on policies relevant to the Project is provided in **Chapter 5 Legislation and Policy**.

Legislation

- 10.2.2. A summary of the relevant legislation is given in **Table 10-1**.

Table 10-1 Legislation relevant to the water environment assessment

Technical Guidance Document	Context
Control of Pollution Act 1974 ¹	Make further provision with respect to waste disposal, water pollution, noise, atmospheric pollution and public health.
Reservoirs Act 1975 ²	Provides regulation for the operation and maintenance of reservoirs to ensure the design is fit for purpose, and that maintenance (including frequent inspections of reservoir embankments) ensures the condition of the embankments. As a consequence, the chance of them failing and giving rise to flooding problems is remote.
Environmental Protection Act 1990 ³	Makes provision for the improved control of pollution arising from certain industrial and other processes. It re-enacts the provisions of the Control of Pollution Act 1974 relating to waste on land, including modifications to the functions of the regulatory and other authorities concerned in the collection and disposal of waste and makes further provision in relation to such waste. Part 2 of the Act makes provision for the improved control of pollution arising from certain industrial and other processes. Part 2A of the Act provides the regulatory basis for the identification, designation, and remediation of contaminated land.

¹ UK Government. (1974) Control of Pollution Act July 1974. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1974/40> (Accessed July 2026)

² UK Government (1975) Reservoirs Act May 1975. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1975/23> (Accessed July 2026)

³ UK Government (1990) Environmental Protection Act November 1990. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1990/43/contents> (Accessed July 2026)

Technical Guidance Document	Context
The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015 ⁴	Regulations implementing the European Union (EU) Directive on environmental liability setting out the principles for prevention and remedy of environmental damage. Construction and operational activities for the Proposed Development have the potential to cause pollution and the regulations place emphasis on businesses to proactively implement pollution prevention measures so that damage to the environment does not arise.
The Construction (Design and Management) Regulations 2015 ⁵	The Construction (Design and Management) Regulations (CDM) place specific duties on clients, designers, and contractors, so that health and safety is considered throughout the life of a construction project from its inception to its subsequent final demolition and removal. They include the requirement to appoint a Principal Designer and Principal Contractor to co-ordinate health and safety aspects during construction. Under the CDM regulations, designers must avoid foreseeable risks so far as reasonably practicable by eliminating hazards from the construction, cleaning, maintenance, and proposed use and demolition of a structure; reducing risks from any remaining hazard; and giving collective safety measures priority over individual measures. Construction of the Proposed Development would fall under the requirements of the Regulations requiring consideration of health and safety to be incorporated into the design of the Proposed Development components and at construction stage.
Land Drainage Act 1991 ⁶ and 1994 ⁷	Stipulates, in combination with the Water Resources Act, that before work on or near an 'Ordinary Watercourse' is carried out, an Ordinary Watercourse Consent is required. The Flood Defence consenting regime for 'Main Rivers', which used to be part of this Act, was replaced by flood risk activities permits under the Environmental Permitting Regulations 2016.
Water Resources Act 1991 ⁸ (Amendment) (England and Wales) Regulations 2009 ⁹ , Water Act 2003 ¹⁰	States that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter 'Controlled Waters'. The Act was revised by the Water Act 2003, which sets out regulatory controls for water abstraction, water impoundment and protection of water resources. Important for the Project is the potential requirement to obtain a licence for dewatering of engineering works and to ensure that any impact on the environment can be mitigated. Provisions for the regulation of water discharges to controlled waters are set out in the Environmental Permitting (England and Wales) Regulations 2016. These have replaced provisions in the earlier Acts.

⁴ UK Government. (2015) The Environmental Damage Prevention and Remediation Amendment Wales Regulations July 2015. (Online) Available from: <https://www.legislation.gov.uk/wsi/2015/1394/contents/made> (Accessed July 2026)

⁵ UK Government. (2015) The Construction Design and Management Regulations April 2015. (Online) Available from: <https://www.legislation.gov.uk/ukxi/2015/51/contents> (Accessed July 2026)

⁶ UK Government. (1991) Land Drainage Act December 1991. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1991/59/contents> (Accessed July 2026)

⁷ UK Government. (1994) Land Drainage Act September 1994. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1994/25/contents> (Accessed July 2026)

⁸ UK Government. (1991) Water Resources Act July 1991. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1991/57/contents> (Accessed July 2026)

⁹ UK Government. (2009) Water Resources Act 1991 Amendment for England and Wales Regulations December 2009. (Online) Available from: <https://www.legislation.gov.uk/ukxi/2009/3104/contents> (Accessed July 2026)

¹⁰ UK Government. (2003) Water Act November 2003. (Online) Available from: <https://www.legislation.gov.uk/ukpga/2003/37/contents> (Accessed July 2026)

Technical Guidance Document	Context
Environment Act 1995 ¹¹	Established the Environment Agency (EA) and gave it responsibility for environmental protection and flood defence. Natural Resources Wales (NRW) was formed in April 2013, largely taking over the functions of the Countryside Council for Wales, Forestry Commission Wales and the Environment Agency in Wales.
Water Supply (Water Quality) Regulations 2018 ¹²	Primarily concerned with the quality of water supplied by water undertakers whose areas are wholly or mainly in Wales, including water used for drinking and arrangements for the publication of water quality information.
Priority Substances Directive (2008/105/EC) Revision of the Priority Substances Directive 2013/39/EU ¹³	Sets out environmental quality standards in the field of water policy for Europe, with the aim of minimising the threat to the aquatic environment and effects such as acute and chronic toxicity to aquatic organisms, accumulation in the ecosystem and losses of habitats and biodiversity, as well as a threat to human health.
The EU Floods Directive 2007/60/EC, as enacted into domestic law by the Flood Risk Regulations 2009 ¹⁴	Enacted into domestic law by the Flood Risk Regulations 2009. It requires that in accordance with flood risk management plans, there should be a focus on the prevention of flooding, through avoidance of planned development in present and future flood prone areas, and protection by taking measures to reduce the likelihood of flooding.
Flood and Water Management Act 2010 ¹⁵	Sets out the Government's proposals to improve flood risk management, water quality and ensure water supplies are more secure. The Act includes consideration and responsibilities for managing flood risk and consideration of drainage including the use of Sustainable Drainage Systems (SuDS).
The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015 ¹⁶	Sets out the environmental standards to be used for the second cycle of river basin plans, covering the period 2016-21. Along with the updated Water Environment (WFD) (England and Wales) Regulations 2003, they transpose Directive 2013/39/EC on environmental quality standards for priority substances.
The Environment (Wales) Act 2016 ¹⁷	Aims to enable resources in Wales to be managed in a more proactive, sustainable and joined-up way and to establish the legislative framework necessary to tackle climate change. It includes provisions relating to land drainage and establishes a Flood and Coastal Erosion Committee which oversees and provides guidance on wider risks and benefits of flood and coastal erosion risk management in Wales. The Act also makes provisions within Wales for the planning and managing of natural resources at a national and local level. Natural resources are

¹¹ UK Government. (1995) Environment Act July 1995. (Online) Available from: <https://www.legislation.gov.uk/ukpga/1995/25/contents> (Accessed July 2026)

¹² UK Government. (2017) The Water Supply (Water Quality) Regulations in Northern Ireland October 2017. (Online) Available from: <https://www.legislation.gov.uk/nisr/2017/212/made> (Accessed July 2026)

¹³ UK Government. (2013) Directive 2013/39/EU of the European Parliament and of the Council of the European Union 2013, as enacted in the UK law by the Flood Risk Regulations August 2013. (Online) Available from: <https://www.legislation.gov.uk/eudr/2013/39/contents> (Accessed July 2026)

¹⁴ UK Government. (2009) Directive 2007/60/EC of the European Parliament and of the Council of the European Union, as enacted into UK law by the Flood Risk Regulations December 2009. (Online) Available from: <https://www.legislation.gov.uk/eudr/2007/60/contents> (Accessed July 2026)

¹⁵ UK Government. (2010) Flood and Water Management Act April 2010. (Online) Available from: <https://www.legislation.gov.uk/ukpga/2010/29/contents> (Accessed July 2026)

¹⁶ UK Government. (2015) The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations September 2015. (Online) Available from: <https://www.legislation.gov.uk/uksi/2015/1623/contents> (Accessed July 2026)

¹⁷ UK Government. (2016) The Environment (Wales) Act March 2016. (Online) Available from: <https://www.legislation.gov.uk/anaw/2016/3/contents> (Accessed July 2026)

Technical Guidance Document	Context
	defined in Part 1, 2, as including several resources of relevance to the water environment assessment: “(a) animals, plants and other organisms; (b) air, water and soil; (c) minerals; (d) geological features and processes.”
Well-being of Future Generations (Wales) Act (2015) ¹⁸	The Act does not refer explicitly to soils or land contamination; however, it requires public bodies in Wales to think about the long-term impact of their decisions. It requires them to act in accordance with sustainable development principles, with the aim of achieving well-being goals.
Private Water Supplies (Wales) Regulations 2017 ¹⁹	The Regulations require Local Authorities to monitor Private Water Supplies.
Environmental Permitting (England and Wales) (Regulations (EPR), 2016 (as amended) ²⁰	Replaces the previous 2010 regulations. It provides a consolidated framework for environmental permits and exemptions for waste operations and water discharge activities (previously consented under the Water Resources Act 1991, and the Control of Pollution Act 1974), and groundwater activities. It also sets out the powers, functions, and duties of the regulators.
The European Union (EU) Water Framework Directive (2000/60/EC) (WFD) as enacted into domestic law by the Water Environment WFD (England and Wales) (Amendment) Regulations 2017 ²¹	The EU WFD is enacted into domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. A fundamental requirement of the WFD is to attain Good Ecological Status, or Good Ecological Potential within each defined water body, by December 2027 at the latest and to ensure that any deterioration in status is prevented.
Environment Act, 2021 ²²	The Environment Act (2021) makes provision for Environmental Improvement Plans (EIPs), including a target-based approach for water bodies, aligned with the WFD targets. Currently, only one EIP, the Defra 25-year plan has been produced, which sets out the high level (national aspirations) for the environment.

Planning Policy

10.2.3. A summary of the relevant national and local planning policy is given in **Table 10-2**.

¹⁸ Welsh Government. (2015) The Well-being of Future Generations Act Wales April 2015. (Online) Available from: <https://www.gov.wales/well-being-of-future-generations-wales> (Accessed July 2026)

¹⁹ UK Government. (2017) The Private Water Supplies (Wales) Regulations November 2017. (Online) Available from: <https://www.legislation.gov.uk/wsi/2017/1041/contents> (Accessed July 2026)

²⁰ UK Government. (2016) The Environmental Permitting (England and Wales) Regulations December 2016. (Online) Available from: <https://www.legislation.gov.uk/uksi/2016/1154/contents> (Accessed July 2026)

²¹ UK Government. (2017) The Water Environment (Water Framework Directive) (England and Wales) Regulations April 2017. (Online) Available from: <https://www.legislation.gov.uk/uksi/2017/407/contents> (Accessed July 2026)

²² UK Government. (2021) Environment Act November 2021. (Online) Available from: <https://www.legislation.gov.uk/ukpga/2021/30/introduction/enacted> (Accessed July 2026)

Table 10-2 Planning policy relevant to the water environment assessment

Technical guidance document	Context
<u>National Planning Policy</u>	
National Development Framework (Future Wales: The National Plan 2040) ²³	This is the national development framework for Wales, which has development plan status. Policy 8 – Flooding The policy sets out the requirement for sustainable development which puts a priority on nature-based flood management solutions, as well as supporting strategic growth and regeneration in National and Regional Growth Areas. Policy 17 – Renewable and Low Carbon Energy and Associated Infrastructure The policy sets out the prioritising of renewable energy to fulfil climate commitments, permitting large-scale wind energy in designated areas while protecting sensitive zones. Proposals must demonstrate community benefits, and grid infrastructure design should minimise visual impact, supported by stakeholder collaboration for a resilient grid network transition. Policy 19 – Strategic Policies for Regional Planning The policy states that environmental consideration when planning developments and managing resources is vital, on a strategic and local scale. Environmental issues identified must be fully assessed and addressed. Policy 33 – Cardiff, Newport and the Valleys This policy sets out the ambitions for the Cardiff, Newport, and Valleys region of Wales, which includes Caerphilly. This is inclusive of development and growth strategies with reference to natural resources, climate change, flooding and biodiversity.
The National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales, Welsh Government ²⁴	The National Strategy for FCERM in Wales, as required under the Flood and Water Management Act 2010, set out the management approach for risks associated with flooding and coastal erosion across Wales over a 10-year period. NRW are responsible for managing the flood risks from the main rivers and sea across Wales; whilst Local Authorities as Lead Local Flood Authorities (LLFA) are responsible for managing risks associated with surface water, groundwater, and Ordinary Watercourses.
Planning Policy Wales (PPW) ²⁵	The PPW sets out the land use planning policies of the Welsh Government. It details the requirements when constructing new developments including the provision of SuDS enabling surface water to be managed and consideration of impacts to water resources (groundwater and ecology).

