Foel Fach Wind Farm Limited.

Foel Fach Wind Farm – Environmental Statement Volume II

Main Written Statement – Chapter 15

Project Reference: 664094

This chapter is summarised within the Non-Technical Summary of this Environmental Statement

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CONTENTS

TABLES

15 SUMMARY OF EFFECTS

15.1 Introduction

15.1.1 The likely significant effects of the Proposed Development during the construction, operational and decommissioning phases and during the whole life cycle of the development, as assessed and reported in this volume of the Environmental Statement (ES), are summarised in **Table 15.1**, **Table 15.2, Table 15.3** and **Table 15.4** respectively. Where relevant, details of proposed mitigation relating to effects and how the mitigation would be secured (typically through planning conditions) is summarised. Taking account of the mitigation proposals, the residual effects and monitoring proposals are also summarised.

15.1.2 Intra- and inter- cumulative effects are summarised separately in **ES Volume II, Chapter 14: Cumulative Effects**.

15.2 Construction Phase Residual Effects

Table 15.1 Summary of the Effects Assessment for the Construction Phase of the Proposed Development

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Terrestrial Ecology					
River Dee and Bala Lake SAC and River Dee SSSI and Afon Dyfrdwy (River Dee) SSSI	Habitat Loss/ Displacement & Disturbance to SAC/ SSSI qualifying species	Good practice pollution prevention measures outlined in the CEMP & associated works including Ecological Clerk of Works (ECoW)	Secured by planning condition	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	Water quality monitoring as part the CEMP (pre-, during and post-construction)
Candidate Local Wildlife Site: Llandderfel Wildlife site - candidate	Habitat Loss/ Displacement & Disturbance to designated site	Species and Habitat Protection Plan, habitat reinstatement measures outlined in the CEMP & associated works including ECoW	Secured by planning condition	**Negligible / Minor (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Notable habitats (Annex 1 and Section 7)	Direct and Indirect Habitat Loss/ Disturbance of notable habitats	Species and Habitat Protection Plan, habitat reinstatement measures outlined in the CEMP & associated works including ECoW	Secured by planning condition	**Minor / Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed

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Ornithology					
Migneint-Arenig-Ddualllt SPA (and component SSSI)	Habitat Loss/ Displacement & Disturbance to SPA/ SSSI qualifying species	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Berwyn SPA (and component SSSI)	Habitat Loss/ Displacement & Disturbance to SPA/ SSSI qualifying species	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Red kite	Habitat Loss/ Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Golden plover	Habitat Loss/ Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)**	No monitoring proposed

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				ST (displacement & disturbance) & LT (habitat loss)	
Kestrel	Habitat Loss/ Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Land, Soils and Water					
Surface water	Physical changes to overland drainage and surface water flows. Construction activities will result in physical changes to overland and surface water flows. This may cause	Constructed drains would be no longer or deeper than necessary. Cross-drains would be installed at appropriate frequency to minimise concentration of flows	ECoW supervision/licences secured by planning condition	**Low adverse (not significant)** LT	Pre-construction water quality monitoring programme to be established. Monitoring at designated locations during construction phase, undertaken by

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	concentration of flows within the Site and diversion of flows between sub-catchment areas				ECoW or Principal Contractor
Surface water	Particulates and suspended solids. Construction works involving earthworks would generate loose sediment which could potentially gain access to surface watercourses and waterbodies through entrainment in surface runoff	Surface water from the areas surrounding the turbine bases and all hardstanding areas would be prevented from entering the working areas by appropriate use of peripheral bunding and cut-off drains. Sediment control measures would be used around all stripped areas and excavated working areas, including temporary storage areas	ECoW supervision/licences secured by planning condition	**Low adverse (not significant)** MT/T	Water quality monitoring at designated locations during construction phase, undertaken by ECoW or Principal Contractor
Surface water Groundwater	Water contamination	Handling, storage and disposal of all potential	ECoW supervision/licences	**Low adverse (not significant)**	Water quality monitoring at

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	from fuels, oils, concrete batching or foul drainage Spillage of fuels, oils, wet concrete, concrete washout water or foul drainage from welfare facilities could have an adverse effect on surface or groundwater quality	pollutants within the Site would be undertaken following published guidance. Wastewater would be removed by tanker for treatment and disposal at a suitably licensed site outside any phosphate-sensitive catchment areas	secured by planning condition	MT/T	designated locations during construction phase, undertaken by ECoW or Principal Contractor
Private Water Supplies (PWS) sources Ground Water Dependant Terrestrial Ecosystems (GWDTE) Designated sites with linkages to surface or groundwater	Changes in or contamination of water supply to vulnerable receptors. All excavations and changes to water flow paths could potentially affect water	All groundworks requiring excavation would be minimised as far as practicable, within the necessary engineering constraints for construction. Water discharge to be tested for contamination prior to discharge to ground	ECoW supervision/licences secured by planning condition	**Low adverse (not significant)** LT	Visual and in-situ water quality monitoring would be undertaken at each of the 10 potentially at-risk PWS on a twice-daily

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	supply to vulnerable receptors. Spills and incidents involving polluting materials, and excavation works generating loose sediment, could potentially affect vulnerable receptors				basis (morning and afternoon) while works are ongoing within 500 m of the supply sources
Infrastructure and property downstream of Proposed Development	Increased flood risk. Some areas within the Site and downstream of the Site have a high risk of flooding from surface water, small watercourses and rivers. There is	An Outline Drainage Strategy for the Proposed Development has been included as part of **ES Volume III, Appendix 7.10: Outline Drainage Strategy**	N/A	**Negligible (not significant)** LT	No monitoring proposed

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	potential that the Proposed Development may increase flood risk to areas downstream				
Soils within the Site	Soil erosion and compaction. Construction activity, particularly plant and vehicle movements, soil stripping and stockpiling, would affect the nature of the soils within the Site	All traffic routes would be clearly demarcated, and vehicles would not be permitted access outside these areas. Soils would be handled in line with handling procedures set out and would be stored for as short a time as practicable. The mitigation measures would be set out in a Soil Management Plan	Secured by planning condition	**Low adverse (not significant)** MT/T	No monitoring proposed
Peat soils within the Site	Peat soil excavation, storage, reinstatement and erosion.	An outline PMP has been provided for the Proposed Development and is provided in of **ES Volume III, Appendix 7.4: Peat Management Plan**	N/A	**Low adverse (not significant)** LT	Monitoring of areas of reinstated peat soil within the Site

