Contents

4	**Development Description**	**2**
4.1	Introduction	2
4.2	Development description	2
4.3	Delivery Route	4
4.4	Pre-Construction	5
4.5	Construction Activities	6
4.6	Operation	12
4.7	Decommissioning	14
4.8	Embedded environmental measures	15
4.9	Implementation of embedded environmental measures	19

Table 4.1	Proposed turbine locations	4
Table 4.2	Estimated tonnages of materials required for construction of the Proposed Development	11
Table 4.3	Summary of environmental measures to be implemented	20

4 Development Description

4.1 Introduction

4.1.1. This Chapter provides an overview of the Proposed Development, including a description of the Site, infrastructure elements, and the key elements of the construction, operational and decommissioning phases. The extent of the Site and its wider geographical context is set out in **Figure 1.1** and **1.2.** Please refer to **Chapter 2 – Approach to Environmental Impact Assessment** for further information relating to the Site boundary and EIA Assessment Area.

4.1.2. The description of the Proposed Development presented in this Chapter has been used by the EIA technical specialists as the basis for assessing its effects upon the environment.

4.2 Development description

4.2.1. The Proposed Development is a wind farm consisting of a maximum of three wind turbines, each with a three-bladed rotor with a diameter of up to 136m, a hub height of up to 112m and maximum height to blade tip of 180m.

4.2.2. The application also comprises associated infrastructure including:

- Substation and transformer housing;
- Temporary construction compound;
- Temporary Site offices;
- Crane pads and cabling; and
- Access track construction.

4.2.3. There are references in this Draft ES to specific components of the Proposed Development to support the baseline and technical assessments. The Site is defined in 4.2.4 below and shown on **Figure 1.2.** There is specific reference to:

- 'Main Windfarm Site' - This encompasses the proposed windfarm development site and surrounding parcels at Rhyswg Farm;
- 'Access track' - This captures the proposed access route between T2 and the southernmost track of the Proposed Mynydd Maen project'; and
- 'Offline access track' – This describes the offline access track between Old Pant Road (Pantside) and an unclassified road (Inset A on **Figure 1.2**). The track is required to transport the turbine components into the Site from the public highway whilst avoiding the existing unclassified road and identified pinch points (See **Appendix 12B**). An assessment of this track has not been undertaken as part of the Draft ES as the design is yet to be determined.

Site location and surroundings

4.2.4. The Site lies within the Caerphilly County Borough Council (CCBC) and Torfaen County Borough Council (TCBC) area and comprises a mix of semi-improved and unimproved grassland (the "Site"), as shown in **Figure 1.1** and **Figure 1.2.**

4.2.5. The Site is located on the upper slopes (between approximately 350 m and 440 m AOD) of ridges that extend to the west and southwest of the massif formed by Mynydd Llwyd, Mynydd Twyn-glas and Mynydd Maen. To the north of the Site is the deeply incised and heavily afforested valleys of Nant Gwyddon, which joins the Ebbw River at Abercarn. Beyond this several tributaries of the Ebbw River have created a complex of ridges and valleys that reduce in elevation westward toward the valley of the Ebbw River. The most southerly of these is the steep-sided Cwm Hafod-fach, the northern end of which is occupied by the Hafod sandstone quarry.

4.2.6. The outskirts of Abercarn and Newbridge are located approximately 1km and 2km to the west and northwest of the Main Windfarm Site, respectively. Crosskeys is around 2km to the south. The settlement of Cwmcarn lies approximately 2km to the east of the Site. The eastern boundary of the Site borders Ebbw Forest whilst Cwmcarn Forest lies to the south. Cwmcarn Forest includes (amongst other things) a visitor centre, tourist accommodation, play area and bike trail. Additionally, the Main Windfarm Site is partially located within the Cwm Gofapi Woods Site of Importance for Nature Conservation (SINC). The proposed access track between T2 and the proposed Mynydd Maen project also traverses the Mynydd Maen, East of Newbridge SINC.

Public Rights of Way

4.2.7. The central section of the Main Windfarm Site is traversed by several restricted byways which also run along part of the northern and part of the southern boundary. The southeast section of the Main Windfarm Site is traversed by a public footpath, which runs adjacent to part of the southern boundary. The proposed access track between T2 and Mynydd Maen southern-most on-site tracks runs across restricted byway (ABEC/RBW189/1). The Public Rights of Way network is shown on **Figure 15.1**.

4.2.8. The proposed access between the Site and proposed Mynydd Maen Wind Farm is also located on land identified as open access – 'other statutory land' within the Mynydd Maen Common which is provisioned under the Countryside and Rights of Way (CRoW) act 2000[1].

Wind Farm development proposals

4.2.9. The Proposed Development will be designed with an operational life of 30 years. At the end of this period the Applicant has three options; to decommission the wind farm and dismantle and remove the turbines; to apply for an extension to the operating period using existing equipment; or apply to install new equipment on the Site. For the purposes of this assessment, it is assumed that the wind farm would be decommissioned.

4.2.10. The layout of the Proposed Development, incorporating maximum tip heights of up to 180m, has been chosen because it balances high productivity with the environmental sensitivities present at the Site. The grid references for each turbine are provided within **Table 4.1**.

4.2.11. The current wind farm layout, including access tracks, temporary construction compound and substation are shown on **Figure 1.2.**

[1] Data Map Wales, (2025). *Open Access – Other Statutory Access Land* (publication date 26 July 2016). Available online at: Open Access - Other Statutory Access Land | DataMapWales (Accessed November 2025).

Table 4.1 Proposed turbine locations

Turbine ID	Easting	Northing
1	323000	194675
2	323720	195050
3	323850	194540

Site Access

4.2.12. The A472 and A467 are A roads in the area that traffic related to the Proposed Development would utilise before using the local road network and farm tracks (unclassified road) that are needed to access the Site. The principal access to the Site from the local highway network will require an Offline access track between Old Pantside Road (Pantside) and the existing farm track that runs adjacent to Ty Oakley Farm and Pen y Caeau Farm. The Offline access track is yet to be designed but will be located to the south of the existing farm track and rejoin to the south-east of Pen y Caeau Farm.

4.2.13. To the east of Pen y Caeau Farm, access into the Site would be taken via the internal access tracks of the neighbouring proposed wind farm development site at Mynydd Maen, which proposes 13 wind turbines (DNS Planning Reference: DNS/327/6725). From the southern end of the Mynydd Maen site, a new segment of access track will be required to align the Proposed Development with the proposed tracks around Mynydd Maen common and existing farm tracks. This route passes over Registered Common Land[1] and appropriate secondary consent will be sought as part of the DNS application.

4.2.14. A number of access tracks would also be constructed between the turbines within the Site. **Figure 1.3** provides details of the proposed access route to the Site. For further information relating to the assessment of the Site access, please refer to **Chapter 2.**

Grid connection

4.2.15. All wind farms need to be connected into the grid distribution system, though such connections are often subject to a different consenting process to the wind farms themselves. The Applicant has undertaken discussions with National Grid Electricity Distribution (NGED) and has a grid connection offer with a connection point approximately 3.5km southeast of the Site. At this stage, it is understood that the intention is for NGED to deliver the connection potentially using its permitted development rights, or Section 37 of the Electricity Act. If it is subsequently decided that all or part of the connection should be an overhead line (OHL) connection, a separate DNS application would be required. As a result, the grid connection between the on-site substation and the grid will be subject to a separate application for consent and does not form part of this DNS application.

4.3 Delivery Route

4.3.1. It is anticipated that the Abnormal Indivisible Loads (AILs) (transporting turbine equipment) would travel by road from Swansea which is the closest port in the region capable of handling wind turbine equipment and as such is in line with the Government's "Water Preferred" policy towards AIL movements. The Port of Swansea has been used by renewables deliveries in the past for a number of wind farms including, Mynydd y Betws, Pen y Cymoedd and Brechfa Forest. The port has sufficient quay and storage space is well located for the strategic trunk road agent.
An AIL access study has been undertaken and is provided as **Appendix 12A.**

4.4 Pre-Construction

4.4.1. This section describes those aspects that have become standard practice for developing a consented wind farm proposal into a buildable project. In the technical chapters of this Draft ES which follow, additional environmental management and mitigation proposals are set out, and, for the avoidance of doubt, they are additional to the inherent environmental measures that are embedded into the development proposals as described in this Chapter.

Environmental Management Plans

4.4.2. A draft Outline Construction Environmental Management Plan (CEMP) has been produced as part of the Draft ES (**Appendix 4A**). Further detail on the CEMP is set out below in **Section 4.8**. The detailed CEMP would be secured as a condition of the consent.

