

and drainage channels. Suitability for brown trout was poor given the shallow depths. Whilst brown trout were not recorded via eDNA sampling (thus considered absent), European eel were detected (**Table 4.1**). Despite good suitability for smooth newt, the species was not detected via eDNA sampling. There was no suitability for white-clawed crayfish. No otter signs were recorded in vicinity of the site.

No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling (**Appendix C**).

Given the presence of Red-listed European eel (eDNA), in addition to Annex I acid oligotrophic lake habitat [3160], the aquatic ecological evaluation of site P2 was of **county importance (Table 4.4)**.



Plate 4.10 Representative image of site P2, September 2023

4.1.11 Site P3 – pond, Muingmore

Pond P3 was located at a small 0.4ha pond adjacent to (west of) site P2. The pond had a complex margin with numerous small peninsulas and bays. The margins were gently sloping and the pond ranged from 0.6-1.5m in depth with a bed composed entirely of deep soft sediment (peat) with a high cover of floc and diatomaceous masses. The water was peat-stained. The shallow basin supported abundant white water-lily and floating bur-reed (*Sparganium angustifolium*). Occasional bulbus rush, spike rush and Red-listed pipewort (*Eriocaulon aquaticum*) were present in the margins with the littorals dominated by *Sphagnum cuspidatum*. Bladderwort (*Utricularia* sp.) was rare. The pond was considered representative of the Annex I habitat 'Natural dystrophic lakes and ponds [3160]' (but not oligotrophic isoetid lake habitat [3110] due to fragmented distribution of indicator species). The site was bordered by lowland blanket bog (PB2) with mature coniferous afforestation (WD4) to the east.

Electro-fishing was not undertaken at the lacustrine site. However, a fisheries appraisal indicated that the pond had moderate suitability for brown trout and high suitability for European eel and both species were detected via eDNA sampling (**Table 4.1**). The heavily vegetated pond was suitable for

smooth newt although none were recorded by sweep sampling or eDNA sampling. There was no suitability for white-clawed crayfish and the species was not recorded present. No otter signs were recorded in vicinity of the site.

No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via sweep sampling (**Appendix C**).

Given the presence of salmonids and Red-listed European eel (eDNA), in addition to Annex I acid oligotrophic lake habitat [3160], the aquatic ecological evaluation of site P4 was of **county importance (Table 4.4)**.



Plate 4.11 Representative image of site P3, September 2023

4.1.12 Site P4 – pond, Doolough

Site P4 was located at a small 0.65ha pond adjacent to the proposed site boundary. The pond had a complex margin with numerous small peninsulas and bays. The margins were steep and the pond ranged from 1.4-2.5m in depth with a bed composed entirely of deep soft sediment (peat). The water was peat-stained. Given this and relatively high depths, macrophyte cover was low in the open water areas with rare white-water lily. However, the littorals supported locally frequent bulbous rush and Red-listed pipewort with abundant floating bur-reed on the shelf zone of the shallower southern shore. Bog pondweed and bog bean stands were scattered, with bladderwort (*Utricularia* sp.) recorded as rare. Free-floating agglomerations of *Sphagnum cuspidatum* were present along the margins. Based on the criteria outlined by O'Connor (2015), the macrophyte community locally dominated by pipewort was considered representative of the Annex I habitat 'Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]'. The site was bordered by lowland blanket bog (PB2) with mature coniferous afforestation (WD4) to the north.

Electro-fishing was not undertaken at the lacustrine site. However, a fisheries appraisal indicated that the pond had good suitability for brown trout and European eel and both species were detected via eDNA sampling (**Table 4.1**). The pond was largely unsuitable (low macrophyte cover, too deep) to support smooth newt and none were recorded by sweep sampling or eDNA sampling. There was no suitability for white-clawed crayfish. No otter signs were recorded in vicinity of the site.

No macro-invertebrate species of conservation value greater than ‘least concern’, according to national red lists, were recorded via sweep sampling (**Appendix C**).

Given the presence of salmonids (eDNA) and Red-listed pipewort, in addition to the Annex I Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]’, the aquatic ecological evaluation of site P4 was of **county importance (Table 4.4)**.



Plate 4.12 Representative image of site P4, September 2023

4.1.13 Site C1 – An Mhoing Mhór River, Muingmore

Site C1 was located on the Mhoing Mhór River (EPA code: 33M23), a tributary of the Doolough Stream, adjacent to the site boundary. The lowland depositing peat channel had been deepened historically to facilitate land drainage for adjoining conifer plantations. The river was 0.5m wide and between 0.2-0.3m deep with bank heights of 1.5-2m. The profile was dominated by slow-flowing glide with the substrata comprised entirely of soft peat. Due to high shading and peat-staining, macrophytes were absent. The peaty banks supported the liverwort *Pellia epiphylla*, a species common a wet river banks. The site bordered by degraded lowland blanket bog (PB2) and mature conifer plantations (WD4).

No fish were recorded via electro-fishing at site C1 (**Appendix A**). The river was not of fisheries value at this location given its heavily modified nature and siltation pressures. There was no suitability for white-clawed crayfish and the species was not recorded. No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status) (Appendix C)**. However, it should be noted that this was a tentative rating given an absence of suitable riffle areas for sampling (Toner et al., 2005). No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of aquatic species or habitats of higher conservation value, the aquatic ecological evaluation of site C1 was of **local importance (lower value) (Table 4.4)**.



Plate 4.13 Representative image of site C1 on the Mhoing Mhór River, September 2023

4.1.14 Site C2 – Doolough Stream, Muingmore

Site C2 was located on the Doolough Stream (33D02) adjacent to the site boundary. The lowland depositing stream (FW2) had been historically straightened and deepened through adjoining blanket bog and improved grassland but retained some semi-natural features. The peat-stained stream was 2-3m wide and between 0.2-0.8m deep with banks of 1.5-2m in height. The profile comprised riffle and glide sequences with occasional pool. The substrata were dominated by heavily silted mixed gravels with localised small boulder and cobble. Cover of filamentous algae and floc was high (c.30-40%), indicating significant enrichment. Macrophyte growth was limited to sparse bog pondweed. No aquatic bryophytes were recorded. The site was bordered by degraded blanket bog (PB2) and semi-improved grassland (GA1).

Brown trout and European eel were the only fish species recorded via electro-fishing at site C2 (**Appendix A**). The site was a good quality salmonid nursery despite historical drainage, siltation and enrichment pressures with a relatively high density of mixed cohort trout. Salmonid spawning habitat was moderate given the presence of mixed gravels in pool and deeper glide as with areas downstream (e.g. site C4) but was reduced because of siltation and enrichment pressures. Suitability for European eel was moderate (cobble refugia and sufficiently deep) with a small population of adults present. No soft sediment settlement areas suitable for lamprey ammocoetes were present and the species was

not recorded. While some low potential for white-clawed crayfish existed given instream refugia and deeper water, none were recorded. No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status) (Appendix C)**. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the presence of salmonids and Red-listed European eel, the aquatic ecological evaluation of site C2 was of **local importance (higher value) (Table 4.4)**.



Plate 4.14 Representative image of site C2 on the Doolough Stream, September 2023

4.1.15 Site C3 – unnamed stream, Muingmore

Site C3 was located on an unnamed tributary of the Doolough Stream adjacent to the site boundary. The U-shaped lowland depositing peat channel (FW2) had been historically deepened throughout and did not feature flowing water at the time of survey. The stream was 1m wide with stagnant pools of water to 0.1m in depth. The substrata were comprised entirely of soft peat. The site supported abundant watercress (*Nasturtium* agg.) with high levels of terrestrial encroachment by creeping bent grass (*Agrostis stolonifera*).

No fish were recorded via electro-fishing at site C3 (**Appendix A**). The site was not of fisheries value at this location given its ephemeral nature and historical modifications. There was no suitability for white-clawed crayfish and the species was not recorded present. No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (poor status) (Appendix C)**. However, it should be noted that this was a tentative rating given an absence of suitable riffle areas for sampling (Toner et al., 2005). No macro-invertebrate species of conservation value greater than

'least concern', according to national red lists, were recorded via Q-sampling.

Given the absence of aquatic species or habitats of higher conservation value, the aquatic ecological evaluation of site C3 was of **local importance (lower value) (Table 4.4)**.



Plate 4.15 Representative image of site C3 on an unnamed Doolough Stream tributary, September 2023

4.1.16 Site C4 – Doolough Stream, Muingmore

Site C4 was located on the Doolough Stream (33D02) approximately 1.2km downstream of site C2. The lowland depositing stream (FW2) had been historically deepened through adjoining blanket bog and improved grassland but retained some semi-natural features with frequent meanders in a sinuous channel. The peat-stained stream was 2-3m wide and between 0.2-0.6m deep with banks of 1.5-2m in height. The profile comprised slow-flowing glide with localised riffle and pool. The substrata were dominated by heavily silted mixed gravels with localised small boulder and cobble. These had a moderate cover (c.20%) of filamentous algae and floc. Macrophyte growth was limited to occasional bog pondweed. Aquatic bryophyte coverage was low although some *Pellia epiphylla* and *Scapania undulata* were present locally. The site was bordered by degraded blanket bog (PB2).

Brown trout, European eel and three-spined stickleback were recorded via electro-fishing at site C4 (**Appendix A**). Despite historical drainage and siltation pressures, the site was a good quality salmonid nursery supporting a relatively high density of juvenile trout. Localised pools and instream boulder provided valuable holding areas for adult salmonids although the quality of the holding habitat was poor overall (shallow water). Mixed gravels provided moderate quality salmonid spawning habitat, with the value reduced due to siltation. The site was of moderate value for European eel with a low density of adults recorded. No soft sediment settlement areas suitable for lamprey ammocoetes were identified. While some low potential for white-clawed crayfish existed given instream refugia and deeper water, none were recorded. No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3-4 (moderate status) (Appendix C)**. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the presence of salmonids and Red-listed European eel, the aquatic ecological evaluation of site C4 was of **local importance (higher value) (Table 4.4)**.



Plate 4.16 Representative image of site C4 on the Doolough Stream, September 2023

4.1.17 Site C5 – Doolough Stream, Muingmore

Site C5 was located on the Doolough Stream (33D02) at the L1205 local road crossing approximately 0.9km downstream of site C4. The lowland depositing peatland stream (FW2) had been historically deepened through adjoining lowland blanket bog and bordering improved grassland habitats. The stream was 2-4m wide and between 0.2-0.8m deep with a semi-natural profile and bank heights of 1-1.2m. The profile comprised riffle and glide sequences with occasional pool. The substrata were dominated by heavily silted mixed gravels with localised small boulder and cobble. As per upstream, cover of filamentous algae and floc was high (c.40%), indicating significant enrichment. Macrophyte growth was limited to sparse bog pondweed. No aquatic bryophytes were recorded. The site was bordered by degraded blanket bog (PB2) and semi-improved grassland (GA1). Blanket growth of iron-oxidising bacteria was also present upstream of the bridge in the channel margins. The site supported occasional common water starwort and alternate water-milfoil (*Myriophyllum alterniflorum*) with the moss species *Fontinalis antipyretica* also being occasional on instream boulders. Water horsetail (*Equisetum fluviatile*) and branched bur-reed (*Sparganium erectum*) were also present locally. The open banks supported bramble and gorse that graded into degraded lowland blanket bog (PB2) and improved pasture (GA1).

Brown trout was the only fish species recorded via electro-fishing at site C5 (**Appendix A**). The site was a good quality salmonid nursery supporting a relatively high density of juvenile trout. The presence of

deeper glide and a rocky bed provided refugia but these were impacted by siltation and eutrophication pressures in addition to historical drainage (i.e. deepening). Salmonid spawning habitat was of moderate quality. Abundant deep glide provided good quality holding habitat for adult salmonids. The site was a moderate quality European eel nursery given the presence of deeper water with ample refugia but none were recorded. No soft sediment settlement areas suitable for lamprey ammocoetes were identified. While some low potential for white-clawed crayfish existed given instream refugia and deeper water, none were recorded. No white-clawed crayfish or freshwater pearl mussel were detected via eDNA sampling (**Table 4.1**). No otter signs were recorded in vicinity of the site.