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	Construction activity, particularly plant and vehicle movements, soil stripping and stockpiling, would affect the nature of the peat soils within the Site				and of peatland restoration, to include visual inspection and soil moisture measurement. Details to be agreed with NRW
Peat soils Surface water Groundwater Proposed Development infrastructure Construction personnel	Peat instability. Construction activity may affect peat stability near to or associated with the works	A detailed peat slide risk assessment has been undertaken for the Proposed Development and is provided in **ES Volume III, Appendix 7.5: Peat Slide Risk Assessment**	N/A	**Low** or **Negligible adverse** **(not significant)** LT	Monitoring around all excavations where peat soils are affected would be undertaken to check for early signs of peat soil instability. Details to be

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					agreed with NRW
Groundwater	Modification to groundwater flow paths. Interruption of shallow and deeper subsurface groundwater flow paths due to excavation works for the Proposed Development	Groundwater monitoring boreholes would be established in the borrow pit and turbine foundation areas prior to construction works. Any groundwater present would be managed in line with best practice, and any required discharge licence would be obtained prior to excavation commencing. Cables would be laid in disturbed ground adjacent to access tracks, with clay bunds used where cables cross notable slopes to minimise in-trench groundwater flow. The mitigation measures and groundwater monitoring would be set out in the CEMP	Secured by planning condition	**Low adverse (not significant)** LT	No monitoring proposed
Cultural Heritage					

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Linear Feature (HA001)	Site clearance for the Turbine 10 (T10) hardstanding will remove a section of the linear feature	Archaeological excavation	Secured by planning condition	**Minor adverse (not significant)** P / D / LT	Monitoring would be carried out by The Trust for Welsh Archaeology (WAT) to ensure that any measures set out by the Local Authority as a condition of consent remain appropriate and are adhered to
Peat deposits deeper than 20 cm in depth	Site clearance for Turbines T01, T04, T07, T08, and T09 hardstanding, as well as access	Purposive peat sampling by geoarchaeological specialist prior to commencement of construction activity	Secured by planning condition	**Minor adverse (not significant)** P / D / LT	Monitoring would be carried out by WAT to ensure that any measures

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	tracks between first junction and T06, access track between T06 and T07, and the access track between T08 and watercourse crossing to the west of T09				set out by the Local Authority as a condition of consent remain appropriate and are adhered to
Currently unknown historic receptors within the Site	Site clearance for the Proposed Development within the upland area could potentially remove unknown historic receptors	UAV magnetometer survey and potential for additional archaeological mitigation, recording, or excavation	Secured by planning condition	**Minor adverse (not significant)** P / D / LT	Monitoring would be carried out by WAT to ensure that any measures set out by the Local Authority as a condition of consent remain appropriate

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					and are adhered to
Landscape and Visual					
Landscape Features					
Upland moorland vegetation (upland grazing moorland with elevated peaks, unimproved and semi-improved acid grassland, dry acid heath, and acid neutral flush areas)	Temporary removal or disturbance for turbine foundations, access tracks, hardstanding areas, and infrastructure. Limited impact affecting small portion of wider upland area	Soil resource managed per Outline Soil Management Plan	Secured by planning condition	**Minor – Moderate adverse (not significant)** T / D / ST	Habitat monitoring as part of wider ecological survey program
Small watercourses and tributaries	Limited impacts from watercourse crossings with appropriate	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed

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	construction methods				
Upland landform LANDMAP Geological Landscape aspect area SNPGL132	No notable impact to topography, minor earthworks	No mitigation proposed	N/A	**Negligible (not significant)** T / D / ST	No monitoring proposed
Landscape Character					
Adjacent LANDMAP VS Areas within 5 km (CNWVS048 - Maes-newyddion uplands CNWVS049 - Moel Gwern-nannau CNWVS006 - Ceirw and Medrad valleys) Adjacent LANDMAP VS Areas within 5 km – 10 km (CNWVS077 - Garn Prys, DNBGHVS068 - Clocaenog Forest and	Limited visibility of construction activities visible from elevated areas with direct sightlines to construction zone	No mitigation proposed	N/A	**Minor adverse (not significant)** T/D/ST	No monitoring proposed

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DNBGHVS095 - Dee Valley-Corwen)					
Adjacent LANDMAP VS Areas within 5 km – 10 km (SNPVS093 - Llandderfel and Dee Valley bottom, SNPVS097 - Cwm Pennant, SNPVS103 - Y Berwyn, SNPVS104 - Cwm Hirnant valley, SNPVS105 - Bwlch y Groes uplands, SNPVS098 - Afon Llafar, SNPVS088 - Llyn Celyn and SNPVS124 - Water)	Limited visibility of construction activities visible from elevated areas with direct sightlines to construction zone	No mitigation proposed	N/A	**Minor – Moderate adverse (not significant)** T/D/ST	No monitoring proposed
Adjacent LANDMAP VS Areas within 5 km (SNPVS092 – Bethel, SNPVS136 – Sarnau, SNPVS089 - Afon	Limited visibility of construction activities visible from elevated areas with direct	No mitigation proposed	N/A	**Moderate adverse (not significant)** T / D / ST	No monitoring proposed

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Mynach valley, SNPVS090 - Afon Tryweryn, SNPVS135 - Cefn Caer-Euni and SNPVS137 - Parc y Derwgoed) Adjacent LANDMAP VS Areas within 5 km – 10 km (CNWVS044 – Cerrigydrudion, CNWVS004 - Mwdwl Eithin, DNBGHVS070 - Maerdy Hills, DNBGHVS073 - Gwyddelwern Hill, DNBGHVS100 - Berwyn Mountain and SNPVS125 - Arenig Fawr beyond 6.5 km)	sightlines to construction zone				
Adjacent LANDMAP VS Areas within 5 km	Construction activities visible from elevated areas with direct	No mitigation proposed	N/A	**Moderate adverse (significant)** T / D / ST	No monitoring proposed

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(CNWVS050 Foel Goch and SNPVS087 – Migneint) Adjacent LANDMAP VS Areas within 5 km – 10 km (SNPVS125 - Arenig Fawr within 6.5 km)	sightlines to construction zone				
Adjacent LANDMAP VS Areas within 5 km (SNPVS095 - Rhyd-uchaf) Host Aspect Area - SNPVS091 Foel Goch Uplands	Construction activities including crane operations, ground works, and vehicle movements visible across this high-value upland landscape	No mitigation proposed	N/A	**Moderate - Major adverse (significant)** T / D / ST	No monitoring proposed
Adjacent LANDMAP VS Areas within 5 km	Construction activities including crane operations, ground works, and vehicle	No mitigation proposed	N/A	**Major adverse (significant)** T / D / ST	No monitoring proposed