4.4.3. The construction works would require a Construction Method Statement (CMS) to set out overriding construction principles, programme and health and safety requirements etc. The CMS would also be secured as a condition of the consent and would be agreed with the relevant local planning authority(s) in advance of commencement of development. Further detail on the CMS is set out below in **Section 4.8**. Additional CMSs corresponding to individual construction activities may also be provided. They would identify reference documentation for that activity; principally the CEMP and also any relevant individual management plans (e.g., waste, habitat, water management plans), legislation and construction drawings and documents. For each construction activity, the CMS would detail all environmental sensitivities pertaining to the activity alongside the controls/mitigation measures to be put in place. Approvals or consents required to complete the activity would also be described.

4.4.4. Detailed management plans are frequently requested as pre-commencement documents for agreement with the relevant local planning authority and relevant environmental regulators. Once these are agreed, the provisions and requirements set out therein would be incorporated into the CEMP. The Draft ES is accompanied by the below documents which will be finalised for formal submission along with the Final ES:

- An Outline Construction Traffic Management Plan (CTMP) (**Appendix 12B**); and
- An Outline Surface Water Drainage Strategy (ODS) (**Appendix 10A**).

Geotechnical Investigations

4.4.5. Geotechnical Investigation (GI) work would be carried out at the pre-construction stage to determine detailed ground conditions to allow for the design of foundations and micro-siting of turbines, along tracks, and at construction compound and wind farm substation locations. This would provide support to the project team to develop further phases of detailed design work. The geotechnical fieldwork undertaken may include (but not be limited to): visual inspections; machine and hand excavated trial pits; windowless sample boreholes; rotary core boreholes; and sampling and laboratory based geotechnical and geochemical testing. This information would inform the detailed track design, the turbine foundation design and identify any micro-siting requirements.

4.5 Construction Activities

Enabling works

4.5.1. Prior to the main construction phase commencing, a number of enabling works may be necessary, including:

- Geotechnical investigations: excavation of trial pits or boreholes (see above);
- Upgrading of existing access point and tracks and construction of new access tracks and passing places inter-linking the turbine locations and sub-station; this will require import of suitable roadstone;
- Any required upgrades to public roads, including road widening to allow the abnormal loads to negotiate corners, protection of any below ground services and the temporary removal or resiting of infrastructure (ie signage); and
- Establishment of Site compounds.

Local sources of stone

4.5.2. Stone materials for track building are expected to be imported from local quarries; no borrow pits are proposed on the Site. Concrete for construction of the turbine foundations and substation structures will be imported to Site.

4.5.3. It is anticipated that stone would need to be imported from existing quarries and could be sourced from one or more of the local established sources identified below:

- Gryphonn Quarry, Trefil, Tredegar; and
- Hafod Quarry, Abercarn, Newbridge.

Site infrastructure

4.5.4. The following components would be required for the Proposed Development and typical design details are shown on the accompanying figures listed:

- Typical Wind turbine (**Figure 4.1**)
- Wind turbine foundation (**Figure 4.2**);
- Wind turbine crane hard standing (**Figure 4.3**);
- Typical internal Site track cross sections (**Figure 4.4**);
- Typical cable trench details (**Figure 4.5**);
- Typical switchroom and substation compound (**Figure 4.6**); and
- Substation building elevations (**Figure 4.7**).

Micrositing

4.5.5. In carrying out the various surveys that are necessary in advance of construction activities, environmental, geotechnical and health and safety sensitivities, as well as wind-related sensitivities such as turbulence, might be identified that could be avoided if the locations of turbines or tracks are re-sited to a relatively small degree (i.e., ‘microsited’). It is therefore proposed that some flexibility for infrastructure micrositing be retained and that appropriate limits of deviation would be

up to 50m for turbines and 100m for internal wind farm tracks and other infrastructure such as the substation and Site compound. This mitigation may be restricted further in terms of specific locational hard constraints, for example not micrositing closer to a watercourse if within 50m of a watercourse.

Wind turbines

4.5.6. The preferred choice of wind turbine to be installed is the Vestas V136 (4.5MW). If a change of wind turbine is required, it will not exceed the physical parameters specified in the consent.

4.5.7. The turbines of the Proposed Development are a three bladed variable speed pitch regulated with the rotor and nacelle mounted on a cylindrical tower. This is a typical modern, horizontal axis design comprising four main components: a rotor (consisting of a hub and three blades); a nacelle (containing the generator and often a gearbox) to which the rotor is mounted; a tower; and a foundation.

4.5.8. Wind turbines convert the kinetic energy of the wind into electrical energy, the air passing over the blades causing them to rotate. This low-speed rotational motion of the blades is converted into electrical energy by a generator located inside the nacelle at a nominal voltage of 690V.

4.5.9. A transformer located immediately adjacent to the turbine tower in a small kiosk (typically 5.0m x 2.5m x 2.5m (L x W x H)) steps up the voltage which is then fed to the control building via underground electrical cabling linking all of the turbine unit transformers. Some turbine options may allow transformers to be incorporated into the nacelle, or into the base of the tower itself. An external kiosk is more likely and therefore has been considered by this assessment as a worst-case assessment. The electricity generated by the Proposed Development would be metered and fed into the electricity transmission network to which it is connected.

4.5.10. The design process has considered an appropriate colour for the wind turbines. They would be painted in a neutral colour (colour specification, light grey RAL 7035) with a semi-matt finish so as to minimise the visual intrusion. Note however that the montages supporting **Chapter 6: Landscape and Visual Impact** are shown in white to ensure adequate contrast in the imagery. The components for each turbine would be brought to the Site separately, with the towers being delivered in three or four sections. The overall assembly process for each turbine takes approximately two to four days, depending on weather conditions.

4.5.11. Wind turbine towers, nacelles and blades will be transported to the Site via low bed trailers, some incorporating rear steering. The towers will be delivered in three or four sections, which will be stored at each turbine lay-down area until lifted into position. Some storage of components may also be required at the Site compound dependent on weather conditions and access track construction progress at the time of delivery.

4.5.12. Two teams will carry out erection, each using either two road-going cranes (of approximately 100 tonne capacity and 500 or 800 tonne capacity) or crawler cranes. The construction contractors would determine the actual cranes used, together with the exact programme and number of teams on Site.

Wind turbine foundations

4.5.13. Where rockhead, or suitable bearing, is relatively shallow (<2m), the wind turbine foundations will bear directly onto rock. Where rockhead or suitable bearing is between 2-5m depth, the existing

overburden will be excavated and replaced with suitable load-bearing material, most likely to be imported stone.

4.5.14. The foundation design will depend on the results from detailed ground investigation; it is currently expected that turbines will not require piled foundations. Should piling be necessary, it is proposed to agree the methodologies for this and any conditions which may be appropriate with the determining authority prior to construction. It is expected that the conditions would vary depending on the relative location of the turbine to potential receptors for any adverse environmental impacts.

4.5.15. Foundations will usually comprise a reinforced concrete base slab with dimensions of approximately 20m diameter x 4m depth. This will include a circular steel support plinth to suit the base profile of the wind turbine steel tower and will then be overlaid by stone and previously excavated overburden and dressed back with topsoil to allow re-vegetation. The design of these foundations in terms of size and depth minimises excavation requirements, minimises visible projection above the ground and allows the re-establishment of surface vegetation following construction. The final choice of foundation design will be based on the most efficient use of materials and local ground conditions. A typical wind turbine foundation is shown on **Figure 4.2.**

Crane pads

4.5.16. Each wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. This provides a stable base on which to lay down turbine components ready for assembly and erection, and to Site the two cranes necessary to lift the three-tower section, nacelle, and rotor into place. Areas for crane pads were identified to avoid sensitive ecology habitats, archaeological constraints, and areas of steeper gradients where possible. The crane hardstanding will be left in place following construction in order to allow for the use of similar plant should major components need replacing during the operation of the wind farm. These could also be utilised during de-commissioning at the end of the wind farms life.

4.5.17. The total area of hardstanding at each turbine location including the turbine foundations and the crane pad will be sized to suit the turbine manufacturer's requirements but will be approximately 2,200m^2. It is anticipated that approximately a third of this area will be dressed back with topsoil and landscaped into the surrounding area upon completion of turbine erection. A typical crane hardstanding is illustrated in **Figure 4.3**.

Internal wind farm tracks

4.5.18. Approximately 4.65km of internal access tracks will be required, which includes 4.45km of new access tracks and 190m of existing tracks which will require upgrades. The internal access track network will commence at the southern end of Mynydd Maen Wind Farm, where upgrades are required to facilitate the tie in between the two development's tracks. Approximately 2.35km of track will then be required between Mynydd Maen Wind Farm and the Main Windfarm Site.