Biological water quality, based on Q-sampling, was calculated as **Q3 (moderate status) (Appendix C)**. No macro-invertebrate species of conservation value greater than 'least concern', according to national red lists, were recorded via Q-sampling.

Given the presence of salmonids and Red-listed European eel, the aquatic ecological evaluation of site C5 was of **local importance (higher value) (Table 4.4)**.



Plate 4.17 Representative image of site C5 on the Doolough Stream, September 2023

4.2 White-clawed crayfish

No white-clawed crayfish were recorded via hand-searching or sweep netting of instream refugia during the survey of 54 no. survey sites. Furthermore, no crayfish were detected via eDNA sampling of the Doolough Stream or two unnamed watercourses in vicinity of the proposed site boundary (**Table 4.1**). These findings were in keeping with the known absence of the species in the wider Owenmore[Mayo]_SC_030 and Glencastle_SC_010 river sub-catchments (**Figure 3.1**).

4.3 eDNA analysis

In keeping with the known historical distribution of the species in the survey area (**Figure 3.1**), no freshwater pearl mussel or white-clawed eDNA was detected in an unnamed river (site A2), unnamed river (B6) or Doolough Stream (C5) (0 positive qPCR replicates out of 12; **Table 4.1, Appendix C**). However, the invasive pathogen crayfish plague (*Aphanomyces astaci*) was detected at all 3 no. riverine sampling locations (**Table 4.1**).

Brown trout eDNA was detected in pond sites P1, P3 and P4 (1 positive replicates out of 12, respectively). European eel eDNA was detected at sites P1, P2 and P3 (12, 12 & 2 positive replicates out of 12, respectively (**Table 4.1**). Despite some habitat suitability, no smooth eDNA was detected in the 4 no. pond sites during the survey.

4.4 Invasive aquatic species

With the exception of crayfish plague (above), no aquatic invasive species were recorded during the September 2023 surveys.

4.5 Biological water quality (macro-invertebrates)

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from 40 no. riverine sites³ in September 2023 (**Appendix C**).

A total of 11 no. sites on the Munhin River (D3), Ballybeg River (D5), Srahanarry Stream (D6), unnamed Owenmore River tributaries (D4, D11, D22, D23, D24, D25), Moneynierin River (E1) and the Ballisodare River (E3) achieved **Q4 (good status)** (**Figures 4.1, 4.2 & 4.3**). This was given the presence of the EPA group A (most pollution sensitive) species such as the flattened mayfly *Rhithrogena semicolorata* and stonefly *Protonemura meyeri* in fair numbers (5-10% of total abundance) (**Appendix C**).

A total of 10 no. sites on an unnamed Tullaghan Bay tributary (B3), Doolough Stream (sites C4 & C5), Bellanumera Stream (D7), Briska River (D8), unnamed Owenmore River tributaries (D18, D26, D29 & D3) and the River Deel (E2) achieved **Q3-4 (moderate status)** given the presence of EPA group A mayflies *Ecdyonurus dispar* or *Heptagenia sulphurea* and or stoneflies *Protonemura meyeri* or *Nemoura cinerea* in low numbers (<5%), respectively (**Appendix C**).

With the exception of site E4 (see below), the remaining sites (i.e. A1, A2, B1, B2, B4, B5, B6, C1, C2, C3, C5, D1, D2, D9, D10, D20, D21 & E7) achieved **Q2-3 or Q3 (poor status)** based on a dominance of

³ A total of 10 no. sites (D12, D13, D14, D15, D16, D17, D19, D27, D28 & E6) were dry at the time of the survey. Four no. sites (P1, P2, P3 & P4) were ponds and thus were not suitable for Q sampling.

EPA group C species, including the mayfly *Baetis rhodani*, freshwater shrimp (*Gammarus duebeni*) and New Zealand mud snail (*Potamopyrgus antipodarum*) (**Appendix C**). These sites did not support any group A species and an absence of or only low numbers of group B species such as the stonefly *Leuctra hippopus*.

Site E4 on the Carrowgobbadagh River (adjacent to TDR works) achieved **Q2 (bad status)** based on the dominance of highly pollution tolerant group D and E taxa (**Appendix C**). However, the tidal channel was largely unsuitable for Q-sampling given a lack of riffle areas and this rating was therefore tentative (as per Toner et al., 2005).

Many of the Q-ratings recorded in September 2023, particularly higher gradient channels along the GCR, were tentative only due to low summer flows (i.e. absence of riffle or glide habitat).

4.6 Pond macro-invertebrate communities

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the composite sweep samples collected from sites P1, P2, P3 or P4 in September 2023.

The pond samples were dominated by a typical assemblage of oligotrophic lacustrine taxa such as damselfly larvae (Coenagrionidae), lesser water boatman (*Corixa punctata*), backswimmers (*Notonecta viridis*), phantom midge larvae (Chaoboridae) and biting midge larvae (*Chironomus* spp.) (**Appendix C**).

Table 4.1 eDNA results in the vicinity of the proposed Muingmore wind farm, Co. Mayo (positive qPCR replicates out of 12 in parentheses)

Site	Watercourse	Freshwater pearl mussel	White-clawed crayfish	Crayfish plague	Brown trout	European eel	Smooth newt
A2	Unnamed river	Negative (0/12)	Negative (0/12)	Positive (12/12)	n/a	n/a	n/a
B6	Unnamed river	Negative (0/12)	Negative (0/12)	Positive (11/12)	n/a	n/a	n/a
C5	Doolough Stream	Negative (0/12)	Negative (0/12)	Positive (12/12)	n/a	n/a	n/a
P1	Pond	n/a	n/a	n/a	Positive (1/12)	Positive (12/12)	Negative (0/12)
P2	Pond	n/a	n/a	n/a	Negative (0/12)	Positive (12/12)	Negative (0/12)
P3	Pond	n/a	n/a	n/a	Positive (1/12)	Positive (2/12)	Negative (0/12)
P4	Pond	n/a	n/a	n/a	Positive (1/12)	Negative (0/12)	Negative (0/12)

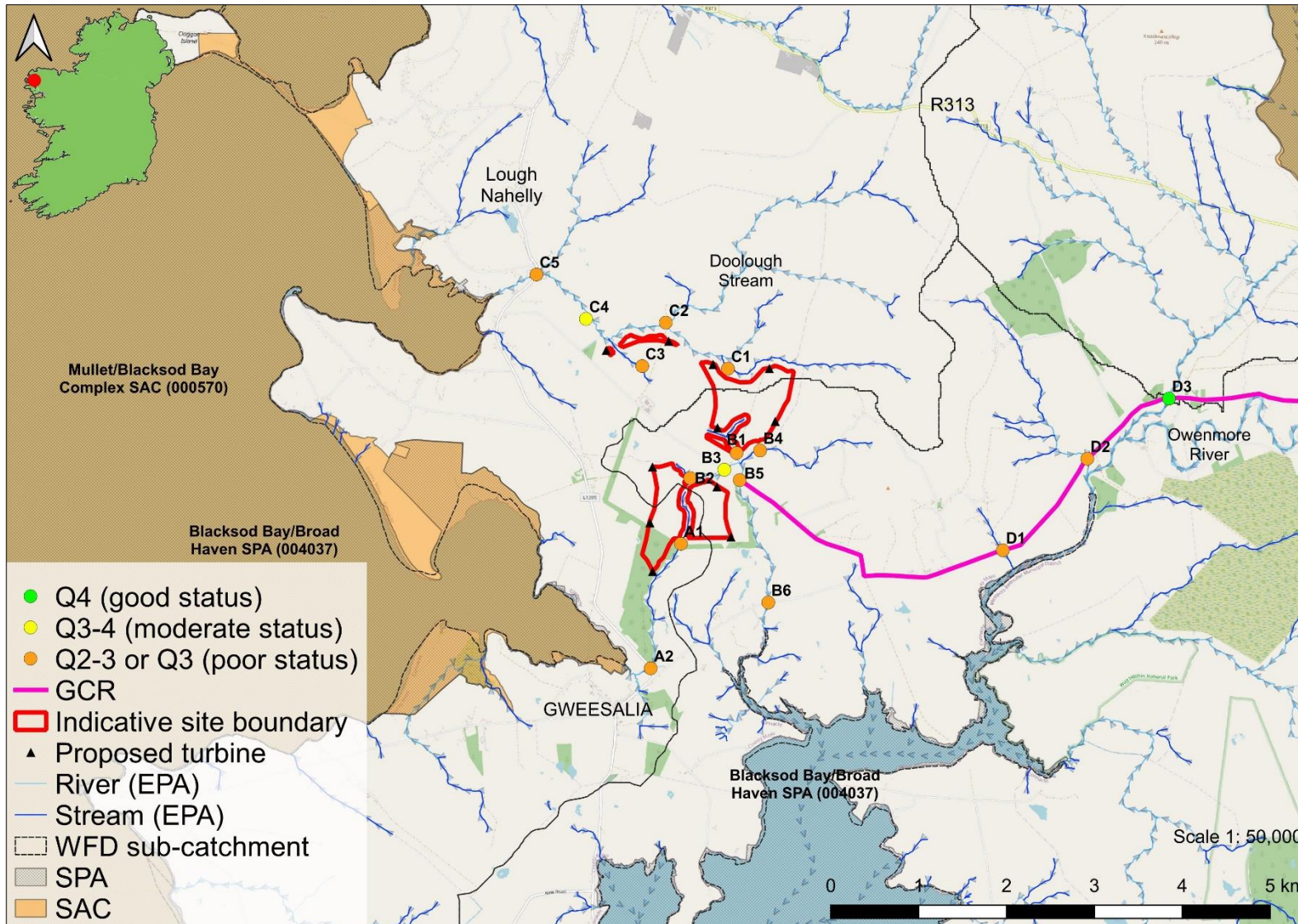


Figure 4.1 Overview of the biological water quality status in the vicinity of the proposed Muingmore wind farm, September 2023

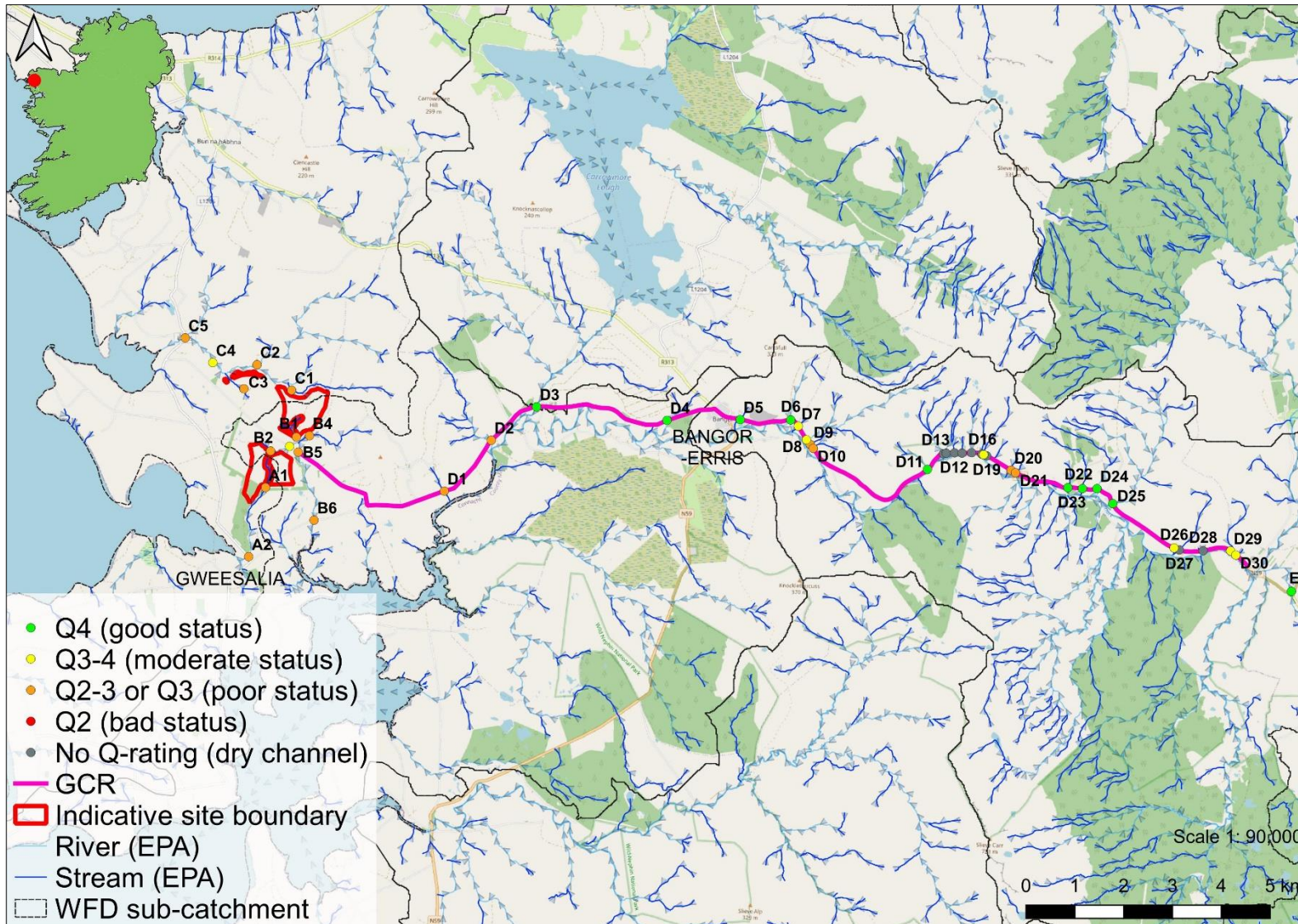


Figure 4.2 Overview of the biological water quality status in the vicinity of the proposed Muingmore wind farm GCR, September 2023