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(SNPVS094 - Bala Plain and SNPVS099 - Bala Lake (Llyn Tegid))	movements visible across this high-value upland landscape				
Visual Amenity					
Representative viewpoints: 16 (Castell Dinas Brân), 20 (Moel Morfydd) and 21 (Moel y Plas)	Construction activities such as crane operation. The considerable intervening distance would make construction activities largely invisible or indiscernible, with only the tallest cranes potentially visible as very small scale features in exceptional weather conditions	No mitigation proposed	N/A	**Negligible (not significant)** T / D / ST	No monitoring proposed

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Representative viewpoints: 4 (Mwnwgl-y-llyn Bridge), 5 (Llangower), 6 (Footpath Bryn-yr-Hydd), 7 (Carnedd y Filiast), 9 (B4391 South of Rhanneg), 10 (Picnic Area west of Llyn Celyn Reservoir), 11 (Footpath North of Bryn-y-gwrgi), 12 (Arenig Fawr), 13 (Footpath South of Hafodty Hafod Dre),14 (Green Lane, Corwen), 15 (East of Cynwyd), 17 (B4501 North of Cerrigydrudion), 18 (B4501 South of Cerrigydrudion), and 19 (Moel y Garnedd (ENP)	Construction activities such as cranes used during turbine erection would be visible above the intervening terrain and forest cover for relatively short periods. VP 9 cranes would not appear particularly prominent during the construction period, due to their apparent scale diminishing with distance	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
Representative viewpoints:	Cranes would be visible during the	No mitigation proposed	N/A	**Moderate adverse (significant)**	No monitoring proposed

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8 (Cerrigydrudion)	construction phase			T / D / ST	
Representative viewpoints: 1 (Cefnddwysarn), 2 (A4212), and 3 (Caer-gerreg)	Cranes would be visible during the construction phase	No mitigation proposed	N/A	**Moderate – Major adverse (significant)** T / D / ST	No monitoring proposed
Settlements - Tynant, Wenallt, Bethel, Llanfihangel Glyn Myfyr, Glan-yr-afon, Glasfryn, Cefn-brith and Betws Gwerfil Goch	Limited or no theoretical visibility of the Proposed Development at construction phase	No mitigation proposed	N/A	**No Effect / Negligible (not significant)** T / D / ST	No monitoring proposed
Settlements - Maerdy	Very limited visibility of construction activities due to the distance (7.5 km) and screening provided by the valley location and	No mitigation proposed	N/A	**Negligible (not significant)** T / D / ST	No monitoring proposed

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	intervening topography. Any visibility would be limited to glimpses of construction cranes from elevated locations				
Settlements – Settlements at distances of 10-20 km	Very limited theoretical visibility due to distance and intervening topography	No mitigation proposed	N/A	**Negligible - Minor adverse (not significant)** T / D / ST	No monitoring proposed
Settlements - Llanfor, Llandderfel, Cerrigydrudion and Llandrillo	Limited moderate visibility of construction activities	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
Settlements – Bala town centre and southern areas, and Rhyd-uchaf	Minor / moderate visibility of construction activities	No mitigation proposed	N/A	**Minor - Moderate adverse (not significant)** T / D / ST	No monitoring proposed

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Settlements - Cefnddwysarn	Residents would experience some views of the construction cranes.	No mitigation proposed	N/A	**Moderate adverse (not significant)** T / D / ST	No monitoring proposed
Settlements – Bala (4.0 km S) Northern elevated areas of settlement, and Frongoch	Moderate visibility of construction activities	No mitigation proposed	N/A	**Moderate adverse (significant)** T / D / ST	No monitoring proposed
Settlements - Sarnau	Clear visibility of construction activities from elevated settlement locations, with cranes particularly prominent on horizon	No mitigation proposed	N/A	**Moderate -Major adverse (significant)** T / D / ST	No monitoring proposed
National Trails, Long Distance Walking	Routes would experience negligible effects due to their	No mitigation proposed	N/A	**Negligible (not significant)** T / D / ST	No monitoring proposed

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Routes and Public Rights of Way - Public Rights of Way (Eastern Sector (5-10 km East)) Other Long-Distance Routes (15+ km) - Wales Coastal Path, Cambrian Way, Snowdonia Slate Trail (Eryri NP) and Offa's Dyke Path	distance from the Site and/or routing through enclosed valley landscapes				
National Trails, Long Distance Walking Routes and Public Rights of Way – Public Rights of Way (Northern Sector (5-10	Walkers on elevated sections would have distant views of construction activities, with tall cranes potentially visible on the far horizon	No mitigation proposed	N/A	**Negligible - Minor adverse (not significant)** T / D / ST	No monitoring proposed

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km North) and Southern Sector (5-10 km South))					
National Trails, Long Distance Walking Routes and Public Rights of Way – Hiraethog Trail – distant sections (6-10 km north) Dee Valley Way North Berwyn Way Public Rights of Way (Western Sector (5-10 km West)) Public Rights of Way 10-20 km from Site.	Walkers on elevated sections would have distant views of construction activities, with tall cranes potentially visible on the far horizon	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed

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National Trails, Long Distance Walking Routes and Public Rights of Way – Public Rights of Way (Northern Sector (0-5 km North) and Southern Sector (0-5 km South)) Hiraethog Trail - closest sections (4-5 km north) Cross Britain Way	Users of the PRoW within 5km would experience close-range views of construction activities including crane operations and turbine erection. Walkers on the closest sections of the Hiraethog trail (4-5 km) would experience clear views of construction activities, including tall cranes, turbine component delivery, and foundation works visible across the	No mitigation proposed	N/A	**Moderate adverse (not significant)** T / D / ST	No monitoring proposed

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	moorland landscape. On Cross Britain Way, visibility would be possible for those walking in the direction towards Bala for around the final 3 km, at which point the route would lie around 5 to 7 km from the nearest proposed turbine				
National Trails, Long Distance Walking Routes and Public Rights of Way – Public Rights of Way (Western Sector (0-5 km West))	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Moderate - Major adverse (significant)** T / D / ST	No monitoring proposed

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National Trails, Long Distance Walking Routes and Public Rights of Way – Public Rights of Way (Eastern Sector (0-5 km East))	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Major adverse (significant)** T / D / ST	No monitoring proposed
Road users – Various Minor Roads 5-10 km (including local cycling routes)	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Negligible - Minor adverse (not significant)** T / D / ST	No monitoring proposed
Road users - B4391, A5, A494 and Minor Roads within 5 km (Eastern Area) (including local cycling routes)	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
Road users - Minor Roads within 5 km (Southern Area)	Change to the existing view as a result of	No mitigation proposed	N/A	**Minor - Moderate adverse (not significant)**	No monitoring proposed