²³ Welsh Government. (2021) Written Statement: Publication of 'Future Wales – the national plan 2040' and Planning Policy Wales Edition 11 February 2021. (Online) Available from: <https://www.gov.wales/written-statement-publication-future-wales-national-plan-2040-and-planning-policy-wales-edition-11> (Accessed July 2026)

²⁴ Welsh Government. (2020) The National Strategy for Flood and Coastal Erosion Risk Management in Wales October 2020. (Online) Available from: <https://www.gov.wales/sites/default/files/publications/2021-03/the-national-strategy-for-flood-and-coastal-erosion-risk-management-in-wales.pdf> (Accessed July 2026)

²⁵ Welsh Government. (2024) Planning Policy Wales Edition 12 February 2024. (Online) Available from: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf> (Accessed July 2026)

Technical guidance document	Context
Technical Advice Note 15 (TAN15) ²⁶	Technical Advice Note 15: Development and Flood Risk (TAN15 – July 2004) was produced by the then Welsh Assembly Government (now the Welsh Government). TAN15 provides technical guidance which supplements the policy set out in Planning Policy Wales (Edition 12, February 2024) (Welsh Assembly Government, 2024) in relation to development and flooding, providing a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. Consultation on an updated version of TAN15 has recently been prepared (January 2020). The draft update includes a range of changes to the guidance, in particular, it removes reference to the Development Advice Map (DAM) and refers to a “Wales Flood Map” held by NRW. However, the consultation draft clearly states that TAN15 (2004) remains current until such a time that the replacement is confirmed. TAN15 (2004) has therefore been used to underpin this assessment. TAN15 is supplemented by the Development Advice Map (DAM) which provides the basis for assessment under TAN15. The DAM was last updated in July 2017. Justification Test The Justification Test is intended to assess the appropriateness of proposed developments, based upon location in respect of flood zones and the type of development proposed.
<u>Local Planning Policy</u>	
Bridgend Replacement Local Development Plan 2018–2033; Neath Port Talbot Local Development Plan 2011–2026; and Rhondda Cynon Taf Local Development Plan / emerging Revised LDP	Relevant local planning policy context for the water environment assessment, including policies/objectives relating to protection of the water environment, flood risk, climate change and sustainable development.

Technical Guidance

10.2.4. A summary of the technical guidance for water environment is given in **Table 10-3**.

Table 10-3 Technical guidance relevant to the water environment assessment

Technical Guidance Document	Context
NRW – Flood consequence assessments: climate change allowances ²⁷	Guidance regarding uplifts to be applied to hydrological modelling inputs to be used to help minimise vulnerability and provide resilience to the impacts of climate change.
Sustainable Drainage (SuDS) Statutory Guidance, Welsh Government ²⁸	The SuDS Statutory Guidance establishes the requirements of Schedule 3 of the Flood and Water Management Act 2010; a framework for the approval and adoption of surface water management

²⁶ Welsh Government. (2004) Technical advice note (TAN) 15: Development, Flooding and Coastal Erosion July 2004. (Online) Available from: <https://www.gov.wales/technical-advice-note-tan-15-development-flooding-and-coastal-erosion> (Accessed July 2026)

²⁷ Welsh Government. (2021) Climate Change Allowances and Flood Consequence Assessments September 2021. (Online) Available from: <https://www.gov.wales/climate-change-allowances-and-flood-consequence-assessments> (Accessed July 2026)

²⁸ Welsh Government. (2019) Sustainable Drainage (SuDS) Statutory Guidance June 2019. (Online) Available from: <https://www.gov.wales/sustainable-drainage-systems-suds-guidance> (Accessed July 2026)

Technical Guidance Document	Context
	systems serving new developments. The SuDS Approval Bodies (SABs) are assigned under the same Act, which give local authorities the responsibility to approve drainage systems for new developments. The overall objective of the legislation is to deliver effective, multi-purpose SuDS, which will remain effective for the lifetime of the development.
PINS Advice Note 18: The Water Framework Directive ²⁹	The WFD provides a comprehensive framework for water protection and management across the European Union and aims to prevent deterioration and improve the status of all water bodies.
GOV – Guidance: Groundwater risk assessment for your Environmental permit ³⁰	A groundwater risk assessment that evaluates whether the proposed activity could pollute groundwater, which includes all water underground, below the water table, in contact with soil or rock.
Environment Agency – The Environment Agency’s approach to groundwater protection ³¹	A framework for managing and safeguarding groundwater resources, which takes a precautionary approach, preventing pollution, safeguarding supply through the designation of Source Protection Zones (SPZ’s), and promotes efficient and responsible use of groundwater resources.
Natural Resources Wales – How to comply with Sustainable Drainage Systems (SuDS) standard ³²	Outlines advice to developers and SABs on three of the SuDS Standards: S2 hydraulic control, S3 water quality and S5 biodiversity.
<u>Construction Industry Research and Information Association (CIRIA) reports³³</u>	
Report C532: Control of Water Pollution from Construction Sites (2001)	Provides practical support for consultants and contractors on how to plan and manage construction projects to control water pollution.
Report C624: Development and Flood Risk - Guidance for the Construction Industry (2004)	Guidance for developers and the construction industry on the implementation of good practice in the assessment and management of flood risk as part of the development process and is intended to promote development that is sustainable in terms of flood risk.
Report C648: Control of Water Pollution from Linear Construction Projects (2006)	Guidance for clients, consultants, designers, contractors, and regulators on how to plan and manage water pollution from linear construction projects.
Report C649: Control of Water Pollution from Linear Construction Projects - Site Guidance (2006)	Guidance specifically aimed at on-site construction personnel working on linear infrastructure construction projects.
Report C650: Environmental Good Practice on Site, second edition (2005) ³⁵	Provides practical guidance about managing construction on-site to control environmental impacts.

²⁹ UK Government. (2024) Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive September 2024. (Online) Available from: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive> (Accessed July 2026)

³⁰ UK Government. (2016) Groundwater Risk Assessment for your Environmental Permit Guidance February 2016. (Online) Available from: <https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit> (Accessed July 2026)

³¹ UK Government. (2017) Groundwater Protection Position Statements March 2017. (Online) Available from: <https://www.gov.uk/government/publications/groundwater-protection-position-statements> (Accessed July 2026)

³² Natural Resources Wales. (2025) How to Comply with Sustainable Drainage Systems (SuDS) Standards August 2025. (Online) Available from: <https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/how-to-comply-with-sustainable-drainage-systems-standards?lang=en> (Accessed July 2026)

³³ CIRIA. (2026) Construction Industry Research and Information Association Resources. (Online) Available from: https://www.ciria.org/CIRIA/Resources/Resource_overview/Resources/Resources_overview.aspx (Accessed July 2026)

Technical Guidance Document	Context
Report C651: Environmental Good Practice - Pocket Book (2005)	Contains a series of good practice guidance and practical advice for the management of construction sites to minimise environmental impacts.
Report C692: Environmental Good Practice on Site (2010)	General good practice guidance and practical advice for the management of construction sites to minimise environmental impacts.
Report C698: Site Handbook for the Construction of SuDS (2007)	Guidance of site engineers and SuDS practitioners on the construction of SuDS to facilitate their effective implementation with developments.
Report C753: The SuDS Manual (2015)	Best practice guidance on the planning, designing, construction, operation and maintenance of SuDS to facilitate their effective implementation within developments.
Report C809 Sustainable Management of Surplus Soils	CIRIA C809 provides guidance on the avoidance and management of surplus soils and aggregates arising during construction and development projects, to help projects comply with the principles of the Waste Hierarchy, circular economy, sustainability, zero landfill, and net zero objectives. As waste policy is devolved in the UK, CIRIA C809 sets out relevant legislation, guidance and tools for the sustainable management of surplus soils for the devolved administrations.
Pollution Prevention Guidance Notes (PPGs) and Guidance for Pollution Prevention Notes (GPPs) (both are maintained by NetRegs and provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland and Scotland)³⁴	
GPP 1: Understanding your environmental responsibilities - good environmental practices (October 2020)	Guidance document based on relevant legislation and reflects current good practice.
GPP 2: Above ground oil storage tanks (January 2018)	Guidance to support the safety of above ground oil storage tanks and minimise the risk of causing pollution.
GPP 3: Use and design of oil separators in surface water drainage systems (March 2022)	Guidelines to support decision making on whether an oil separator is needed for a site, and if so what size and type separator is appropriate.
GPP 5: Works and maintenance in or near water (February 2018)	Guidance document based on relevant legislation and setting out current good practice for working in or near water.
PPG 6: Working at construction and demolition sites (2012)	Practical advice and guidance to help prevent pollution from construction and demolition sites. Sets out legislative requirements and good practice measures to reduce the risk of a pollution incident.
GPP 8: Safe storage and disposal of used oils (July 2017)	Guidance based on relevant legislation and setting out current good practice for the safe storage and disposal of used oils.
GPP 20: Dewatering underground ducts and chambers (January 2018)	Guidelines for dewatering underground ducts and chambers, based on relevant legislation and setting out current good practice.
GPP 21: Pollution incident response planning (June 2021)	Guidelines setting out current best practice for producing an incident response plan.
GPP 22: Dealing with spills (October 2018)	Guidance applicable to those responsible for storing and transporting materials that could cause pollution if they spill. It may also be useful for those who respond to spills, or those responsible for transporting or storing waste from spills.

³⁴ SEPA. (2021) Environment Guidance for Pollution Prevention (GPP) Documents June 2021. (Online) Available from: <https://www.netregs.org.uk/tools/guidance-for-pollution-prevention-gpp-documents> (Accessed July 2026)

Technical Guidance Document	Context
GPP 26 Safe storage - drums and intermediate bulk containers (IBCs) (February 2019)	Guidance aimed at site operators and those responsible for the storing and handling of drums and IBCs.

10.3 Consultation and Engagement

Overview

- 10.3.1. The assessment has been informed by consultation responses and ongoing stakeholder engagement.

Scoping Opinion

- 10.3.2. A Scoping Direction was issued by the Planning Inspectorate, on behalf of the Welsh Ministers, on 12 June 2026. A summary of the relevant responses received in the Scoping Opinion in relation to the water environment and confirmation of how these have been addressed within the assessment to date is presented in **Table 10-4**.

Table 10-4 Summary of EIA Scoping Direction Responses for the water environment

Consultee	Consideration	How addressed in this Draft ES
Planning and Environment Decisions Wales (PEDW)	Hydrology and Water Quality (ID.49) – PEDW noted that the proposed development has the potential to affect natural drainage patterns, water quality and watercourses through turbine foundations, cable routes, access tracks, drainage infrastructure and associated excavations. NRW advises that erosion and sediment release may adversely affect the water environment including downstream receptors, local abstractions and private water supplies. PEDW expects the ES to assess the likely significant effects on hydrology, water quality, water- dependent receptors during construction, operation and decommissioning and identify the appropriate mitigation measures where necessary.	Potential effects on hydrology, water quality, water-dependent receptors, abstractions and private water supplies are considered within this chapter (Section 10.9) and supporting appendices. A Private Water Supply Risk Assessment has not yet been undertaken. Appendix 10D sets out the proposed methodology and approach to identifying potential PWS receptors, with the full Risk Assessment to be undertaken and presented in the final ES.
PEDW	Peat and Peat forming Soils (ID.52) – PEDW is in agreement with the advice from Bridgend County Borough Council (BCBC) and Neath Port Talbot County Borough Council (NPTC) that where peat or peat-forming soils are present, the assessment should consider the potential effects of the proposed development on peat hydrology, carbon storage, habitat condition and water quality. PEDW expects the ES to include peat depth surveys where appropriate and identify	Peat and peat forming soils have been investigated and results are included in the Soil and Peat Survey Report (Appendix 11B) and discussed further in Chapter 11 .

Consultee	Consideration	How addressed in this Draft ES
	any necessary peat management and mitigation measures.	
PEDW / BCBC / NPTC	Downstream effects (ID.53) – BCBC advises that the EIA should assess downstream effects on designated sites and aquatic habitats. NPTC further advises that measures should be identified to prevent sedimentation and pollution of downstream watercourses during construction. The ES should therefore assess likely significant downstream effects on watercourses, aquatic habitats and designated sites and identify appropriate mitigation measures where required.	Downstream receptors are considered through this chapter's assessment of watercourses, aquatic habitats, water quality and WFD water bodies. The WFD Assessment (Appendix 10B) considers relevant WFD surface water bodies and concludes that, with embedded measures (outlined in Section 10.6) including standard good construction and operational practice, pollution prevention controls and surface water management, no deterioration in WFD quality elements or overall WFD water body status is anticipated.
NRW	Water Framework Directive (ID.54) - NRW advises that a Water Framework Directive assessment should be undertaken to assess whether any waterbodies could be affected by the proposed development or whether the proposals could result in deterioration of waterbody status. The ES should therefore include a Water Framework Directive assessment where relevant.	A WFD Assessment has been prepared as Appendix 10B . The assessment considers relevant surface water and groundwater bodies and concludes that potential impacts during construction, operation and decommissioning are temporary, localised and / or controlled through embedded mitigation, with no deterioration in WFD quality elements or overall WFD water body status anticipated.
Lead Local Flood Authority / PEDW	Flood Risk and Watercourse Crossings (ID.55) - Lead Local Flood Authority comments state that watercourses within the site are classified as ordinary watercourses and that any crossings or culverting works may require separate consent. PEDW agrees that the ES should assess likely significant effects relating to flood risk, watercourse crossings, and drainage infrastructure and should be informed by a Flood Risk Assessment.	Flood risk and watercourse crossing matters are addressed through this chapter within the Flood Consequence Assessment (FCA) and Outline Drainage Strategy (ODS) (Appendix 10A) . The FCA and ODS assesses flood risk from all relevant sources, considers climate change, and identifies that the principal flood risk arises from localised surface water flow routes and ordinary watercourses. Where crossings are required, the drainage design would maintain existing hydraulic connectivity and minimise changes to the existing drainage regime.
PEDW / NRW	Groundwater and mining legacy (ID.50) – NRW advised that the Site is located within an area with a historic mining legacy and that groundwater conditions may require further investigation. PEDW agreed that likely significant effects on groundwater and hydrogeological conditions should be assessed and informed by site investigations where required.	Groundwater and hydrogeological receptors are included within the scope of this chapter . The assessment is supported by the Groundwater Dependent Terrestrial Ecosystem (GWDTE) appendix (Appendix 10C) and relevant ground conditions baseline information, including review of hydrological, hydrogeological and geological data.