Figure 4.3 Overview of the biological water quality status in the vicinity of the proposed Muingmore wind farm TDR, September 2023

4.7 Aquatic ecological evaluation

An aquatic ecological evaluation of each survey site was based on the results of desktop review (i.e., presence of fish of conservation value), fisheries habitat assessments, the presence of protected or rare invertebrates (e.g. white-clawed crayfish), environmental DNA analysis, the presence of rare macrophytes and aquatic bryophytes and or associated representations of Annex I habitats. Furthermore, biological water quality status also informed the aquatic evaluation (**Table 4.4**).

Sites E2 on the River Deel and E3 on the Ballisodare River were evaluated as **international importance** given their locations within the River Moy SAC (002298) and Unshin River SAC (001898), respectively.

Sites P1, P2, P3 were evaluated as **county importance** given the presence of a macrophyte community representative of the Annex I habitat 'Natural dystrophic lakes and ponds [3160]'. Site P4 was also of **county importance** as it supported abundant pipewort, a near threatened red-listed macrophyte (Wyse-Jackson et al. 2016) and a macrophyte community representative of the Annex I habitat 'Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]'. Site D3 on the Munhin River was also evaluated as **county importance** due to the presence of several fish species of high conservation value (i.e. salmon and lamprey) and Q4 (good status) water quality and the fact that the river serves as an important ecological corridor between several European sites (e.g. Carrowmore Lake SAC and Blacksod Bay/Broad Haven SPA).

A total of 22 no. sites in vicinity of the site boundary (A2, B4, B5, B6, C2, C4 & C5), GCR (D2, D4, D5, D6, D8, D18, D22, D23, D24, D25, D26, D29 & D30) and TDR (E1 & E4) were evaluated as **local importance (higher value)** in terms of their aquatic ecology. This evaluation was due to the presence of fish species of high conservation value, otter and or Q4 (good status) water quality (**Table 4.4**).

The remaining sites 25 no. sites (i.e. sites A1, B1, B2, B3, C1, C3, D1, D7, D9, D10, D11, D12, D13, D14, D15, D16, D17, D19, D20, D21, D27, D28, E5, E6 & E7) were evaluated as **local importance (lower value)** given an absence of aquatic species or habitats of high conservation value and less than good status water quality.

Table 4.2 Relative abundance of fish species of higher conservation value recorded per survey site in the vicinity of the proposed Muingmore wind farm, September 2023

Site	Watercourse	Atlantic salmon	Brown trout	<i>Lampetra</i> sp.	European eel	Other species
Sites in vicinity of site boundary						
A1	Unnamed river	No fish recorded				
A2	Unnamed river				Medium	Flounder
B1	Unnamed river	No fish recorded				
B2	Unnamed river	No fish recorded				
B3	Unnamed river	No fish recorded				
B4	Unnamed stream		Low			
B5	Unnamed river		Medium			
B6	Unnamed river		High		Low	Three-spined stickleback
C1	An Mhoing Mhór River	No fish recorded				
C2	Doolough Stream		High		Low	
C3	Unnamed stream	No fish recorded				
C4	Doolough Stream		High		Low	Three-spined stickleback
C5	Doolough Stream		Very high			
P1	Pond		eDNA		eDNA	
P2	Pond		eDNA		eDNA	
P3	Pond				eDNA	
P4	Pond		eDNA			
GCR crossings						
D1	Unnamed stream	No fish recorded				
D2	Goolamore River		Medium			Minnow
D3	Munhin River	Medium	Low	Low		Sea trout, flounder, minnow
D4	Unnamed river	No fish recorded				
D5	Ballybeg Stream	No fish recorded				
D6	Srahanarry Stream	Medium	Low			
D7	Bellanumera Stream	No fish recorded				
D8	Briska River	Low	Medium		High	
D9	Unnamed stream	No fish recorded				
D10	Unnamed stream	No fish recorded				
D11	Unnamed river	No fish recorded				

Site	Watercourse	Atlantic salmon	Brown trout	<i>Lampetra</i> sp.	European eel	Other species
D12	Unnamed river	No fish recorded				
D13	Unnamed river	No fish recorded				
D14	Unnamed stream	No fish recorded				
D15	Unnamed stream	No fish recorded				
D16	Unnamed river	No fish recorded				
D17	Unnamed stream	No fish recorded				
D18	Unnamed stream		Low		Low	
D19	Unnamed stream	No fish recorded				
D20	Unnamed stream	No fish recorded				
D21	Unnamed stream	No fish recorded				
D22	Unnamed stream		Medium			
D23	Unnamed stream		Low			
D24	Unnamed river		Medium			
D25	Unnamed river	Very high	Medium		Low	
D26	Unnamed stream	Low	Low			Minnow
D27	Kilsallagh Stream	No fish recorded				
D28	Unnamed stream	No fish recorded				
D29	Unnamed stream		Low			
D30	Unnamed stream		Low			Minnow, three-spined stickleback
TDR nodes						
E1	Moneynierin River	Low	Low			Three-spined stickleback
E2	River Deel	High				Minnow, roach, three-spined stickleback
E3	Ballisodare River	High	Low		Medium	
E4	Carrowgobbadagh Stream				Low	Three-spined stickleback
E5	Abbeylands Stream	No fish recorded				
E6	Drumgowan Stream	No fish recorded				
E7	Bogside River	No fish recorded				

Table 4.3 Summary of aquatic species and habitats of higher conservation value recorded in the vicinity of the proposed Muingmore wind farm, September 2023

Site	Watercourse	Freshwater pearl mussel	White-clawed crayfish	Otter signs ⁴	Annex I aquatic habitats	Rare or protected macrophytes/aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
Sites in vicinity of site boundary			None recorded	No signs	Not present	None recorded	None recorded	None recorded
A1	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
A2	Unnamed river	Negative eDNA result at site	None recorded; negative eDNA result at site	No signs	Not present	None recorded	None recorded	None recorded
B1	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
B2	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
B3	Unnamed river		None recorded; negative eDNA result at site	No signs	Not present	None recorded	None recorded	None recorded
B4	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
B5	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
B6	Unnamed river	Negative eDNA result at site	None recorded; negative eDNA result at site	No signs	Not present	None recorded	None recorded	None recorded
C1	An Mhoing Mhór River		None recorded; negative eDNA result at site	No signs	Not present	None recorded	None recorded	None recorded
C2	Doolough Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
C3	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
C4	Doolough Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
C5	Doolough Stream	Negative eDNA result at site	None recorded; negative eDNA result at site	No signs	Not present	None recorded	None recorded	None recorded
P1	Pond		None recorded	No signs	Acid oligotrophic lake [3160]	None recorded	None recorded	European eel (eDNA)

Site	Watercourse	Freshwater pearl mussel	White-clawed crayfish	Otter signs ⁴	Annex I aquatic habitats	Rare or protected macrophytes/aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
P2	Pond		None recorded	No signs	Acid oligotrophic lake [3160]	None recorded	None recorded	European eel (eDNA)
P3	Pond		None recorded	No signs	Acid oligotrophic lake [3160]	Pipewort (<i>Eriocaulon aquaticum</i>)	None recorded	European eel (eDNA)
P4	Pond		None recorded	No signs	Acid oligotrophic lake [3160]; oligotrophic isoetid lake [3110]	Pipewort (<i>Eriocaulon aquaticum</i>)	None recorded	None recorded
GCR crossings								
D1	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D2	Goolamore River		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D3	Munhin River		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon, <i>Lampetra</i> sp., sea trout
D4	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D5	Ballybeg Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D6	Srahanarry Stream		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon
D7	Bellanumera Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D8	Briska River		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon, European eel
D9	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D10	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D11	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D12	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D13	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D14	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded

Site	Watercourse	Freshwater pearl mussel	White-clawed crayfish	Otter signs ⁴	Annex I aquatic habitats	Rare or protected macrophytes/aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
D15	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D16	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D17	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D18	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	European eel
D19	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D20	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D21	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D22	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D23	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D24	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D25	Unnamed river		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon, European eel
D26	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon
D27	Kilsallagh Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D28	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D29	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
D30	Unnamed stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
TDR nodes							None recorded	
E1	Moneynierin River		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon
E2	River Deel		None recorded	No signs	Not present	None recorded	None recorded	Atlantic salmon
E3	Ballisodare River		None recorded	2 no. spraint sites	Floating river vegetation [3260]	None recorded	None recorded	Atlantic salmon

Site	Watercourse	Freshwater pearl mussel	White-clawed crayfish	Otter signs ⁴	Annex I aquatic habitats	Rare or protected macrophytes/aquatic bryophytes	Rare or protected macro-invertebrates	Other species/habitats of high conservation value
E4	Carrowgobbadagh Stream		None recorded	No signs	Floating river vegetation [3260]	None recorded	None recorded	None recorded
E5	Abbeylands Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
E6	Drumgowan Stream		None recorded	No signs	Not present	None recorded	None recorded	None recorded
E7	Bogside River		None recorded	No signs	Not present	None recorded	None recorded	None recorded

Conservation value: Eurasian otter (*Lutra lutra*), Atlantic salmon (*Salmo salar*) & lamprey (*Lampetra* spp.) are listed under Annex II of the Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) ('EU Habitats Directive') and are protected under the Irish Wildlife Acts 1976-2023. European eel are 'critically endangered' according to most recent ICUN red list (Pike et al., 2020) and listed as 'critically engendered' in Ireland (King et al., 2011). Atlantic salmon and sea trout are also protected under the Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations. Apart from the Inland Fisheries Acts 1959 to 2017, non-anadromous brown trout and coarse fish species have no legal protection in Ireland.