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(including local cycling routes) and B4401	construction activities			T / D / ST	
Road users - Minor Roads within 5 km (Northern Area) (including local cycling routes)	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Moderate adverse (not significant)** T / D / ST	No monitoring proposed
Road users - Minor Roads within 5 km (Western Area) (including local cycling routes)	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Moderate adverse (significant)** T / D / ST	No monitoring proposed
Road users - B4501	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Major adverse (significant)** T / D / ST	No monitoring proposed
National Cycle Network Routes - Route 82 (Bangor to Fishguard),	No change to the existing view as a result of construction activities	No mitigation proposed	N/A	**No Effect (not significant)** T / D / ST	No monitoring proposed

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National Cycle Network Routes - Route 8 (Lôn Las Cymru) and Regional Mountain Biking Areas	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Negligible (not significant)** T / D / ST	No monitoring proposed
Registered Parks and Gardens – Rhiwlas Registered Historic Park and Garden (Grade II)	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
Local Landscape Designations – Mynydd Hiraethog upland mosaic SLA	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
National Landscapes – Clwydian Range and Dee Valley National Landscape	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Minor-Moderate adverse (not significant)** T / D / ST	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
National Park – Eryri NP - LCA 16: Dyffryn Dyfil	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Moderate adverse (significant)** T / D / ST	No monitoring proposed
National Park – Eryri NP - LCA 15: Yr Arenig Local Landscape Designations – Afon Ceirw valley mosaic SLA	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Moderate-Major adverse (significant)** T / D / ST	No monitoring proposed
Local Landscape Designations – Bala Hinterland SLA (host)	Change to the existing view as a result of construction activities	No mitigation proposed	N/A	**Major adverse (significant)** T / D / ST	No monitoring proposed
Residential properties within 2 km (R3, R4, R5, R6, R11, R12, R13, R17, R20, R21)	Views of turbines with topographic screening	No mitigation proposed	N/A	**Minor – Moderate adverse (not significant)**	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	reducing visual impact			T / D / LT	
Residential properties within 2 km (R1, R2, R7, R8, R9, R10, R14, R15, R16 and R18)	Views of construction activities including tall cranes, machinery movement, and ground works from elevated residential locations	Construction compound maintained with neat appearance. Temporary lighting operated per agreed scheme	N/A	**Moderate - Major adverse (significant)** T / D / ST	No monitoring proposed
Noise					
Noise sensitive receptors (i.e. residential properties)	Potential wind turbines construction noise activities onsite (i.e. onsite activities such as earthwork on tracks and foundations, activities at the	Additional noise mitigation measures suggested includes good practice and adhering to set construction hours	CEMP Secured by planning condition	**Not significant**	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	construction compound, and wind turbine delivery and erection)				
Noise sensitive receptors (i.e. residential properties)	Potential wind turbines construction noise traffic offsite (i.e. construction vehicles, light and HGV, arriving and departing on the road near the Site entrance)	No mitigation proposed	N/A	**Not significant**	No monitoring proposed
Traffic & Transport					
B4501 Users / Residents	Large loads	Construction Traffic Management Plan (CTMP) including agreement of AIL route modifications and improvements, a site worker transport and travel	Secured by planning condition	**Minor adverse (not significant)** T / D / ST	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		arrangement plan and appropriate traffic management measures to be put in place on the B5401 leading through to the Site, to avoid conflict with general traffic. An Abnormal Load Traffic Management Plan will be prepared and delivered by the Abnormal Load supplier			
PRoW / Path / Common Land / Open Access Land Users within the Site	Severance	Construction Traffic Management Plan including a site worker transport and travel arrangement plan. Provision of an onsite Access Management Plan (AMP) including a Public Access Management Area and notifications of temporary suspension	Secured by planning condition	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
PRoW / Path / Common Land / Open Access	Pedestrian delay	Construction Traffic Management Plan. Provision	Secured by planning condition	**Minor adverse (not significant)**	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Land Users within the Site		of an onsite AMP including a Public Access Management Area and notifications of temporary suspension		T / D / ST	
PRoW / Path / Common Land / Open Access Land Users within the Site	Non-motorised user amenity	Construction Traffic Management Plan, e.g site signage. Provision of an onsite AMP including a Public Access Management Area and notifications of temporary suspension	Secured by planning condition	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
PRoW / Path / Common Land / Open Access Land Users within the Site	Fear and intimidation	Construction Traffic Management Plan. Provision of an onsite AMP, e.g speed restrictions and notifications of temporary suspension	Secured by planning condition	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
PRoW / Path / Common Land / Open Access Land Users within the Site	Road safety	Construction Traffic Management Plan e.g onsite briefing for construction drivers. Provision of an onsite AMP including a Public Access Management Area and	Secured by planning condition	**Minor adverse (not significant)** T / D / ST	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		notifications of temporary suspension			
PRoW / Path / Common Land / Open Access Land Users within the Site	Large loads	Abnormal Load TMP – will be prepared and delivered by the Abnormal Load supplier	Secured by planning condition	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
Aviation					
Low flying military aircraft	Manoeuvring of aircraft horizontally and/or vertically to avoid charted and lit obstacles	No mitigation proposed	N/A	**Minor adverse (not significant)** T / D / ST	No monitoring proposed
Hawarden Airport IFPs	The proposed blade tip heights are assessed as not requiring changes to the current published Hawarden Airport IFPs, therefore no	No mitigation proposed	N/A	**No effect (not significant)** T / D / ST	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	effects are anticipated				

15.3 Operational Phase Residual Effects

Table 15.2 Summary of the Effect Assessment for the Operational Phase of the Proposed Development

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Terrestrial Ecology					
Foraging/commuting bats	Bat collision risk mortality and barotrauma	Requirement for 'feathering' of turbine blades	Secured by planning condition	**Negligible / Minor adverse (not significant)** LT	No monitoring proposed
	Habitat, loss and damage to bat foraging or commuting habitat	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Ornithology					
Migneint-Arenig-Dduallt SPA (and component SSSI)	Displacement & Disturbance to SPA/SSSI qualifying species	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed
	Collision risk	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed
Berwyn SPA (and component SSSI)	Displacement & Disturbance to SPA/SSSI qualifying species	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	Collision risk	No mitigation proposed	N/A	**Minor adverse (not significant)** – red kite (at the SPA population-level) LT **Negligible (not significant)** – all other SPA/ SSSI species LT	No monitoring proposed, although the protocol for monitoring (and removal) of carcasses from the Site (with respect to red kite) will be detailed in the HMP, post consent
Red kite	Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed
	Collision risk	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed, although the protocol for monitoring (and removal) of carcasses from the Site will be