Consultee	Consideration	How addressed in this Draft ES
NPTC	Construction management and pollution prevention (ID.56) – NPTC advised that construction activities, including track formation and drainage works, could affect hydrology, watercourses and ground conditions, and that appropriate construction management, drainage, sediment control and pollution prevention measures should be identified.	Construction-phase controls are addressed through embedded measures and the Outline CEMP (Appendix 4A). Measures (detailed in Section 10.6) include pollution prevention, sediment control, surface water management and good construction practice to avoid or reduce adverse effects on the water environment.
Dŵr Cymru Welsh Water (DCWW)	Water infrastructure and drainage assets (ID.57) – DCWW advised that the Site is crossed by existing water mains, public sewers and lateral drains, and that these assets should be identified and protected during construction. The Scoping Direction states that the ES should identify any interaction with existing water and sewerage infrastructure and describe measures proposed to protect those assets.	Existing water and sewerage infrastructure is considered within the drainage and utilities baseline (see Section 10.5), with any asset protection requirements identified through ongoing consultation with DCWW. DCWW confirmed that the application does not propose to connect to the public sewerage system and offered no objection in principle but advised that assets crossing the Development Site should be located and protected.
PEDW / NRW	Decommissioning (ID.59) – NRW advised that decommissioning should not be assumed to be construction in reverse and that the nature, extent and duration of decommissioning activities should be considered, including any infrastructure proposed to remain in situ.	Consideration of potential decommissioning effects is given where relevant, while recognising that any future decommissioning assessment would need to be undertaken in accordance with the legislation and guidance in force at that time.
PEDW / DCWW	Sustainable Drainage Systems (ID.58) – PEDW noted DCWW's advice that the Proposed Development may require SuDS approval and that surface water drainage proposals should be developed in consultation with the SuDS Approval Body.	The FCA and Outline Drainage Strategy (Appendix 10A) sets out how surface water runoff would be managed over the lifetime of the Proposed Development, including information to support a future pre-SAB application. The drainage approach is decentralised, with runoff managed locally within each catchment and discharged to the nearest receiving watercourse to maintain the existing hydrological regime where possible.

Technical Engagement

- 10.3.3. Technical engagement with consultees in relation to the water environment is ongoing. Consultation has been undertaken with key stakeholders, namely NRW, BCBC in its role as LLFA and DCWW to inform this report.
- 10.3.4. A summary of the technical engagement undertaken to date is outlined in **Table 10-5**.

Table 10-5 Technical engagement on the water environment assessment

Consultee	Consideration	How addressed in this Draft ES
NRW	An enquiry was issued to NRW on 04 June 2026 requesting information relating to historic flooding, groundwater flood risk, identified watercourses, flood risk management assets, flood studies and flood mapping associated with the development site. A response was received from NRW on 10 June 2026 confirming that the site lies outside NRW's fluvial and tidal flood outlines shown on the NRW Flood Map and, therefore, NRW holds no relevant flood risk data for the site.	An FCA is appended to this ES (Appendix 10A).
LLFA / SAB	An enquiry was issued to BCBC, acting as the LLFA, on 15 June 2026 requesting information relating to local flood risk, historic flood incidents, ordinary watercourses, drainage infrastructure and any planned flood alleviation schemes affecting the development site.	No response received to date.
DCWW	An enquiry was issued to DCWW on 04 June 2026 requesting information relating to historic sewer flooding incidents, existing drainage assets, infrastructure constraints, expected easements, planned improvement works and sewer flood risk management schemes associated with the development site. A response was received from DCWW on 08 July 2026 confirming that there are no recorded sewer flooding incidents within the area requested and no known flood risk associated with or planned for the area. DCWW also confirmed that there appear to be no assets within the development site red line boundary, no recorded easements, and no reported drainage constraints, capacity issues or infrastructure limitations that may affect the proposed development. No planned infrastructure improvement schemes or existing sewer flood risk management schemes were identified.	Information received from DCWW has been incorporated into the FCA and ODS (Appendix 10A).
Relevant LPAs	A request was issued to the relevant LPAs requesting available information on known Private Water Supplies within or near the Proposed Development and associated access routes.	At the time of writing, no responses have been received. Once received, the information will be used to inform the Private Water Supply Risk Assessment, which will be undertaken and presented in the final ES. The proposed methodology is provided in Appendix 10D .

10.4 Data gathering methodology

- 10.4.1. This section outlines the methodology employed to gather data relevant to the water environment within the designated Study Areas. It defines the Study Areas and lists the data sources and surveys used to inform this Chapter and associated appendices.

Study area

- 10.4.2. The Study Area for this chapter is defined as the geographic region where direct impacts of the Proposed Development on water environment receptors are anticipated:
- hydrology (surface water features, groundwater, flood risk and Designated Sites): the Proposed Development plus a 1 km buffer. Associated receptors downstream within the Afon Alwen and River Dee are considered for up to 5 km from the Proposed Development;
 - water supplies (public and private): the Proposed Development plus a 3 km buffer; and
 - in accordance with SEPA (2024) guidance³⁵ the 'GWDTE Study Area' comprises a 250 m buffer from the Proposed Development where excavations are likely to be greater than 1 m depth, reduced to a 100 m buffer from excavations less than 1 m depth. To be precautionous, all excavations associated with tracks, turbines and other infrastructure are considered to be >1 m and therefore a 250 m buffer is used.
- 10.4.3. Indirect impacts are considered through the use of appropriate buffers and downstream receptor extents, which capture potential hydrological, groundwater and water quality pathways.
- 10.4.4. The Study Areas are illustrated graphically in **Figure 10.1** and **Figure 10.6**.

Desk Study

- 10.4.5. A desktop study to establish the baseline conditions was undertaken in order to:
- describe surface water hydrology, including watercourses, springs and waterbodies;
 - identify private drinking water abstraction and public water supplies;
 - identify flooding risks;
 - describe the hydromorphological conditions of watercourses;
 - collect information relating to recreational and fisheries resources;
 - collate hydrological flow and flooding data for the immediate area and main downstream watercourses;
 - collect soil, geological and hydrogeological information; and
 - confirm surface water catchment areas and watersheds for the Development Site.
- 10.4.6. A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 10-6**.

³⁵ SEPA. (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems. (Online) Available from: <https://www.sepa.org.uk/media/a1yh0blg/guidance-on-assessing-the-impacts-of-developments-on-groundwater-dependent-terrestrial-ecosystems.docx> (Accessed July 2026)

Table 10-6 Data sources used to inform the water environment assessment

Organisation	Data source	Data provided
British geological Survey (BGS)	GeoIndex (onshore) - British Geological Survey ³⁶ (accessed July 2026)	1:50,000 scale Bedrock Geology, 1:50,000 scale Superficial Geology, 1:50,000 scale Linear Features, Aquifer Designation, 1:625,000 Hydrogeology, 1,50,000 scale Borehole Records
BCBC	Bridgend Local Development Plan 2018-2033 (accessed July 2026) ³⁷	Local Development Plan with relevant planning policies
	Bridgend Strategic Flood Consequence Assessment ³⁸ (October 2020)	Flood Consequences Assessment sections of Local Development Plan
	Flood Risk Management Plan – Strategy Document September 2016 ³⁹ (accessed July 2026)	Lead Local Flood Authority (LLFA) prepared Local Flood Risk Investigation Areas
Ordnance Survey (OS)	Local Ordnance Survey (OS) mapping	Topography and location of springs
NRW	LLE – Source Protection Zones (SPZ) Merged ⁴⁰ (accessed July 2026)	Geo Portal for Wales (Lle) for Source protection zones
	Lle – Licenced Water Abstractions ⁴¹	Licenced Water Abstractions
	Water Watch Wales Map gallery	WFD data
Department for Environment, Food & Rural Affairs (Defra)	Multi-Agency Geographic information for the Countryside (MAGIC) interactive map ⁴²	Topographical mapping
Coal Authority	Coal Authority Interactive Map ⁴³	Coal mining information including recorded mine entries, shallow coal mining working, coal outcrops, fissures and breaklines, and Development High Risk Areas.

Survey work

- 10.4.7. On-site survey work undertaken to inform the water environment baseline has included Phase 1 habitat survey work, undertaken on 18 and 19 February 2025 and 11 and 12 March 2025, which was used to inform the identification of potential GWDTE receptors.

³⁶ BGS. (2020) British Geological Survey Data. (Online) Available from: <https://www.bgs.ac.uk/map-viewers/geoindex-onshore> (Accessed July 2026)

³⁷ BCBC. (2024) Bridgend County Borough Council Local Development Plan 2018-2033 March 2024. (Online) Available from: <https://www.bridgend.gov.uk/media/izcfp1f/written-statement.pdf> (Accessed July 2026)

³⁸ BCBC. (2020) Bridgend County Borough Council Strategic Flood Consequence Assessment October 2020. (Online) Available from: <https://www.bridgend.gov.uk/media/xx1n3muo/sd62-bridgend-strategic-flood-consequences-assessment-2020.pdf> (Accessed July 2026)

³⁹ BCBC. (2016) Bridgend County Borough Council Flood Risk Management Plan August 2016. (Online) Available from: <https://www.bridgend.gov.uk/media/1yflynyb/bridgend-flood-risk-management-plan.pdf> (Accessed July 2026)

⁴⁰ Welsh Government. (2026) Data and Maps Source Protection Zones Wales May 2026. (Online) Available from: https://datamap.gov.wales/layers/inspire-nrw:NRW_Source_Protection_Zones (Accessed July 2026)

⁴¹ Welsh Government. (2026) Data and Maps Licenced Water Abstractions Wales July 2026. (Online) Available from: https://datamap.gov.wales/layers/geonode:nrw_water_resource_permits (Accessed July 2026)

⁴² DEFRA. (2002) Department for Environment, Food and Rural Affairs Multi-Agency Geographic information for the Countryside Interactive Mapping. (Online) Available from: <https://magic.defra.gov.uk/MagicMap.aspx> (Accessed July 2026)

⁴³ UK Government. (2026) Coal Mining Remediation Authority Map Viewer. (Online) Available from: <https://datamine-cauk.hub.arcgis.com> Accessed July 2026)

The GWDTE Assessment (**Appendix 10C**) is currently based on Phase 1 habitat data and is therefore considered high level and indicative in the absence of detailed National Vegetation Classification (NVC) survey data. Updated NVC classifications will be provided following completion of targeted NVC survey work as part of the final ES.

- 10.4.8. A Phase 1 soil and peat survey was also completed in July 2026, comprising soil depth probing and targeted confirmatory soil coring to establish the presence, depth and character of soils and peat / peaty soils across the Development Site. Full details of the Phase 1 soil and peat survey are provided in **Appendix 11B**.

10.5 Overall baseline

- 10.5.1. This section presents the established baseline environmental characteristics for the Development Site and surrounding area, with particular reference to the water environment. The baseline has been informed by available desk-based data, project information, consultation responses and site-specific information gathered during the EIA process and forms the basis for the assessment of likely significant effects reported in this ES.
- 10.5.2. Baseline conditions are considered across the Development Site as a whole and within the specified Study Areas, with specific consideration given to water environment receptors and impact pathways where these are relevant to the proposed wind farm infrastructure and associated works.

Current baseline

Topography

- 10.5.3. Ground levels vary across the Development Site, with the Northern Array reaching approximately 425 m AOD and the Southern Array falling from around 348 m AOD in the north to approximately 147 m AOD in the south.

Hydrology

- 10.5.4. The Proposed Development is located within an upland hydrological setting, where surface water drainage generally follows the local topography towards ordinary watercourses and downstream valley catchments.
- 10.5.5. The watercourses within and adjacent to the Development Site are generally characteristic of upland headwater systems, with narrow channels, localised sinuosity and variable flows influenced by rainfall, runoff and topography.
- 10.5.6. Within the Northern Array, the main watercourses are Nant Gwyn Bach and Nant Cwm-du. Nant Gwyn Bach intersects the northern boundary of the array, while Nant Cwm-du rises in the eastern part of the Northern Array and flows southwards following the local topographic gradient. Minor unnamed tributaries of Nant Cwm-du are also present and are considered likely to represent small headwater drainage features (**Figure 10.2**).
- 10.5.7. Within the Southern Array, the main watercourse is Nant Cedfyw, which rises within the central part of the array and flows southwards. Other watercourses within the wider Study

Area include Nant Cwm-du, located approximately 715 m west of the Southern Array; Garw Fechan, located approximately 400 m from the Proposed Development at its closest point; and the Afon Garw, located approximately 640 m east of the Southern Array.