4.5.19. The track network connecting to the Site and the turbines will comprise of newly formed stoned tracks. The track construction will be approximately (~) 5m wide, ~0.6m deep (dependent of ground conditions), with a ~2m grass verge either side. Typical track cross sections are shown in **Figure 4.4.**

4.5.20. Further details relating to the movement of traffic on and off the Site are reported in **Chapter 12: Traffic and Transport** and the Outline Construction Traffic Management Plan (**Appendix 12B**).

Track layout design

4.5.21. There are various constraints which have influenced the track layout design, some generic and some site-specific:

- Track length is kept to a minimum and utilises existing access tracks where possible to reduce environmental impact, construction time and material quantities (imported stone);
- New track gradients are to be kept to less than 8 percent (1 in 12.5) and radius curves to 50m where practicable to accommodate the requirements of delivery vehicles and also to allow construction plant to move safely around the Site;
- Track layout is designed to reflect contours and avoid cross slopes and deep cut and fill into existing terrain where possible; and
- Tracks are routed to avoid sensitive ecological, archaeological, and hydrological features, where possible.

4.5.22. The track design resulted from optimisation of these criteria.

Electrical connection

4.5.23. Following turbine foundation construction, some of the required electrical infrastructure would be installed such as the small transformers to be located either internally within the turbine towers or adjacent to each turbine in a small kiosk (5.0m x 2.5m x 2.5m (L x W x H)).

4.5.24. Underground cables will link the turbines on the Site and to the on-site substation situated in the east of the Site. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 750mm deep and 450mm wide. To minimise ground disturbance, cables will be routed alongside the roads connecting each parcel of land. **Figure 4.5** shows a typical cable trench detail.

4.5.25. The arrangement of the substation, to be in the eastern end of the Site, would depend on NGED's requirements, and shall be determined by the rating of the grid connection and requirement for a step-up transformer. If required, a transformer would be provided within the substation compound which would comprise a stoned area of approximately 37.5m x 35m containing the transformer and associated equipment (isolators, circuit breakers). If a transformer is not required, then all electrical equipment would be housed within the substation building. The substation building (approximately 14m x 10m) would be a single storey building which will house metering, protection and control equipment, storage, and welfare facilities. The substation building would be traditional blockwork construction and faced in stone with a slate roof. Associated fencing would be either moorland green/brown or dark grey in order to blend with either the existing landscape colours or traditional building colours for the area. **Figure 4.7** provides an illustration of the switchroom and substation compound.

Site accommodation and construction compounds

4.5.26. A temporary Site office comprising a portacabin, a single parking space and a vehicle layby would be located at the Site compound. This office would be manned during construction hours and provide a sign-in / out function for the Site. This would prevent unauthorised vehicular access to the Site and allow supervision of anyone remaining on-Site beyond agreed working hours.

4.5.27. The location of the temporary construction compound is illustrated on **Figure 1.2**. A maximum area of 50m x 50m in area has been assumed as a worse case for the assessment but this may be reduced depending on Site requirements at the start of the construction phase.

4.5.28. Once the erection and commissioning of the wind turbines is complete, the construction compound would be removed and the land reinstated.

Site security and lighting

4.5.29. The construction compound would be lit with security lighting, which would face inwards to minimise light pollution. The construction compound may be enclosed within a security fence around the perimeter of the substation and the access to electrical compounds would be via a locked access gate.

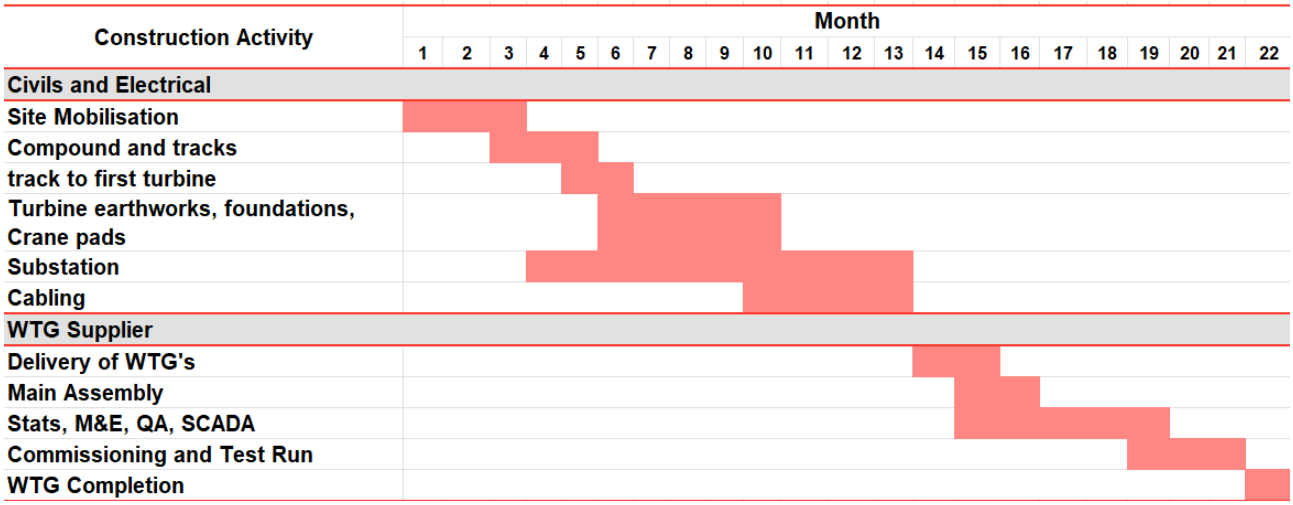
Proposed working hours

Development timescales and programme

4.5.30. It is anticipated that the construction period for the Proposed Development would be approximately 22 months in duration. An indicative programme for construction activities is shown in **Plate 4-1** below. The start date for construction activities is largely dependent upon the date that consent might be granted and grid transmission availability; subsequently the programme would be influenced by constraints on the timing and duration of any mitigation measures confirmed in the individual technical chapters or by the application decision.

4.5.31. At the time of writing this Draft ES, it is anticipated that construction would commence in 2029 and finish in 2031.

Plate 4-1 Indicative construction programme



4.5.32. Where possible, operations would be carried out concurrently (thus minimising the overall length of the construction programme). In addition, development would be phased such that, at different parts of the Site, the civil engineering works would be continuing whilst wind turbines are being erected. Site restoration would be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.

4.5.33. The final length of the programme would be dependent on seasonal working and weather conditions. Summer months are favoured for construction due to longer periods of daylight allowing longer (and safer) working days. Summer months are generally also drier which aids construction progress and reduces the impact of Site debris (mud etc) reaching the public highway, although wheel wash facilities would be installed at the main Site entrance / exit points.

4.5.34. For the purposes of this Draft ES, subject to the caveats noted below, construction activities have been assumed to take place between 07:00 to 19:00 hours on weekdays and 07:00 to 13:00 on Saturdays. Quiet on-site working activities such as electrical commissioning have been assumed to extend outside the core working times, noted above, where required. No working will be undertaken on Sundays. Working hours may be reduced at times due to seasonal or weather restrictions or in certain locations where required as mitigation (for example during the breeding bird season should a stand-off from an active nest be required).

4.5.35. Weather, in particular wind, has a strong influence on the timing of construction activities. Crane activities are generally limited during strong winds (>9 m/s) and erection during these weather conditions may be avoided for safety reasons, with the actual limiting conditions being reviewed as part of the crane lifting plan. As a result of this, it may be necessary to carry out turbine erection activities out with the standard working times and during periods of calm weather. During periods of cold weather, concrete pouring of the turbine bases may be prohibited (temperatures <4°C) or subject to specific cold weather working practices.

Development phasing

4.5.36. Construction of the Proposed Development would consist of two main elements. Firstly, civil, and electrical construction of the infrastructure and secondly, erection and commissioning of turbines. Construction of the control building, and the grid connection are lengthy processes which would commence early in the construction programme to allow a live grid connection to coincide with the commissioning of the turbines. As noted, many individual construction processes would run partly or fully concurrently whilst others would progress in a sequence with or without some overlap in time.

4.5.37. There are constraints which will require cessation of construction of specific parts of the Site during certain times of the year. These are discussed in later technical chapters as appropriate. Construction phasing to avoid those constraints will be agreed with the determining authorities and relevant consultees should development consent be agreed.

Site material quantities

4.5.38. A number of materials would be required to construct the different elements of the Proposed Development. **Chapter 12: Traffic & Transport** provides a detailed breakdown of the estimated material requirements for each element (e.g. Site track, crane pads, hardstanding areas, turbine foundations etc), and a summary of total tonnages for each material to be used is provided in **Table 4.2**.