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
					detailed in the HMP, post consent
Golden plover	Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed
	Collision risk	No mitigation proposed	N/A	**Negligible / Minor adverse (not significant)** LT	No monitoring proposed
Kestrel	Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed
	Collision risk	No mitigation proposed	N/A	**Negligible / Minor adverse (not significant)** LT	No monitoring proposed
Land, Soils and Water					
Surface water	Physical changes to overland drainage	No mitigation proposed	N/A	**Negligible (not significant)**	Monitoring during the operational

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	and surface water flows. No additional changes to overland drainage and surface water flows are anticipated during the operational phase			LT	phase will be undertaken monthly for the first year, and subsequently as agreed with NRW
Surface water	Particulates and suspended solids The main operational phase work would involve maintenance and repair of tracks, hardstanding areas and all operational phase drainage infrastructure. This could generate loose sediment	Any sections of track or hardstanding showing signs of excessive wear would be repaired as necessary with suitable rock from external sources. Where appropriate, measures from the Surface Water Management Plan (SWMP) approved prior to the	Secured by planning condition	**Low adverse (not significant)** ST/T	Monitoring during the operational phase will be undertaken monthly for the first year, and subsequently as agreed with NRW

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	which could potentially gain access to surface watercourses and waterbodies through surface runoff	construction phase would remain in place throughout the operational phase. These mitigation measures would be secured via the agreed SWMP			
Surface water Groundwater	Water contamination from fuels, oils or foul drainage. The risk of contamination from fuels, oils or foul drainage is considered lower during operation	Procedures for storage and handling of potentially polluting materials and for dealing with spills and emergencies would remain in place throughout the operational phase. Wastewater would be removed by tanker for treatment and disposal at a suitably licensed site outside any	Secured by planning condition	**Negligible (not significant)** ST/T	No monitoring is proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		phosphate-sensitive catchment areas. Where appropriate, measures from the Pollution Prevention Plan approved prior to the construction phase would remain in place throughout the operational phase. These measures would be secured via the agreed SWMP			
PWS sources GWDTE Designated sites with linkages to surface or groundwater	Changes in or contamination of water supply to vulnerable receptors. Only minor works would take place during the operational phase to allow necessary	Procedures for storage and handling of potentially polluting materials and for dealing with spills and emergencies would remain in place throughout the operational phase.	Secured by planning condition	**Negligible (not significant)** LT	Visual and in situ monitoring as required if works are taking place within 250 m of an identified PWS source

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	maintenance activities for the Proposed Development. However, during maintenance works, there may be spillage of polluting materials into vulnerable receptors	Where appropriate, measures from the Pollution Prevention Plan approved prior to the construction phase would remain in place throughout the operational phase. These measures would be secured via the agreed SWMP			
Infrastructure and property downstream of Proposed Development	Increased flood risk. Proposed Development may potentially increase flood risk to areas downstream	Operational phase monitoring and maintenance of long-term drainage infrastructure would prevent increase to downstream flood risk. The SWMP and Emergency Incident Plan approved during the construction phase	Secured by planning condition	**Negligible (not significant)** LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		would remain in place throughout the operational phase			
Soils within the Site	Soil erosion and compaction. No soil stripping or stockpiling activities are planned for the operational phase	Mitigation measures set up during the construction phase will be maintained	Secured by planning condition	**Negligible (not significant)** MT/T	No monitoring proposed
Peat soils within the Site	Peat soil excavation, storage, reinstatement and erosion. No peat soil stripping, stockpiling or handling activities are planned for the operational phase	Mitigation measures set up during the construction phase will be maintained	Secured by planning condition	**Negligible (not significant)** LT	No monitoring proposed
Peat soils Surface water Groundwater	Peat Instability No changes to the proposed	No mitigation proposed	N/A	**No change (not significant)** LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Proposed Development infrastructure	infrastructure are anticipated during the operational phase				
Groundwater	Modification to groundwater flow paths	No mitigation proposed	N/A	**Negligible (not significant)** LT	No monitoring proposed
Cultural Heritage					
Cairn, Garnedd Fawr, Llandderfel (WAT HER PRN 3258)	Indirect impact on the setting of the receptor that positively contributes to it cultural significance	No mitigation proposed	N/A	**Minor adverse (not significant)** T / I / MT	No monitoring proposed
Hut Circle, Llandderfel (WAT HER PRN 15611)	Indirect impact on the setting of the receptor that positively contributes to it cultural significance	No mitigation proposed	N/A	**Minor adverse (not significant)** T / I / MT	No monitoring proposed
Landscape and Visual					

