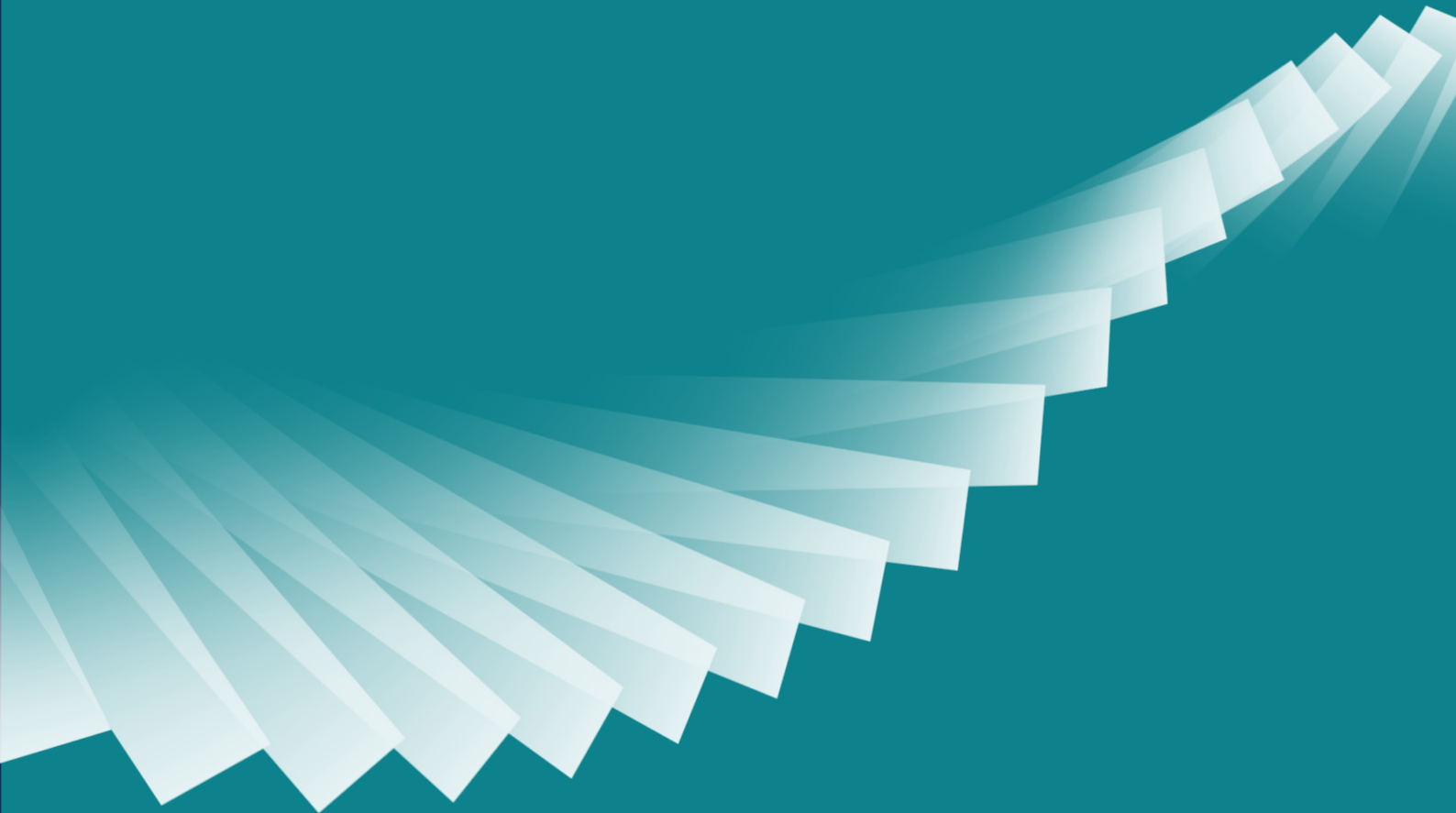




Bute Energy
Aberedw Energy Park

Appendix 9.5:

Water Framework Directive Assessment





Appendix 9.5 Aberedw Energy Park: Water Framework Directive Assessment

P24039_R4

June 2025



Document Control

Title

Appendix 9.5 Aberedw Energy Park: Water Framework Directive Assessment

Client

LUC
On behalf of
Aberedw Energy Park



Reference

P24039_R4

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1. Introduction

1.1. Instruction

Aqua Terra Consultants Ltd was instructed by Land Use Consultants Ltd (LUC; the Client) on behalf of Aberedw Energy Park Ltd (the Applicant) to provide an assessment of the proposed Aberedw Energy Park near Builth Wells (the Site) under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD). Instruction to proceed in accordance with Aqua Terra Consultants Work Scope was confirmed by LUC sub-consultant agreement 12522.

1.2. Site context

The Site is located in Powys, mid-Wales, approximately 3km east of Builth Wells and 1.25km north of Aberedw. The Site lies within the catchment of the River Wye. There are numerous minor watercourses (Ordinary Watercourses) present across the Site, the majority of which drain to the River Edw. A small area at the north of the Site is drained by Camnant Brook and the western edge of the Site is drained by the River Wye. Headwaters of the River Edw that drain the Site include the tributaries of Cwmblaenerw Brook and the tributaries of Milo Brook which follow the two valleys which extend southwards between Aberedw Hill and Llan-fraith Hill.

1.3. Report scope

This report presents an assessment of the potential impacts that the Proposed Development may have on the water bodies to which the land drains, and whether the proposed works comply with the requirements of the river basin management plan (RBMP). The aim of the report is to determine whether the proposed works will affect the environmental objectives of the WFD, which are;

- to prevent deterioration of the status of surface waters and groundwater;
- to achieve objectives and standards for protected areas;
- to aim to achieve good status for all water bodies or, for heavily modified water bodies and artificial water bodies, good ecological potential and good surface water chemical status;
- to reverse any significant and sustained upward trends in pollutant concentrations in groundwater;
- attain the cessation of discharges, emissions and losses of priority hazardous substances into surface waters; and,
- progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants.

The Severn River Basin District River Basin Management Plan (EA, 2022) provides water body objectives and this document assesses the potential impact that the proposed works may have on attaining these objectives.

1.4. Limitations

This report is written strictly for the benefit of the Client and bound by the conditions presented in Appendix A.