Table 4.2 Estimated tonnages of materials required for construction of the Proposed Development

Material	Estimated total tonnage
Stone	42,793

Sand	1,145
Concrete	4,028

4.5.39. All materials required for construction of the Proposed Development would be delivered from quarries and batching plants in the local area.

Waste management

4.5.40. At this stage it is not possible to estimate quantities of waste and surplus materials which would be produced on Site. Any such waste materials produced, which are expected to be minimal, and surplus material excavated from constructing turbine bases, access roads and other infrastructure would be removed from Site in HGVs and taken to an appropriate waste recycling or disposal facility. No other discharges are anticipated from the development. Site waste management procedures are discussed further in the Draft Outline CEMP provided alongside this Draft ES.

Vulnerability to major accidents and disasters

4.5.41. The Draft Outline CEMP details measures to manage the environmental impacts of the Proposed Development during the post consent phase. Such measures will minimise the likelihood of major accidents or disasters arising from construction of the Proposed Development, for example through pollution prevention, management of waste, and water management measures (see **Section 4.8** for further details).

4.5.42. The construction works for the Proposed Development would also be undertaken in accordance with primary health and safety legislation, including:

- The Health and Safety at Work Act 19742;
- The Management of Health and Safety and Work Regulations 1999 (as amended)3; and
- The Construction (Design and Management) (CDM) Regulations 20154.

4.5.43. As required by the CDM Regulations a Construction Phase (Health & Safety) Plan will be prepared for the works by the Site contractors, setting out emergency procedures to be followed in the event of such an incident.

Employment proposals

4.5.44. Potential job creation levels are discussed in detail in **Chapter 15: Socio-economics.**

4.6 Operation

Wind turbine characteristics

4.6.1. The power output from a wind farm largely depends on the strength of the wind blowing across the Site. Wind turbines start to generate electricity at a wind speed of about 4m/s, their output

[2] UK Government (1974). The Health and Safety at Work Act etc 1974. [Online] Available at: https://www.legislation.gov.uk/ukpga/1974/37/contents
[3] UK Government (1999). The Management of Health and Safety and Work Regulations 1999 (as amended). [Online] Available at: https://www.legislation.gov.uk/uksi/1999/3242/contents/made
[4] UK Government (2015). Construction (Design and Management) Regulations 2015. [online] Available at: https://www.legislation.gov.uk/uksi/2015/51/contents [Accessed April 2025].

increasing up to their maximum rated power at a wind speed of about 12m/s. As the wind speed increases further, the output is limited to the maximum until the wind speed reaches 25m/s when the wind turbine shuts down automatically.

4.6.2. The proportion of time which the turbines would be generating electricity is therefore dependent on the time that the wind speed is between 4 and 25m/s. Generation output from a wind farm is also seasonally dependent, such that approximately two thirds of the total annual energy yield from the wind farm is expected to be delivered in the six months between October and March, with the remaining six months delivering the other third.

Meteorological effects

4.6.3. Although wind farms require wind for electricity generation, at high wind speeds (>25m/s or 56mph) they shut themselves down to avoid excessive wear on the components; the rotor is both aerodynamically and mechanically braked. However, modern wind turbines are designed to withstand much higher wind speeds and are normally certified against structural failure for wind speeds up to 150mph. Lightning generally has no effect on turbines, though as with all structures there is risk of damage if hit directly by lightning. Turbines are fitted with a lightning protection system as part of their design.

4.6.4. Snow does not generally pose problems other than with access to the Site. Occasionally very heavy snow and ice may affect the anemometer or aerodynamics of the turbine blades resulting in temporary automatic shutdown. The wind turbine would restart automatically after accumulations have naturally thawed.

Servicing and emergency repairs

4.6.5. Turbines would be maintained by a local team of technicians. Turbines would be typically maintained at 6 monthly internals, with each service requiring on average two technicians over two days per turbine. Technicians operate in transit vans or 4x4 vehicles.

4.6.6. Technicians would also visit turbines to repair faults, again typically working in pairs in a transit van or 4x4. Most components would be replaced by hoisting to the nacelle using onboard cranes / hoists within the turbine. In instances of a major fault requiring major component replacement (e.g., blade failure), cranes would be required to remove components.

4.6.7. High Voltage equipment (substation) would be inspected and maintained at 6 monthly intervals, typically by two technicians over two days.

4.6.8. Servicing and emergency works would be covered by the *Construction (Design and Management) Regulations 2015*.

Extended services

4.6.9. At regular periods through the project life, oils and components will require changing which will increase the service time on Site per machine.

4.6.10. Gearbox oil changes are required approximately every 18 months. Changing the oil and worn components will extend each turbine service by one day.

4.6.11. Blades would be inspected annually, either by drone or rope access. Repairs may be carried out every few years using a cherry picker or rope access.

4.6.12. Blade inspection and repair work is especially weather-dependent. Light winds and warm, dry conditions are required for blade repairs. Hence mid-summer (June, July, and August) is the most appropriate period for this work.

Emergency operations

4.6.13. The following factors could have significant effects on the duration of emergency operations:

- Working with cranes is highly weather dependant; wind speed and cloud cover being the key factors (due to crane and manhandling safety limits);
- The availability of spares will determine delivery times to Site for a replacement; and
- The duration of repair on a component where there is no spare available is event specific.

4.6.14. It has been found that operation in the first three or four years will highlight any manufacturing and/or installation issues which may require multiple replacements. In general, unscheduled maintenance is more likely to be required at the project start up and towards the end of the 30-year period at the end of the design life.

Track maintenance

4.6.15. Site tracks are likely to be maintained annually with a JCB, dumper and a roller taking around 5 to 10 days and will generally be undertaken in the summer months when the tracks have dried out.

4.7 Decommissioning

Wind farm decommissioning requirements

4.7.1. There are two options available at the end of the operational lifetime of the Proposed Development. As wind energy is a renewable resource and thus a sustainable method of generation, the first is to re-power the Site with new machines, which would require a new application and a further ES. The second option is to remove the wind turbines and re-instate the Site.

4.7.2. Wind turbines can easily be removed and the hardstanding areas re-instated. Prior to wind turbine removal, due consideration would be given to any potential impacts arising from these operations. Some of the potential issues could include:

- Potential disturbance by the presence of a crane, HGVs, and engineers on-site;
- On-site temporary compound would need to be located appropriately;
- Time of year and timescale (to be outside sensitive periods); and
- Access tracks may remain in use for the benefit of the landowner and other stakeholders.

Wind turbine decommissioning

4.7.3. Wind turbines (towers, nacelle, hub, blades, and electrical kiosk) can be dismantled using a crane and removed from Site. When dismantling and removing the turbines the bases would be broken out to below ground levels and all cables cut at depth below ground level and left in the ground. Roads would either be left for use by the landowner or covered with topsoil. No stone would be removed from the Site. The decommissioning works are estimated to take six months. This

approach is considered to be less environmentally damaging than seeking to remove foundations and cables entirely.

4.7.4. The turbine components themselves will be taken to an appropriate recycling facility where applicable. Due to the timescales, it is not possible to identify a specific facility at this time.

4.7.5. It should be noted that the developer will set up a decommissioning fund during the life of the Proposed Development.

Substation and distribution system decommissioning

4.7.6. The control building, substation and associated equipment would be removed, and the components reused or recycled. It is likely that the plant would be re-used as it has a life well in excess of the Proposed Development itself. The buried distribution cables within the Site would be de-energised and would be cut off below ground level at the ends. Any disturbed areas would be reinstated and re-vegetated.

Access track decommissioning

4.7.7. Following decommissioning of the Proposed Development, some wind farm tracks may remain in perpetuity for future use by landowners, other stakeholders and for recreational purposes. It is also considered that the disturbance associated with their removal and disposal of the material would have a much greater environmental effect than leaving them in situ.

Transmission system decommissioning

4.7.8. There may well be other users of the wider transmission system at the end of the Proposed Development. In this case, the relevant circuits would not be removed when the Proposed Development is decommissioned.

4.8 Embedded environmental measures

Introduction

4.8.1. A key benefit of the EIA process is the opportunity it gives to integrate environmental considerations into the iterative design of a project. Embedded environmental (mitigation) measures are those measures which are inherent to the Proposed Development and are integral to and should be included in consideration of the application. Embedded measures include those assumed to be in place during construction, operation, and decommissioning. Embedded measures include those considered as industry standard or best practice.

4.8.2. Embedding environmental measures has been a feature of the process that has led to the final design of the Proposed Development (see **Chapter 3** for further details); these embedded measures therefore form part of the Proposed Development which is assessed.