⁴ Otter signs within 150m of the survey site

Table 4.4 Aquatic ecological evaluation summary of the Muingmore wind farm survey sites according to NRA (2009) criteria

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
Sites in vicinity of site boundary				
A1	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
A2	Unnamed river	n/a	Local importance (higher value)	Red-listed European eel recorded
B1	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
B2	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
B3	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
B4	Unnamed stream	n/a	Local importance (higher value)	Brown trout recorded
B5	Unnamed river	n/a	Local importance (higher value)	Brown trout recorded
B6	Unnamed river	n/a	Local importance (higher value)	Atlantic salmon, brown trout & Red-listed European eel recorded
P1	Pond	n/a	County importance	Annex I oligotrophic lake habitat [3160] present
P2	Pond	n/a	County importance	Annex I oligotrophic lake habitat [3160] present
P3	Pond	n/a	County importance	Annex I oligotrophic lake habitat [3160] present
P4	Pond	n/a	County importance	Annex I oligotrophic isoetid lake habitat [3110] & near threatened pipewort present
C1	An Mhoing Mhór River	33M23	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
C2	Doolough Stream	33D02	Local importance (higher value)	Brown trout & Red-listed European eel recorded
C3	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
C4	Doolough Stream	33D02	Local importance (higher value)	Brown trout & Red-listed European eel recorded

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
C5	Doolough Stream	33D02	Local importance (higher value)	Brown trout & Red-listed European eel recorded
GCR sites				
D1	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
D2	Goolamore River	33G12	Local importance (higher value)	Atlantic salmon & brown trout recorded
D3	Munhin River	33M03	County importance	Atlantic salmon, brown trout, sea trout & lamprey (<i>Lampetra</i> sp.) recorded; Q4 (good status) water quality
D4	Unnamed river	n/a	Local importance (higher value)	Q4 (good status) water quality
D5	Ballybeg Stream	33B40	Local importance (higher value)	Q4 (good status) water quality
D6	Srahanarry Stream	33S23	Local importance (higher value)	Atlantic salmon & brown trout recorded; Q4 (good status) water quality
D7	Bellanamera Stream	33B38	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3-4 (moderate status) water quality (tentative rating)
D8	Briska River	33B33	Local importance (higher value)	Atlantic salmon, brown trout & Red-listed European eel recorded
D9	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
D10	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
D11	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
D12	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D13	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D14	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D15	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D16	Unnamed river	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
D17	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D18	Unnamed stream	n/a	Local importance (higher value)	Brown trout & Red-listed European eel recorded
D19	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D20	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
D21	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)
D22	Unnamed stream	n/a	Local importance (higher value)	Brown trout recorded; Q4 (good status) water quality
D23	Unnamed stream	n/a	Local importance (higher value)	Brown trout recorded; Q4 (good status) water quality (tentative rating)
D24	Unnamed river	n/a	Local importance (higher value)	Brown trout recorded; Q4 (good status) water quality
D25	Unnamed river	n/a	Local importance (higher value)	Atlantic salmon, brown trout & Red-listed European eel recorded; Q4 (good status) water quality
D26	Unnamed stream	n/a	Local importance (higher value)	Atlantic salmon & brown trout recorded
D27	Kilsallagh Stream	33K13	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D28	Unnamed stream	n/a	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
D29	Unnamed stream	n/a	Local importance (higher value)	Brown trout recorded
D30	Unnamed stream	n/a	Local importance (higher value)	Brown trout recorded;
TDR sites				
E1	Moneynierin River	33M16	Local importance (higher value)	Atlantic salmon & brown trout recorded; Q4 (good status) water quality
E2	River Deel	34D01	International importance	Located within River Moy SAC (002298)
E3	Ballisodare River	35B05	International importance	Located within the Unshin River SAC (001898)

Site no.	Watercourse	EPA code	Evaluation of importance	Rationale summary
E4	Carrowgobbadagh Stream	35C95	Local importance (higher value)	Red-listed European eel recorded
E5	Abbeylands Stream	36A15	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q2-3 (poor status) water quality (tentative rating)
E6	Drumgowan Stream	37D49	Local importance (lower value)	No aquatic species or habitats of high conservation value (dry ephemeral channel)
E7	Bogside River	37B26	Local importance (lower value)	No aquatic species or habitats of high conservation value; Q3 (poor status) water quality (tentative rating)

Conservation value: Eurasian otter (*Lutra lutra*), Atlantic salmon (*Salmo salar*) & lamprey (*Lampetra* spp.) are listed under Annex II of the Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) ('EU Habitats Directive') and are protected under the Irish Wildlife Acts 1976-2023. European eel are 'critically endangered' according to most recent ICUN red list (Pike et al., 2020) and listed as 'critically engendered' in Ireland (King et al., 2011). Atlantic salmon and sea trout are also protected under the Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations. Apart from the Inland Fisheries Acts 1959 to 2017, non-anadromous brown trout and coarse fish species have no legal protection in Ireland.

5. Discussion

The watercourses in the vicinity of the proposed Muingmore wind farm project (inclusive of the GCR & TDR) were typically heavily modified lowland channels (straightened, deepened, realigned) draining blanket bog or higher gradient/higher energy upland channels (prone to spate). Significant siltation (primarily from peat escapement), and less so eutrophication, was evident throughout much of the survey area. This, coupled with low summer flows, reduced the aquatic value of many survey watercourses. Nevertheless, over half of the survey sites were evaluated of at least **local importance (higher value)** in terms of their aquatic ecology given the presence of fish of high conservation value and or Q4 (good status) water quality (**Table 4.4**). Sites P1, P2, P3 and P4 were evaluated as **county importance** given the presence of Annex I aquatic habitats. Sites E2 on the River Deel and E3 on the Ballisodare River were evaluated as **international importance** given their locations within the River Moy SAC (002298) and Unshin River SAC (001898), respectively.

5.1 Fisheries

A fish species assemblage typical of Ireland's north-west – namely Atlantic salmon, brown trout, sea trout, European eel, lamprey (*Lampetra* sp.), three-spined-stickleback, minnow and flounder - were recorded during the electro-fishing survey (**Table 4.2**). Although brown trout were relatively widespread in the survey area inclusive of the GCR (recorded at 23 no. sites), Atlantic salmon were more localised and recorded from a total of 10. no sites on an unnamed Tullaghan Bay tributary (B6), Goolamore River (D2), Munhin River (D3), Srahanarry Stream (D6), Broska River (D8), unnamed Owenmore tributaries (D25, D26), Moneynierin River (E1), River Deel (E2) and the Ballisodare River (E3) (**Appendix A**). Fish populations in vicinity of the site boundary were dominated by brown trout with Atlantic salmon recorded only from the lower reaches of an unnamed Tullaghan Bay tributary (site B6). Sea trout were recorded from a single site on the Munhin River (D3). Lamprey (*Lampetra* sp.) were also recorded from a single site only (Munhin River at site D3) and this restricted distribution reflected the poor habitat suitability in the survey area (i.e. higher energy and heavily silted peat channels; **Appendix A**). European eel were recorded in typically low abundances from a total of 9 no. riverine sites on an unnamed river (A2), an unnamed Tullaghan Bay tributary (B6), Doolough Stream (C2, C4), Briska River (D8), unnamed Owenmore River tributary (D18, D25), Ballisodare River (E3) and the Carrowgobbadagh Stream (E4), in addition to pond sites P1, P2 and P3 (eDNA only) (**Table 3.1**). The restricted distribution of European eel in the survey area was also primarily due sub-optimal habitat (**Appendix A**). Of the riverine survey sites, 27 of 50 in total did not support fish at the time of survey given poor quality fisheries habitats or dry, ephemeral channels.

5.2 Annex I aquatic habitats

The Annex I habitat 'Water courses of plain to montane levels, with submerged or floating vegetation of the *Ranunculion fluitantis* and *Callitriche-Batrachion* (low water level during summer) or aquatic mosses [3260]' (commonly referred to as floating river vegetation, FRV) was recorded at sites E3 on the Ballisodare River and E4 on the Carrowgobbadagh Stream (adjacent to proposed TDR works). Whilst not representing a diverse example of the habitat, the tidal reaches of the heavily modified Carrowgobbadagh Stream (E4) supported abundant macrophytes including several FRV indicators such as *Callitriche stagnalis*, *Potamogeton* sp. & *Ranunculus* sp. (EC, 2013). The Ballisodare River (E4)

supported floating river vegetation primarily due to the presence of indicator *Ranunculus* sp. and *Fontanalis antipyretica*.

Three pond sites (P1, P2, P3 & P4) (in vicinity of the site boundary) corresponded the Annex I habitat ‘Natural dystrophic lakes and ponds [3160]’. Annex I acid oligotrophic lakes are typically associated with small lakes and ponds in Atlantic and upland blanket bog, and wet heath (Gray et al., 2022; O’Connor, 2015) and are considered species-poor botanically with a community characterised by bryophytes of the genus *Sphagnum* and sustain the *Utricularietalia* phytosociological order (EC, 2013). In Ireland, this lake habitat has been broadly interpreted as ‘species poor lake and pond systems dominated by *Sphagnum* mosses and restricted to blanket bogs and wet heaths’ (O’Connor, 2015). Whilst the margins of sites P1, P2 and P3 were dominated by *Sphagnum* species such as *S. cuspidatum*, site P4 was more representative of the Annex I oligotrophic isoetid lake habitat [3110] with species including bog pondweed, bladderwort (*Utricularia* sp.), bulbous rush and locally abundant Red-listed pipewort, a Red-listed, near-threatened species in Ireland with a limited distribution (Wyse-Jackson et al., 2016). However, the co-occurrence of both habitats is common in Ireland (Evans, 2006).

5.3 Crayfish plague detection

No white-clawed crayfish were recorded through hand searching of instream refugia during the surveys, or via eDNA sampling, thus supporting the absence of historical and contemporary records from the Blacksod-Broadhaven hydrometric area (33) and much of the survey area (with the exception of the River Deel & Ballisodare River; NPWS & NCPSP⁴ data). This absence is primarily due to low alkalinities and unsuitable geologies for the species (Demers et al., 2005; Lucy & McGarrigle, 1987).

However, the invasive pathogen crayfish plague was detected via eDNA sampling at all 3 no. sampling riverine locations in vicinity of the proposed wind farm site boundary despite the absence of crayfish (**Table 4.1**). Crayfish plague had previously been detected in hydrometric area 33 by Triturus using eDNA sampling in the Owenmore River (near Bellacorick) and Ballinglen River catchments in 2022. Crayfish plague is listed at one of the world’s 100 worst invasive species (GISD, 2022; Lowe et al., 2000) and is becoming highly prevalent across Ireland.

5.4 Otter

Although suitable foraging habitat was widespread, otter signs were only recorded (within 150m of the survey sites) at a single site on the Ballisodare River (E3), where 2 no. spraint sites (and anal jelly) were recorded under the N59 road bridge. The paucity of signs throughout the survey area, inclusive of the site boundary and GCR, was considered to mainly reflect the smaller, higher-energy, high gradient nature of most survey watercourses which generally provide more restricted, stochastic prey resources and reduced foraging opportunities for otter compared with lower-gradient, larger watercourses (Scorpio et al., 2016; Remonti et al., 2009). Furthermore, predation by otter (and hence habitat utilisation) in small salmonid tributaries is highly seasonal and closely linked to adult migrations in the autumn and winter periods (Sittenthaler et al., 2019; Carss et al., 1990). No breeding (holt) or couch (resting) areas were identified in the vicinity of the survey sites in September 2023.

⁴ National Crayfish Plague Surveillance Programme

5.5 Macro-invertebrates

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the samples taken from 50 no. riverine or 4 no. pond sites (**Appendix C**). Whilst a low number of sites (11 no. but none within vicinity of the proposed site boundary or turbine array; **Figure 4.1**) achieved **Q4 (good status)**, the majority of sampling sites failed to meet the target good status ($\geq Q4$) requirements of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC). Siltation and less so eutrophication of the watercourses (primarily from peat escapement but also agriculture & forestry) was noted during the surveys and is known to be the primary threat to water quality in the survey area (EPA data), in addition to hydromorphological modifications.

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7. Appendix A – fisheries assessment report

Please see accompanying fisheries assessment report

8. Appendix B – eDNA analysis lab report

Folio No: E19345
Report No: 1
Client: Triturus Environmental Ltd
Contact: Bill Brazier

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN WATER FOR AQUATIC SPECIES DETECTION

SUMMARY

When aquatic organisms inhabit a waterbody such as a pond, lake or river they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm the presence or absence of the target species within the waterbody.