2. Site Description

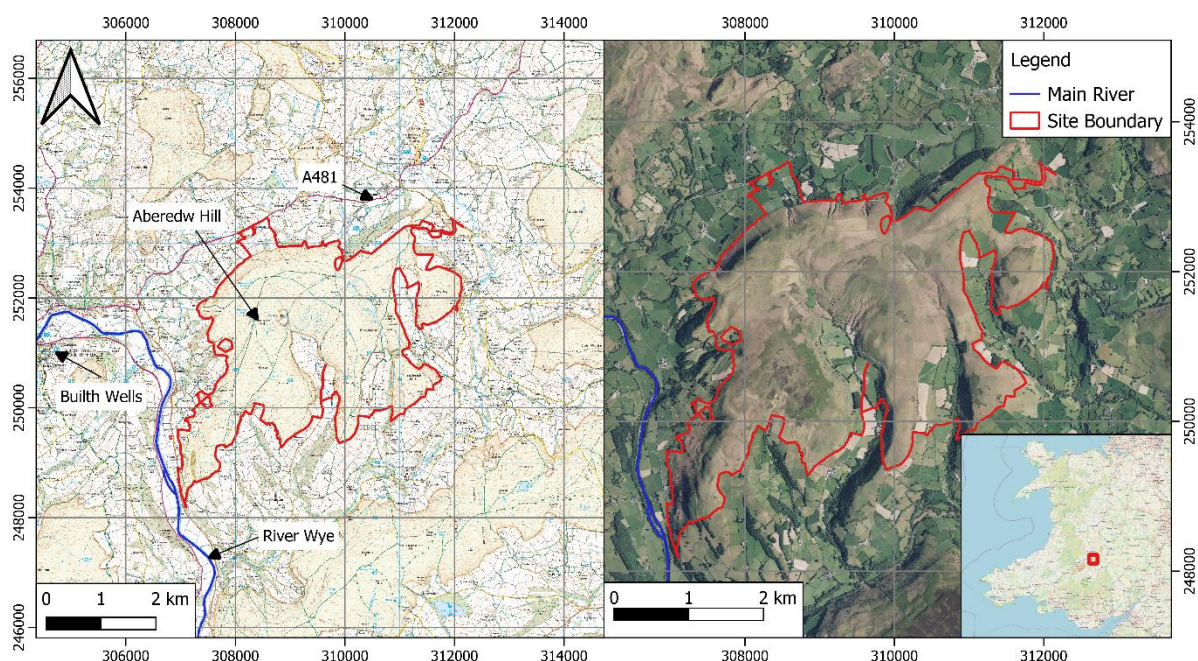
2.1. Site location

The Site is located in Powys, mid-Wales, approximately 3km east of Builth Wells and 1.25km north of Aberedw and is 1322.55 hectares in size. The national grid reference for the approximate Site centre is SO 09397 51302.

The River Wye runs north to south just west of the Site, and the A481 runs west to east just to the north of the majority of the Site, with a small portion of the Site located to the north of the A481. Part of the north of the Site is within the Colwyn Brook Marshes (North and South) Site of Special Scientific Interest (SSSI). No development is proposed within the SSSI.

Figure 2-1 provides the site location and an aerial image of the Site showing the current layout and condition.

Figure 2-1 Site location



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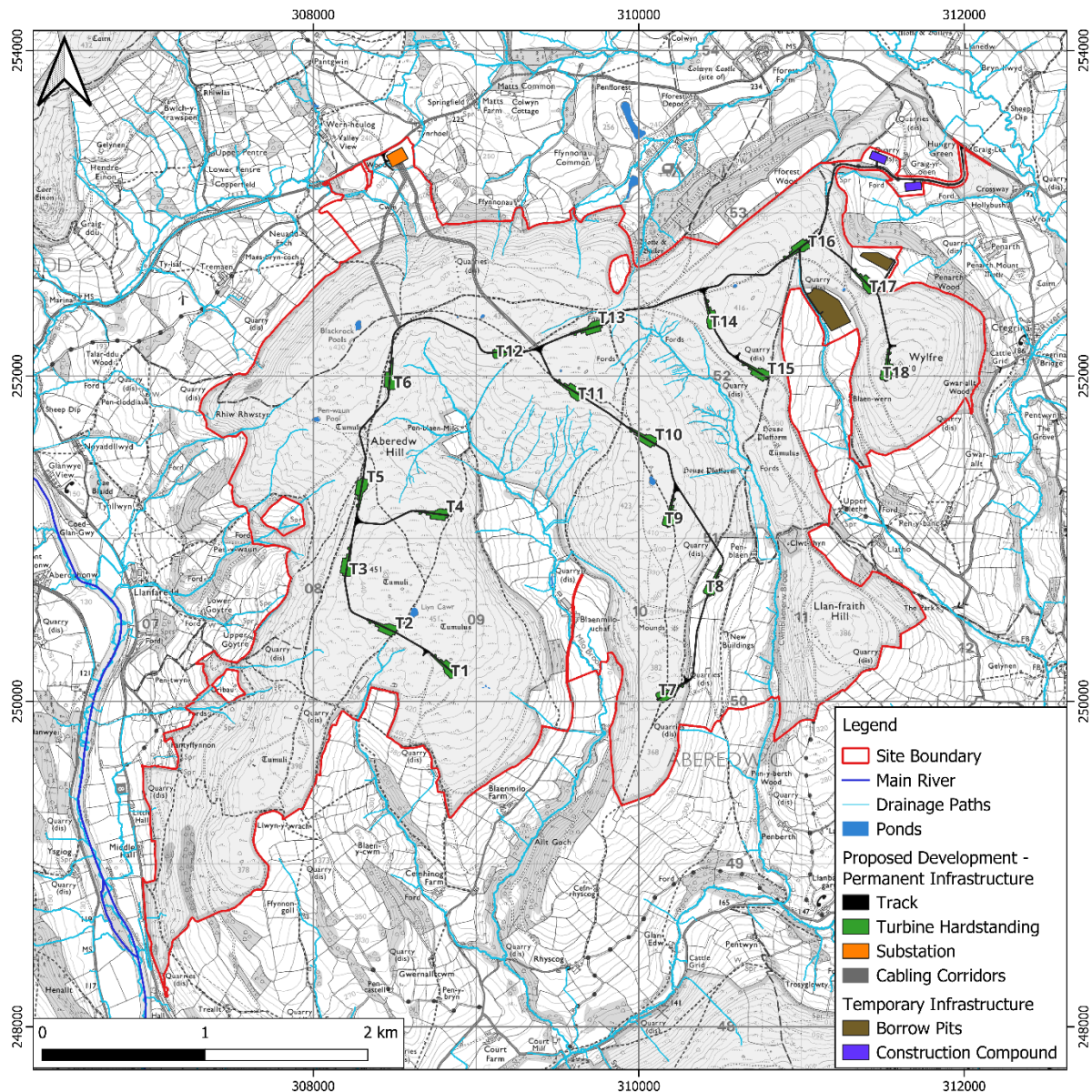
2.2. Proposed development

The Proposed Development comprises a wind farm and ancillary development and the layout provided by the Client is provided in Appendix B. A single watercourse crossing is required immediately adjacent to the substation where the access track passes over a surface water flow path – although no permanent watercourse is present here. It will also be necessary for the cable corridors to cross three ephemeral streams. The cables are proposed to be laid underground, with

existing topsoil replaced following installation, and this will take place in the summer when the streams are likely to be dry.