4.8.3. In addition to the plans and management plans described in **Section 4.5**, the following provides an overview of some of the general environmental management considerations for the construction of the Proposed Development. These provisions do not replace or affect the implementation of specific environmental measures detailed in the specialist assessment chapters which follow.

Construction Environmental Management Plan (CEMP)

4.8.4. The CEMP will be the master document for consolidating all environmental requirements and undertakings that relate to the Site. As such it aims to ensure that construction activities for the Proposed Development are carried out in accordance with legislation and best practice for minimising the effects of construction on the environment and local communities.

4.8.5. The CEMP will be produced prior to the commencement of works and made available to the appointed civil engineers and construction company, and its objectives will be to:

- Provide a mechanism for delivering many of the embedded environmental measures described in the ES;
- Ensure compliance with legislation through setting out the need for consultation with 'consultation bodies' (see Regulation 2 in the EIA Regulations), and by obtaining necessary consents and licences from relevant bodies;
- Provide a framework for monitoring and compliance auditing and inspection to ensure the environmental measures included in the Proposed Development are being implemented;
- Ensure environmental best practices are adopted throughout the construction stage;
- Provide a framework for dealing with adverse effects as they occur; and
- Ensure a prompt response should unacceptable adverse effects be identified during the works.

4.8.6. The CEMP will remain a live document throughout the pre-construction and construction processes and some provisions may extend into the operational phase. The CEMP will consolidate all appropriate embedded measures, and additional mitigation and enhancement strategies where required, and would clearly outline what should be implemented, where, and by whom. A Draft Outline CEMP is provided alongside this Draft ES (**Appendix 4A**)

Construction Method Statement (CMS)

4.8.7. The CMS would be prepared following the grant of consent and be subject to approval with individual elements and the supporting CEMP. The proposed content of the CMS is as follows:

- Ground Investigation (GI) methods including appropriate reference to the CEMP;
- Turbine and infrastructure locations following post GI micro-siting involving a number of technical specialists;
- Good practice guidance relevant to H&S, design details etc;
- Design detail for infrastructure (e.g., foundation specification, foundation and crane hardstanding configuration, confirmation of track sections to be excavated, external finish to buildings, security fencing form and location, etc) - see Section 4.6;
- Design detail for pollution control measures (location specific arrangements and design for management of dewatering activities) - see Section 4.6;
- Material import requirements and confirmation of stone and concrete source - see Section 4.6;
- Programme of works and working hours controls -see Section 4.6; and
- Site restoration plan to be implemented to restore areas affected by construction activity.

Construction Transport Management Plan

4.8.8. A CTMP would be produced and agreed with the Local Authority in advance of commencement of development. The CTMP would address traffic related planning conditions and would include, but not be limited to:

- Communication – The CTMP would include a strategy for communication with local residents and businesses. The strategy would include procedures to keep affected parties aware of when works would be carried out, if / when roads would be closed (and diversionary routes to be used if there are closures) and how to contact the construction team with a query or complaint;
- Traffic Management – Detailed traffic management strategies would be provided for each stage of the construction works alongside finalised road traffic signage arrangements and a proposed programme of safety inspections on the public highway. This would include details of proposed timings of deliveries and transportation during the construction period;
- Road Condition Survey pre and post construction;
- Remedial Works – Details of procedure for conducting emergency road maintenance, on-going remedial work, and final remedial work along with an agreed maintenance period for any repairs carried out on the public road; and
- Contact and Liaison – Details would be outlined with respect to road safety and condition monitoring, including a named individual who would be responsible for liaising and coordinating with PEDW, Caerphilly County Borough Council.

4.8.9. A Draft Outline CTMP is provided as **Appendix 12B** of this Draft ES.

Water Management Plan

4.8.10. A Water Management Plan would be produced and agreed prior to the commencement of development. The WMP would provide specific information in relation to the management of water on the construction Site. Practices set out in the WMP would be incorporated into the proposed development CEMP once agreed and where they relate to the construction phase. This would draw on the specific measures set out in **Chapter 10: Water Environment**. An Outline Water Management Plan will be provided as an appendix to the Final ES.

Habitat Management Plan

4.8.11. A HMP would be produced and would include detail of the management, maintenance and monitoring measures requiring delivery over the lifetime of the Proposed Development.

Dust and Air Quality

4.8.12. Particular care would be required to maintain dust emissions at a practicable minimum when working in the vicinity of residential properties and environmentally sensitive areas. Good practice mitigation would be required during dry conditions. The use of Best Practicable Means (as defined in Part III of the Environmental Protection Act 1990) would be employed.

4.8.13. The environmental measures to be implemented to control dust emissions during construction and decommissioning are:

- The use of dust suppression facilities on-site. This would include the provision of water bowsers with sufficient capacity and range to dampen down all areas which may lead to dust escape on-site;

- Any storage on-site of aggregate or fine material would be properly enclosed and screened so that dust escape is avoided. Adequate sheeting would also be provided for the finer materials which are prone to ‘wind whipping’;
- Wheel wash facilities would be installed for vehicles entering and exiting the Development Site where required. This facility would be able to automatically clean the lower parts of the HGVs by removing mud, clay etc from the wheels and chassis in one drive through operation;
- HGVs entering and exiting the Site would be fitted with adequate sheeting to totally cover any load carried which has the potential to be ‘wind whipped’ from the vehicle;
- Good housekeeping or ‘clean up’ arrangements would be employed so that the Site is kept as clean as reasonably practicable. There will be daily inspections of the working areas and immediate surrounding areas to ensure that any dust accumulation or spillages are removed / cleaned up as soon as reasonably practicable; and
- The appointment of a contact to whom complaints / queries about construction dust can be directed. Any complaints to be investigated and action taken where appropriate.

4.8.14. Dust and air quality are not considered any further within this Draft ES because no likely significant effects are anticipated in this regard and have been scoped out of the assessment. This approach was set out in the Scoping Report and no objections were raised in the Scoping Direction.

Site Waste Management

4.8.15. Site waste management practices to be implemented by the appointed contractor for the construction works for the Proposed Development are included in the Draft Outline CEMP provided alongside this Draft ES.

Re-Use and Recycling of Decommissioned Materials

4.8.16. All decommissioned materials would be stored on Site in segregated areas. The principal contractor would provide method statements for the collection, storage, and transportation of materials / waste. Where appropriate, materials / waste would be segregated on the Site in skips or bunded tanks and transported to appropriate Sites or recycling facilities.

4.8.17. No materials would be burned on the Site. Hazardous waste would be held in a separate skip (or suitable bunded facility) and disposed of at a suitably licensed Site.

4.8.18. No waste would leave the Site until the appropriate waste carriers’ license and management certificates for the disposal Site or transfer station have been inspected and authenticated by the relevant parties.

Control of Hazardous Materials

4.8.19. All hazardous materials and substances stored on the Site would be stored in a ‘Haz-bin’ or similar secure lockable container located within the temporary decommissioning compound.

4.8.20. Control of Substances Hazardous to Health (CoSHH) assessments would be completed by all contractors for activities using hazardous substances.

4.8.21. Any on Site facilities for the storage, transportation or refuelling of chemicals, oils or fuels shall be sited on suitable impervious bunds. No discharge to any watercourse, land or underground strata would be permitted.

4.9 Implementation of embedded environmental measures

4.9.1. **Table 4.3** summarises the environmental measures that form part of the Proposed Development, as well as the mechanisms which would be used to ensure that these measures are implemented as part of the Proposed Development. Greater detail on these measures can be found in each of the technical assessment chapters.