RESULTS

Date sample received in laboratory: 20/10/2023
Date results reported: 26/10/2023
Matters affecting result: None

TARGET SPECIES: Brown (Sea) Trout
(Salmo trutta)

Lab ID	Site Name	OS Reference	SIC	DC	IC	Result	Positive Replicates
FK1692	P1 – Pond, Muingmore WF	-	Pass	Pass	Pass	Positive	1/12
FK1691	P3 - Pond, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1687	P4 - Pond, Muingmore WF	-	Pass	Pass	Pass	Positive	1/12
FK1695	P5 – Pond, Muingmore WF	-	Pass	Pass	Pass	Positive	1/12



Forensic Scientists and Consultant Engineers
 SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE, UK
 Tel: +44 (0)1332 292003 Email: scientific@surescreen.com
 Company Registration No. 08950940

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Crayfish plague (*Aphanomyces astaci*)

Lab ID	Site Name	OS Reference	SIC	DC	IC	Result	Positive Replicates
FK1608	A2 – Unnamed river, Muingmore WF	-	Pass	Pass	Pass	Positive	12/12
FK1611	B6 – Unnamed river, Muingmore WF	-	Pass	Pass	Pass	Positive	11/12
FK1615	C5 – Doolough Stream, Muingmore WF	-	Pass	Pass	Pass	Positive	11/12

European eel (*Anguilla anguilla*)

Lab ID	Site Name	OS Reference	SIC	DC	IC	Result	Positive Replicates
FK1692	P1 – Pond, Muingmore WF	-	Pass	Pass	Pass	Positive	12/12
FK1691	P3 - Pond, Muingmore WF	-	Pass	Pass	Pass	Positive	12/12
FK1687	P4 - Pond, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1695	P5 – Pond, Muingmore WF	-	Pass	Pass	Pass	Positive	2/12

Freshwater pearl mussel (*Margaritifera margaritifera*)

Lab ID	Site Name	OS Reference	SIC	DC	IC	Result	Positive Replicates
FK1608	A2 – Unnamed river, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1611	B6 – Unnamed river, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1615	C5 – Doolough Stream, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12



Smooth Newt (*Lissotriton vulgaris*)

Lab ID	Site Name	OS Reference	SIC	DC	IC	Result	Positive Replicates
FK1692	P1 – Pond, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1691	P3 - Pond, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1687	P4 - Pond, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1695	P5 – Pond, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12

White-clawed crayfish (*Austropotamobius pallipes*)

Lab ID	Site Name	OS Reference	SIC	DC	IC	Result	Positive Replicates
FK1608	A2 – Unnamed river, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1611	B6 – Unnamed river, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12
FK1615	C5 – Doolough Stream, Muingmore WF	-	Pass	Pass	Pass	Negative	0/12

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Jennifer Higginbottom

Approved by: Lauryn Jewkes



Forensic Scientists and Consultant Engineers
 SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE, UK
 Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
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METHODOLOGY

The samples detailed above have been analysed for the presence of target species eDNA following scientifically published eDNA assays and protocols which have been thoroughly tested, developed and verified for use by SureScreen Scientifics.

The analysis is conducted in two phases. The sample first goes through an extraction process where the filter is incubated in order to obtain any DNA within the sample. The extracted sample is then tested via real time PCR (also called q-PCR) for each of the selected target species. This process uses species-specific molecular markers (known as primers) to amplify a select part of the DNA, allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines amplification and detection of target DNA into a single step. With qPCR, fluorescent dyes specific to the target sequence are used to label targeted PCR products during thermal cycling. The accumulation of fluorescent signals during this reaction is measured for fast and objective data analysis. The primers used in this process are specific to a part of mitochondrial DNA only found in each individual species. Separate primers are used for each of the species, ensuring no DNA from any other species present in the water is amplified.

If target species DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If target species DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.



INTERPRETATION OF RESULTS

- SIC: Sample Integrity Check [Pass/Fail]**
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
- DC: Degradation Check [Pass/Fail]**
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample, between the date it was made to the date of analysis. Degradation of the spiked DNA marker may indicate a risk of false negative results.
- IC: Inhibition Check [Pass/Fail]**
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
- Result: Presence of eDNA [Positive/Negative/Inconclusive]**
- Positive:** DNA was identified within the sample, indicative of species presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
- Positive Replicates:** Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for species presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. Even a score as low as 1/12 is declared positive. 0/12 indicates negative species presence.
- Negative:** eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of species absence, however, does not exclude the potential for species presence below the limit of detection.
- Inconclusive:** Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for species presence or absence.



9. Appendix C – Macro-invertebrates (biological water quality)

Table 8.1 Macro-invertebrate Q-sampling results for riverine sites in the vicinity of the proposed wind farm site boundary, September 2023 (* = tentative rating)

Group	Family	Species	A1	A2	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	EPA class
Plecoptera	Nemouridae	<i>Nemoura cinerea</i>					1							1		A
Plecoptera	Leuctridae	<i>Leuctra fusca</i>												1	1	B
Plecoptera	Leuctridae	<i>Leuctra hippopus</i>						1	4	7				3	4	B
Trichoptera	Goeridae	<i>Silo pallipes</i>													1	B
Trichoptera	Limnephilidae	<i>Potamophylax cingulatus</i>					1									B
Trichoptera	Limnephilidae	sp. indet. (early instar)								2						B
Trichoptera	Rhyacophilidae	<i>Rhyacophila dorsalis</i>							2							B
Odonata	Coenagrionidae	sp. indet.	6			6							2			B
Odonata	Libellulidae	<i>Sympetrum</i> sp.	2			1										B
Ephemeroptera	Baetidae	<i>Baetis rhodani</i>		1				1	29	45		18		17	10	C
Trichoptera	Polycentropodidae	<i>Plectrocnemia conspersa</i>			1	1										C
Trichoptera	Polycentropodidae	<i>Polycentropus kingi</i>						3								C
Crustacea	Gammaridae	<i>Gammarus duebeni</i>		17	1			3					1	1	8	C
Coleoptera	Dytiscidae	Dytiscidae larva		1	18			1	1				2			C
Coleoptera	Dytiscidae	<i>Dytiscus dimidiatus</i>					1									C
Coleoptera	Dytiscidae	<i>Hygrotus inaequalis</i>				1										C
Coleoptera	Dytiscidae	<i>Ilybius fuliginosus</i>			1											C
Coleoptera	Dytiscidae	<i>Oreodytes sanmarkii</i>												1	1	C
Coleoptera	Dytiscidae	<i>Oreodytes septentrionalis</i>												1		C
Coleoptera	Dytiscidae	<i>Stictotarsus duodecimpustulatus</i>								2		1				C
Coleoptera	Elmidae	<i>Elmis aenea</i>								1						C
Coleoptera	Elmidae	<i>Limnius volckmari</i>						1					1		1	C
Coleoptera	Elmidae	<i>Oulimnius tuberculatus</i>					1					1				C
Coleoptera	Gyrinidae	Gyrinidae larva													2	C
Coleoptera	Gyrinidae	<i>Gyrinus substriatus</i>	2		1	1	1									C

Group	Family	Species	A1	A2	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	EPA class
Coleoptera	Hydrophilidae	<i>Anacaena globulus</i>	1													C
Diptera	Chironomidae	Non- <i>Chironomus</i> spp.			2		1				8		15	1	4	C
Diptera	Culicidae	sp. indet.			1		1						2			C
Diptera	Dixidae	sp. indet.	1		1											C
Diptera	Pediciidae	<i>Dicranota</i> sp.							1						2	C
Diptera	Simuliidae	sp. indet.							2	1		26		4	16	C
Diptera	Tipuliidae	sp. indet.	1													C
Hemiptera	Corixidae	<i>Hesperocorixa linnaei</i>											3			C
Hemiptera	Corixidae	<i>Hesperocorixa sahlbergi</i>	1			1										C
Hemiptera	Hydrometridae	<i>Hydrometra stagnorum</i>	1												1	C
Hemiptera	Gerridae	<i>Gerris</i> sp.									8					C
Hemiptera	Notonectidae	Notonectidae nymph			1											C
Hemiptera	Veliidae	<i>Velia caprai</i>	1													C
Hemiptera	Veliidae	Veliidae nymph			1		1						1			C
Gastropoda	Tateidae	<i>Potamopyrgus antipodarum</i>					2			10		4	4		4	C
Arachnida	Hydrachnidiae	sp. indet.													1	C
Gastropoda	Lymnaeidae	<i>Ampullacaena balthica</i>										4	1	1	18	D
Mollusca	Sphaeriidae	sp. indet.	4		4								2			D
Crustacea	Asellidae	<i>Asellus aquaticus</i>			8		1									D
Hirudinidae	Glossiphoniidae	<i>Glossiphonia complanata</i>								3		1			1	D
Diptera	Chironomidae	<i>Chironomus</i> spp.		1	8			8			2				1	E
Annelidae	Oligochaeta	sp. indet.							1						2	n/a
Malacostraca	Crangonidae	<i>Crangon crangon</i>		1												n/a
Abundance			20	21	48	11	11	18	40	71	18	55	34	31	78	
Q-rating			*Q3	*Q3	*Q3	*Q3	*Q3-4	Q2-3	Q3	Q3	*Q3	Q3	*Q3	Q3-4	Q3	
WFD status			Poor	Poor	Poor	Poor	Mod	Poor	Poor	Poor	Poor	Poor	Poor	Mod	Poor	

Table 8.2a Macro-invertebrate Q-sampling results for riverine sites in the vicinity of the proposed wind farm GCR, September 2023 (* = tentative rating)

Group	Family	Species	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D18	D20	EPA class
Ephemeroptera	Heptageniidae	<i>Heptagenia sulphurea</i>			6					1						A
Plecoptera	Chloroperlidae	<i>Siphonoperla torrentium</i>						1								A
Plecoptera	Nemouridae	<i>Protonemura meyeri</i>					5	16	2				4	1		A
Plecoptera	Nemouridae	<i>Nemoura cinerea</i>				7										A
Plecoptera	Perlodidae	<i>Isoperla grammatica</i>											1			A
Ephemeroptera	Baetidae	<i>Alainites muticus</i>									1					B
Plecoptera	Leuctridae	<i>Leuctra fusca</i>							1	1		1				B
Plecoptera	Leuctridae	<i>Leuctra hippopus</i>	1					5			4	12	3	1		B
Trichoptera	Goeridae	<i>Silo pallipes</i>		1										1		B
Trichoptera	Limnephilidae	<i>Potamophylax cingulatus</i>								1						B
Trichoptera	Limnephilidae	sp. indet. (early instar)												1		B
Trichoptera	Psychomyiidae	<i>Tinodes waeneri</i>										1				B
Trichoptera	Rhyacophilidae	<i>Rhyacophila dorsalis</i>		1									1			B
Hemiptera	Aphelocheiridae	<i>Aphelocheirus aestivalis</i>			11	1										B
Odonata	Coenagrionidae	sp. indet.				11										B
Odonata	Libellulidae	<i>Sympetrum</i> sp.				1										B
Ephemeroptera	Baetidae	<i>Baetis rhodani</i>	1	5	3		40	1	3	10		23	2			C
Trichoptera	Hydropsychidae	<i>Diplectrona felix</i>	3					1			1		2	1		C
Trichoptera	Hydropsychidae	<i>Hydropsyche instabilis</i>			10	2	1									C
Trichoptera	Philopotamidae	<i>Philopotamus montanus</i>									24	2				C
Trichoptera	Philopotamidae	<i>Wormaldia occipitalis</i>					2	3					4			C
Trichoptera	Polycentropodidae	<i>Plectrocnemia conspersa</i>						2			4		2	1		C
Trichoptera	Polycentropodidae	<i>Polycentropus kingi</i>													2	C
Crustacea	Gammaridae	<i>Gammarus duebeni</i>	7	11	4	10			2	2	7	3		6	11	C
Coleoptera	Dytiscidae	<i>Stictotarsus duodecimpustulatus</i>				1										C