These are discussed further in Section 5.2.6 The layout of the Proposed Development in relation to on-Site watercourses is presented in **Error! Reference source not found.**

Figure 2-2 Proposed Site layout in relation to on-Site watercourses



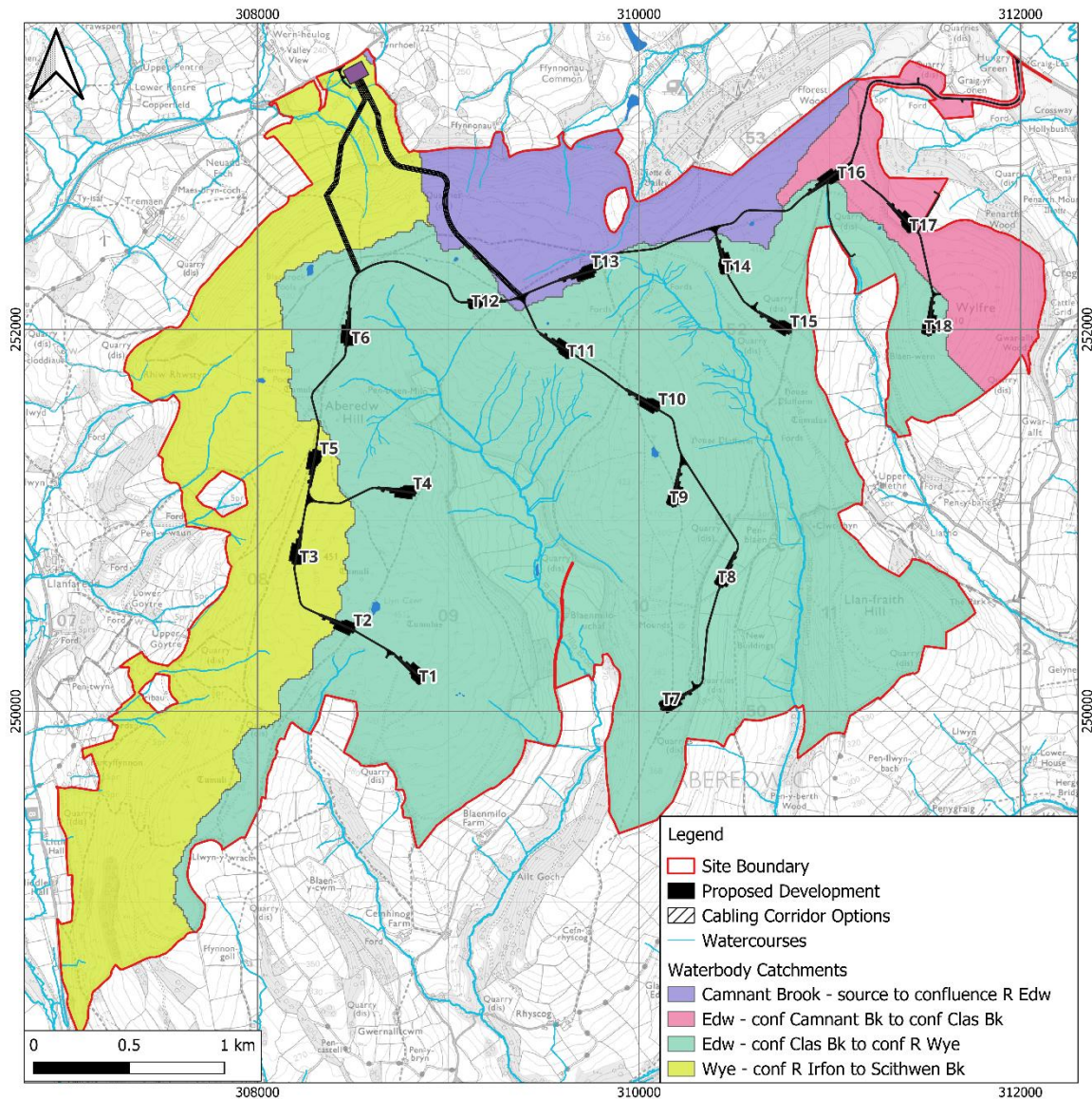
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3. Surface water bodies

3.1. Water bodies with which the Proposed Development may interact

The Site lies within the larger River Severn catchment; the Severn River Basin Management Plan (RBMP) was updated in 2022 and is now in Cycle 3 of the RBMP, with the period running from 2021-2027. The waterbody catchments present within the Site are defined by the Welsh Governments Water Framework Directive River Waterbody Catchments Cycle 3 (NRW, 2022). The catchments are shown in reference to the Site boundary and proposed infrastructure layout in Figure 3-1 below.

Figure 3-2 River waterbody catchments



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Four waterbody catchments are present within the Site boundary, all of which are within the wider River Wye Management Catchment as follows:

- Camnant Brook – source to confluence with River Edw
 - *The Camnant Brook from source to confluence with River Edw* drains a small area in the north of the Site. It is described as 'Natural'.
- River Edw – confluence with Camnant Brook to confluence with Clas Brook
 - *The River Edw from confluence with Camnant Brook to confluence with Clas Brook* drains a small area in the northeast of the Site. It is described as 'Natural'.
- River Edw – confluence with Clas Brook to confluence with River Wye

- *The River Edw from confluence with Clas Brook to confluence with River Wye drains the majority of the Site. It is described as 'Natural'.*
- River Wye – confluence with River Lrfon to confluence with Scithwen Brook
 - *The River Wye from confluence with River Lrfon to confluence with Scithwen Brook drains the western portion of the Site. It is described as 'Natural'.*

3.2. Current waterbody status

WFD Cycle 3 data is available for each of the four waterbodies (NRW, 2022). This is summarised in Table 3-1.

Table 3-1 Current (2022) waterbody status

	Camnant Bk – Source to conf River Edw	River Edw – Conf Camnant Bk to conf Clas Bk	River Edw – Conf Clas Bk to conf River Wye	River Wye – conf River Lrfon to conf Scithwen Bk
Overall waterbody status	Good	Good	Good	Good
Ecological status	Good	Good	Good	Good
Fish status	Good	High	High	No data
Invertebrates	Good	Good	Good	Good
Macrophytes and phyto-benthos status	Good	Good	High	Good
Diatoms	Good	Good	High	
Chemical status	High	High	High	High
Hydrological regime	High	High	High	Not High
Morphology	Not High	Not High	Not High	No data
Driving Element	Fish, invertebrates, macrophytes and phyto-benthos, phosphorous	Invertebrates, macrophytes and phyto-benthos, morphology	Invertebrates, morphology	Invertebrates, macrophytes and phyto-benthos, hydrological regime, phosphorus, temperature

All four waterbodies have an overall waterbody status of 'Good' and an ecological status of 'Good'. Fish status is 'Good' in the Camnant Brook, 'High' in the River Edw from confluence with the Camnant Brook to confluence with the Clas Brook and from confluence with Clas Brook to

confluence with River Wye. Data on fish status was not available for the River Wye from confluence with River Irfon to confluence with Scithwen Brook. Invertebrate, diatom, and macrophytes and phyto-benthos statuses are either "High" or "Good" across all four waterbodies. Driving elements affecting these statuses include fish populations, invertebrates, macrophytes and phyto-benthos, phosphorus levels, morphology, hydrological regime, and temperature.

The entire Site drains to the River Wye catchment, either directly or via the Camnant Brook and River Edw, all of which form part of the River Wye Special Area of Conservation (SAC). The River Wye drains to the River Severn Estuary, which is also designated as a SAC. For the purposes of this assessment, we are focussing on the impacts to the River Wye SAC and assuming that, by proxy, this covers any similar impacts that may infringe upon the Severn Estuary.