Table 4.3 Summary of environmental measures to be implemented

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Construction			
Compensatory tree planting would be implemented in accordance with PPW 12. The proposed planting exceeds PPW 12 requirements, so as to optimise long-term landscape and ecological benefit. A 5:1 (replacement: loss) ratio would be applied regarding trees of high arboricultural quality (A grade), with a 4:1 ratio applied for trees of moderate arboricultural quality (B grade), and a 3:1 ratio applied for trees of low arboricultural quality (C grade). Compensatory planting in relation to tree groups requiring removal comprise broadleaf trees only, such that compensatory planting equivalent to a minimum of 1,600 trees per hectare would also be implemented. As set out in the Illustrative Compensatory Planting Strategy in **Figure 8.2**, planting would utilise species that are reflective of the areas lost and planting locations have been chosen so as to ensure healthy establishment, ensuring unconstrained, long-term growth to optimise environmental benefits. A management/maintenance regime would be applied to all retained and newly created habitats to ensure their successful establishment and long-term benefit.	Developer / Contractor	Outline Landscape and Ecological Management Plan (LEMP) secured via DNS condition.	Chapter 6, Table 6.9
Habitat: Revegetation and reinstatement. Where permanent loss occurs, loss would be offset by mitigation planting elsewhere on site as compensation and enhancement would be provided.	Developer / Contractor	CEMP and LEMP secured via DNS condition	Chapter 6, Table 6.9
Safety signage and temporary closures. Set out in full in **Table 4.3** of **Chapter 4: Development Description**	Developer / Contractor	CEMP with PRoW Management Plan secured via DNS condition.	Chapter 6, Table 6.9
Known Archaeological Remains: The assets are of local significance and would be avoided by the design of the Proposed Development (as described in Chapter 4.0).	Developer / Contractor	Development design	Chapter 7, Table 7.9
Impacts to previously unknown archaeology within the Site would be mitigated through archaeological recording such as excavation or watching brief in any areas of impact, if appropriate. The exact method of archaeological recording would need to be agreed and would subsequently be secured through a DNS planning condition.	Developer / Contractor	DNS Planning Condition	Chapter 7, Table 7.9
Ruined Barn (05031g) and Rhyswg-Ganol farmstead (02205g) - To assure the avoidance of known archaeological constraints and to ensure construction works do not encroach into the area of the assets they will be temporarily fenced off, with signage instructing avoidance, throughout construction works.	Developer / Contractor	DNS Planning Condition	Chapter 7, Table 7.9

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
The offsetting of the construction footprint from designated sites (excluding Mynydd Maen, East of Newbridge (C32) SINC) by a minimum 15m buffer. The construction phase will necessarily adhere to sensitive working methodologies including the implementation of pollution prevention guidelines to be set out within the CEMP.	Developer / Contractor	Site Layout – secured via planning condition/CEMP	Chapter 8, Table 8.10
The offsetting of the construction footprint from sensitive woodland habitat by a minimum 15m buffer. The utilisation of existing tracks and gaps in field boundaries as far as possible to minimise land take. The construction phase will necessarily adhere to sensitive working methodologies including the implementation of pollution prevention guidelines to be set out within the CEMP.	Developer / Contractor	Site Layout/CEMP	Chapter 8, Table 8.10
Construction works to be carried out during daylight hours. Minimum 50m stand-off from turbine blade tip and suitable bat habitat. Turbines sited away from nearby roosts.	Developer / Contractor	Site Layout/CEMP	Chapter 8, Table 8.10
The construction phase will necessarily adhere to sensitive working methodologies including the avoidance of active setts if found and/or their closure under relevant licensing.	Developer / Contractor	CEMP/ derogation licence (if required)	Chapter 8, Table 8.10
The construction phase will necessarily adhere to sensitive working methodologies including the implementation of pollution prevention guidelines to be set out within the CEMP as well as the requirements of an EPS development licence.	Developer / Contractor	CEMP/ LEMP/EPS development Licence	Chapter 8, Table 8.10
The construction phase will necessarily adhere to sensitive working methodologies including the implementation of pollution prevention guidelines to be set out within the CEMP.	Developer / Contractor	CEMP	Chapter 8, Table 8.10
Construction methods and programme will consider the location of identified nest sites with the timing and duration of works managed to avoid direct conflict. Where works cannot be scheduled to avoid the main breeding season, additional measures such as the employment of protection zones around nest sites and visual screens/noise screens would be considered. The use of lighting around the proposed construction compound will be restricted.	Developer / Contractor	CEMP secured by DNS condition.	Chapter 9, Table 9.12
Proposals have sought to minimise habitat losses and only small areas of habitat will be lost to facilitate new access tracks. Measures to prevent impacts on breeding birds	Developer / Contractor	CEMP and ECMS secured by DNS condition.	Chapter 9, Table 9.12

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
will be set out in the CEMP/Ecological Construction Method Statement (ECMS) and include: ● Vegetation clearance outside of the breeding bird season (i.e., between September and February); ● Use of dedicated working areas and construction access routes; ● Ecological Clerk of Works (ECoW) to carry out pre-works checks and monitoring of construction areas where they cannot be completed outside of the breeding bird season (March to August inclusive); and Any active bird nests in or immediately adjacent to working areas would be identified and provided with appropriate no working protection zones.			
ID1 - Good working practices Good working practices will be implemented during construction, with adherence to the Outline Construction Environmental Management Plan (CEMP), which will be secured through a planning consent condition, and relevant guidance. ID2- Water Management Plan (WMP) Implementation of an appropriate Water Management Plan (WMP) for the construction phase of the Proposed Development, utilising SuDS principles, including collection, conveyance and attenuation/infiltration storage where suitable. Suitable temporary silt fencing, bunding and water quality measures (i.e., silt capture to maintain storage volume) will be included in the design of these works. Sufficient capacity will be provided onsite to hold runoff prior to discharge runoff to ground and/or any water discharge into watercourses is limited to greenfield rates. A water quality monitoring programme will be agreed with NRW and implemented prior, during and following construction to ensure that the measures taken to protect the water environment are effective. ID3 – Water discharges Further investigation of the viability of infiltration as a means by which surface water runoff and, if required, any water accumulating at the base of the excavations (most likely comprising rainfall runoff)) could be discharged to ground will be undertaken through liaison with CCBC and by undertaking soakaway testing exercises. Information from the future Phase 2 Geo-environmental Ground Investigation (details	Developer / Contractor	CEMP	Chapter 10, Table 10.7

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
provided in Chapter 11: Ground Conditions of the Draft ES) will also be considered to assess the potential for introducing pollutants pathways to groundwater via leaching from contaminated soils. In the case that the soakaway testing concludes that infiltration is not solely sufficient in managing runoff, and discharge to the watercourses is required, this will be subject to a consent from the NRW or CCBC. The water discharge would be suspended if a flood alert or flood warning is in place downstream (and the discharges from the Proposed Development site could feasibly contribute to the flood event). Any discharge to surface water would be restricted to the greenfield runoff rate and will be treated in a suitable basin/trench before discharging. ID4 - Materials Management Plan Excavated materials during construction works should be segregated and stored/ re-used on-Site in accordance with a Materials Management Plan (in compliance with the CL:AIRE Definition of Waste: Code of Practice). Any temporary on-site storage of excavated materials suspected or confirmed to be contaminated will be on impermeable sheeting, covered over and with adequate leachate / runoff drainage to prevent migration of contaminants from the stockpile. Materials will be segregated where possible to prevent cross-contamination occurring. Such materials will only be reused if they are confirmed as suitable for use in line with the requirements of the Materials Management Plan. ID5 – Soil stockpiles Stockpiles will be appropriately maintained and have the minimum lifespan possible, with materials being reinstated as construction works progress. Where these remain in situ for 3 months or longer, seeding management techniques will be used. Stockpiles will be stored exclusively within areas of very low flood risk (Flood Zone 1 in the FMfP). ID6 - Standoff distance No works will be undertaken within 3m of any watercourse (other than for watercourse crossings and drainage mitigation). Any works within 8m of an Ordinary Watercourse will be subject to a Land Drainage Consent (LDC) from CCBC.			
ID7 - Watercourse/surface water flow path crossings No mapped watercourses are currently crossed as part of the design. There is the potential that ephemeral preferential flow paths may need a crossing during the construction phase. The design of any new temporary crossings will be confirmed as	Developer / Contractor	CEMP	Chapter 10, Table 10.7

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
part of the detailed drainage design, and any requirement for Ordinary Watercourse consent by CCBC confirmed. Suitable mitigation measures will be identified and proposed, where necessary and applicable, to ensure no detrimental impact. ID8 - Underground cables The underground cables linking the turbines to the substation will be constructed in discrete sections with the reinstatement process commenced in as short a timeframe as practicable.			
ID9 – Fuel, oil and chemicals storage (construction phase) Areas of construction compounds that are used for fuel storage, plant maintenance and refuelling will be surfaced with fully impermeable materials to prevent any infiltration of contaminated runoff and contain bunding. An effective accident response protocol will 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 will be maintained to minimise the risks of oil leaks or similar. Any tanks containing oils, fuels and chemicals will be double skinned. There will be a bunded capacity of 100% of the maximum tank volume for non-hazardous fluids. For fuels or oils the bund capacity will be the larger of 110% of the largest tank volume for single tank bunds, (or, in the case of multi tank bunds, 110% of the largest tank capacity or 25% of the combined tank capacity, whichever is the largest). Fuel storage will be in accordance with Pollution Prevention Guidelines (PPGs). All stores of fuel will be located at least 20m from any watercourses and away from areas at risk of flooding. If concrete batching is to happen on Site, appropriate controls and water treatment facilities are to be agreed with NRW prior to construction. The use of sulphate resistant concrete is recommended.	Developer / Contractor	CEMP	Chapter 10, Table 10.7
ID10 – Turbine excavation Although shallow groundwater in the underlying ground is not anticipated, as a precautionary approach, it is proposed that Phase 2 geo-environmental ground investigation, to be completed at the pre-construction stage (Chapter 11: Ground Conditions of the Draft ES).	Developer / Contractor	CEMP	Chapter 10, Table 10.7
ID13 – Temporary components Once construction is complete, any temporary components (such as working areas) will be removed, and the ground reinstated to preconstruction conditions. Any excavations will be backfilled using soil stockpile materials, slightly above natural ground level to allow for settlement.	Developer / Contractor	CEMP	Chapter 10, Table 10.7