- 10.5.8. No statutory main rivers are located within the Development Site. The nearest statutory main river is Afon Garw, located approximately 640 m east of the Southern Array and situated approximately 198 m below the elevation of the Development Site.
- 10.5.9. Key WFD surface water bodies relevant to the Development Site are:
- Garw – headwaters to confluence with Ogmere: located to the east of the Southern Array, with the Afon Garw approximately 640 m east of the Southern Array at its closest point. Moderate ecological potential, High chemical status;
 - Llynfi – headwaters to Lletty Brongu STW: located to the west / downstream of the Northern Array, with the Afon Llynfi approximately 1 km west of the Northern Array at the confluence with Nant Gwyn Bach. Moderate ecological status, High chemical status; and
 - Llynfi – Lletty Brongu STW to confluence with Ogmere: located downstream of the Southern Array, with Nant Cedfyw flowing to its confluence with the Afon Llynfi approximately 2.8 km south of the Southern Array. Moderate ecological status, High chemical status.
- 10.5.10. For the purpose of evaluation of sensitivity of receptors, taking a precautionary approach, the higher status of ecological/chemical has been selected for assigning sensitivity based on the criteria in **Table 10.11**.

Flood Risk

- 10.5.11. A qualitative FCA (**Appendix 10A**) has been undertaken where the risks of flooding have been considered from all potential sources. The assessment has considered the flood risk to the Proposed Development as well as the potential to increase flooding downstream that could be caused by the Proposed Development.
- 10.5.12. The FCA identifies that the majority of the Development Site is located within Flood Zone 1 and is at a generally low risk of flooding (**Figure 10.3**). The principal flood risk relates to localised surface water and small watercourse flow routes within parts of the Development Site, associated with ordinary watercourses, drainage corridors and lower-lying areas (**Figure 10.4**). Flood risk from fluvial, coastal, groundwater, public sewers, reservoirs and canals is considered low or negligible.

Designated Sites

- 10.5.13. NRW⁴⁴ and DataMapWales⁴⁵ information indicates that there are several Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and Sites of Importance for Nature Conservation (SINCs) within 5 km of the Proposed Development as listed in **Table 10-7**.

⁴⁴ NRW. (2026) Natural Resources Wales Site Maps. (Online) Available from <https://naturalresourceswales.gov.uk/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en> (Accessed July 2026)

⁴⁵ Welsh Government. (2026) Data and Maps Catalogue Wales. (Online) Available from: <https://beta.datamap.gov.wales> (Accessed July 2026)

Table 10-7 Designated Sites within 5 km of the Proposed Development

Designation	Approximate distance from the Development Site and key attributes	Hydrological Connection to Proposed Development
Blackmill Woodlands SAC	Within the Study Area; designated for old sessile oak woods and <i>Blechnum</i> . Approximately 7.7 km south-east of the Northern Array and 4.3 km south-east of the Southern Array.	Given the intervening distance between the Proposed Development and the Designated Site, there is no hydrological connectivity via either surface water or groundwater pathways. Consequently, the Site is not considered susceptible to hydrological impacts arising from the Proposed Development and has been scoped out of further assessment.
Cwm Du Woodlands SSSI	Approximately 0.4 km south of the Northern Array and 1.2 km west of the Southern Array. Designated for an ancient sessile valley oakwood. It is also noted for local groundwater flushes supporting a rich ground flora.	Given the intervening distance between the Proposed Development and the Designated Site, there is no hydrological connectivity via either surface water or groundwater pathways. Consequently, the Site is not considered susceptible to hydrological impacts arising from the Proposed Development and has been scoped out of further assessment.
Cwm Cyffog SSSI	Approximately 4.7 km south-west of the Northern Array and 1.7 km east of the Southern Array. Designated for upland blanket mire dominated by purple moor-grass <i>Molinia caerulea</i> with a range of bog-mosses <i>Sphagnum</i> spp. and white beak-sedge <i>Rhynchosdora alba</i> is locally rare.	Given the intervening distance between the Proposed Development and the Site, there is no hydrological connectivity via either surface water or groundwater pathways. Consequently, the Site is not considered susceptible to hydrological impacts arising from the Proposed Development and has been scoped out of further assessment.
Craig Du SINC	Located outside of the Proposed Development construction areas; it is adjacent to the Southern Array boundary and it is approximately 2.3 km southeast of the Northern Array. Comprises the habitats: dense continuous bracken <i>Pteridium aquilinum</i> ; broadleaved semi-natural woodland; semi-improved acid grassland; and acid dry dwarf shrub heath.	No hydrological connectivity has been identified between the Proposed Development and the SINC, as there are no credible surface water or groundwater pathways between them. Consequently, significant hydrological effects are not anticipated and the SINC has been scoped out of further assessment.
Nant-y-forest SINC	Located outside of the Proposed Development construction areas, approximately 90 m northwest of the Southern Array and 1.6 km southeast of the Northern Array. Comprises the habitats: marsh/marshy grassland; wet dwarf shrub heath; dry heath/acid grassland mosaic; dry modified bog-moss bog; semi-improved acid	No hydrological connectivity has been identified between the Proposed Development and the SINC, as there are no credible surface water or groundwater pathways between them. Consequently, significant hydrological effects are not anticipated and the SINC has been scoped out of further assessment.

Designation	Approximate distance from the Development Site and key attributes	Hydrological Connection to Proposed Development
	grassland; broadleaved semi-natural woodland; acid/neutral flush; and acid dry dwarf shrub heath.	
Blaen-Cwmdu SINC	Located outside of the Proposed Development construction areas, approximately 120 m south of the Northern Array and 1.8 km northwest of the Southern Array. Comprises the habitats: marsh/marshy grassland; semi-improved natural grassland; semi-improved acid grassland; dense continuous scrub; broadleaved semi-natural woodland; acid/neutral flush; and acid dry dwarf shrub heath.	No hydrological connectivity has been identified between the Proposed Development and the SINC, as there are no credible surface water or groundwater pathways between them. Consequently, significant hydrological effects are not anticipated and the SINC has been scoped out of further assessment.

Climate

- 10.5.14. The Development Site is located within an upland area of Wales, where the maritime climate is influenced by Atlantic weather systems and local conditions can vary considerably due to elevation and exposure. It is likely to experience higher rainfall, cloud cover and wind exposure than lower-lying or sheltered areas.

Geology

- 10.5.15. In respect of the underlying bedrock geology, BGS Geoindex (Onshore)⁴⁶ 1:50,000 scale mapping indicates that the Northern and Southern Array areas are underlain east to west by the following:
- Pennant Sandstone formation; and
 - South Wales Middle Coal Measures formation - mudstone, siltstone and sandstone.
- 10.5.16. BGS Geoindex (Onshore) 1:50,000 scale mapping indicates that superficial deposits consist of Devensian till throughout the Development Site.

Soils and Peat

- 10.5.17. Soil and peat baseline information is presented in **Appendix 11B: Phase 1 Soil and Peat Survey Report** and is assessed in **Chapter 11: Ground Conditions**. In summary, the Development Site is predominantly underlain by shallow upland mineral soils, with localised organic-rich and peaty soils associated with wetter depressions, flushes and areas of flow convergence.
- 10.5.18. The Phase 1 Soil and Peat Survey comprised 188 probing locations and 10 auger core locations. No peat deposits meeting the assessment definition of peat were recorded, with the maximum observed peat thickness being 0.28 m. Three precautionary high sensitivity

⁴⁶ BGS (2026). British Geological Survey Geoindex Onshore. (Online) Available from: <https://www.bgs.ac.uk/map-viewers/geoindex-onshore> (Accessed July 2026)

soil zones were identified around Turbine T2, sections of track between T1 and T3, and land surrounding Turbine T6, and these will inform ongoing design development and future targeted surveys.

Hydrogeology and Groundwater

- 10.5.19. The WFD Assessment (**Appendix 10B**) identifies Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits within the relevant catchment area.
- 10.5.20. The Development Site lies within the Swansea Carboniferous Coal Measures WFD groundwater body (Overall Status: Poor). The groundwater body is a large underground water resource formally designated and managed under the WFD and is monitored by NRW to protect regional water quality and regulate borehole abstractions.
- 10.5.21. The Scoping Report (**Appendix 1A**) identifies no significant risk from groundwater or artificial sources within the Study Area; however, the FCA (**Appendix 10A**) notes that groundwater vulnerability is generally medium across the Northern Array and medium to high across parts of the Southern Array.
- 10.5.22. Groundwater is therefore not anticipated to represent a significant constraint, although localised shallow groundwater interaction may occur in wetter areas and would be considered where relevant to construction activities and drainage design.

Public and Private Water Supplies

- 10.5.23. The public water supply serving the area is provided by DCWW. Consultation with DCWW confirmed that the Site is not located within a DCWW drinking water catchment and that there are no public sewer assets, drainage constraints or recorded sewer flooding incidents within the Development Site.
- 10.5.24. Information regarding PWSs has been requested from the relevant local authorities; however, no responses have been received at the time of writing. Consequently, the location and nature of any PWSs that may be present within the Study Area have not yet been confirmed.
- 10.5.25. Information provided by NRW indicates that there are five licensed abstractions within 3 km of the Proposed Development. However, these abstractions have been identified as being for 'production of energy', or 'industrial, commercial, public services' and have been screened out due to being identified as for industrial processes, and there being no plausible risk anticipated to the continuity of supply.
- 10.5.26. A further 11 properties in the vicinity of the Proposed Development have been identified as having the potential to be served by PWS and will be reviewed as part of the ongoing assessment process (**Figure 10.5**).
- 10.5.27. Further information is contained within the PWS Risk Assessment (**Appendix 10D**).

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

- 10.5.28. The GWDTE assessment presented in **Appendix 10C** is based exclusively on information gathered during the Phase 1 Habitat Survey undertaken on 18 and 19 February and 11

and 12 March 2025. As portions of the survey were completed outside the optimal botanical survey period, comprehensive data on species composition and abundance were not available across all habitats.

- 10.5.29. In the absence of detailed NVC survey data, the assessment is necessarily high level and should be regarded as indicative only. Consequently, habitat descriptions could not be refined to a level that would enable the confident assignment of NVC communities. Given that the assessment is focused on the identification of potential GWDTEs, potential corresponding NVC communities have been identified only for those habitats recorded during the Phase 1 survey that may represent GWDTEs. Any NVC communities referred to within this assessment should therefore be considered indicative of the vegetation communities most likely to be present and used as a guide only. Confirmed NVC classifications will be provided following completion of the targeted NVC survey as presented in the final ES.
- 10.5.30. The identification and assessment of GWDTE has been completed with reference to SEPA guidance (2024)³⁵. The identification of GWDTE habitats has used Phase 1 Habitat survey information, which is presented in **Figure 10.6**.
- 10.5.31. Potential GWDTE communities identified within the GWDTE Study Area are:
- M23 / MG10 mosaic - *Juncus effusus* / *acutiflorus* - *Galium palustre* Rush-pasture / *Holcus lanatus* - *Juncus effusus* Rush-pasture; and
 - H4 / H9 / H12 / M15 mosaic - *Scirpus cespitosus* - *Erica tetralix* Wet heath.
- 10.5.32. DataMapWales⁴⁷ identifies several potential groundwater-dependent habitats in the wider area, but almost all lie outside the GWDTE Study Area. The only habitat within the Study Area is an area of purple moor grass near T6, which survey work classified as likely M25 marshy grassland. As M25 is no longer considered a potential GWDTE under current SEPA guidance, no significant impacts on GWDTEs are anticipated, and no further assessment is required.
- 10.5.33. A review of their habitat characteristics, topographic setting and the Conceptual Site Model (CSM) indicates that neither is substantially groundwater dependent. The H4 / H9 / H12 / M15 heath and wet heath mosaic is located on level upland ground and is considered to be sustained by localised surface water inputs and nearby runoff. The MG10 / M23b rush pasture mosaic occupies a similar hilltop setting and is also considered to be supported predominantly by rainfall and slowed surface runoff.
- 10.5.34. Neither parcel shows evidence of groundwater emergence, or has likely hydrological connectivity with proposed excavations. On this basis, the habitats have been screened out from further GWDTE assessment, and no specific GWDTE mitigation is required beyond standard embedded and good practice measures.
- 10.5.35. It is anticipated that supplementary NVC surveys will be undertaken in due course and shall be incorporated into an updated version of this GWDTE assessment prior to the final ES submission. However, based on **Appendix 10C**, further survey information is unlikely to substantially alter the assessment outcomes or conclusions in relation to the presence

⁴⁷ Welsh Government. (2026) Data and Maps for Wales. (Online) Available from: <https://datamap.gov.wales/maps/new#/> (accessed July 2026)

of potential GWDTE communities that are actually dependent on groundwater and consequential likely adverse effects.

Future baseline

- 10.5.36. Without the Proposed Development, the future hydrological and hydrogeological baseline is likely to be influenced primarily by climate change. The Welsh Government's March 2026 Flood Consequence Assessment guidance⁴⁸ provides the relevant allowances for assessing the effects of climate change on flood risk in Wales, including allowances for peak river flows and rainfall uplift. These allowances are based on UK Climate Projections 2018 and apply to planning applications submitted from 1 April 2026.
- 10.5.37. For the Proposed Development, located in the West Wales River Basin District, the 2080s peak river flow allowance is 35% for the central estimate and 70% for the upper estimate. For rainfall, the Wales-wide 2070s uplift is 30% for the central estimate and 40% for the upper estimate.
- 10.5.38. Projected changes include drier summers, wetter winters and slightly higher annual average temperatures, with more frequent and intense storm events. This may increase variability in surface water flows, place greater pressure on water abstractions during summer months, and increase peak flows, runoff rates and flood risk during extreme rainfall events.
- 10.5.39. Other future changes may also influence the water environment baseline, including:
- changes in the location or rate of surface water and groundwater abstractions;
 - potential changes to WFD surface water and groundwater body status;
 - improvements in water quality associated with catchment management measures; and
 - changes in runoff rates and pathways associated with future development within downstream valley areas.
- 10.5.40. The Development Site includes areas of wet and marshy habitat, although peatland features have generally been avoided through the design process where identified. Future climate change could alter the condition of these habitats, with more intense rainfall potentially increasing drainage and erosion pressures, while warmer and drier periods could lead to desiccation and degradation.