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Landscape Character					
Adjacent LANDMAP VS Areas within 5 km (CNWVS048 - Maes-newyddion uplands and CNWVS049 - Moel Gwern-nannau) Adjacent LANDMAP VS Areas within 5 km – 10 km (CNWVS077 - Garn Prys, DNBGHVS068 - Clocaenog Forest and DNBGHVS095 - Dee Valley-Corwen)	Landscape character effects due to close proximity to the Proposed Development	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
Adjacent LANDMAP VS Areas within 5 km – 10 km (SNPVS093 - Llandderfel and Dee Valley bottom, SNPVS097 - Cwm Pennant, SNPVS103 - Y Berwyn, SNPVS104 - Cwm Hirnant valley, SNPVS105 - Bwlch y	Landscape character effects due to close proximity to the Proposed Development	No mitigation proposed	N/A	**Minor – Moderate adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Groes uplands, SNPVS098 - Afon Llafar, SNPVS088 - Llyn Celyn and SNPVS124 - Water)					
Adjacent LANDMAP VS Areas within 5 km (SNPVS137 - Parc y Derwgoed, SNPVS092 – Bethel, SNPVS136 – Sarnau, SNPVS089 - Afon Mynach valley and SNPVS090 - Afon Tryweryn) Adjacent LANDMAP VS Areas within 5 km – 10 km (CNWVS044 – Cerrigydrudion, CNWVS004 - Mwdwl Eithin, DNBGHVS070 - Maerdy Hills, DNBGHVS073 - Gwyddelwern Hills and DNBGHVS100 - Berwyn Mountain)	Landscape character effects due to close proximity to the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Adjacent LANDMAP VS Areas within 5 km (CNWVS050 - Foel Goch, CNWVS006 - Ceirw and Medrad narrow valleys and SNPVS087 – Migneint) Adjacent LANDMAP VS Areas within 5 km – 10 km (SNPVS125 - Arenig Fawr)	Landscape character effects due to close proximity to the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (significant)** P / D / LT	No monitoring proposed
Adjacent LANDMAP VS Areas within 5 km (SNPVS095 - Rhyd-uchaf)	Landscape character effects due to close proximity to the Proposed Development	No mitigation proposed	N/A	**Moderate – Major adverse (significant)** P / D / LT	No monitoring proposed
Adjacent LANDMAP VS Areas within 5 km (SNPVS135 - Cefn Caer-Euni, SNPVS094 - Bala Plain and SNPVS099 - Bala Lake (Llyn Tegid))	Landscape character effects due to close proximity to the Proposed Development	No mitigation proposed	N/A	**Major adverse (significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Host Aspect Area- SNPVS091 - Foel Goch Uplands					
Visual Amenity					
Residential properties within 2 km (R3, R4, R5, R6, R11, R12, R13, R17, R20, R21)	Views of turbines with topographic screening reducing visual impact	No mitigation proposed	N/A	**Minor – Moderate adverse (not significant)** P / D / LT	No monitoring proposed
Residential properties within 2 km (R1, R2, R7, R8, R9, R10, R14, R15, R16 and R18)	Direct views of turbines at close range, appearing as prominent vertical elements but not dominant or overbearing	No mitigation proposed	N/A	**Moderate – Major and Major adverse (significant)** P / D / LT	No monitoring proposed
Representative viewpoints: 13 (Footpath South of Hafodty Hafod Dre),14 (Green Lane, Corwen), 15 (East of Cynwyd),16 (Castell Dinas Brân), 20 (Moel	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / ST	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Morfydd) and 21 (Moel y Plas)					
Representative viewpoints: 11 (Footpath North of Bryn-y-gwrgi)	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Minor – Moderate adverse (not significant)** P / D / ST	No monitoring proposed
Representative viewpoints: 8 (Cerrigydrudion)	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (not significant)** P / D / ST	No monitoring proposed
Representative viewpoints: 18 (B4501 South of Cerrigydrudion)	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (significant)** P / D / ST	No monitoring proposed
Representative viewpoints: 1 (Cefnddwysarn), 2 (A4212), 3 (Caer-gerreg), 4 (Mwnwgl-y-llyn Bridge), 5 (Llangower), 6 (Footpath Bryn-yr-Hydd), 7	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Moderate – Major adverse (significant)** P / D / ST	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
(Carnedd y Filiast), 9 (B4391 South of Rhanneg), 10 (Picnic Area west of Llyn Celyn Reservoir), 12 (Arenig Fawr), 17 (B4501 North of Cerrigydrudion) and 19 (Moel y Garnedd (ENP))					
Settlements – Tynant, Wenallt, Bethel, Llanfihangel Glyn Myfyr, Glan-yr-afon, Glasfryn, Cefn-brith, Betws Gwerfil Goch	The proposed wind turbines may be visible from elevated parts of the settlements, though distance, topography and vegetations would significantly reduce visual prominence	No mitigation proposed	N/A	**Negligible (not significant)** P / D / ST	No monitoring proposed
Settlements – Settlements within 10-20 km.	The complex upland topography creates extensive screening, with only occasional glimpses of distant turbine	No mitigation proposed	N/A	**Negligible-Minor adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	tips possible from elevated locations				
Settlements – Llandderfel and Llandrillo	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
Settlements – Llanfor, Bala town centre and southern areas, and Maerdy	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Minor-Moderate adverse (not significant)** P / D / LT	No monitoring proposed
Settlements – Rhyd-uchaf and Cerrigydrudion	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (Significant)** P / D / LT	No monitoring proposed
Settlements – Bala Northern elevated areas of settlement	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Moderate-Major adverse (Significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Settlements – Frongoch, Sarnau and Cefnddwysarn	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Major adverse (significant)** P / D / LT	No monitoring proposed
National Trails, Long Distance Walking Routes and Public Rights of Way - Other Long-Distance Routes (15+ km) - Wales Coastal Path, Cambrian Way, Snowdonia Slate Trail (Eryri NP) and Offa's Dyke Path	Walkers would have no meaningful visibility of the Proposed Development	No mitigation proposed	N/A	**Negligible (not significant)** P / D / LT	No monitoring proposed
National Trails, Long Distance Walking Routes and Public Rights of Way - Hiraethog Trail – distant sections (beyond 8 km)	Walkers would have no meaningful visibility of the Proposed Development	No mitigation proposed	N/A	**Negligible-Minor adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Public Rights of Way (Southern Sector (5-10 km South))					
National Trails, Long Distance Walking Routes and Public Rights of Way - The Dee Valley Way Public Rights of Way between 10-20 km	Walkers would have no meaningful visibility of the Proposed Development	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
National Trails, Long Distance Walking Routes and Public Rights of Way – North Berwyn Way Public Rights of Way (Northern Sector (5-10 km North))	Walkers would have no meaningful visibility of the Proposed Development	No mitigation proposed	N/A	**Minor-Moderate adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
National Trails, Long Distance Walking Routes and Public Rights of Way - Cross Britain Way – (greater than 7 km from closest turbine) Public Rights of Way (Eastern Sector (5-10 km East))	Walkers would have no meaningful visibility of the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (not significant)** P / D / LT	No monitoring proposed
National Trails, Long Distance Walking Routes and Public Rights of Way - Hiraethog Trail – distant sections (6-8 km) Cross Britain Way – (5-7 km from closest turbine)	Visual effects due to the proximity views of the Proposed Development	No mitigation proposed	N/A	**Moderate adverse (significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Public Rights of Way (Western Sector (5-10 km West))					
National Trails, Long Distance Walking Routes and Public Rights of Way - Public Rights of Way (Northern Sector 3-5 km (0-5 km North), Eastern Sector 3-5 km (0-5 km East)) Hiraethog Trail - closest sections (4-5 km)	Visual effects due to the proximity views of the Proposed Development. Seven to ten turbines would appear as prominent vertical elements horizon and skyline becoming a notable feature in views	No mitigation proposed	N/A	**Moderate-Major adverse (significant)** P / D / LT	No monitoring proposed
National Trails, Long Distance Walking Routes and Public Rights of Way - Public Rights of Way (Southern Sector (0-5 km South), Northern Sector 2-3	Upland bridleways and elevated footpaths within 3 km would experience a medium magnitude of change. Full	No mitigation proposed	N/A	**Major adverse (significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
km (0-5 km North), Eastern Sector within 3km (0-5 km East) and Western Sector (0-5 km West))	views of the turbine array.				
Road Users – Various Minor Roads 5-10 km (including local cycling routes)	Where visibility occurs, it would typically be from elevated sections where blade tips appear on the horizon	No mitigation proposed	N/A	**Negligible – Minor adverse (not significant)** P / D / LT	No monitoring proposed
Roads - A5	Road users would experience limited visibility of turbines appearing as distant elements on the horizon	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
Road Users – Minor Roads within 5 km - Southern Area (including local cycling routes) and B4401	B4401 - Road users would see turbines predominantly as blade tips	No mitigation proposed	N/A	**Minor – Moderate adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	appearing on the horizon Southern – Road users would see up to 4-6 turbine blade tips, from limits sections				
Road Users – Minor Roads within 5 km – Eastern Area and A494	A494 - Road users would experience prominent views of 7-10 turbines, both blade tips and hubs from elevated sections. Roadside vegetation screens much of the route. Eastern - From some limited elevated sections, road users would experience views of up to 5-8 turbines on the horizon	No mitigation proposed	N/A	**Moderate adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Road Users – B4391 Minor Roads within 5 km – Northern	B4391 - Road users would experience some visibility of turbines on the horizon Northern - Road users would experience view of no more that 4 – 7 turbines, predominantly as blade tips.	No mitigation proposed	N/A	**Moderate adverse (significant)** P / D / LT	No monitoring proposed
Road Users - B4501 Minor Roads within 5 km – Western Area	B4501 - Clear and prominent views of the development, with 9-10 turbines visible both as blade tips and hubs. Western - Prominent views of 7-10 turbines, both blade tips and hubs	No mitigation proposed	N/A	**Major adverse (significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
National Cycle Network Routes - NCN Route 82 (Bangor to Fishguard)	No visual effects due to distance and intervening topography	No mitigation proposed	N/A	**No Effect (not significant)** P / D / LT	No monitoring proposed
National Cycle Network Routes - NCN Route 8 (Lôn Las Cymru) and Regional Mountain Biking Areas	Limited visual effects due to distance and intervening topography	No mitigation proposed	N/A	**Negligible (not significant)** P / D / LT	No monitoring proposed
Registered Parks and Gardens – Rhiwlas Registered Historic Park and Garden (Grade II).	Change to the existing view as a result of Proposed Development	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
Local Landscape Designations – Mynydd Hiraethog upland mosaic SLA National Landscapes – Clwydian Range and Dee Valley National Landscape	Change to the existing view as a result of Proposed Development	No mitigation proposed	N/A	**Minor-Moderate adverse (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
National Park – Eryri NP - LCA 16: Dyffryn Dyfil	Change to the existing view as a result of Proposed Development	No mitigation proposed	N/A	**Moderate adverse (significant)** P / D / LT	No monitoring proposed
Local Landscape Designations – Afon Ceirw valley mosaic SLA National Park – Eryri NP - LCA 15: Yr Arenig	Change to the existing view as a result of Proposed Development	No mitigation proposed	N/A	**Moderate-Major adverse (significant)** P / D / LT	No monitoring proposed
Local Landscape Designations – Bala Hinterland SLA (host)	Change to the existing view as a result of Proposed Development	No mitigation proposed	N/A	**Major adverse (significant)** P / D / LT	No monitoring proposed
Noise					
Noise sensitive receptors (i.e. residential properties)	Potential operational wind turbines noise effects	Mitigation suggested including implementation of a planning noise condition and	Secured by planning condition	**Not significant**	No routine monitoring would be required during the operational phase although