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
A soil resources survey will be completed by a soil scientist / experienced soil specialist for the main windfarm site prior to construction. The findings of the soil resources survey will be used to inform the construction phase SMP and Soil Resources Plan (which may be part of a Materials Management Plan**,** MMP). Peat survey is being completed for the proposed access track, this will also provide information on the soils present and the findings of the survey will be used inform soil handling during construction. Storage and handling of soil will be informed by the Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites to avoid damage to soil structure and help to minimise soil compaction, and associated measures will be detailed in the SMP. The SMP will be submitted to the local authority for comment prior to construction. If **G**round **C**onditions require it, a temporary trackway of either metal, wood, or plastic, would be used for vehicles to access the working areas. This would be removed once construction is complete. During topsoil stripping, machinery with low ground pressure will be used to minimise soil compaction, including during construction of the access tracks, the tracks will then be available for heavier vehicles to use to avoid impacts on other areas. Temporary storage of soils will be carried out in accordance with a MMP. This document will outline where excavated non-waste materials will be reused in line with the CL:AIRE Definition of Waste Code of Practice (DoWCoP). The MMP will include a declaration by a Qualified Person that the MMP has been completed in accordance with the DoWCoP and that best practice is being followed. The CEMP will refer to the MMP. If peat cannot be avoided, then a Peat Management Plan will be developed for the Proposed Development.	Developer / Contractor	SMP, MMP and CEMP secured via DNS condition	Chapter 11, Table 11.6
A soil resources survey will be completed for the main windfarm site by a soil scientist / experienced soil specialist prior to construction and the findings of the soil resources survey will be used to inform the construction phase **S**MP for soil handling and measures to minimise soil erosion from exposed (stripped) soils or stockpiled soils. Measures to avoid soil compaction (which can result in soil erosion by increasing surface run-off) are integrated into the CEMP to avoid damage to soil. The CEMP refers to the MMP which will detail how temporary storage of soils is to be managed. Soil stockpiles will be stored for the shortest amount of time possible.	Developer / Contractor	SMP and CEMP secured via DNS condition	Chapter 11: Table 11.6

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
If peat cannot be avoided, then a Peat Management Plan will be developed for the Proposed Development. Elements of the Proposed Development which require removal of topsoil during construction and where topsoil cannot be reinstated will be kept to the minimum footprint required for the Proposed Development. Storage and handling of soil will be informed by the Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites to avoid damage to soil structure. This measure will be integrated into the CEMP (in support of the Final ES) following the proposed peat and soil survey. Permanently displaced soil will be reused within the Proposed Development Site where practicable in accordance with the MMP, will be referenced in the CEMP. A soil resources survey will be completed for the wind farm development site by a soil scientist / experienced soil specialist prior to construction and the findings of the soil resources survey will be used to inform the construction phase SMP for soil handling and storage, which will allow excavated soil that is surplus to the Proposed Development to be retained in good condition and potentially reused offsite (in accordance with the MMP). Where it is identified through soil resource and materials management planning that topsoil or subsoil cannot be reinstated at its original location, sampling and testing of excavated topsoil and subsoil will be completed in accordance with BS:3882:2015 and BS:8601:2013, respectively, at the earliest opportunity, to inform the reuse of these soils elsewhere within the Proposed Development or at a suitable offsite receptor site in compliance with the Definition of Waste: Code of Practice (CL:AIRE, 2011) and the MMP. Peat depth survey has been completed for the proposed wind farm development site and has confirmed the absence of peat. Peat survey is being completed for the access track to collect data on where peat is present along the route. This data will inform detailed design, to enable the Proposed Development to avoid peat where possible and will inform the assessment in the Final ES. If peat cannot be avoided, then a Peat Management Plan will be developed for the Proposed Development.		SMP, MMP and CEMP secured via DNS condition	Chapter 11: Ground Conditions, Table 11.6
A Phase 1 geo-environmental desk study has been completed for the Proposed Development (**Appendix 11A**). Phase 2 intrusive geo-environmental ground investigation will be completed during the pre-construction phase, including soil sampling and chemical testing, to confirm the **G**round **C**onditions. Potential risks to human health from any known, suspected or unexpected ground contamination will be avoided by adopting appropriate working methods and all	Developer / Contractor	MMP and CEMP secured via DNS condition	Chapter 11: Ground Conditions, Table 11.6

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
aspects of construction will be completed in compliance with the Construction (Design and Management) Regulations 2015, CAR 2012 and the Health and Safety at Work Act (1974) and regulations made under the Act. These legal obligations include the requirement for risk assessments and method statements for all construction related activities and the use of appropriate working methods, training and Personal Protective Equipment (PPE). Temporary storage of excavated materials will be in accordance with the MMP. Contamination if found will be subject to appropriate risk assessment and if necessary, either removed, treated and/or mitigated as part of the Proposed Development. The CEMP includes an unexpected contamination protocol. Best practice air quality management measures will be applied as described in Institute of Air Quality Management (IAQM) (2014) guidance on the Assessment of Dust from Demolition and Construction 2014, version 1.1.			
In accordance with LCRM, a Phase 1 geo-environmental desk study has been completed for all elements of the Proposed Development, and the report is appended to the Draft ES (**Appendix 11A**). Further investigation or remediation will also be undertaken in accordance with LCRM.	Developer / Contractor	CEMP and DNS planning condition	Chapter 11, Table 11.6
A Coal Mining Risk Assessment (CMRA) has been competed for the Proposed Development site and includes recommendations to address potential ground instability risks associated with former deep coal mining and possible unrecorded shallow mine workings. To ensure that land stability issues are understood and adequately addressed in the design, intrusive investigation will be completed during the pre-construction phase, as recommended in the CMRA, i.e., boreholes and trial pits. Remediation may subsequently be needed. The planned intrusive investigations and any remediation work required based on the findings of these investigations will be communicated to the Mining Remediation Authority in advance of undertaking the works. The basis of the structural design for the Proposed Development will be completed in general accordance with design standards to minimise the risk of future structural or geotechnical instability.	Developer / Contractor	DNS planning condition	Chapter 11, Table 11.6
Materials selected for the above and below ground wind farm equipment will be suitably resistant to weather and **G**round **C**onditions and have sufficient anticipated lifespan to ensure that they are unlikely to significantly degrade during the operational phase.	Developer / Contractor	CEMP secured via DNS condition	Chapter 11, Table 11.6

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
In the event that damage to above ground equipment is observed, appropriate action will be taken to investigate any potential impacts to ground (soils and groundwater) in accordance with LCRM. Underground electrical cables installed for the Proposed Development will not be oil-filled. Buried cables will be protected from damage/ deterioration by the use of sand/ soil cushioning to avoid them being in contact with sharp stones/ objects, and placement of marker tape above the cables will help to alert anyone digging to their presence.			
Wheel washing facilities will be installed on site. Sheeting installed prior to leaving site.	Developer / Contractor	DNS planning condition/CTMP.	Chapter 12, Table 12.10
Specific travel routes to and from site are defined for delivery vehicles.	Developer / Contractor	DNS planning condition/CTMP.	Chapter 12, Table 12.10
No existing accident problem identified. HGVs to use identified route.	Developer / Contractor	DNS planning condition/CTMP.	Chapter 12, Table 12.10
Best Practicable Means (BPM) as defined in Section 72 of the CoPA.	Developer / Contractor	CEMP	Chapter 13, Table 13.9
Safety signs will be required during construction alerting users to the construction activities being undertaken. Use of Site staff (banksman) to manage deliveries to Site.	Developer / Contractor	CEMP	Chapter 15, Table 15.11
Restricted Byway ABEC/RBW189/1 will require temporary closure during the access road construction phase only to allow for the creation of the access track between T2 and Mynydd Maen wind farm. Following construction of the road the route would then remain open. This route will also require management with information boards and signage provided to advise recreational users of the construction works taking place. Users may have to wait for a short period of time before crossing the access road (with such restrictions likely to last for minutes rather than hours) when abnormal loads or high traffic loads are expected. At such times staff (a banksman) will manage such temporary restrictions.	Developer / Contractor	CEMP DNS Condition	Chapter 15, Table 15.11
At the intersection (ABEC/RBW191/1, ABEC/RBW192/1, ABEC/RBW194/1) of the PRoW along the route of the proposed access between T2 and T3 it is envisaged that similar measures outlined above would ensure that access is appropriately managed during construction of the access track and the wind farm development.	Developer / Contractor	CEMP DNS Condition	Chapter 15, Table 15.11