10.6 Embedded measures

- 10.6.1. A range of environmental measures have been embedded into the Proposed Development as outlined in **Chapter 4: Development Description. Table 10-8** outlines how these embedded measures would influence the water environment assessment.

⁴⁸ Welsh Government. (2026) Guidance on Flood Consequences Assessments: Climate Change Allowances March 2026. (Online) Available from: <https://www.gov.wales/sites/default/files/publications/2026-03/climate-change-allowances-and-flood-consequence-assessments.pdf> (Accessed July 2026)

Table 10-8 Summary of the embedded environmental measures

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
Construction			
Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw Downstream	Potential sediment mobilisation, pollution, localised changes to runoff pathways and disturbance to bed, bank and riparian habitats during works near watercourses.	The Proposed Development layout has been developed to avoid watercourses and riparian corridors where practicable, with crossings and works near watercourses minimised. Where required, crossings have been designed to maintain flow conveyance, hydrological connectivity and water quality. Construction drainage and pollution prevention measures would be implemented through the Outline CEMP (Appendix 4A), secured by planning condition.	Outline CEMP (Appendix 4A), secured by planning condition. Watercourse Crossing Schedule. Ordinary Watercourse Consent where required.
WFD surface water bodies: Garw and Llynfi catchments	Potential deterioration in water quality or WFD quality elements through sediment input, pollution, altered runoff pathways or localised hydromorphological disturbance.	Existing drainage pathways would be retained where practicable and runoff managed within the same hydrological catchments. SuDS and pollution prevention measures (to be implemented through the outline CEMP (Appendix 4A)) would be used to control runoff rates, sediment and water quality before discharge to receiving watercourses. Surface water runoff would be managed through appropriately designed drainage systems to control discharge rates, volumes and sediment mobilisation. Runoff and sediment would be intercepted and treated prior to discharge where required, with drainage features designed to minimise erosion and sediment deposition. Existing riparian vegetation and natural drainage features would be retained where practicable, and pollution prevention measures implemented to protect water quality and WFD objectives (further detail within Annex D of the Water Framework Directive Assessment (Appendix 10B)).	Outline CEMP (Appendix 4A). WFD Assessment; Outline Drainage Strategy / detailed drainage design.
Flood risk receptors, including the Development Site and downstream receptors	Increased surface water runoff from temporary works, access tracks, crane pads, turbine foundations and disturbed ground, with potential downstream flood risk or increased erosional power.	New impermeable areas would be limited where practicable. Access tracks, crane pads and ancillary infrastructure would use semi-permeable construction where appropriate. Temporary and permanent drainage would be designed using SuDS principles to attenuate runoff, mimic natural drainage pathways and manage flows within the same catchments where practicable.	FCA; Outline Drainage Strategy; CEMP (Appendix 4A); SAB approval where required.

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
Groundwater, aquifers and Swansea Carboniferous Coal Measures groundwater body	Potential pollution of groundwater, localised shallow groundwater interaction, dewatering effects and changes to groundwater flow pathways, particularly in wetter or peaty areas.	Pollution prevention measures would be included within the outline CEMP, including controlled storage of fuels and chemicals, bunding, spill response procedures and appropriate management of concrete, wastewater and dewatering. Dewatering, where required, would be localised, temporary and managed to avoid adverse effects on groundwater and connected receptors.	Outline CEMP (Appendix 4A), groundwater management measures; environmental permit where required.
PWS and licensed abstractions	Potential effects on water quality or water quantity where a supply or abstraction is hydrologically connected to the Development Site.	Pollution prevention measures would be included within the outline CEMP, including controlled storage of fuels and chemicals, bunding, spill response procedures and appropriate management of concrete, wastewater and dewatering. Dewatering, where required, would be localised, temporary and managed to avoid adverse effects on groundwater and connected receptors.	PWSRA, where required; PWS Monitoring and Method Statement; outline CEMP (Appendix 4A); consultation with relevant authority.
Potential GWDTEs	Potential changes to shallow hydrology, drainage, runoff, groundwater interaction, and water quality, including effects on wet or peaty habitats.	The design would continue to avoid sensitive wet habitats where practicable. Cross-drainage and appropriate drainage design would be used to maintain hydrological connectivity where infrastructure could intercept shallow flow pathways.	GWDTE assessment; Outline Drainage Strategy; Outline CEMP (Appendix 4A).
Operation			
Water environment receptors, including ordinary watercourses, WFD water bodies, flood risk receptors, downstream, and groundwater	Permanent infrastructure and drainage may alter surface water runoff, flow routing and water quality if not appropriately managed.	Permanent drainage would remain in place and be designed to manage runoff using SuDS principles, including attenuation and water quality treatment where required. The drainage strategy (Appendix 10A) would seek to maintain existing hydrological connectivity and avoid increasing flood risk elsewhere.	Outline Drainage Strategy / detailed drainage design; operational drainage maintenance plan; SAB approval where required.
Water environment receptors, including ordinary watercourses, WFD water bodies, flood risk receptors, downstream, and groundwater	Accidental release of pollutants such as fuel or oil during operational maintenance activities.	Operational maintenance activities would follow pollution prevention controls, including appropriate storage, handling and spill response procedures. Drainage features would be inspected and maintained to ensure they continue to function as intended.	Operational environmental management procedures; drainage inspection and maintenance plan.

10.7 Scope of the assessment

- 10.7.1. This section sets out the scope of the assessment for the water environment, including surface water, groundwater, flood risk, water quality, water resources and water-dependent receptors. The scope has been informed by the EIA Scoping Report, the Scoping Direction, consultation undertaken to date, the emerging design of the Proposed Development, and the technical assessments prepared to support the Environmental Statement, including FCA and ODS (**Appendix 10A**), WFD Assessment (**Appendix 10B**) and GWDTE Assessment (**Appendix 10C**).

The Proposed Development

- 10.7.2. All the activities and consequent environmental changes associated with the construction, operation and decommissioning of the Proposed Development, as set out in **Chapter 4: Development Description**, have been considered.
- 10.7.3. This includes the construction and operation of up to eight wind turbines and associated infrastructure, including turbine foundations, crane pads, temporary construction compounds, site offices, underground cabling, substations and transformer housing, new and upgraded access tracks, drainage infrastructure and overhead line connections.
- 10.7.4. The assessment considers water environment effects associated with land preparation, earthworks, excavations, construction drainage, temporary and permanent watercourse crossings, access track upgrades, cable trenching, operation of permanent infrastructure, surface water runoff management and maintenance activities.
- 10.7.5. Decommissioning effects are expected to be broadly similar in nature to construction effects, although typically smaller in scale and temporary in duration.

Spatial Scope

- 10.7.6. The spatial scope of the water environment assessment covers the area of the Proposed Development and defined Study Areas. The Study Areas have been defined on a receptor-specific basis, reflecting the potential source-pathway-receptor linkages associated with surface water, groundwater, flood risk, water supplies and water-dependent ecological receptors.
- 10.7.7. The assessment includes ordinary watercourses and drainage features within and adjacent to the Development Site, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw, together with downstream receiving watercourses where there is potential hydraulic connectivity. WFD surface water bodies within the Garw and Llynfi catchments have also been considered, including those identified within the WFD Assessment (**Appendix 10B**).
- 10.7.8. For flood risk, the FCA (**Appendix 10A**) considers all relevant sources of flooding to and from the Proposed Development over its operational lifetime, including fluvial, surface water and small watercourses, groundwater, sewer and drainage infrastructure, highway drainage, reservoir, canal and coastal sources. The FCA also considers receptors including the Proposed Development infrastructure, maintenance personnel, site users, adjacent land, nearby highways, existing watercourses, drainage infrastructure and surrounding residential and commercial receptors that may be affected by flooding.

Temporal Scope

- 10.7.9. The temporal scope of the assessment for the water environment is consistent with the period over which the Proposed Development would be carried out.
- 10.7.10. It covers the 22-month construction programme, and the 30-year operational lifetime of the Proposed Development.
- 10.7.11. For the purpose of describing impacts and effects, the temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur, and are typically defined as either being:
- permanent - these are effects that would remain even when the Proposed Development is complete, although these effects may be caused by environmental changes that are permanent or temporary; or
 - temporary – these are effects that are related to environmental changes associated with a particular activity and that would cease when that activity finishes.
- 10.7.12. Furthermore, the temporal scope of assessment may also consider the duration of the resultant effect, using the following general categories (noting that professional judgement and available guidance would also be applied on a case-by-case basis):
- short-term – less than two years;
 - medium-term – between two and ten years; and
 - long-term – over ten years.
- 10.7.13. If decommissioning is required after 30 years of operation, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works.
- 10.7.14. Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 30 years in the future, it is considered that the significance of effects relating to the decommissioning phase would be no greater than those from the construction phase. These effects are therefore considered at a high level within the assessment, with the assumption that equivalent good practice and embedded environmental measures would be applied during decommissioning.
- 10.7.15. Furthermore, should decommissioning take place, it is expected that an assessment in accordance with the legislation and guidance at the time of decommissioning would be undertaken.

Potential Receptors

- 10.7.16. The principal water environment receptors that have been identified as being potentially subject to effects are summarised in **Table 10-9**.

Table 10-9 Water environment receptors subject to potential effects

Receptors / potential effects	Comment
Ordinary watercourses (including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw) and localised surface water flow routes	The Development Site is drained by a number of ordinary watercourses and headwater drainage features associated with the Northern and Southern Arrays. Although these are not all designated WFD water bodies in their own right, they provide hydrological connectivity to downstream WFD water bodies and may be sensitive to sediment mobilisation, pollution and changes in runoff pathways.
WFD surface water body: Garw – headwaters to confluence with Ogmore	WFD surface water body associated with the wider hydrological Study Area. The WFD Assessment (Appendix 10B) identifies it as a relevant screened-in water body, with a Moderate ecological potential and High chemical status.
WFD surface water body: Llynfi – headwaters to Lletty Brongu STW	WFD surface water body associated with the Development Site and downstream receiving environment. The WFD Assessment (Appendix 10B) identifies it as having a Moderate ecological status and High chemical status.
WFD surface water body: Llynfi – Lletty Brongu STW to confluence with Ogmore	WFD surface water body downstream of the Study Area, identified in the WFD Assessment (Appendix 10B) as having a Moderate ecological status and High chemical status.
Flood risk to the Development Site and downstream receptors	The FCA (Appendix 10A) concludes that the majority of the Development Site is located within Flood Zone 1 and is at generally low flood risk. The principal flood risk relates to localised surface water flow routes and ordinary watercourses, with flood risk from fluvial, coastal, groundwater, sewers, reservoirs and canals considered low or negligible.
Bedrock and superficial aquifers	The WFD Assessment (Appendix 10B) identifies Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits within the relevant catchment area. Groundwater therefore has some sensitivity as a controlled water receptor, particularly where excavations, drainage or pollution pathways could interact with shallow groundwater.
Swansea Carboniferous Coal Measures WFD groundwater body	The Development Site lies within the Swansea Carboniferous Coal Measures groundwater body, a WFD groundwater body with poor overall status.
GWDTE	The potential GWDTEs are not considered to have a substantial reliance on groundwater and are assessed as being of low importance.
Private water supplies and abstractions	The approach extends the Study Area to 3 km for receptors such as water supplies and abstractions where there may be potential for downstream effects from pollutants transported during construction.
Local water-dependent habitats, including marshy grassland, wet heath and peaty habitats	The Development Site includes semi-improved grassland, marshy grassland and heathland, with wet or peaty habitats potentially sensitive to changes in drainage, groundwater interaction, runoff and water quality.

Likely significant effects

- 10.7.17. The effects on water environment receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 10-10**.

Table 10-10 Summary of likely significant water environment effects

Activity	Receptor	Effect
Construction and Decommissioning		
Land preparation (earthworks, excavation)	Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw; localised surface water flow routes; WFD surface water bodies within the Garw and Llynfi catchments; groundwater; and any confirmed hydraulically connected private water supplies or abstractions.	Modification of Surface Water Drainage Patterns and Flooding Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance. Pollution Incidents Accidental release of pollution into the water environment by leaks / spillage of oil / fuel, leaching from excavated soils and concrete leaching leading to deterioration. Discharge of potentially polluted water generated from construction activities (e.g., dewatering / water ingress activities, concrete batching, surface water runoff) into surface water or groundwater leading to deterioration in the water quality of the water environment receptors. Erosion and Sedimentation Temporary increase in sediment-loading of surface water runoff from construction / dismantling areas leading to deterioration in the surface water quality environment and deterioration in the status of WFD surface water bodies.
Impermeable land associated with access tracks and construction / dismantling areas	Ordinary watercourses, localised surface water flow routes, downstream flood risk receptors, and WFD surface water bodies within the Garw and Llynfi catchments.	Modification of Surface Water Drainage Patterns and Flooding Increase in surface water runoff and therefore, increase in flood risk downstream and increase in potential erosional power of surface overland flow.
Development of temporary infrastructure near watercourses and potential temporary watercourse crossings (to be confirmed within final designs)	Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw; watercourse bed, bank and riparian habitats; WFD surface water bodies within the Garw and Llynfi catchments; and downstream flood risk receptors.	Temporary changes to watercourse flow conveyance leading to deterioration in the status of WFD surface water bodies and / or flood risk. Erosion and Sedimentation Temporary disturbance to watercourse bed, banks and riparian habitats could result in localised erosion, sediment mobilisation and changes to flow conveyance, leading to deterioration in surface water quality and WFD status. Pollution Incidents Works near watercourses and temporary crossings could introduce a risk of accidental pollution from spills, leaks, concrete washout or sediment-laden runoff, leading to deterioration in surface water or groundwater quality.