Group	Family	Species	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D18	D20	EPA class
Coleoptera	Elmidae	<i>Elmis aenea</i>		1					1					1		C
Coleoptera	Elmidae	<i>Limnius volckmari</i>	2	11	7			1								C
Coleoptera	Elmidae	<i>Oulimnius tuberculatus</i>						1								C
Coleoptera	Scirtidae	Scirtidae larva										1				C
Diptera	Chironomidae	Non- <i>Chironomus</i> spp.				3	1	2	4		1				2	C
Diptera	Culicidae	sp. indet.				1	1									C
Diptera	Pediciidae	<i>Dicranota</i> sp.	2	1		1	2		1							C
Diptera	Simuliidae	sp. indet.		7		1	5	3			3	7	2	1		C
Diptera	Tipuliidae	sp. indet.									1				1	C
Hemiptera	Gerridae	<i>Gerris</i> sp.													8	C
Hemiptera	Veliidae	Veliidae nymph		2							1					C
Gastropoda	Tateidae	<i>Potamopyrgus antipodarum</i>	9	9	6	4	2	1	1	6				11		C
Arachnida	Hydrachnidiae	sp. indet.					1									C
Hirudinidae	Piscicolidae	<i>Piscicola</i> sp.												1		C
Gastropoda	Lymnaeidae	<i>Ampullacaena balthica</i>			4	1										D
Hirudinidae	Glossiphoniidae	<i>Glossiphonia complanata</i>			4											D
Diptera	Chironomidae	<i>Chironomus</i> spp.				1			1							E
Annelidae	Oligochaeta	sp. indet.	3	1	1		1	1						2		n/a
Abundance			28	50	56	45	61	38	16	21	47	50	21	28	24	
Q-rating			Q3	Q3	Q4	Q4	Q4	Q4	*Q3-4	Q3-4	*Q3	*Q3	Q4	Q3-4	*Q3	
WFD status			Poor	Poor	Good	Good	Good	Good	Mod	Mod	Poor	Poor	Good	Mod	Poor	

Table 8.2b Macro-invertebrate Q-sampling results for riverine sites in the vicinity of the proposed wind farm GCR, September 2023 (* = tentative rating)

Group	Family	Species	D21	D22	D23	D24	D25	D26	D29	D30	EPA class
Ephemeroptera	Ephemeridae	<i>Ephemera danica</i>		9	15	10	26	14	11	19	A
Ephemeroptera	Heptageniidae	<i>Ecdyonurus dispar</i>				1					A
Ephemeroptera	Heptageniidae	<i>Rhithrogena semicolorata</i>					3				A
Plecoptera	Chloroperlidae	<i>Siphonoperla torrentium</i>					1				A
Plecoptera	Perlodidae	<i>Isoperla grammatica</i>				1				8	A
Ephemeroptera	Baetidae	<i>Alainites muticus</i>		1	1	1				3	B
Plecoptera	Leuctridae	<i>Leuctra hippopus</i>	2	9	9	16	10	2	12	9	B
Trichoptera	Sericostomatidae	<i>Sericostoma personatum</i>			4	7	5		2	3	B
Hemiptera	Aphelocheiridae	<i>Aphelocheirus aestivalis</i>			2			1	5	1	B
Ephemeroptera	Ephemerellidae	<i>Serratella ignita</i>					1				C
Trichoptera	Hydropsychidae	<i>Hydropsyche instabilis</i>							1	1	C
Trichoptera	Hydropsychidae	<i>Hydropsyche siltalai</i>	4	1			2			2	C
Trichoptera	Philopotamidae	<i>Wormaldia occipitalis</i>					1				C
Trichoptera	Polycentropodidae	<i>Plectrocnemia conspersa</i>	1	2					3		C
Trichoptera	Polycentropodidae	<i>Polycentropus kingi</i>		1			1		2	2	C
Coleoptera	Dytiscidae	<i>Oreodytes septentrionalis</i>						1			C
Coleoptera	Elmidae	<i>Elmis aenea</i>		8		8		16	6	5	C
Coleoptera	Gyrinidae	<i>Gyrinus substriatus</i>								1	C
Coleoptera	Scirtidae	Scirtidae larva							1		C
Diptera	Chironomidae	Non- <i>Chironomus</i> spp.	1				1			1	C
Diptera	Culicidae	sp. indet.		1					1		C
Diptera	Limoniidae	<i>Antocha</i> sp.		9	15	10	26	14	11	19	C
Diptera	Pediciidae	<i>Dicranota</i> sp.				1					C
Diptera	Tipuliidae	sp. indet.					3				C
Hemiptera	Corixidae	<i>Hesperocorixa linnaei</i>					1				C

Group	Family	Species	D21	D22	D23	D24	D25	D26	D29	D30	EPA class
Hemiptera	Gerridae	<i>Gerris</i> sp.				1				8	C
Hemiptera	Notonectidae	Notonectidae nymph		1	1	1				3	C
Hemiptera	Veliidae	Veliidae nymph	2	9	9	16	10	2	12	9	C
Hirudinidae	Glossiphoniidae	<i>Glossiphonia complanata</i>			4	7	5		2	3	D
Diptera	Chironomidae	<i>Chironomus</i> spp.			2			1	5	1	E
Abundance			8	40	37	56	85	36	47	58	
Q-rating			*Q3	Q4	Q4	Q4	Q4	Q3-4	Q3-4	Q3-4	
WFD status			Poor	Good	Good	Good	Good	Mod	Mod	Mod	

Table 8.3 Macro-invertebrate Q-sampling results for riverine sites in the vicinity of the proposed wind farm TDR, September 2023 (* = tentative rating)

Group	Family	Species	E1	E2	E3	E4	E5	E7	EPA class
Ephemeroptera	Ephemeridae	<i>Ephemera danica</i>			3				A
Ephemeroptera	Heptageniidae	<i>Ecdyonurus dispar</i>	6		2				A
Ephemeroptera	Heptageniidae	<i>Heptagenia sulphurea</i>	2	1	3				A
Plecoptera	Nemouridae	<i>Protonemura meyeri</i>	5						A
Ephemeroptera	Baetidae	<i>Alainites muticus</i>	1					1	B
Plecoptera	Leuctridae	<i>Leuctra fusca</i>	5					1	B
Trichoptera	Hydroptilidae	<i>Ithytrichia</i> sp.			1				B
Trichoptera	Odontoceridae	<i>Odontocerum albicorne</i>	1						B
Trichoptera	Rhyacophilidae	<i>Rhyacophila dorsalis</i>		1	3			1	B
Trichoptera	Sericostomatidae	<i>Sericostoma personatum</i>						1	B
Ephemeroptera	Baetidae	<i>Baetis rhodani</i>	18		5				C
Ephemeroptera	Ephemerellidae	<i>Serratella ignita</i>	1		1				C
Trichoptera	Hydropsychidae	<i>Hydropsyche instabilis</i>	1						C
Trichoptera	Hydropsychidae	<i>Hydropsyche siltalai</i>	1		1				C
Trichoptera	Philopotamidae	<i>Chimarra marginata</i>			17				C




Group	Family	Species	E1	E2	E3	E4	E5	E7	EPA class
Trichoptera	Philopotamidae	<i>Wormaldia occipitalis</i>						3	C
Trichoptera	Polycentropodidae	<i>Plectrocnemia conspersa</i>						1	C
Trichoptera	Polycentropodidae	<i>Polycentropus kingi</i>					1	1	C
Crustacea	Gammaridae	<i>Gammarus duebeni</i>	2		3			19	C
Coleoptera	Dytiscidae	<i>Nebrioporus depressus</i>		1					C
Coleoptera	Elmidae	<i>Elmis aenea</i>	2		2			2	C
Coleoptera	Elmidae	<i>Limnius volckmari</i>	1						C
Diptera	Chironomidae	Non- <i>Chironomus</i> spp.					2		C
Diptera	Pediciidae	<i>Dicranota</i> sp.	1						C
Diptera	Simuliidae	sp. indet.	5		3				C
Diptera	Tipuliidae	sp. indet.					5		C
Hemiptera	Veliidae	Veliidae nymph						2	C
Gastropoda	Bithyniidae	<i>Bithynia tentaculata</i>			3				C
Gastropoda	Tateidae	<i>Potamopyrgus antipodarum</i>	1	8					C
Gastropoda	Planorbidae	<i>Planorbis planorbis</i>			1				C
Gastropoda	Lymnaeidae	<i>Ampullacaena balthica</i>		1		277			D
Crustacea	Asellidae	<i>Asellus aquaticus</i>		2	1	4	4		D
Hirudinidae	Glossiphoniidae	<i>Glossiphonia complanata</i>					2		D
Diptera	Chironomidae	<i>Chironomus</i> spp.				8		1	E
Abundance			53	14	49	289	14	33	
Q-rating			Q4	Q3-4	Q4	*Q2	Q2-3	Q3	
WFD status			Good	Mod	Good	Bad	Poor	Poor	





Table 8.4 Macro-invertebrate Q-sampling results for pond sites P1, P2, P3 & P4, September 2023 (listed in order of abundance)





Group	Family	Species	P1	P2	P3	P4
Odonata	Coenagrionidae	sp. indet.	23	22	44	15
Diptera	Chaoboridae	sp. indet.	9	9		1
Hemiptera	Corixidae	<i>Corixa punctata</i>	7			
Hemiptera	Notonectidae	<i>Notonecta viridis</i>	7	6		
Diptera	Chironomidae	<i>Chironomus</i> spp.	4	3	9	2
Mollusca	Lymnaeidae	<i>Ampullacaena balthica</i>	4	3		
Diptera	Dixidae	sp. indet.	2			
Trichoptera	Polycentropodidae	<i>Plectrocnemia conspersa</i>	2	1		1
Diptera	Chironomidae	Non- <i>Chironomus</i> spp.	1		3	
Hemiptera	Corixidae	<i>Callicorixa praeusta</i>	1	1		
Hemiptera	Corixidae	<i>Sigara</i> sp.	1			
Odonata	Libellulidae	<i>Sympetrum</i> sp.	1		7	
Coleoptera	Dytiscidae	<i>Hygrotus inaequalis</i>		1		
Coleoptera	Dytiscidae	<i>Ilybius fuliginosus</i>		1		
Coleoptera	Gyrinidae	<i>Gyrinus aeratus</i>			1	
Coleoptera	Gyrinidae	<i>Gyrinus substriatus</i>				1
Diptera	Ceratopogonidae	sp. indet.			3	
Diptera	Culicidae	sp. indet.		1		
Ephemeroptera	Leptophlebiidae	<i>Paraleptoplebia</i> sp.			1	1
Hemiptera	Corixidae	<i>Hesperocorixa moesta</i>			2	
Mollusca	Sphaeriidae	sp. indet.		7		
Trichoptera	Leptoceridae	<i>Triaenodes bicolor</i>			1	
Abundance			62	55	71	21





10. Appendix D – aquatic survey site summaries for GCR & TDR sites





Table 10.1 Summary of GCR and TDR aquatic survey sites, September 2023





Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
GCR crossings						
D1	Unnamed stream	Historically deepened & realigned stream (FW2). 0.5m wide, 0.1-0.2m deep. Slow-flowing glide & riffle with no pool. Bedded boulder, cobble & mixed gravels with moderate siltation. No macrophytes due to shading with occasional <i>Rhynchostrigium riparioides</i> . Bordered by GA1 habitat.	Not of fisheries value due to small size & depths. No fish recorded.	Q3 (poor status)	Local importance (lower value)	
D2	Goolamore River (33G12)	Historically deepened lowland river (FW2) with semi-natural profile of slow-flowing glide & pool. 3m wide & 0.1-0.4m deep. Heavily silted boulder, cobble & mixed gravels. No macrophytes due to shading with abundant <i>Fontinalis antipyretica</i> & <i>Rhynchostrigium riparioides</i> . Bordered by wet GA1 habitat.	Atlantic salmon, brown trout & minnow recorded. Moderate quality salmonid spawning, nursery & holding habitat.	Q3 (poor status)	Local importance (higher value)	
D3	Munhin River (33M03)	Large semi-natural lowland tributary of Owenmore River. 8-10m wide and 0.2-1.6m deep with profile of riffle, glide & pool. Abundant mixed gravels & sand with small boulder & cobble. Moderate siltation. Occasional <i>Potamogeton</i> sp., <i>Myriophyllum alterniflorum</i> , <i>Callitriche hamulata</i> & <i>Sparganium erectum</i> with frequent <i>Fontinalis antipyretica</i> . Bordered by wet GA1 habitat.	Atlantic salmon, brown trout, sea trout, lamprey (<i>Lampetra</i> sp.), minnow & flounder recorded. Good quality salmonid habitat with sub-optimal lamprey habitat.	Q4 (good status)	Local importance (higher value)	





Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D4	Unnamed river	Historically straightened & deepened lowland tributary (FW2) of Owenmore River. 1m wide & 0.05-0.1m deep with poor flows. Riffle & stagnant pools. Small boulder with cobble & heavily silted gravels. No macrophytes or aquatic bryophytes. Bordered by GA1 and WD4 habitat.	Not of fisheries value due to small size, shallow depths & poor flows. No fish recorded.	Q4 (poor status)	Local importance (higher value)	
D5	Ballybeg Stream (33B40)	Historically realigned lowland tributary (FW2) of Owenmore River. 1.5m wide & 0.05m deep with poor flows & much of bed exposed (dry). Small boulder & cobble with mixed gravels. No macrophytes or aquatic bryophytes. Bordered by BL3 habitat (Bangor Erris).	Not of fisheries value due to small size, shallow depths & poor flows. No fish recorded.	Q4 (poor status)	Local importance (higher value)	
D6	Srahanarry Stream (33S23)	Semi-natural upland spate tributary (FW1) of Owenmore River. 1.5-3m wide & 0.1-0.5m deep with boulder cascades. Boulder & cobble with localised mixed gravels. Moderate siltation. No macrophytes but occasional <i>Fontinalis antipyretica</i> , <i>Scapania undulata</i> & <i>Brachythecium rivulare</i> . Bordered by GA1 habitat.	Atlantic salmon & brown trout recorded. Good quality salmonid nursery & spawning habitat. Culvert was a significant barrier to fish passage.	Q4 (poor status)	Local importance (higher value)	
D7	Bellanumera Stream (33B38)	Historically realigned upland stream (FW1) with low summer flows. 0.5m wide & 0.05m deep. Exposed small boulder & cobble with coarse gravels, moderate siltation. No macrophytes or aquatic bryophytes. Bordered by wet GA1 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3-4 (moderate status) (tentative rating)	Local importance (lower value)	





Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D8	Briska River	Semi-natural, high-energy upland spate tributary (FW1) of Owenmore River. 2.5-3m wide & 0.1-0.4m deep. Boulder cascades with boulder, cobble & mixed gravels with moderate siltation. No macrophytes but occasional <i>Fontinalis antipyretica</i> & <i>Rhynchostegium riparioides</i> . Bordered by GA1 habitat.	Atlantic salmon, brown trout & European eel recorded. Very good quality salmonid nursery & good quality spawning habitat. High value eel nursery.	Q3-4 (moderate status)	Local importance (higher value)	
D9	Unnamed stream	Historically deepened & realigned upland tributary (FW1) of Owenmore River. 0.5m wide & 0.05m with poor flows. Small boulder & cobble with localised coarse gravels. Moderate siltation. No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3 (poor status) (tentative rating)	Local importance (lower value)	
D10	Unnamed stream	Historically deepened upland tributary (FW1) of Owenmore River. 0.5m wide & 0.05-0.2m deep. Boulder cascades with low flows & shallow glide. Semi-dry bed with cobble & localised coarse gravels, moderate siltation. No macrophytes but occasional <i>Brachythecium rivulare</i> . Bordered by GA1 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3 (poor status) (tentative rating)	Local importance (lower value)	
D11	Unnamed river	High gradient, seasonal upland tributary (FW1) of Owenmore River. 1-1.5m wide & 0.05m deep. Sinuous profile with cascades & localised pool with angular cobble & boulder. No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3 (poor status) (tentative rating)	Local importance (lower value)	




Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D12	Unnamed river	Very high gradient, ephemeral upland tributary (FW1) of Owenmore River. 2m wide & dry at the time of survey. Large boulder & cobble bed. No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	
D13	Unnamed river	Very high gradient, ephemeral upland tributary (FW1) of Owenmore River. 1m wide & dry at the time of survey. Large boulder & cobble bed. No macrophytes or aquatic bryophytes.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	
D14	Unnamed stream	Very high gradient, ephemeral upland tributary (FW1) of Owenmore River. 1m wide & dry at the time of survey. Large boulder & cobble bed. No macrophytes or aquatic bryophytes.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	
D15	Unnamed stream	Very high gradient, ephemeral upland tributary (FW1) of Owenmore River. 1m wide & dry at the time of survey. Large boulder & cobble bed. No macrophytes or aquatic bryophytes.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	




Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D16	Unnamed river	Very high gradient, ephemeral upland tributary (FW1) of Owenmore River. 2m wide & dry at the time of survey. Large boulder & cobble bed. No macrophytes or aquatic bryophytes.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	
D17	Unnamed stream	Very high gradient, ephemeral upland tributary (FW1) of Owenmore River. 1m wide & dry at the time of survey. Large boulder & cobble bed. No macrophytes or aquatic bryophytes.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	
D18	Unnamed stream	High gradient, upland tributary (FW1) of Owenmore River in incised valley. 1.5-2m wide & 0.1-0.3m deep. Boulder cascades with boulder, cobble & mixed gravels with light siltation. No macrophytes or aquatic bryophytes. Bordered by WN2 habitat.	Brown trout & European eel recorded. Moderate quality salmonid & eel nursery.	Q3-4 (moderate status)	Local importance (higher value)	
D19	Unnamed stream	Ephemeral U-shaped, 2m wide drainage channel (FW4) tributary of Owenmore River, dry at the time of survey. No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to ephemeral (dry) nature.	n/a (dry channel)	Local importance (lower value)	

Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D20	Unnamed stream	U-shaped drainage channel (FW4) tributary of Owenmore River, 0.5m wide with no flows & stagnant pools of peaty water. Peat bed (no hard substrata). No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3 (poor status) (tentative rating)	Local importance (lower value)	
D21	Unnamed stream	Historically straightened & deepened upland tributary (FW1) of Owenmore River. 0.5m wide with stagnant shallow water (no flows). Boulder & cobble bed with iron-oxidising bacteria. No macrophytes but <i>Scapania undulata</i> locally. Bordered by wet GA1 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3 (poor status) (tentative rating)	Local importance (lower value)	
D22	Unnamed stream	Meandering upland tributary (FW1) of Owenmore River. 1-1.5m wide & 0.05-0.15m deep. Riffle & glide with boulder, cobble & bedded, heavily silted mixed gravels. <i>Veronica beccabunga</i> along margins with <i>Rhynchostegium riparioides</i> & <i>Hygrohypnum ochraceum</i> . Bordered by wet GA1 & WD4.	Brown trout recorded. Moderate quality salmonid nursery & spawning habitat, no holding.	Q4 (good status)	Local importance (higher value)	
D23	Unnamed stream	High gradient upland tributary (FW1) of Owenmore River. 1-1.5m wide & 0.1-0.3m deep with low flows. Boulder cascades with glide & pool. Boulder, cobble & bedded, heavily silted mixed gravels. No macrophytes but <i>Rhynchostegium riparioides</i> on boulders. Bordered by wet GA1.	Brown trout recorded. Moderate quality salmonid nursery, spawning & holding habitat.	Q4 (good status) (tentative rating)	Local importance (higher value)	

Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D24	Unnamed river	High gradient upland tributary (FW1) of Owenmore River. 2m wide & 0.1-0.4m deep with low flows. Boulder cascades with cobble & bedded, heavily silted mixed gravels. No macrophytes but <i>Chiloscyphus polyanthos</i> & <i>Rhynchostegium riparioides</i> on boulders. Bordered by wet GA1 & WS1.	Brown trout recorded. Moderate quality salmonid nursery & spawning habitat with good quality holding.	Q4 (good status)	Local importance (higher value)	
D25	Unnamed river	Moderate gradient upland tributary (FW1) of the Owenmore River. 2-4m wide and 0.2-0.4m deep. Boulder cascades with local riffle-glide-pool sequences. Boulder, cobble & silted mixed gravels. No macrophytes but frequent <i>Rhynchostegium riparioides</i> . Bordered by wet GA1 & WS1.	Atlantic salmon, brown trout & European eel recorded. Excellent quality salmonid nursery with good quality spawning & moderate quality holding habitat. Moderate value for eel.	Q4 (good status)	Local importance (higher value)	
D26	Unnamed stream	Historically deepened & straightened upland tributary (FW1) of Owenmore River. 1.5m wide & 0.1-0.2m deep. Shallow glide with riffle & localised pool. Boulder, cobble & mixed gravels with high filamentous algal cover & moderate siltation. No macrophytes but abundant <i>Rhynchostegium riparioides</i> & <i>Fontinalis antipyretica</i> . Bordered by GA1.	Atlantic salmon, brown trout & minnow recorded. Moderate quality salmonid nursery & spawning with poor holding habitat.	Q3-4 (moderate status)	Local importance (higher value)	
D27	Kilsallagh Stream (33K13)	Ephemeral U-shaped, 0.5m wide drainage channel (FW4) tributary of Owenmore River, dry at the time of survey. No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to ephemeral (dry) nature	n/a (dry channel)	Local importance (lower value)	

Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
D28	Unnamed stream	Ephemeral U-shaped, 2m wide drainage channel (FW4) tributary of Owenmore River, dry at the time of survey. No macrophytes or aquatic bryophytes. Bordered by GA1 habitat.	Not of fisheries value due to ephemeral (dry) nature	n/a (dry channel)	Local importance (lower value)	
D29	Unnamed stream	Historically deepened & straightened upland tributary (FW1) of Owenmore River. 1-1.5m wide & 0.1-0.2m deep. Shallow glide with riffle & localised pool. Boulder, cobble & coarse gravels with moderate siltation. No macrophytes but abundant <i>Rhynchoctegium riparioides</i> . Bordered by GA1.	Brown trout recorded. Poor to moderate quality salmonid nursery & spawning with poor holding habitat.	Q3-4 (moderate status)	Local importance (higher value)	
D30	Unnamed stream	Historically deepened & straightened upland tributary (FW1) of Owenmore River. 1m wide & 0.1-0.2m deep. Shallow glide with riffle & localised pool. Boulder, cobble & heavily bedded coarse gravels with moderate siltation. <i>Veronica beccabunga</i> , <i>Apium nodiflorum</i> & <i>Iris psuedacorus</i> with but abundant <i>Brachythecium rivulare</i> . Bordered by GA1.	Brown trout, minnow & three-spined stickleback recorded. Poor quality salmonid habitat overall.	Q3-4 (moderate status)	Local importance (higher value)	
TDR nodes						
E1	Moneynierin River (33M16)	Upland eroding river (FW1), 2-3m wide & 0.1-0.4m deep. Riffle, glide & pool with boulder, cobble & mixed gravels. High filamentous algal cover. <i>Sparganium erectum</i> , <i>Myriophyllum alterniflorum</i> & <i>Juncus bulbosus</i> instream with <i>Carex rostrata</i> . Bordered by PB2.	Atlantic salmon, brown trout & three-spined stickleback recorded. Moderate quality salmonid spawning, nursery & holding habitat.	Q4 (good status)	Local importance (higher value)	

Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
E2	River Deel (34D01)	Large, semi-natural lowland karstic limestone river (FW1) with low seasonal flows at time of survey. 35m wide & 0.2-0.5m deep with frequent stagnant pools (no flows). Boulder & cobble bed with locally frequent <i>Fontinalis antipyretica</i> and <i>Cinclidotus fontinaloides</i> . Bordered by BL3 habitat (Crossmolina)	Atlantic salmon, roach, minnow & three-spined stickleback recorded. Good quality salmonid nursery & spawning habitat, moderate quality holding (under normal flows). Unsuitable for lamprey. Freshwater pearl mussel known upstream.	Q3-4 (moderate status)	International importance (located within River Moy SAC)	
E3	Ballisodare River (35B05)	Large, semi-natural lowland river (FW2), 30m wide & 0.2-1.5m deep. Riffle, glide & pool with boulder, cobble & mixed gravels. Moderate siltation. Occasional <i>Ranunculus</i> sp., <i>Schoenoplectus lacustris</i> , <i>Sparganium erectum</i> & <i>Apium nodiflorum</i> with frequent <i>Fontinalis antipyretica</i> , <i>Rhynchostegium riparioides</i> and occasional <i>Chiloscyphus polyanthos</i> & <i>Cinclidotus fontinaloides</i> . Bordered by BL3 habitat.	Atlantic salmon, brown trout & European eel recorded. Very good quality salmonid nursery & holding habitat with good quality spawning. High value for eel. 2 no. otter spraint sites	Q4 (good status)	International importance (located within Unshin River SAC)	
E4	Carrowgobbadagh Stream (35C95)	Historically deepened & straightened tidal channel (CW3) downstream of attenuation pond. 3m wide & 1-2m deep. Soft silt bed with abundant macrophytes, <i>Callitriche stagnalis</i> , <i>Potamogeton</i> sp. & <i>Ranunculus</i> sp. (Annex I 3260). Abundant filamentous algae. Bordered by BL3 habitat.	European eel & three-spined stickleback recorded. Poor quality salmonid habitat but of high value as an eel nursery.	Q2 (bad status) (tentative rating)	Local importance (higher value)	