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		selection of an appropriate candidate wind turbine			good practice does suggest planning condition which would require compliance monitoring triggered in the event of a noise complaint
Aviation					
Low flying military aircraft	Manoeuvring of aircraft horizontally and/or vertically to avoid charted and lit obstacles	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
Hawarden Airport IFPs	The proposed blade tip heights are assessed as not requiring changes to the current published Hawarden Airport IFPs, therefore no	No mitigation proposed	N/A	**No effect (not significant)** P / D / LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation will be secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	effects are anticipated				
Hawarden Airport radar	There is no line of sight between the Hawarden Airport radar and the Proposed Development due to intervening terrain therefore no effects are anticipated	No mitigation proposed	N/A	**No effect (not significant)** P / D / LT	No monitoring proposed
NERL Great Dun Fell radar	Effects on the Great Dun Fell radar will be removed by the use of in-fill data from a 3rd radar	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed
NERL St Anne's radar	Effects on the St Annes radar will be removed by the use of in-fill data from a 3rd radar	No mitigation proposed	N/A	**Minor adverse (not significant)** P / D / LT	No monitoring proposed

15.4 Decommissioning Phase Residual Effects

Table 15.3 Summary of the Effect Assessment for the Decommissioning Phase of the Proposed Development

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Terrestrial Ecology					
River Dee and Bala Lake SAC and River Dee SSSI and Afon Dyfrdwy (River Dee) SSSI	Habitat Loss/ Displacement & Disturbance to SAC/ SSSI qualifying species	Good practice pollution prevention measures outlined in the CEMP, DEMP & associated works including ECoW	Secured by planning condition	**Negligible (not significant)** ST (displacement & disturbance) & ST (habitat loss)	Reassessment of the status and condition of the receptor and the Site nearer the time of decommissioning. Water quality monitoring as part the DEMP (pre-, during and post-decommissioning)
Candidate Local Wildlife Site: Llandderfel Wildlife site - candidate	Habitat Loss/ Displacement & Disturbance to designated site	Species and Habitat Protection Plan, habitat reinstatement measures outlined in the CEMP & associated works including ECoW	Secured by planning condition	**Negligible / Minor adverse (not significant)** ST (displacement & disturbance) & ST (habitat loss)	Reassessment of the status and condition of the receptor and the Site nearer the time of decommissioning

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Notable habitats (Annex 1 and Section 7)	Direct and Indirect Habitat Loss/ Disturbance of notable habitats	Species and Habitat Protection Plan, habitat reinstatement measures outlined in the CEMP & associated works including ECoW	Secured by planning condition	**Negligible / Minor adverse (not significant)** ST (displacement & disturbance) & ST (habitat loss)	Reassessment of the status and condition of the receptor and the Site nearer the time of decommissioning
Ornithology					
Migneint-Arenig-Dduallt SPA (and component SSSI)	Habitat Loss/ Displacement & Disturbance to SPA/ SSSI qualifying species	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Berwyn SPA (and component SSSI)	Habitat Loss/ Displacement & Disturbance to SPA/ SSSI qualifying species	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Red kite	Habitat Loss/ Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)**	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
				ST (displacement & disturbance) & LT (habitat loss)	
Golden plover	Habitat Loss/ Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Kestrel	Habitat Loss/ Displacement & Disturbance	No mitigation proposed	N/A	**Negligible (not significant)** ST (displacement & disturbance) & LT (habitat loss)	No monitoring proposed
Land, Soils and Water					
Surface water	Physical changes to overland drainage and surface water flows. Construction activities will result in physical changes to overland and surface water flows. This may cause	Constructed drains would be no longer or deeper than necessary. Cross-drains would be installed at appropriate frequency	Ecological Clerk of Works (ECoW) supervision/licences secured by planning condition	**Negligible (not significant)** LT	Pre-construction water quality monitoring programme to be established. Monitoring at designated locations during construction