Activity	Receptor	Effect
Operational Phase		
Impermeable land take (solid concrete foundations for turbines, substation and access tracks)	Ordinary watercourses, localised surface water flow routes, downstream flood risk receptors, and WFD surface water bodies within the Garw and Llynfi catchments.	Modification of Surface Water Drainage Patterns and Flooding Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow. Changes to watercourse flow conveyance as a result of new or modified temporary watercourse.
Maintenance activities	Ordinary watercourses, WFD surface water bodies within the Garw and Llynfi catchments, groundwater, and any confirmed hydraulically connected private water supplies or abstractions.	Pollution Incidents Accidental spillage of pollutants (fuel or oil) leading to a deterioration in water quality. Potential change to water quality of a water supply resource which may affect the viability of an abstraction.

Effects Scoped out

- 10.7.18. No identified potential water receptors or effects were scoped out at the EIA Scoping Report stage.
- 10.7.19. Coastal flooding, reservoir flooding, canal flooding and public sewer flooding are not considered to require detailed assessment within the water environment chapter, as the FCA (**Appendix 10A**) identifies these sources as negligible or with no viable pathway to the Proposed Development or surrounding receptors. Therefore, they are scoped out of further assessment.
- 10.7.20. The WFD Assessment (**Appendix 10B**) identifies that, with embedded measures in place, no deterioration in WFD quality elements or overall WFD water body status is anticipated at the water body scale. Accordingly, no further detailed WFD impact assessment or additional site-specific mitigation is identified as being required for the construction or operational stages at this stage. However, watercourse crossings and access track upgrades are not fully defined and will require further consideration at detailed design stage where interaction with watercourses is confirmed.
- 10.7.21. The designated sites identified within **Section 10.5** of this Chapter have been scoped out from further assessment. The sites are not hydrologically connected to the Proposed Development, and there are no credible pathways by which changes in surface water runoff, groundwater regime, flow patterns, or water quality could affect the features for which the sites are designated. In the absence of a source-pathway-receptor linkage, significant hydrological effects are not reasonably foreseeable and have therefore been scoped out of further assessment.

10.8 Assessment methodology

- 10.8.1. The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to EIA**. However, whilst this has informed the approach that has been used in this water environment assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this water environment assessment.
- 10.8.2. The identification of potentially significant effects on receptors within the Study Area broadly follows the approach of the Standards for Highways (2020) Design Manual for Roads and Bridges (DMRB) guidance document LA113⁴⁹ – Road Drainage and the Water Environment; although not directly applicable to the nature of the Proposed Development, the assessment principles set out within the DMRB guidance provide an acknowledged and accepted basis for assessing significant effects of developments on the water environment.
- 10.8.3. The significance of an effect resulting from the Proposed Development is primarily determined by the value of a given water feature and the magnitude of the effect. In terms of hydrology, the key determinants of magnitude relate to surface water quantity (level and flow) and water quality. However, depending on the effects of surface water flows, there may also be indirect effects on downstream morphology and sediment dynamics, river water quality and flood risk.
- 10.8.4. The assessment has involved the following:
- detailed desk studies and site visits to establish baseline conditions of the area;
 - identification of embedded good practice measures to avoid and mitigate against any identified adverse effects resulting from the Proposed Development;
 - evaluation of the likely significant environmental effects with consideration of the potential embedded measures, taking account of the sensitivity of the baseline features, the potential magnitude of these effects and the probability of these effects occurring; and
 - the residual significance of the environmental effects following the consideration of additional mitigation measures.

Approach

- 10.8.5. The assessment approach is broadly presented in three stages:
- estimating the importance of receptors;
 - estimating the magnitude of potential impacts on receptors; and
 - assessing the significance of the potential effects on receptors.
- 10.8.6. The significance of the effect resulting from the Proposed Development is assessed with reference to the importance (or sensitivity / value) of a given receptor and the magnitude of the impact. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Proposed Development. The residual effects of the Proposed

⁴⁹ UK Government. (2020) LA 113 Road Drainage and the Water Environment March 2020. (Online) Available from: <https://www.standardsforhighways.co.uk/search/d6388f5f-2694-4986-ac46-b17b62c21727> (Accessed July 2026)

Development on receptors is evaluated assuming that identified mitigation measures are fully implemented.

- 10.8.7. Assessments have been carried out cognisant of national and local planning obligations and policies; as well as established best practice principles as per published industry guidance specific to water quality / pollution, flood risk, water supplies (public and private) and sensitive receptors including surface and groundwater bodies (as listed in **Section 10.2**)
- 10.8.8. Furthermore, residual effects (i.e. those which remain post-mitigation) are identified and assessed as either 'significant' or 'not significant'.

Sensitivity of Receptor

- 10.8.9. Sensitivity of receptors has been determined on the basis of each receptor's ability to absorb the anticipated effect. Three levels of sensitivity have been used as shown in **Table 10-11** below. Evaluation of sensitivity requires a degree of judgement, based on defined characteristics and values but calling on professional experience.

Table 10-11 Sensitivity criteria

Sensitivity	Criteria	Examples of Potential Receptors
High	The receptor has very limited ability to absorb change without fundamentally altering its present character, is of very high environmental value and / or is of international importance.	Receptor is a designated site protected under national or international legislation, such as SSSI, SAC or Special Protection Area (SPA). Receptor has 'High' or 'Good' WFD overall status. Receptor supports key species and habitats sensitive to changes in suspended sediment concentrations and turbidity, such as salmon or freshwater pearl mussels. Receptor contains areas of regionally important economic mineral deposits. Regionally important public surface water or groundwater supply. Also includes Registered supplies which serve >50 people or abstract >10 m³ day for domestic purposes. Receptor supports GWDTE evaluated as potentially highly groundwater dependent and is nationally or regionally rare. Receptor contains a range of hydromorphological features with very little modification. Land use type defined as 'Emergency Services' in the TAN15 development categories and essential infrastructure equivalent. Receptor is a watercourse or floodplain, with a possibility of direct flood risk to populated areas, which are sensitive to increased flood risk by the possible increase in water levels. Receptor provides clear flood alleviation benefits. Receptor is classed as a high productivity aquifer (class 1A or 2A).
Medium	The receptor has some ability to absorb change without significantly altering its present character, is of medium environmental value and	Conditions supporting a site with a national conservation designation (e.g., SSSI, NNR), where the designation is based specifically on aquatic features. WFD surface water or groundwater body with overall 'Moderate' status / potential.

Sensitivity	Criteria	Examples of Potential Receptors
	/ or is of national / regional importance.	A watercourse in natural equilibrium and exhibiting a natural range of fluvial processes. Water use supporting human health and economic activity at a local scale, such as PWSs for domestic use or for primary food production applicable under Regulation 9 PWS Regulations (2017). Features with a medium vulnerability to flooding. Flood risk land use type defined as 'Highly vulnerable development' in the TAN15 development categories. Receptor is a watercourse or floodplain with a possibility of direct flood risk to high value agricultural areas, which are moderately sensitive to increased flood risk by the possible increase in water levels. Receptor provides limited flood alleviation benefits. Receptor supporting GWDTE evaluated as potentially highly or moderately groundwater dependent but is not rare, and commonplace at a regional or local level. Receptor is classed as a moderate or low productivity aquifer (class 1B or 2B).
Low	The receptor is tolerant of change without detriment to its present character, is of low environmental value and / or of local importance.	Conditions supporting a site with a local conservation designation, e.g. SINC, Local Nature Reserve (LNR), where the designation is based specifically on aquatic features, or an undesignated but highly / moderately water-dependent ecosystem, including a Local Wildlife Site (LWS) and a GWDTE. WFD surface water body (or part thereof) or groundwater body with overall Moderate / Poor or lower status / potential, or non-WFD water bodies. A modified or highly modified watercourse showing signs of modification and recovery to a natural equilibrium and currently exhibiting a limited range of fluvial processes or no active flow processes or morphological diversity. Unlicensed non-potable surface water and groundwater abstraction (and associated catchment). Unlicensed potable surface water and groundwater abstraction for non-human use e.g. agricultural PWSs. Land use type defined as 'Less vulnerable development' or 'Other' in the TAN15 development categories, including 'water compatible' development equivalents. Receptor is a watercourse or floodplain which passes through low value agricultural areas, less sensitive to increased flood risk by the possible increase in water levels. Receptor supporting GWDTE based on National Vegetation Classification (NVC) mapping, with local water sources not considered as predominantly groundwater.

Magnitude of Impact

- 10.8.10. The magnitude of impact includes the timing, scale, size and duration of any potential environmental effects. Four levels of magnitude have been used, as defined in **Table 10-12** below. The magnitude of change on water receptors is independent of the value of the receptor, and its assessment is semi-quantitative, based on professional judgement.

Table 10-12 Magnitude criteria

Magnitude	Criteria	Examples of Potential Receptors
High	Effects result in major changes, over a significant area, to key characteristics such that the post-development character / composition / attributes will be fundamentally changed for a significant / permanent period of time and will affect the use or integrity of the element.	Deterioration in river flow regime, morphology, or water quality, leading to sustained, permanent or long-term breach of relevant Conservation Objectives (COs) or non-temporary downgrading of status of a WFD surface water body or resulting in the inability of the surface water body to attain Good Status. Deterioration in groundwater levels, flows or water quality, leading to non-temporary downgrading of status of WFD groundwater body, or the inability of the groundwater body to attain Good status. Complete or severely reduced water availability and / or quality, compromising the ability of water users to abstract. Change in flood risk resulting in potential loss of life or major damage to the property or infrastructure.
Medium	Noticeable but not substantial changes. Changes of sufficient magnitude to affect the use/integrity, in some circumstances over a substantial area, to key characteristics. Changes may not be permanent and may resolve.	Deterioration in river flow regime, morphology or water quality, leading to periodic, short-term and reversible breaches of relevant COs, or potential temporary downgrading of status of surface water body status, although not affecting the ability of the body to achieve future WFD objectives. Deterioration in groundwater levels, flows or water quality, leading to potential temporary downgrading of status of WFD groundwater, although not affecting the ability of the body to achieve future WFD objectives. Moderate reduction in water availability and / or quality, which may compromise the ability of the water user to abstract on a temporary basis or for limited periods, with no longer-term impact on the purpose for which the water is used. Change in flood risk resulting in potential for moderate damage to the property or infrastructure. Changes to an aquifer in terms of water level or yield, with small changes to nearby dependent abstractions / habitats. Partial change or loss of a GWDTE, where the value of the Site would be affected.
Low	Noticeable but minor changes with barely discernible changes for any length of time, with insufficient magnitude to affect its use/integrity in most circumstances. Such changes may also be reversible with time.	Slight change in river flow regime, morphology or water quality, but remaining generally within COs, and with no short-term or permanent change to status of WFD surface water body. Slight deterioration in groundwater levels, flows or water quality, but with no short-term or permanent downgrading of status of WFD groundwater body. Minor reduction in water availability and / or quality, but unlikely to affect the ability of a water user to abstract. Change in flood risk resulting in potential for minor damage to property or infrastructure. Small change to or loss of a GWDTE, where the value of the Site would not be affected.
Very Low	Little or no change to element, with insufficient magnitude to affect its	No or very slight change in river flow regime or surface water quality, and no consequences in terms of COs or status of WFD surface water body or dependent receptors.

Magnitude	Criteria	Examples of Potential Receptors
	use / integrity. Any changes would be negligible, unnoticeable or have no predicted changes.	No or very slight change in groundwater levels or groundwater quality, and no consequences in terms of status of WFD groundwater body or dependent receptors. No, or very slight change in water availability or quality and no change in ability of the water user to exercise licenced rights or continue with small private abstraction. Increased frequency of flood flows, but which does not pose an increased risk to property or infrastructure. Minimal or no change to an aquifer in terms of water level or yield, with no discernible change to dependent abstractions / habitats.

Significance Evaluation Methodology

- 10.8.11. The significance of water-related effects is derived by considering both the value of the feature and the magnitude of change. In this assessment, effects are considered to be significant or not significant according to the matrix in **Table 10-13**.

Table 10-13 Significance evaluation matrix relating to the water environment

		Magnitude of Change			
		High	Medium	Low	Very low
Sensitivity / Importance / Value	High	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects have the potential to be significant, and they would normally be deemed to be significant, however in some instances these are deemed to be acceptable based on professional judgment. Significance can be 'Beneficial', 'Adverse' or 'Neutral'.

10.9 Assessment of water environment effects

Construction

- 10.9.1. The potential for effects on the water environment is greatest during the construction phase due to the high levels of activity on the Development Site and when there is greatest change to the existing environment. The potential effects associated with the construction of the Proposed Development are discussed and assessed in the following section.

- 10.9.2. The assessment results are based on the successful implementation of the relevant embedded measures which are detailed in **Section 10.6**.