Annex I habitats that are a primary reason for selection of the River Wye as a SAC are "*water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation*" and Annex I habitats present as a qualifying feature, but not a primary reason are "*transition mires and quaking bogs*" (River Wye/Afon Gwy, 2015). Several Annex II species are a primary reason for selection including White-clawed (or Atlantic stream) crayfish, Sea lamprey, Brook lamprey, River lamprey, Twaite shad, Atlantic salmon, Bullhead, and Otter (JNCC, 2015).

Annex I habitats that are a primary reason for selection of the Severn Estuary as a SAC are "*Estuaries; mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadows (Glauco-Puccinellietalia maritima)*" and Annex I habitats present as a qualifying feature, but not a primary reason for selection are "*sandbanks which are slightly covered by sea water all the time; and reefs*" (JNCC, 2015). Annex II species are a primary reason for selection include Sea lamprey, River lamprey, and Twaite shad (JNCC, 2015).

3.3. WFD status of Ordinary Watercourses on Site

There is currently no data available with which to classify the small watercourses present on the Site. This is because they are all tributaries of the water bodies named under WFD. In order to undertake this assessment, it has been assumed that all tributaries of water bodies have the same current classification under WFD as the water body into which they drain.

The Proposed Development includes the collation of baseline data on all watercourses on Site during the post consent, pre-commencement period of the development. This data will be used to confirm the WFD status of each watercourse in its own right. Should the baseline data indicate that an individual tributary is of higher classification than the water body into which it drains, this information will be used to refine the design and mitigation actions in order to provide the appropriate level of protection to sustain this higher classification.

4. Groundwater classification

The Site lies within the Wye Uplands Lower Palaeozoic Groundwater zone, which has an overall classification of 'Poor' driven by its Poor Chemical status (NRW, 2022). The 2020 assessment found the zone to be overall 'Not at risk' with respect to Drinking Water (NRW, 2022).

The Bedrock beneath Site is classified by NRW and the British Geological Survey (BGS) as a Secondary B Aquifer (BGS, 2025). A Secondary B aquifer is defined as a *"predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering"* (EA, 2024).

The groundwater has been assigned a vulnerability rating of High over the majority of the Site area, with some areas classified as medium vulnerability (BGS, 2020).

All private water supplies within 750 m of the Site were identified and carried forward into an initial assessment. This used the widely recognised 'Source-Pathway-Receptor' (SPR) model to identify those Private Water Supplies (PWSs) at risk of being impacted by the Proposed Development. The model elements in relation to the PWSs assessment are:

Source: nearest development feature

Pathway: groundwater / surface water flow defined by catchment/ borehole

Receptor: PWS supply catchment

PWS supplied from local springs may be impacted naturally by local topography and other intersecting watercourses. Wells and shallow boreholes will likely be supplied from shallow groundwater, which generally are influenced by the surface water catchments. Deeper boreholes are likely to be supplied from deep groundwater. It is unlikely that these will be impacted by the Proposed Development, as standard good practice mitigation to control the storage and use of fuels and chemicals on Site will be followed.

Table 4-1 summarises the PWS sources and the Source-Pathway-Receptor (SPR) assessment.

Table 4-1 Private Water Supplies Source-Pathway-Receptor Assessment

Field ID	X coordinates	Y coordinates	Type	Property or Farm Supplied	Potential SPR	Information
1	313119	254174	Spring	Ty'n-y-coed	No	Site not within predicted supply catchment
2	308056	254127	Spring	Cilberllan, Hundred House	No	Site not within predicted supply catchment
3	312382	253866	Borehole	Bryn-llwyd	No	Proposed works outwith 250m buffer of borehole
4	311647	253321	Spring	Graig-yr-onen	Yes	Site within predicted supply catchment
5	307324	253309	Spring	Lower Pentre	No	Site not within predicted supply catchment
6	310038	253202	Mixed	Fforest Fields Caravan and Camping Site	Yes	Site within predicted supply catchment
7	306819	253166	Spring	Henre Einon	No	Site not within predicted supply catchment

Field ID	X coordinates	Y coordinates	Type	Property or Farm Supplied	Potential SPR	Information
8	312970	253095	Spring	Box Farm	No	Site not within predicted supply catchment
9	309326	252923	Spring	Ffynnonau	Yes	Site within predicted supply catchment
10	310060	252750	Spring	Unknown	Yes	Site within predicted supply catchment
11	312885	252416	Spring	Glanedw Farm	No	Site not within predicted supply catchment
12	312193	251515	Spring	Gwr allt	Yes	Site within predicted supply catchment
13	305718	251207	Borehole	Glanserth	No	Proposed works outwith 250m buffer of borehole
14	311285	251181	TBD	Upper Llethr	Yes	Site within predicted surface water catchment
15	311901	251093	Well	Pen-y-banc	Yes	Site within predicted supply catchment
16	312706	251022	Borehole	Upper llwyntudor	No	Proposed works outwith 250m buffer of borehole
17	311466	251015	Spring	Llatho	Yes	Site within predicted supply catchment
18	307436	250991	TBD	Peny-waun	Yes	Site within predicted surface water catchment
19	310674	250901	TBD	Pen-blaen	Yes	Within Site boundary
20	312678	250889	Borehole	Lower Llwyntudor	No	Proposed works outwith 250m buffer of borehole
21	306310	250738	Borehole	Aberduhonw	No	Proposed works outwith 250m buffer of borehole
22	306250	250738	Spring	Pont Duhonw	No	Site not within predicted supply catchment
23	311845	250572	Borehole	The Park	No	Proposed works outwith 250m buffer of borehole

Field ID	X coordinates	Y coordinates	Type	Property or Farm Supplied	Potential SPR	Information
24	309586	250468	Spring	Blaenmilo-uchaf	Yes	Site within predicted supply catchment
25	307597	250383	TBD	Upper Goytre	Yes	Site within predicted surface water catchment
26	312675	250318	Well	Dan y Bryn	No	Site not within predicted supply catchment
27	313071	250296	Borehole	Cwmfillo	No	Proposed works outwith 250m buffer of borehole
28	312879	250231	Borehole	Cwmfillo	No	Proposed works outwith 250m buffer of borehole
29	306676	250221	Spring	Unknown	No	Site not within predicted supply catchment
30	312591	250194	Borehole	Llanedw	No	Proposed works outwith 250m buffer of borehole
31	312891	250108	Borehole	Upper Rhose	No	Proposed works outwith 250m buffer of borehole
32	305807	249756	Borehole	Penlangrug	No	Proposed works outwith 250m buffer of borehole
33	312871	249672	Borehole	Gilfach	No	Proposed works outwith 250m buffer of borehole
34	312325	249486	Spring	Hergest	No	Site not within predicted supply catchment
35	305251	249368	Well	Unknown	No	Site not within predicted supply catchment
36	309207	249354	Spring	Blaenmilo Farm	Yes	Site within predicted supply catchment
37	311852	249277	Borehole	Unknown	No	Proposed works outwith 250m buffer of borehole
38	307044	249157	Spring	Middle Hall	Yes	Site within predicted supply catchment