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	concentration of flows within the Site and diversion of flows between sub-catchment areas	to minimise concentration of flows			phase, undertaken by ECoW or Principal Contractor
Surface water	Particulates and suspended solids. Construction works involving earthworks would generate loose sediment which could potentially gain access to surface watercourses and waterbodies through entrainment in surface runoff	Surface water from the areas surrounding the turbine bases and all hardstanding areas would be prevented from entering the working areas by appropriate use of peripheral bunding and cut-off drains. Sediment control measures would be used around all stripped working areas	ECoW supervision/licences secured by planning condition	**Negligible (not significant)** MT/T	Water quality monitoring at designated locations during construction phase, undertaken by ECoW or Principal Contractor
Surface water Groundwater	Water contamination from fuels, oils, concrete batching or foul drainage Spillage of fuels, oils, wet concrete, concrete	Handling, storage and disposal of all potential pollutants within the Site would be undertaken	ECoW supervision/licences secured by planning condition	**Negligible (not significant)** MT/T	Water quality monitoring at designated locations during construction phase, undertaken

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	washout water or foul drainage from welfare facilities could have an adverse effect on surface or groundwater quality	following published guidance. Wastewater would be removed by tanker for treatment and disposal at a suitably licensed site outside any phosphate-sensitive catchment areas			by ECoW or Principal Contractor
Private Water Supplies (PWS) sources Ground Water Dependant Terrestrial Ecosystems (GWDTE) Designated sites with linkages to surface or groundwater	Changes in or contamination of water supply to vulnerable receptors. All excavations and changes to water flow paths could potentially affect water supply to vulnerable receptors. Spills and incidents involving polluting materials, and excavation works generating loose	All groundworks requiring excavation would be minimised as far as practicable, within the necessary engineering constraints for construction. Water discharge to be tested for contamination prior to discharge to ground	ECoW supervision/licences secured by planning condition	**Negligible (not significant)** LT	Visual and in-situ water quality monitoring would be undertaken at each of the 10 potentially at-risk PWS on a twice-daily basis (morning and afternoon) while works are ongoing within 500 m of the supply sources

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	sediment, could potentially affect vulnerable receptors				
Infrastructure and property downstream of Proposed Development	Increased flood risk. Some areas within the Site and downstream of the Site have a high risk of flooding from surface water, small watercourses and rivers. There is potential that the Proposed Development may increase flood risk to areas downstream	An Outline Drainage Strategy for the Proposed Development has been included as part of **ES Volume III, Appendix 7.1: Flood Consequences Assessment**	N/A	**Negligible (not significant)** LT	No monitoring proposed
Soils within the Site	Soil erosion and compaction. Construction activity, particularly plant and vehicle movements, soil stripping and stockpiling, would affect the nature of the soils within the Site	All traffic routes would be clearly demarcated, and vehicles would not be permitted access outside these areas. Soils would be handled in line with handling procedures	Secured by planning condition	**Negligible (not significant)** MT/T	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		set out and would be stored for as short a time as practicable. Mitigation measures set up during the construction phase will be maintained			
Peat soils within the Site	Peat soil excavation, storage, reinstatement and erosion. Construction activity, particularly plant and vehicle movements, soil stripping and stockpiling, would affect the nature of the peat soils within the Site	An outline PMP has been provided for the Proposed Development and is provided in of **ES Volume III, Appendix 7.4: Peat Management Plan**	N/A	**Negligible (not significant)** LT	Monitoring of areas of reinstated peat soil within the Site and of peatland restoration, to include visual inspection and soil moisture measurement. Details to be agreed with NRW
Peat soils Surface water Groundwater Proposed Development	Peat instability. Construction activity may affect peat stability near to or associated with the works	A detailed peat slide risk assessment has been undertaken for the Proposed Development and is provided in **ES**	N/A	**Negligible (not significant)** LT	Monitoring around all excavations where peat soils are affected would be undertaken to check for early signs of

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
infrastructure Construction personnel		**Volume III, Appendix 7.5: Peat Slide Risk Assessment**			peat soil instability. Details to be agreed with NRW
Groundwater	Modification to groundwater flow paths. Interruption of shallow and deeper subsurface groundwater flow paths due to excavation works for the Proposed Development	Groundwater monitoring boreholes would be established in the borrow pit and turbine foundation areas prior to construction works. Any groundwater present would be managed in line with best practice, and any required discharge licence would be obtained prior to excavation commencing. Cables would be laid in disturbed ground adjacent to access tracks, with clay bunds used where cables cross notable slopes	Secured by planning condition	**Negligible (not significant)** LT	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
		to minimise in-trench groundwater flow. Mitigation measures set up during the construction phase will be maintained			
Landscape and Visual					
Landscape Features & Character	Similar to construction phase effects with restoration of areas following infrastructure removal	No mitigation proposed	N/A	**Minor - Moderate adverse (not significant to significant)** T / D / ST	Ecological monitoring during restoration
Visual Amenity	Similar to construction phase with visibility of decommissioning activities and crane operations for turbine removal	No mitigation proposed	N/A	**Minor - Major adverse (not significant - significant)** T / D / ST	No monitoring proposed
Aviation					
Low flying military aircraft	Manoeuvring of aircraft horizontally and/or	No mitigation proposed	N/A	**Minor adverse (not significant)**	No monitoring proposed

Receptor	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
Key: P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	vertically to avoid charted and lit obstacles			T / D / ST	
Hawarden Airport IFPs	The proposed blade tip heights are assessed as not requiring changes to the current published Hawarden Airport IFPs therefore no effects are anticipated	No mitigation proposed	N/A	**No effect (not significant)** T / D / ST	No monitoring proposed

15.5 Whole Lifecycle Residual Effects

Table 15.4 Summary of the Effect Assessment for the Whole Lifecycle of the Proposed Development (Construction, Operation, and Decommissioning)

Impact	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
Climate					
Global Atmosphere	The Proposed Development is anticipated to result in GHG Savings of	It has been assumed that all activities during construction, operation and	N/A	**Beneficial (significant)** T / I / MT	No monitoring proposed

Impact	Potential effects	Additional (secondary and tertiary) mitigation	How additional mitigation secured	Residual effects	Monitoring
P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable					
	1,264,305 tCO2e against a grid-mix electricity generation over its 40 year lifespan, and 2,632,967 tCO2e against a fossil fuel mix electricity generation	decommissioning would be conducted in accordance with good practice guidance			