Pollution Incidents

- 10.9.3. During the construction phase, a number of potential pollutants will be present on-site to facilitate civil engineering activities, including oil, fuels, chemicals, unset cement and concrete, and waste and wastewater from construction activities. With chemicals and oil being stored and used onsite, along with concrete batching, there is the potential for a pollution incident to occur. Any pollution incident occurring on the Development Site could have a detrimental effect on the water quality of the nearby surface waters, groundwater and/or soil, thereby also indirectly affecting ecology.
- 10.9.4. The following receptors are anticipated to be potentially impacted by pollution incidents:
- Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw;
 - Localised surface water flow routes and downstream hydrologically connected watercourses;
 - WFD surface water bodies:
 - Garw – headwaters to confluence with Ogmore;
 - Llynfi – headwaters to Lletty Brongu STW;
 - Llynfi – Lletty Brongu STW to confluence with Ogmore;
 - Swansea Carboniferous Coal Measures WFD groundwater body;
 - Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits;
 - Potential GWDTEs and local water-dependent habitats;
 - Downstream hydrologically linked designated sites; and
 - Any confirmed hydraulically connected private water supplies and abstractions
- 10.9.5. The adoption of the applicable good practice measures would reduce the probability of an incident occurring and also reduce the magnitude of any incident due to a combination of good site environmental management procedures, including minimised storage volumes, staff training, contingency equipment and emergency plans.
- 10.9.6. The **Outline CEMP (Appendix 4A)** sets out working methods to protect surface water and groundwater from pollution and adverse impacts with key measures including the following:
- areas of construction compounds that are used for fuel storage, plant maintenance and refuelling would be surfaced with fully impermeable materials to prevent any infiltration of contaminated runoff;
 - an accident response protocol would be developed to ensure any spillages or potential pollution incidents are dealt with appropriately including the provision of containment for spills of contaminated liquids;
 - plant and machinery would be maintained to minimise the risks of oil leaks or similar. Any tanks containing oils, fuels and chemicals would be double skinned;

- fuel storage would be in accordance with PPGs. All stores of fuel would be located at least 20 m from any watercourses and away from areas at risk of flooding;
- oil and chemical storage would be secured in over-ground bunded areas, limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas;
- emergency spill kits would be retained onsite with regular briefings and training for site operatives on emergency response arrangements;
- the Outline CEMP (**Appendix 4A**), would include a procedure for encountering unexpected contamination or suspected contamination, which would require additional testing and risk assessment to determine appropriate measures;
- materials would be segregated where possible to prevent cross-contamination occurring and would only be reused if confirmed to be suitable for use; and
- any temporary onsite storage of excavated materials suspected or confirmed to be contaminated would be placed on impermeable sheeting, covered over and with adequate leachate / runoff drainage to prevent migration of contaminants from the stockpile.

10.9.7. Further investigation and demarcation of PWS would be completed prior to construction and would inform mitigation requirements including the arrangement of pollution prevention measures within the vicinity of any PWS abstraction. The mitigation would be detailed in the PWS Monitoring and Method Statement (PWSMS) that would be prepared post-consent. PWS monitoring at selected abstractions within the vicinity of the Proposed Development would also be undertaken prior to, during and after construction. The monitoring strategy would be agreed with the LPA post consent.

10.9.8. Taking into account the design and embedded measures, including pollution prevention controls, construction drainage, sediment management, spill response and standard good practice measures, the assessment of pollution incident effects is summarised in **Table 10-14**:

Table 10-14 Assessment of Pollution Incident effects

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw, and localised surface water flow routes	Medium	Low	Minor adverse	Not significant
WFD surface water body: Garw, headwaters to	High	Very Low	Minor adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
confluence with Ogmore				
WFD surface water body: Llynfi, headwaters to Lletty Brongu STW	High	Low	Moderate adverse	Not Significant - Although the significance matrix indicates a Moderate adverse effect, professional judgement has been applied to reflect the very low likelihood of occurrence following implementation of embedded mitigation and established good practice.
WFD surface water body: Llynfi, Lletty Brongu STW to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
Swansea Carboniferous Coal Measures WFD groundwater body	Low	Very Low	Negligible adverse	Not significant
Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits	Medium	Very Low	Negligible adverse	Not significant
Potential GWDTEs	Low	Very Low	Negligible adverse	Not significant
Local water-dependent habitats, including marshy grassland, wet heath and peaty habitats	Medium	Low	Minor adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Any confirmed hydraulically connected private water supplies or abstractions	High	To be confirmed – awaiting PWS information from relevant councils. The PWS Risk Assessment will be undertaken as part of the final ES, following receipt of PWS data.		

Erosion and Sedimentation

- 10.9.9. Increase in surface water runoff and therefore, increase in flood risk downstream may increase the potential erosional power of surface overland flows. Soil erosion, loss of soil and sediment generation may occur in areas where the ground has been disturbed during construction, including in situations where engineering activities occur close to watercourses, such as at watercourse crossings and where higher velocity surface water flows may occur due to local slopes and drainage design. Surface water passing through the drainage could exhibit high localised flows, increasing the potential for bank erosion.
- 10.9.10. Sediment transport in watercourses could result in high turbidity levels which could affect the ecology, particularly fish stocks, by reducing the light and oxygen levels in the water.
- 10.9.11. Sediment deposition can further affect watercourses by potentially smothering plant life, invertebrates and spawning grounds and can reduce the flood storage capacity of channels and block culverts, resulting in an increased flood risk.
- 10.9.12. Erosion and sedimentation could also alter the water quality at water abstractions including PWS.
- 10.9.13. The following receptors are anticipated to be potentially impacted by erosion and sedimentation:
- Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyrw;
 - WFD surface water bodies:
 - Garw – headwaters to confluence with Ogmore;
 - Llynfi – headwaters to Lletty Brongu STW;
 - Llynfi – Lletty Brongu STW to confluence with Ogmore;
 - Flooding (on-site and downstream); and
 - PWS.
- 10.9.14. The adoption of the applicable good practice measures will reduce the probability of an incident occurring and also reduce the magnitude of any incident due to a combination of good site environmental management procedures, including additional precautions when

operating machinery close to watercourses, soil management, staff training, contingency equipment and emergency plans.

- 10.9.15. There will also be a dilution factor relevant to any potential sedimentation as effects move away from any Proposed Development infrastructure.
- 10.9.16. The **Outline CEMP (Appendix 4A)** sets out working methods to protect surface water and groundwater from adverse impacts. Key measures identified to reduce erosion and sedimentation include the following:
- vegetation clearance would be scheduled only as needed; buffer strips would be retained as vegetated features and revegetation encouraged with native species;
 - silt traps would be employed and maintained in appropriate locations;
 - temporary interception bunds and drainage ditches would be constructed upslope of excavations such as turbine foundations to minimise surface runoff ingress and in advance of excavation activities;
 - the integration of SuDS, with a specific focus on Source and Site control measures and is applicable to both temporary construction and permanent drainage networks;
 - excavation and earthworks would be suspended during and immediately following periods of heavy rainfall in order to minimise sediment generation and soil damage;
 - in the case of pollution incident effects, good practice site environmental management measures and the dilution factor involved would be expected to reduce any potential sedimentation effect downstream;
 - a programme of monitoring and inspection to ensure that all drainage functions effectively and as intended;
 - PWS monitoring at selected abstractions within the vicinity of the Proposed Development would also be undertaken prior to, during and after construction. The monitoring strategy would be agreed with the LPA post consent.
- 10.9.17. Taking into account the design and embedded measures, including pollution prevention controls, construction drainage, sediment management, spill response and standard good practice measures, the assessment of sedimentation effects is summarised in **Table 10-15**:

Table 10-15 Assessment of Erosion and Sedimentation effects

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw, and localised surface water flow routes	Medium	Low	Minor adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
WFD surface water body: Garw, headwaters to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
WFD surface water body: Llynfi, headwaters to Lletty Brongu STW	High	Low	Moderate adverse	Not Significant - Although the significance matrix indicates a Moderate adverse effect, professional judgement has been applied to reflect the very low likelihood of occurrence following implementation of embedded mitigation and established good practice.
WFD surface water body: Llynfi, Lletty Brongu STW to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
Flood risk receptors, including the Development Site, downstream receptors and watercourse flow routes	Low	Low	Negligible adverse	Not significant
Any confirmed hydraulically connected private water supplies or abstractions	High	To be confirmed – awaiting PWS information from relevant councils. The PWS Risk Assessment will be undertaken as part of the final ES, following receipt of PWS data.		

Modification of Surface Water Drainage Patterns and Flooding

- 10.9.18. Construction activities could temporarily alter surface water drainage patterns through vegetation clearance, soil compaction, creation of temporary hardstanding, excavation works, access track construction and temporary drainage. This could locally alter runoff

rates, interrupt existing flow pathways or increase flow concentration if not appropriately managed.

- 10.9.19. The following receptors are anticipated to be potentially impacted by the modification of surface water drainage patterns:
- Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw;
 - WFD surface water bodies:
 - Garw – headwaters to confluence with Ogmore;
 - Llynfi – headwaters to Lletty Brongu STW;
 - Llynfi – Lletty Brongu STW to confluence with Ogmore;
 - Flooding
 - Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits; and
 - Swansea Carboniferous Coal Measures WFD groundwater body.
- 10.9.20. The FCA (**Appendix 10A**) identifies that the majority of the Development Site is located within Flood Zone 1 and is generally at low risk of flooding, with the principal flood risk associated with localised surface water flow routes and ordinary watercourses. Where infrastructure crosses mapped drainage corridors or flow routes, appropriate drainage design and hydraulic connectivity would be incorporated to manage residual risk.
- 10.9.21. Temporary construction drainage would be used to manage runoff during construction. Measures could include:
- interception drainage;
 - check dams;
 - settlement features;
 - cross-drainage; and
 - SuDS-based source control measures.
- 10.9.22. Existing flow pathways would be maintained where practicable, and watercourse crossings would be designed to maintain flow conveyance and avoid increasing flood risk upstream or downstream.
- 10.9.23. Taking into account the design and embedded measures, the assessment of effects on surface water drainage patterns and flooding is summarised in **Table 10-16**:

Table 10-16 Assessment of Modification of Surface Water Drainage Patterns and Flooding

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Ordinary watercourses, including Nant Gwyn Bach,	Medium	Low	Minor adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Nant Cwm-du and Nant Cedfyw				
WFD surface water body: Garw, headwaters to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
WFD surface water body: Llynfi, headwaters to Lletty Brongu STW	High	Low	Moderate adverse	Not Significant - Although the significance matrix indicates a Moderate adverse effect, professional judgement has been applied to reflect the very low likelihood of occurrence following implementation of embedded mitigation and established good practice.
WFD surface water body: Llynfi, Lletty Brongu STW to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
Flooding, including the Development Site, localised surface water flow routes and downstream flood risk receptors	Low	Very Low to Low	Negligible adverse	Not significant
Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits	Medium	Low	Minor adverse	Not significant
Swansea Carboniferous	Low	Very Low	Negligible adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Coal Measures WFD groundwater body				

Operational

- 10.9.24. This section sets out the likely operational effects of the Proposed Development. Many of the effects identified during construction would not be expected to lead to significant effects during the operational phase. This includes effects associated with pollution as well as erosion and sedimentation. Operational phase effects on PWS are also not anticipated.

Modification of Surface Water Drainage Patterns and Flooding

- 10.9.25. Surface water drainage patterns may be altered by a new permanent drainage system that would serve the Proposed Development and in particular, the impermeable areas for the concrete foundations, substation and access tracks.
- 10.9.26. The following receptors are anticipated to be potentially impacted by the modification of surface water drainage patterns in the operation phase:
- Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw;
 - WFD surface water bodies:
 - Garw – headwaters to confluence with Ogmore;
 - Llynfi – headwaters to Lletty Brongu STW;
 - Llynfi – Lletty Brongu STW to confluence with Ogmore;
 - Flood risk receptors;
 - Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits;
 - Swansea Carboniferous Coal Measures WFD groundwater body; and
- 10.9.27. However, the adoption of the applicable good practice measures would incorporate a sustainable drainage strategy that minimises disturbance of existing hydrological systems to reduce the adverse effect on surface water drainage patterns.
- 10.9.28. No additional changes to overland drainage and surface water flows are anticipated during the operational phase of the Proposed Development. All permanent drainage infrastructure would remain in place during the Proposed Development's operation in accordance with the final drainage strategy.
- 10.9.29. Operational drainage measures would include:
- permanent SuDS features to attenuate and manage runoff;

- retention of existing drainage pathways where practicable;
- design of crossings to maintain hydraulic connectivity;
- discharge control to manage flows to receiving watercourses; and
- inspection and maintenance of drainage infrastructure during operation.