Field ID	X coordinates	Y coordinates	Type	Property or Farm Supplied	Potential SPR	Information
39	306558	248971	Spring	Ysgiog	No	Site not within predicted supply catchment
40	308760	248860	Borehole	Cefnhinog Farm	No	Proposed works outwith 250m buffer of borehole
41	308982	248810	Borehole	Unknown	No	Proposed works outwith 250m buffer of borehole
42	310858	248778	Spring	Unknown	Yes	Site within predicted supply catchment
43	311143	248704	Borehole	Llanbadarny -garreg	No	Proposed works outwith 250m buffer of borehole
44	311161	248691	Well	Llanbadarny -garreg	Yes	Site within predicted supply catchment
45	311108	248691	Well	Llanbadarny -garreg	Yes	Site within predicted supply catchment
46	311497	248571	Spring	Fronoleu	No	Site not within predicted supply catchment
47	310697	248549	Spring	Pentwyn	No	Site not within predicted supply catchment
48	310208	248496	Borehole	Glan Edw	No	Proposed works outwith 250m buffer of borehole
49	309530	248369	Spring	Rhyscog	No	Site not within predicted supply catchment
50	309505	247920	Borehole	Court Mill	No	Proposed works outwith 250m buffer of borehole
51	308913	247889	Spring	Court Farm	No	Site not within predicted supply catchment
52	308308	247798	Borehole	Trevaughan	No	Proposed works outwith 250m buffer of borehole
53	309241	247604	Spring	Unknown	No	Site not within predicted supply catchment

Field ID	X coordinates	Y coordinates	Type	Property or Farm Supplied	Potential SPR	Information
54	307996	247598	Spring	Unknown	Yes	Site within predicted supply catchment
55	306518	247587	Spring	Allt-mawr-isaf	No	Site not within predicted supply catchment

5. Screening and scoping

5.1. Screening

Activities defined as “Low risk” under the WFD do not require a WFD assessment according to EA guidance. The Proposed Development cannot be defined as “Low Risk” in this regard as the development may interact with the water environment in a more significant way and may pose a risk to the ecological or chemical status of surface water or groundwater. Hence the assessment has been progressed to the scoping stage.

5.2. Scoping

EA (Water Framework Directive assessment: estuarine and coastal waters, 2023) guidance requires that the WFD assessment consider the following receptors:

- hydromorphology;
- biology – habitats;
- biology – fish;
- water quality and;
- protected areas.

An assessment is also required if there is a risk of introducing invasive non-native species through the proposed works.

In considering whether potential impacts to each of these receptors should be assessed within the scope of this document, the nature of the proposed works and their interaction with the aquatic and fluvial environment was considered. Of particular importance are the series of mitigation measures that are embedded within the design for the Proposed Development. These are discussed in turn below:

5.2.1. Design considerations

A 50m buffer around watercourses and waterbodies (and their respective flood risk areas) has been applied during the preliminary project design, and the layout of the infrastructure placed to avoid this buffer, with the exception of where a watercourse crossing is required. The orientation of the crossing has been amended where possible to make the length of track within the buffer as short as possible. There are a number of locations where encroachment into this buffer has been unavoidable, however these are all typically associated with surface water flood risk rather than identified streams/surface water features.

A 250m buffer has been drawn around all GWDTEs, reflective of the maximum buffer within which consideration of the interaction of the Proposed Development with GWDTEs is required under SEPA (Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on, 2017) guidance. The infrastructure design was placed to be outside of this buffer where possible.

Watercourse crossings, where required, will be designed to maintain and not reduce the existing capacity of the channels.

Access tracks will be served by a network of surface water infiltration trenches, to accommodate runoff during a 1 in 30 year event. These will include check dams to slow down sediment transport.

Relief drains will cross the access tracks at regular intervals to maintain the existing flow paths, in particular with reference to GWDTEs, and where surface water flowpaths have been identified that may feed areas of peat or other wetland habitat. Drainage will be installed before or during access track construction, rather than afterwards to ensure that the access track design is not compromised.

At least 3 groundwater monitoring wells will be installed in the footprint of each proposed borrow pit, and data gathered on the groundwater elevation and behaviour. This information will then be used to inform the drainage design of the borrow pit, ensuring that the associated recharge/ soakaway trench is situated on the down-gradient side of the excavation (thus maintaining the overall hydrogeological regime). To protect water quality, 4 surface water monitoring points will also be installed around the proposed borrow pit locations as summarised in Appendix 9.7: Outline Water Quality Monitoring Plan.

5.2.2. Construction Environmental Management Plan

The construction of the Proposed Development will be managed by use of the Construction Environmental Management Plan (CEMP). This document includes the following provisions for minimising effects of the Proposed Development on water resources:

- A Surface Water Management Plan as an appendix to the CEMP, which includes;
 - Provision for protection measures to control silt and other run-off within the construction Site footprint (e.g., silt fencing, earth bunds etc.).
 - Temporary works requirements in containing, managing and treating surface-water runoff as it leaves the construction site, including any necessary attenuation, settlement and treatment prior to water discharge.
 - Requirement for works sequencing, soils management etc. in order that the impacts of each section of works are minimised.
- Proper storage and use of oils, fuels, and construction chemicals;
- Provision of Site-worker accommodation and sanitation facilities; and
- Management and removal of waste materials.

5.2.3. Outline Drainage Strategy

An Outline Drainage Strategy has been developed for the Site (P24039_R7/ Appendix 9.4) and will be put in place in order to:

- Maintain surface water run-off at greenfield run-off rates. This will be accomplished through the use of SUDs measures, applied in order of hierarchy as per SUDs guidance.
- Maintain surface water and soil throughflow through a detailed track infrastructure drainage design. This will be informed by a detailed ground investigation conducted pre-construction and involve monitoring of groundwater elevations in the area.

5.2.4. Foul drainage

The Proposed Development will include a welfare unit during the Operational phase, and welfare facilities will also be required on Site during the construction and decommissioning phases. As a result, there will be a requirement to manage the foul effluent for the proposed lifetime of the development. The location of the Proposed Development is such that a mains sewerage connection will not be possible.

The potential for the Proposed Development to create additional phosphate loading on the River Wye SAC during the construction and operational phases has been identified. In consultation with NRW as part of the Scoping response it has been confirmed that *“if the foul water is to be transported and treated (in accordance with the appropriate regulations) at a suitable Wastewater Treatment Works outside of a Phosphorus Sensitive Catchment with the relevant Environmental Permits in place, then we are satisfied that the increase in discharge is unlikely to have an adverse effect on site integrity.”* It is therefore proposed to retain effluent in tanks and transfer to a waste water treatment works on a regular basis. It will be necessary to work with the operator of the waste water treatment works to ensure that it has capacity to accept the effluent without detriment to its impact on the River Wye SAC.

5.2.5. Habitat Management Plan

An Outline Habitat Management Plan (Appendix 7.5 of the ES) proposes management measures within the Site designed to mitigate impacts, and provide compensation and/or enhancement for biodiversity.