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
ABEC/RBW195/1 It is envisaged that similar measures to those outlined above would ensure that access is appropriately managed during construction of the access track and the wind farm development.	Developer / Contractor	CEMP DNS Condition	Chapter 15, Table 15.11
Temporary closure will be required in the vicinity of the works to construct T2. It is proposed that a temporary permissive path is provided during construction that connects ABEC/RBW192/1 in the northeast of the Site (east of T2) with the intersection of ABEC/RBW194/1 and ABEC/RBW195/1 providing users connectivity during construction. See **Figure 15.2**. Management measures including signage (as outlined above) will be required to direct users to use the permissive path.	Developer / Contractor	CEMP DNS Condition	Chapter 15, Table 15.11
These restricted byways (ABEC/RBW191/2, ABEC/RBW195/**2**) are north and south of T1. It is not anticipated that these footpaths will require any temporary closures or diversions. However, appropriate signage will be erected to notify recreational users of the construction works and identify alternative routes (particularly ABEC/RBW193/1 to the north) should users wish to use paths further from construction activities.	Developer / Contractor	CEMP DNS Condition	Chapter 15, Table 15.11
A temporary closure of ABEC/FP205/1 will be required during construction. During construction a permissive path will be provided west of the existing footpath connecting with the line of the existing route of the footpath, enabling users to walk west of the construction activities for T3 and rejoin the existing route of the footpath. See Figure 15.2. Management measures including signage will be required as above.	Developer / Contractor	CEMP DNS Condition	Chapter 15, Table 15.11
Areas of construction activity such as excavations would be fenced off to protect livestock. Plant and machinery removed to construction compound overnight. The temporary loss will be compensated for with a new area of replacement land designated as common.	Developer / Contractor	CEMP and Secondary consent through DNS via powers under section 16 of the Commons Act 2006	Chapter 15, Table 15.11
The Site will remain open for access. However, temporary measures, such as temporary restriction of access whilst access road is laid and delivers underway, will be required during construction to restrict access and ensure safety of potential users.	Developer / Contractor	CEMP	Chapter 15, Table 15.11
Operation			

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
The single storey substation building would be traditional blockwork construction and faced in stone with a slate roof. Associated fencing would be either moorland green/brown or dark grey in order to blend with either the existing landscape colours or traditional building colours for the area.	Developer	DNS planning condition	Chapter 6: Table 6.9
The turbine rotors and upper towers will be largely visible against the sky and therefore a non-reflective pale grey colour (e.g., RAL 7035) will be selected to minimise contrast.	Developer	DNS planning condition	Chapter 6: Table 6.9
Designs have kept effects to a minimum (as described in Chapter 4).	Developer	Development Design	Chapter 7, Table 7.9
Minimum 50m stand-off between turbine blade tip and suitable bat habitat to be maintained.	Developer / Contractor	Development Design	Chapter 8, Table 8.10
Strategy developed to monitor the number and frequency of collisions to inform need for additional mitigation during operation such as curtailment or feathering.	Developer / Contractor	A Collision Mitigation and Monitoring Strategy (CMMS) secured via DNS condition.	Chapter 9, Table 9.12
Landscape and Ecology Management Plan (LEMP) setting out the long-term management and enhancement of habitats, for all wildlife, including birds. An Outline LEMP (oLEMP) will be submitted alongside the Final ES.	Developer / Contractor	LEMP secured via DNS condition.	Chapter 9, Table 9.12
Maintenance methodology to be adopted via CMMS that ensures major maintenance works avoid the breeding season, where possible, and/or are completed sensitively where nest sites of Schedule 1 species are known. LEMP will include ongoing long-term management measures to enhance wider opportunities for any disturbed or displaced birds.	Developer / Contractor	CMMS and LEMP.	Chapter 9, Table 9.12
ID11 – Detailed drainage design Detailed drainage design for the operational wind farm development, utilising SuDS principles including attenuation storage where necessary, to ensure sufficient capacity is available on Site to discharge runoff to ground and/or watercourses (discharge limited to greenfield rates). The detailed drainage design will be prepared in accordance with the Drainage Strategy for the operational wind farm development included in Appendix 10A of the Draft ES. ID12 – Fuel, oil and chemicals usage (operational phase)	Developer	DNS planning condition	Chapter 10, Table 10.7

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
Following the construction phase there will be no requirement for fuel, oil or chemicals to be stored on Site, however, small quantities of fuel/oil/chemicals may need to be brought onto Site for maintenance activities. In these cases, only the minimum quantities possible should be brought on to Site and must be removed from Site following completion of works. The fuel/oil/chemicals must be kept in the appropriate containers and sealed when not used for refuelling. An effective accident response protocol will 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 will be maintained to minimise the risks of oil leaks or similar.			
Scheme layout has been developed to ensure that appropriate noise level limits can be achieved when operating in both isolation and under the cumulative scenario.	Developer	DNS condition to secure that the development is delivered in line with the proposed layout and physical parameters for the development	Chapter 13, Table 13.9
Realistic candidate turbine, within the physical parameters for the development, selected for assessment, to demonstrate how appropriate noise level limits can be achieved when operating in isolation and under the cumulative scenario.	Developer	DNS condition to require that the details of the final turbine selected for installation (including noise emission detail) are submitted and to, and approved by, the Local Authorities prior to installation.	Chapter 13, Table 13.9
Implementation of a Shadow Flicker control module will reduce effects to an acceptable level.	Developer	DNS planning condition	Chapter 14, Table 14.5
Following construction, the PRoW would be fully reinstated and be fully open for users. However, recognising the proximity of the PROW to the T2 location, and that users, particularly equestrians, may wish to use an alternative route further from the turbine, the permissive path established in the construction phase that would connect to ABEC/RBW194/1 and ABEC/RBW195/1 would remain open to users. See **Figure 15.2**. The path would be located more than 200m from the T2 location. There is no statutory stand off for turbines from PRoW routes that could be used by equestrians. However, The British Horse Society (2025) advice[51] identifies a separation distance of tip height plus 10% (198m in the case of	Developer	Condition of the DNS	Chapter 15, Table 15.11

Environmental measure	Responsibility for implementation	Compliance mechanism	ES section reference
180m tip height turbines) and suggests that definitive or permissive routes should be provided as alternatives for the lifetime of the project and routes should be provided to avoid coming upon turbines within 200m. Signage measures would be required to alert users (particularly equestrians) to the alternative route should they wish to not pass close to the turbines.			
The signage measures identified above to alert users to the existing alternative route (BEC/RBW193/1) to the north would be applied in the operation phase, should users (particularly equestrians) wish to take a route more than 200m from the turbine location, whilst the PRoWs would remain fully open for users.	Developer	Condition of the DNS	Chapter 15, Table 15.11
In the operation phase the footpath will be fully open, with reinstatement of the footpath after temporary closure during construction. The permissive path at construction would not be required in the operation phase.	Developer	Condition of the DNS	Chapter 15, Table 15.11
Compensatory replacement land provided at construction as common land to replace the 2.568ha of release land. The majority of the 2.568 ha of released land will also be available for use.	Developer	DNS condition	Chapter 15, Table 15.11
In the operational phase access will be permitted. No fencing etc will be used around the access road that could limit access to the Site.	Developer	DNS condition	Chapter 15, Table 15.11
If highlighted by operator, then mitigation options would be investigated such as micrositing or other technical solutions. A 50m micrositing allowance has been requested to mitigate potential interference	Developer	DNS condition	Chapter 16, Table 16-7
MoD may request aviation lighting to ensure turbines visible at night to their aircraft.	Developer	DNS condition	Chapter 16, Table 16-7
Options to be discussed with Cardiff Airport. For example, a number of other wind farm developers are in discussion with Cardiff Airport about funding the provision of a radar upgrade, which would enable operation of wind farms without radar interference	Developer	DNS condition	Chapter 16, Table 16-7
Options to be discussed with NERL (Clee Hill).	Developer	DNS condition	Chapter 16, Table 16-7

Monitoring

Monitoring, where it is required, is explained further within the relevant technical chapters.