10.9.30. Taking into account the design and embedded measures, the assessment of effects in relation to surface water drainage patterns and flooding is summarised in **Table 10-17**:

Table 10-17 Assessment of Operational Modification of Surface Water Drainage Patterns and Flooding

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw	Medium	Very Low	Negligible adverse	Not significant
WFD surface water body: Garw, headwaters to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
WFD surface water body: Llynfi, headwaters to Lletty Brongu STW	High	Very Low	Minor adverse	Not significant
WFD surface water body: Llynfi, Lletty Brongu STW to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
Flood risk receptors, including the Development Site, localised surface water flow routes and downstream receptors	Low	Very Low to Low	Negligible adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits	Medium	Very Low to Low	Negligible to Minor adverse	Not significant
Swansea Carboniferous Coal Measures WFD groundwater body	Low	Very Low	Negligible adverse	Not significant

Pollution Incidents

- 10.9.31. During the operational phase, the potential for pollution effects would be substantially reduced compared with construction, as routine activities would be limited to inspection, maintenance and repair of the wind farm infrastructure, access tracks and drainage features.
- 10.9.32. Potential effects could arise from the accidental release of pollutants, such as fuel or oil, during maintenance activities, with possible pathways to ordinary watercourses, WFD surface water bodies, groundwater, drainage corridors and wet habitats where hydrological connectivity is present.
- 10.9.33. Operational controls would include:
- use of good practice pollution prevention measures during maintenance activities;
 - appropriate storage, handling and use of fuels, oils and other maintenance materials;
 - availability of spill response equipment during maintenance works;
 - regular inspection and maintenance of drainage and SuDS features; and
 - removal and appropriate disposal of silt, oil, grease or other retained materials from drainage components, where required.
- 10.9.34. The FCA and ODS (**Appendix 10A**) identifies that regular inspection and maintenance would be required to ensure the long-term operation of SuDS and the drainage network, including filter drains, pipework, chambers and associated flow control components. Maintenance requirements would be confirmed at the full SAB stage.
- 10.9.35. Taking account of the limited nature of operational maintenance activities and the implementation of operational pollution prevention and drainage maintenance measures, the magnitude of change from accidental releases of pollutants is considered to be **Very**

Low. This reflects the limited scale and intermittent nature of maintenance activities, together with the operational controls that would be in place to prevent, contain and respond to any accidental releases.

- 10.9.36. Taking into account the design and embedded measures, the assessment of pollution incident effects is summarised in **Table 10-18**:

Table 10-18 Assessment of Operational Pollution Incidents

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Ordinary watercourses, including Nant Gwyn Bach, Nant Cwm-du and Nant Cedfyw	Medium	Very Low	Negligible adverse	Not significant
Localised surface water flow routes and drainage corridors	Low	Very Low	Negligible adverse	Not significant
WFD surface water body: Garw, headwaters to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
WFD surface water body: Llynfi, headwaters to Lletty Brongu STW	High	Very Low	Minor adverse	Not significant
WFD surface water body: Llynfi, Lletty Brongu STW to confluence with Ogmore	High	Very Low	Minor adverse	Not significant
Site aquifers, including Secondary A bedrock aquifers and Secondary A / Secondary undifferentiated superficial deposits	Medium	Very Low	Negligible adverse	Not significant
Swansea Carboniferous	Low	Very Low	Negligible adverse	Not significant

Receptor	Sensitivity / importance / value	Magnitude of change	Significance of effect	Significance conclusion
Coal Measures WFD groundwater body				
Any confirmed hydraulically connected private water supplies or abstractions	High	To be confirmed – awaiting PWS information from relevant councils. The PWS Risk Assessment will be undertaken as part of the final ES, following receipt of PWS data.		

Decommissioning

- 10.9.37. During decommissioning of the Proposed Development, potential impacts on the water environment are expected to be similar in nature to those identified during construction, but generally lower in extent and duration.
- 10.9.38. Decommissioning activities are likely to include the removal of above-ground infrastructure, dismantling of turbines, removal or reinstatement of temporary compounds and working areas, and localised works associated with access tracks, drainage features and below-ground infrastructure. Where below-ground infrastructure is proposed to remain *in situ*, this would reduce the extent of ground disturbance and associated risks to the water environment.
- 10.9.39. Potential effects could include localised changes to surface water runoff, sediment mobilisation, accidental pollution incidents and temporary disturbance near watercourses or drainage features. These effects would be managed through relevant good practice measures, including pollution prevention, sediment control, drainage management and reinstatement of disturbed ground. Subject to these measures, decommissioning effects are expected to be temporary, localised and not significant.
- 10.9.40. Decommissioning would be undertaken in accordance with legislation, guidance and environmental management requirements in force at the time and would be supported by a decommissioning environmental management plan where required. No additional specific mitigation measures are therefore identified at this stage.

10.10 Residual Effects and Additional Mitigation Measures

- 10.10.1. Mitigation is considered as additional measures beyond the design principles and good practice and the application of such measures is usually separately noted and residual effects evaluated.
- 10.10.2. In this case, no significant adverse effects have been identified, and therefore there are no residual effects and no additional measures required.

10.11 Assessment of cumulative (inter-project) effects

- 10.11.1. A cumulative effects assessment (CEA) has been undertaken for the Proposed Development which considers the combined impacts with other developments on the same single receptor or resource (inter-project effects). The detailed method followed in identifying and assessing potential cumulative effects is set out in **Chapter 2: Approach to EIA**.
- 10.11.2. The cumulative developments identified in **Figure 2.1** were reviewed as part of this CEA. Developments were scoped into the water environment CEA where there was potential for hydrological connectivity, overlap in construction periods, shared receiving watercourses or catchments, or potential for combined effects on flood risk, drainage, water quality or WFD receptors. Developments were scoped out where they were operational, sufficiently distant, located in separate catchments, or where no realistic source-pathway-receptor linkage with water environment receptors was identified.
- 10.11.3. Operational developments are not considered to have the potential to give rise to in-combination effects with the Proposed Development, as the potential for significant water environment effects is greatest during construction. Off-site cumulative hydrological effects are primarily related to potential changes in water quality, runoff and flood risk during construction. Embedded measures, including construction drainage, sediment control, pollution prevention and maintenance of hydrological connectivity, would reduce the potential for the Proposed Development to contribute to cumulative effects downstream.
- 10.11.4. The FCA and ODS (**Appendix 10A**) provide details on how the potential effects associated with drainage and flood risk would be managed. The permanent SuDS design would incorporate multiple water quality treatments such as swales or attenuation ponds prior to discharge. This would provide sufficient pollution mitigation indices to mitigate against the expected pollution produced on-site as per the SuDS Manual³³.

Pollution Incidents

- 10.11.5. Cumulative pollution effects could occur where multiple developments are constructed within the same or hydrologically connected catchment, with potential pathways to ordinary watercourses, WFD surface water bodies, groundwater or downstream receptors. However, construction-phase pollution risks would be managed through project-specific CEMPs or equivalent measures. For the Proposed Development, embedded measures including pollution prevention, spill response, construction drainage and good practice site management would reduce the potential to contribute to significant cumulative pollution effects.

Erosion and Sedimentation

- 10.11.6. Cumulative erosion and sedimentation effects could occur where construction works associated with more than one development disturb soils within hydrologically connected catchments, increasing sediment mobilisation, turbidity or deposition in downstream watercourses. For the Proposed Development, erosion and sedimentation would be controlled through temporary drainage, silt management, rainfall-related working restrictions, reinstatement of disturbed ground and monitoring. Other developments would

also be expected to implement appropriate construction controls; therefore, significant cumulative effects are not anticipated.

Modification of Surface Water Drainage Patterns and Flooding

- 10.11.7. Cumulative effects on surface water drainage patterns and flood risk could occur where multiple developments alter runoff rates or drainage pathways within the same receiving catchment. Where schemes are located within separate catchments, or where no hydrological connectivity to a shared downstream receptor exists, no realistic source-pathway-receptor linkage would be present. Where connectivity exists, scheme-specific drainage design, SuDS and construction controls would reduce the magnitude of potential effects.
- 10.11.8. Although individual developments may give rise to residual effects on the water environment, significant cumulative effects are not anticipated. This is because residual effects are expected to be localised, temporary and controlled through scheme-specific drainage, pollution prevention and sediment management measures. Where developments are hydrologically connected, the limited spatial extent of residual effects and implementation of mitigation at source would reduce the potential for effects to combine to a significant level.
- 10.11.9. In addition, construction activities across different developments would be expected to occur over varying timescales and locations, reducing the likelihood of concurrent effects influencing the same receptor. Consequently, significant cumulative effects on the water environment are not anticipated.

Overall conclusion

- 10.11.10. It is concluded that following the successful implementation of a CEMP and the good practice measures outlined above, cumulative effects are **not significant**.
- 10.11.11. Overall, taking account of embedded measures, scheme-specific construction controls, drainage design and the absence of realistic source-pathway-receptor linkages for some developments, significant cumulative effects on the water environment are not anticipated.

10.12 Significance conclusions

- 10.12.1. A summary of the results of the water environment assessment is provided in **Table 10-19**.

Table 10-19 Summary of significance of effects

Receptor and summary of predicted effects	Sensitivity / importance / value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Construction Phase				
Land preparation (earthworks and excavation) Potential receptors include ordinary watercourses, localised surface water flow routes, site aquifers, GWDTEs, local water-dependent habitats, WFD surface water bodies, and the Swansea Carboniferous Coal Measures WFD groundwater body. Potential effects could include: Modification of Surface Water Drainage Patterns Changes in the hydromorphology and flow conveyance of watercourses as a result of increased sediment inputs or direct watercourse disturbance; Pollution Incidents Accidental release of potential pollutants during civil engineering activities, including oil, fuels, chemicals, unset cement and concrete	Low to High	Very Low to Low	Negligible to Moderate adverse Not significant	The assessment takes account of embedded measures, including pollution prevention controls, construction drainage, sediment management, spill response and standard good practice measures. Whilst the assessment has identified the moderate adverse effects on certain receptors, these outcomes reflect a precautionary approach based on receptor sensitivity and magnitude of change rather than a realistic expectation of occurrence. In the case of WFD surface water body: Llynfi, headwaters to Lletty Brongu STW, and surface waters, the likelihood of a significant effect arising is considered to be low, due to the implementation of embedded design measures and established construction good practice, which are designed to control pollution risks and maintain natural hydrological regimes.

Receptor and summary of predicted effects	Sensitivity / importance / value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
and waste and wastewater from construction activities; Erosion and Sedimentation Temporary increase in sediment-loading of surface water runoff from construction / dismantling areas leading to deterioration in the surface water quality environment and deterioration in the status of WFD surface water bodies.				
Impermeable land associated with access tracks and construction/dismantling areas Potential receptors include ordinary watercourses, localised surface water flow routes, flood risk receptors, GWDTEs, local water-dependent habitats, and WFD surface water bodies. Potential effects could include: Modification of Surface Water Drainage Patterns and Flooding increase in surface water runoff and	Low to High	Very Low to Low	Negligible to Moderate adverse Not significant	Effects would be temporary and localised. The majority of the Development Site is identified as being within Flood Zone 1, with principal flood risk associated with localised surface water flow routes and ordinary watercourses. Embedded temporary drainage and flow conveyance measures would manage runoff and maintain hydraulic connectivity where practicable.

Receptor and summary of predicted effects	Sensitivity / importance / value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
therefore, increase in flood risk downstream; - soil erosion and sediment generation in areas where the ground has been disturbed; - sediment transport in watercourses resulting in high turbidity levels; - Sediment deposition.				
Development of temporary infrastructure Potential receptors include ordinary watercourses, localised surface water flow routes and downstream flood risk receptors. Potential effects could include: Erosion and Sedimentation Accidental release of potential pollutants during civil engineering activities, including oil, fuels, chemicals, unset cement and concrete and waste and wastewater from construction activities; Pollution Incidents	Low to Medium	Very Low to Low	Negligible to Minor adverse Not significant	The assessment takes account of embedded measures, including pollution prevention controls, construction drainage, sediment management, spill response and standard good practice measures. Temporary infrastructure could alter local flow routes or watercourse conveyance where located near drainage corridors or watercourse crossings. Embedded drainage design, crossing design and maintenance of hydraulic connectivity would reduce the potential for adverse effects.

Receptor and summary of predicted effects	Sensitivity / importance / value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Construction activities could temporarily alter surface water drainage patterns. This could locally alter runoff rates, interrupt existing flow pathways or increase flow concentration if not appropriately managed.				
Operational Phase				
Impermeable land take Potential receptors include ordinary watercourses, localised surface water flow routes and downstream flood risk receptors. Potential effect includes the Modification of Surface Water Drainage Patterns and Flooding Surface water drainage patterns may be altered by a new permanent drainage system that would serve the Proposed Development.	Low to Medium	Very Low to Low	Negligible to Minor adverse Not significant	The permanent drainage strategy would manage runoff, maintain existing drainage pathways where practicable and incorporate SuDS features. Operational inspection and maintenance would ensure drainage infrastructure continues to function effectively. Effects are therefore expected to be localised and controlled through the final drainage design and operational maintenance arrangements.
Maintenance activities Potential receptors include ordinary watercourses, localised surface water flow routes, site aquifers, GWDTEs, local water-dependent habitats, WFD surface water bodies, and the Swansea Carboniferous Coal Measures WFD groundwater body.	Low to High	Very Low	Negligible to Minor adverse Not significant	Operational maintenance activities would be limited and intermittent. Pollution prevention measures, appropriate storage and handling of fuels / oils, spill response equipment, and inspection and maintenance of drainage / SuDS features would reduce the potential for adverse effects.

Receptor and summary of predicted effects	Sensitivity / importance / value of receptor ¹	Magnitude of change ²	Significance ³	Summary rationale
Potential effects include pollution incidents which could arise from the accidental release of pollutants, such as fuel or oil, during maintenance activities,				

1. The sensitivity / importance / value of a receptor is defined using the criteria set out in **Table 10-11** and is defined as low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Table 10-12** and is defined as very low, low, medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity / importance / value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor / negligible (not significant), subject to the evaluation matrix outlined in **Table 10-13**.

10.13 Further work to be undertaken

- 10.13.1. No additional environmental measures are considered necessary at this stage beyond the embedded measures identified in **Table 10-8**. The assessment indicates that, with implementation of embedded mitigation, effects on water environment receptors would be not significant. Further assessment will be undertaken for the final ES, including refinement of drainage design, watercourse crossing requirements and PWS risk assessment. Any supply-specific monitoring or mitigation identified through that further work will be incorporated into the final ES and relevant management plans.