5.2.6. Watercourse crossing details

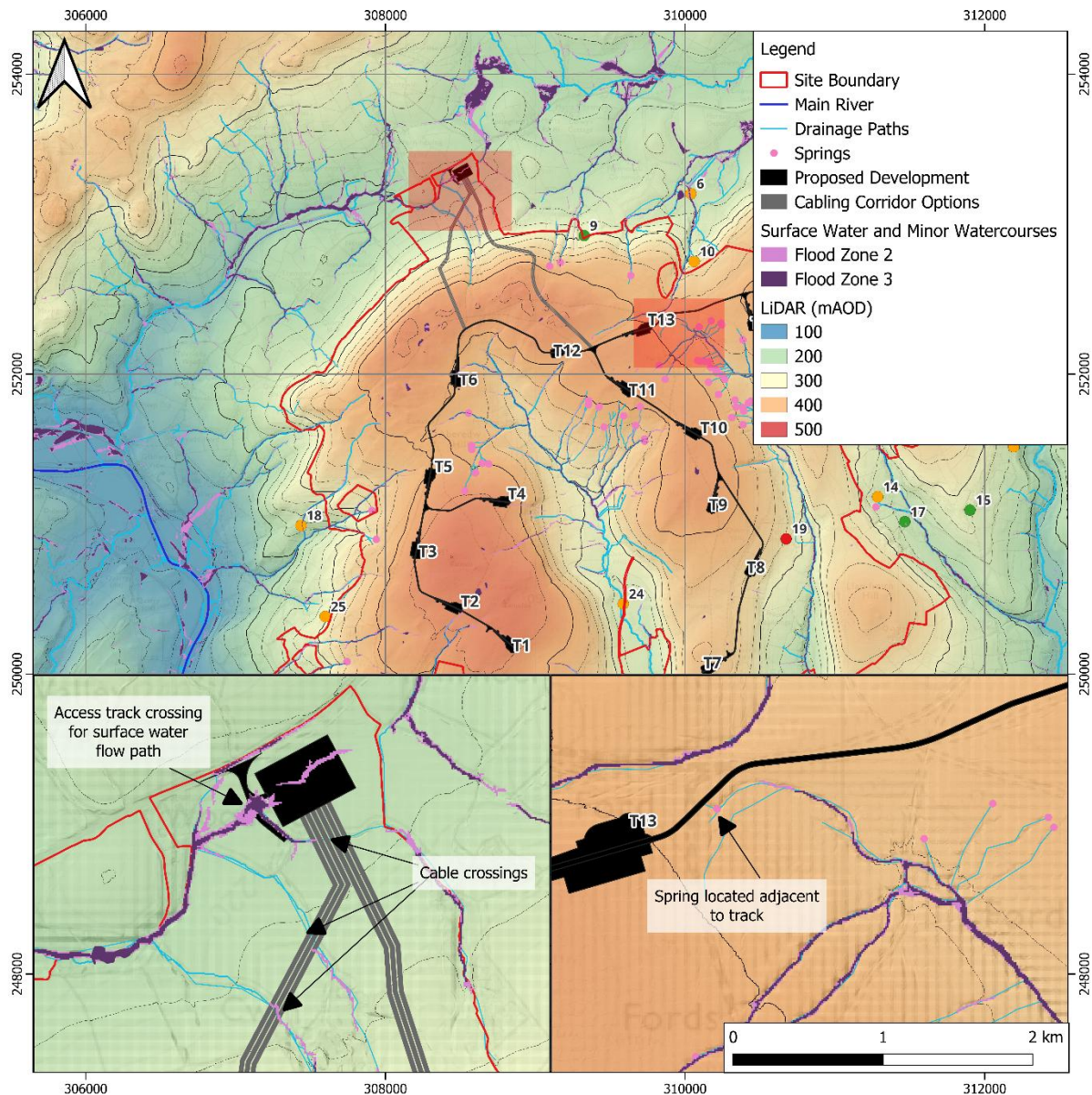
One watercourse crossing has been identified where the access track to the sub-station crosses a dry gully that could represent a flow path during times of heavy rainfall. The watercourse crossing will be designed to maintain, and not reduce, the existing capacity of the flow path and will be sized as part of the detailed drainage study using runoff calculations to inform dimensions. A single span structure is likely to be sufficient, comprising a ring or box culvert, laid into natural ground to maintain existing hydromorphology. The watercourse crossing will be designed to maintain a self-cleansing velocity during the 1 in 30 year event.

The proposed cable crossing routes cross 3 ephemeral watercourses. The cables are proposed to be underlain underground, and will be laid during the dry season when there is unlikely to be any flow and top soil can be reinstated to maintain existing conditions.

The track immediately to the east of T13 passes very close upslope of a spring, and it may be necessary to provide a watercourse crossing at this location to minimise potential impact to the spring. This potential watercourse crossing is discussed in more detail in Section **Error! Reference source not found.** as the spring feeds a GWDTE (C).

Potential watercourse crossing locations are shown in Figure 5-1.

Figure 5-1 Watercourse crossings



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5.2.7. Scoping summary

The combined effect of the above mitigating aspects is to reduce the environmental impact of the development such that for many aspects the change to the environment is reduced significantly. In light of these factors, the potential impact on each of the receptors is discussed in Table 5-1 and used to determine whether an assessment is scoped into this document. Section 6 then provides an assessment of impacts on those receptors scoped into the assessment.

Table 5-1 Scoping summary

Receptor	Comment	Assessment required?			
		Camnant Bk – Source to conf River Edw	River Edw – Conf Camnant Bk to conf Clas Bk	River Edw – Conf Clas Bk to conf River Wye	River Wye – conf River Irfon to conf Scithwen Bk
Hydro-morphology	Overall, the Proposed Development is not expected to significantly interact with or alter the hydromorphological characteristics of on-site watercourses and waterbodies. This is primarily due to the implementation of mitigation measures, including the establishment of vegetated buffer zones adjacent to watercourses, the preservation of natural surface water and subsurface (soil) throughflow pathways, and the maintenance of greenfield runoff rates. The only exception involves the installation of new watercourse crossings. One confirmed crossing is required where the proposed access track intersects a dry gully that may convey flow during high-intensity rainfall events. The crossing will be engineered to maintain existing hydraulic capacity, with culvert sizing based on site-specific runoff calculations. A single-span ring or box culvert, installed at the natural ground level, is proposed to preserve hydromorphological continuity and facilitate self-cleansing flow velocities during a 1-in-30-year storm event. Additionally, the proposed cabling corridor crosses three ephemeral channels. These installations will be completed underground during the dry season, with topsoil reinstated post-construction to retain existing hydrological and geomorphological conditions. Given their temporary nature and negligible impact on hydromorphology, these crossings have been scoped out of further detailed assessment.	No	No	No	No
Biology - habitats	The watercourses located within and adjacent to the Site are considered to have low ecological value for aquatic species, owing to their ephemeral and low-flow hydrological regimes. No ichthyofaunal species were recorded during the ecological surveys. Given the mitigation measures outlined above, the Proposed Development is anticipated to have a negligible impact on the aquatic habitats of the Main Rivers (River Wye and River Edw).	No	No	No	No

Receptor	Comment	Assessment required?			
		Camnant Bk – Source to conf River Edw	River Edw – Conf Camnant Bk to conf Clas Bk	River Edw – Conf Clas Bk to conf River Wye	River Wye – conf River Irfon to conf Scithwen Bk
Biology - fish	The watercourses situated within and adjacent to the Site are assessed as having low ecological value for aquatic species, primarily due to their ephemeral and low-flowing nature. No fish species (ichthyofauna) were recorded during ecological surveys. While the Site ultimately drains into the River Wye catchment, either directly or via the Camnant Brook and River Edw, both of which are designated as part of the River Wye Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), any impacts associated with the construction of watercourse crossings are expected to be negligible and of short duration. This is due to the limited hydrological connectivity, ephemeral flow conditions, and the downstream distance to designated sites.	No	No	No	No
Water quality	Some potential for run-off from construction into aquatic environment, which would potentially adversely impact the Ordinary Watercourse on Site. Watercourses on Site drain directly to the River Wye, which is a designated SAC and SSSI for the numerous important plant and animal species hosted. Hence, the Proposed Development has the potential to alter the water quality of this SAC/SSSI during the construction phase. Due to the mitigating actions set out above, the likelihood of impact is considered very low, but this aspect has been taken forward for impact assessment as a precautionary approach.	Yes	Yes	Yes	Yes
Protected areas	Watercourses on Site drain directly to the River Wye, which is a designated SAC and SSSI for the numerous important plant and animal species hosted. Hence, the Proposed Development has the potential to alter the water quality of this SAC/SSSI during the construction phase. Due to the mitigating actions set out above, the likelihood of impact is considered very low, but this aspect has been taken forward for impact assessment as a precautionary approach.	Yes	Yes	Yes	Yes

Receptor	Comment	Assessment required?			
		Camnant Bk – Source to conf River Edw	River Edw – Conf Camnant Bk to conf Clas Bk	River Edw – Conf Clas Bk to conf River Wye	River Wye – conf River Irfon to conf Scithwen Bk
Invasive non-native species	No aquatic invasive non-native species were identified on Site during ecological surveys of the Site. The CEMP shall include measures to prevent spread or introduction of invasive non-native species through development of an invasive non-native species management plan	No	No	No	No

6. Impact assessment

6.1. Assessing significance

6.1.1. Sensitivity

Sensitivity has been determined on the basis of the importance of environmental features on or near to the Site, and/ or the sensitivity of potentially affected receptors. Table 6-1 details the criteria used for determining the sensitivity of receptors.

Table 6-1: Sensitivity criteria

Sensitivity of receptor	Description
High	- Land use that is highly sensitive to hydrological change (e.g. peat and blanket bog). - A Main River with a water quality classification of 'High' or 'Good'. - Receptor used for recreational use. - Receptor and downstream environment have limited capacity to attenuate natural fluctuations in hydrochemistry or absorb further changes without fundamentally altering its baseline characteristics/ natural processes. - Receptor supports abstractions for public water supply, or private water abstractions for the production of mass-produced food and drinks and/ or supply more than 25 people, or 200 livestock (at any given point in the year). - Receptor is of high environmental importance (i.e. a Special Area of Conservation, Site of Special Scientific Interest or wetland of international and/ or national importance). - The local groundwater constitutes a valuable resource because of its high quality and yield. - Aquifer classified by the BGS as 'highly productive aquifer' or 'moderately producing aquifer' and is of regional or local importance. - Statutorily designated nature conservation sites dependent on groundwater either in the form of GWDTEs, or in the form of baseflow to aquatic environments).
Medium	- Land use that is moderately sensitive to hydrological change (e.g. commercial forestry). - A Main River with a water quality classification of 'Moderate', or an Ordinary Watercourse with a water quality classification that is 'High' or 'Good'. - Receptor and downstream environment have moderate capacity to attenuate natural fluctuations in hydrochemistry or absorb further changes without fundamentally altering its baseline characteristics/ natural processes. - Receptor supports abstractions for private water abstractions for less than 25 people, or 200 livestock (at any given point in the year). - Receptor is of local environmental importance, such as Local Nature Reserves.

Sensitivity of receptor	Description
	○ Aquifer classified by the BGS as 'low productive aquifer' as water quality does not allow potable or other quality sensitive uses. ○ Groundwater dependent terrestrial ecosystems (GWDTEs) which are highly groundwater dependent and have no or minor functional impairment by man-made influence (such as drainage or forestry).
Low	○ All other Ordinary Watercourses. ○ Groundwater dependent terrestrial ecosystems (GWDTEs) which are moderately groundwater dependent or, which are highly groundwater dependent and have some functional impairment by man-made influence (such as drainage or forestry).
Negligible	The receptor is resistant to change and/ or is of little environmental value.

6.1.2. Magnitude

The magnitude of change has been assessed using the categories outlined in Table 6-2 below:

Table 6-2: Magnitude Criteria

Magnitude of change	Description
Large	The Proposed Development could result in a significant change in terms of hydrology, hydromorphology, water quality, hydrogeology, biology, protected areas or other water conditions which will cause irreversible or long term (over 10 years) changes to the receptor.
Medium	The Proposed Development could result in moderate changes to hydrology, hydromorphology, water quality, hydrogeology, biology, protected areas or other water conditions, which will recover over a medium period of time (5 to 10 years).
Small	The Proposed Development could result in a slight change in terms of hydrology, hydromorphology, water quality, hydrogeology, biology, protected areas or other water conditions in the short term (1 to 5 years). Conditions will recover within a short period of time (1 to 5 years).
Negligible	No effect detectable.

6.1.3. Significance

The predicted significance of the effect was determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change as detailed in Table 6-3 below. In EIA terms, an effect is typically considered significant if it results in a moderate or greater level of change in the environmental baseline, either positively or negatively. Significance takes into account the nature, scale, duration, and reversibility of the impact, as well as the value and vulnerability of the affected receptors.

Table 6-3: Significance criteria

Sensitivity of receptor	Magnitude of Impact			
	Large	Medium	Small	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

6.2. Protected Areas

6.2.1. Sensitivity

The Site drains to the River Wye catchment, all of which form part of the River Wye SAC.

The River Wye is designated for its habitat as “a *water course of plain to montane levels with the Ranunculon fluitantis and Callitricho-Batrachion vegetation*” alongside key species of:

- white-clawed crayfish,
- lamprey,
- Atlantic salmon,
- bullhead,
- Twaite shad, and,
- otter.

Due to the Designation of the River Wye, SAC these receptors are considered to be High sensitivity.

6.2.2. Magnitude of change

Impact to the River Wye SAC is to be managed during the construction phase through use of the CEMP, which includes the following provisions to minimise effects:

- A Surface Water Management Plan as an appendix to the CEMP, which includes;
 - Provision for protection measures to control silt and other run-off within the construction site footprint (e.g. silt fencing, earth bunds etc.).
 - Temporary works requirements in containing, managing and treating surface-water runoff as it leaves the construction site, including any necessary attenuation, settlement and treatment prior to water discharge.

- Requirement for works sequencing, soils management etc. in order that the impacts of each section of works are minimised.
- Proper storage and use of oils, fuels and construction chemicals;
- Provision of Site-worker accommodation and sanitation facilities which:
 - Are placed at least 60m from the nearest watercourse and well in excess of 50m from the SAC boundary;
 - Discharge only up to 2m³ of treated effluent to the ground or,
 - Retain foul drainage effluent in tanks and transport to waste water treatment works on a regular basis.
- Management and removal of waste materials.

With the above mitigation in place, the Magnitude of change to the River Wye SAC is considered to be Negligible.

6.2.3. Significance of impact

The River Wye SAC is assessed as having High sensitivity to change. The magnitude of change to both receptors has been assessed as negligible. This results in a Minor significance of impact.

The minor scale of impact is not considered sufficient to lead to detriment to the water bodies such that they no longer attain their current WFD classification. Nor is it considered sufficient to prevent the attainment of the conservation objectives of either protected site. As such, the protected Site's impact associated with the Proposed Development is considered to pose no significant impediment to the attainment of the Severn RBMP objectives.

6.3. Water quality

6.3.1. Sensitivity

Table 6-4: Water quality classification

	Camnant Bk – Source to conf River Edw	River Edw – Conf Camnant Bk to conf Clas Bk	River Edw – Conf Clas Bk to conf River Wye	River Wye – conf River Irfon to conf Scithwen Bk
Chemical status	High	High	High	High
Driving Element	Fish, invertebrates, macrophytes and phyto-benthos, phosphorous	Invertebrates, macrophytes and phyto-benthos, morphology	Invertebrates, morphology	Invertebrates, macrophytes and phyto-benthos, hydrological regime, phosphorus, temperature

The chemical status across the Camnant Brook (Source to conf River Edw), River Edw (source to Conf Camnant Bk to conf Clas Bk), River Edw (Conf Clas Bk to conf River Wye), and River Wye (conf River Lrfon to conf Scithwen Bk) is classed as High. All waterbodies are considered to be Natural.

Therefore, the sensitivity of the all 4 watercourses is considered to be Medium.

6.3.2. Magnitude of change

6.3.2.1. Construction phase

There is potential for short-term impacts on water quality during the construction phase of the development through surface water runoff from bare soil, spoil storage areas and borrow pit drainage/ dewatering during construction works. There is also the potential for release of pollutants and suspended solids from use of hydrocarbons and cement-based compounds.

During the construction, operation and decommissioning phases, there will be welfare facilities on Site, which will be generating foul effluent. As a result, there will be a requirement to manage the foul effluent for the proposed lifetime of the development. This effluent will be removed from site by tanker and disposed of at a suitable Welsh Water waste-water treatment facility as the location of the Proposed Development is such that a mains sewerage connection will not be possible.

Impact to the water quality of waterbodies on Site is to be managed during the construction phase through use of the CEMP, which includes the following provisions to minimise effects

- A Surface Water Management Plan as an appendix to the CEMP, as outlined in Section **Error! Reference source not found..**
- An Outline Drainage Strategy as an appendix to the CEMP, which includes:
 - Maintenance of surface water run-off at greenfield run-off rates. This will be accomplished through the use of SUDs measures, applied in order of hierarchy as per SUDs guidance.
 - Maintenance of surface water and soil throughflow through a detailed track infrastructure drainage design. This will be informed by a detailed ground investigation conducted pre-construction and involve monitoring of groundwater elevations in the area.
- Proper storage and use of oils, fuels and construction chemicals;
- Provision of Site-worker accommodation and sanitation facilities from which foul which:
 - Are placed at least 60m from the nearest watercourse and well in excess of 50m from the SAC boundary;
 - Discharge only up to 2m³ of treated effluent to the ground or,
 - Retain effluent in tanks and transport to waste water treatment works on a regular basis.
- Management and removal of waste materials.

Therefore, with mitigation, the magnitude of change is considered to be Small during construction phase.

6.3.2.2. Operational phase

SuDS techniques can be used to effectively manage the quality of surface water flowing across a site. Different methods can be used to intercept pollutants and allow them to degrade or be stored in-situ without impacting the quality of water further downstream. Frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals

and various organic and inorganic contaminants). Therefore, the first 5mm to 10mm of rainfall will be adequately treated using SuDS.

The widespread use of permeable gravel surfacing on the substation, and infiltration trenches at the turbines (where pollutant load is likely to be smaller) in the SuDS Strategy for the Proposed Development will provide adequate treatment to mitigate the low-medium hazard associated with runoff from the development. The inclusion of check dams along access track drainage ditches will also facilitate the settlement of suspended solids.

The attenuation of mobilised silts and contaminants will allow maintenance of the status quo of the water quality of watercourses on Site.

Additionally, the Outline Habitat Management Plan, as discussed in Section **Error! Reference source not found.**, aims to implement riparian restoration to create a buffer zone around watercourses and exclude livestock from waterbodies and reduce their winter grazing. These techniques will deliver betterment to the water quality of the water bodies by reducing erosion damage and agricultural input, as well as increasing water filtration and buffering peak flows, creating a small, beneficial magnitude of change.

The magnitude of change is therefore considered to be negligible adverse to small beneficial through the operational phase.

6.3.3. Significance of impact

The sensitivity of the Camnant Brook, River Edw and River Wye is Medium.

During **construction phase**, the magnitude of change is assessed as Small. This results in a **Minor significance of change** for Camnant Brook, River Edw and River Wye.

During the **operational phase**, the magnitude of change is assessed as Negligible adverse to Small beneficial, resulting in a **Negligible adverse to Minor Beneficial** significance of change for all four waterbodies.

The negligible to minor adverse scale of impact is not considered sufficient to lead to detriment to the water bodies such that they no longer attain their current WFD classification. As such, the water chemistry impact associated with the development is considered to pose no significant impediment to the attainment of the Severn RBMP objectives.

7. Conclusions

The Proposed Development has been designed with embedded mitigation to avoid and reduce interaction with on Site watercourses.

Standard and well-established construction methods will be deployed to control potential impacts on water quality during construction.

The construction and design of crossings of small watercourses and ephemeral flows on Site will be controlled to avoid and minimise potential impacts on hydromorphology, habitat, fish, water quality and downstream protected areas.

Interactions with watercourses will be further controlled via the CEMP, SWMP and under the requirements of an OWC.

The impact associated with the Proposed Development has been assessed as insufficient to lead to detriment to the water bodies such that they no longer attain their current WFD classification. It has also been assessed to not pose a risk of waterbodies losing their Good classification in the future.

As such, the impact associated with the Proposed Development is considered to pose no significant impediment to the attainment of the Severn RBMP objectives.

8. References

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Appendix A Report conditions

Report Conditions

This report has been prepared by Aqua Terra Consulting Ltd. (Aqua Terra) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by Aqua Terra solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Aqua Terra at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology, and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

Where necessary and appropriate, the report represents and relies on published information from third party, publicly and commercially available sources which is used in good faith of its accuracy and efficacy. Aqua Terra cannot accept responsibility for the work of others.

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