Site no.	Watercourse (EPA code)	Site characteristics	Fisheries summary	Biological water quality	Ecological evaluation	Representative site image
E5	Abbeylands Stream (36A15)	U-shaped drainage channel tributary (FW4) of Abbey River. 0.5m wide & 0.1-0.2m deep with very low flows at time of survey. Deep silt bed with marginal <i>Apium nodiflorum</i> . Bordered by WS1 & WL2 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q2-3 (poor status)	Local importance (lower value)	
E6	Drumgowan Stream (37D49)	Ephemeral U-shaped, 0.5m wide drainage channel (FW4) tributary of Owenmore River, dry at the time of survey. No macrophytes or aquatic bryophytes. Bordered by BL3 & GA2 habitat.	Not of fisheries value due to ephemeral (dry) nature	n/a (dry channel)	Local importance (lower value)	
E7	Bogside River (37B26)	Historically deepened & realigned lowland river (FW2). 1-1.5m wide & 0.1-0.2m deep with slow-flowing glide & occasional pool. Heavily bedded boulder, cobble & coarse gravels with high siltation. <i>Apium nodiflorum</i> in margins with occasional <i>Fontinalis antipyretica</i> & <i>Chiloscyphus polyanthos</i> . Bordered by GS4 habitat.	Not of fisheries value due to small size, depths & poor flows. No fish recorded.	Q3 (poor status)	Local importance (lower value)	



Triturus Environmental Ltd.

42 Norwood Court,

Rochestown,

Co. Mayo,

T12 ECF3.

Appendix 4 Habitat Condition Assessment Report

AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001





Habitat Condition Assessment

Muingmore Wind Farm

RWE Renewables Ireland

Glasshouses 2, 92 George's Street Lower Dún Laoghaire, Co. Dublin, A96 VR66

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Harbour, Dublin, D14
N2Y7

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	Click to enter a date.			
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Appendices

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1.0 Overview

Cutover Bog (PB4) and Lowland Blanket Bog (PB3) were recorded within the Proposed Development Site, comprising the Wind Farm footprint (Main Wind Farm Development Site) and the three overrun areas. Full habitat descriptions and mapping are provided in Technical Appendices 5-1 (Technical Habitat Report, Proposed Development Site) and 5-6 (this report) of this EIA. Several areas exhibit physical structure and plant community composition consistent with the Annex I habitat Blanket Bog [7130]. Where hydrological and vegetative functions are intact, this habitat qualifies as a priority habitat under the Habitats Directive.

Importantly, classification as Cutover Bog (PB4) under the Fossitt system does not preclude alignment with Annex I Blanket Bog [7130]. Annex I classification is determined by geomorphology, peat depth, hydrological regime, and characteristic species assemblages, rather than habitat condition alone. Consequently, areas classified as PB4 may still meet Annex I criteria where these defining attributes are present, irrespective of degradation status.

2.0 Methods

The Proposed Development Site was surveyed in accordance with Best Practice Guidance for Habitat Survey and Mapping published by the Heritage Council of Ireland. Habitats were classified using the standard descriptions and codes set out in 'A Guide to Habitat Types in Ireland' (Heritage Council).

Survey work was undertaken in two phases. The Proposed Main Wind Farm Development Site was surveyed by Dr Alex Fitzgerald (refer to Appendix 5-1), while the three overrun areas were surveyed by Dr Andrew Torsney (refer to Appendix 5-6, this report). Habitat extents were mapped using GIS to calculate the area of each habitat type within the Proposed Development Site.

2.1 Proposed Main Wind Farm Development Site Survey Effort

Within the Proposed Main Wind Farm Development Site, approximately 185 hectares of peatland habitat were identified within the site boundary. In accordance with the Integrated Wetland Management (IWM) guidance, a minimum of 16 habitat condition monitoring plots would be required to characterise habitat condition at this scale. However, a total of 28 plots were undertaken to provide a more robust and spatially representative assessment of species composition and habitat condition. This enhanced survey effort reflects the presence of seven discrete locations where direct habitat loss is proposed. Two monitoring plots were located within each area of potential impact, with a further two plots established in the immediate surrounding habitat to provide contextual baseline condition data. This approach allows for a more defensible comparison between impacted and non-impacted areas and strengthens confidence in the assessment of habitat condition and impact significance. Across all areas mapped as PB4 and/or PB3 habitat a series of 2x2 m plots were assessed across the site.

A total of 28 plots were recorded for the Proposed Main Wind Farm Development Site, 14 of which were within the proposed footprint of the development and 14 were outside of the intended footprint. The data was collected between 11th and the 14th of November 2024 by SLR's Technical Director Andrew Torsney in accordance with the Irish Wildlife Manual No



128¹ and No.79². For the Proposed Main Windfarm Site, the twenty-eight monitoring stops were selected ensuring they were well dispersed across the site (Figure 3-1).

2.2 Overrun Areas Survey Effort

The overrun areas had roughly 14.7 ha of peatland habitats identified – therefore, only 4 quadrats were required. Overrun area 1 had 4 quadrats undertaken and we undertook 8 quadrats at overrun area 3. It was decided to do 8 at the overrun area 3 because the location has been previously mapped as a favourable reference area (FRF) in the Article 17 mapping data. As there were no Annex I peatlands at overrun area 2 no condition assessment was necessary. Across all areas mapped as PB4 and/or PB3 habitat a series of 2x2 m plots were assessed across the site.

The overrun area data was collected between 7th and the 8th of January 2026 by SLR's Technical Director Andrew Torsney in accordance with the Irish Wildlife Manual No 128³ and No.79⁴. It is important to note that no PB4 or PB3 habitat was recorded in overrun area 2 – therefore no condition assessment was required. The twelve monitoring stops recorded in overrun areas 1 and 3 were dispersed across the sites (Figure 5-2 and Figure 5-3).

2.3 Condition Assessment Methods

At each of these monitoring stops a 2x2 m quadrat was set and all species within were identified using vegetative identification techniques. Plant species nomenclature follows Stace 4 and the percentage cover of each species was identified. Moreover, the criteria were assessed at each quadrat as well as a 20m radius around the monitoring stops according to the relevant IWM assessment methods. For all quadrats the Annex I habitat Blanket bogs (* if active bog) [7130] condition assessment criteria were recorded.

In addition to the above – for the Proposed Main Wind Farm Development Site – a condition assessment was undertaken followed the DEFRA metric. Furthermore, it was noted that at this site the community composition of the vegetation aligned more closely with a mosaic of Northern Atlantic wet heaths with *Erica tetralix* [4010] and European dry heaths [4030] (despite the deep peat substrate). Therefore, as a precaution we recorded the condition assessment for these two habitats also. These are not presented in this report as they are not deemed necessary for the purposes of the assessment – the goal is to provide a 35-year habitat management plan to achieve good status of Blanket Bog habitat which has a higher ecological value and is more appropriate for deep peat.

Further consideration was given to possible occurrences of rare or legally protected plant species (as listed in Flora Protection Order 1999) or Red-listed plant species (Curtis & McGough 1998⁵, Wyse Jackson et al. 2016⁶).

¹ Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

² Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

³ Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

⁴ Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

⁵ Curtis, T.G.F. & McGough, H.N. (1988) The Irish Red Data Book. 1 Vascular Plants. Stationery Office, Dublin.

⁶ Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.



Regarding the condition assessment – once the data is recorded the assessment of condition is undertaken based on the pass-fail rates for each of the criteria. Monitoring stops with no failed criteria automatically pass at the stop level. When monitoring stops have failed one or more criteria expert judgement of the ecological condition of those stops may be employed to reassess whether any of those stops might legitimately be permitted to pass, for example if there has been a marginal failure of a single criterion. All other stops are deemed to have failed. In general, it is understood that 4 or more fails is an overall failure of the monitoring stop. At a site level the structure and function of the habitat is assessed regarding Table 2.1.

Table 2.1 Determining site level results for structure and function as per the IWM

Conservation Status	Favourable Good (green)	Unfavourable Inadequate (amber)	Unfavourable Bad (red)
Criteria	No stops fail	1-25% of stops fail	> 25% of stops fail

2.4 Limitations

The survey was conducted in the sub optimal period. However, vegetative identification was used, meaning the flowering heads were not needed to record the species. All species found on site were identified. Cryptic species such as orchids, which would be sub-terrestrial in this period, were not possible to ID. Overall this is not identified to be a significant limitation, but it does hinder the reliability of the data slightly – this was considered throughout the assessment process.

3.0 Proposed Main Wind Farm Development Site Results

In general, the Proposed Main Wind Farm Development Site is of generally consistent community composition with some patches of obvious pine encroachment from the surrounding woodland, but beyond the scrub encroachment there is no spatial variation to note. A total of 46 species were identified across the site at various levels of percentage cover within each quadrat (as can be seen in Appendix A, Table 3.2 and Table 3.3).

Each quadrat was identified to have a good level of within plot diversity, with the data generally ranging from 0.61-0.88; however, there is one quadrat which has Simpsons index reported at 0.44 (Figure 3-1). However, despite this diversity the overall species composition and condition did not align with good habitat condition.

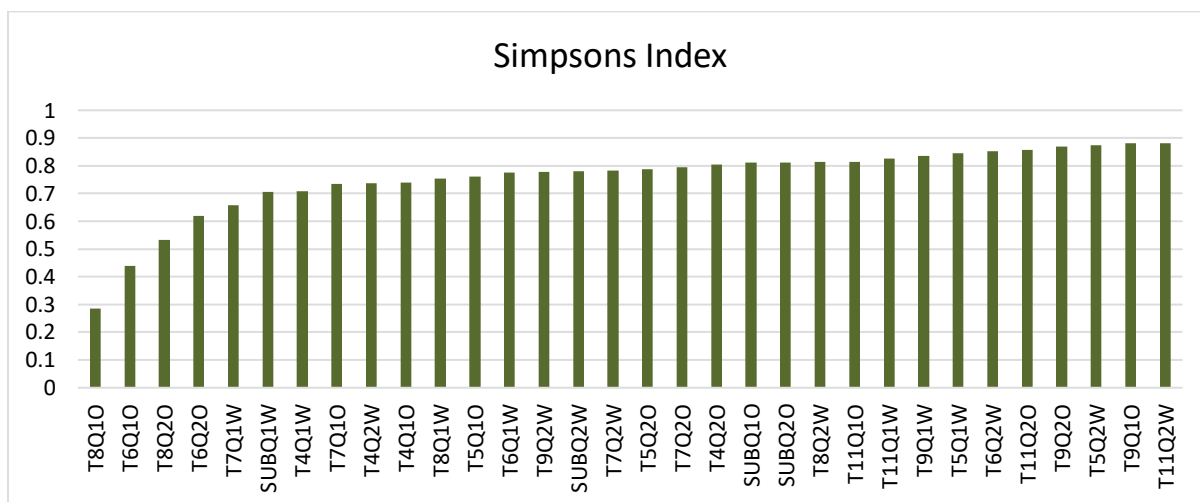


Figure 3-1 Simpsons index for each quadrat showing a range from 0.44 to 0.88



The habitats on site were mapped (Figure 3-3). However, due to accessibility some of the areas had to be identified from a distance, which precluded the ability to conduct a complete condition assessment. The areas used for the condition assessment can be found in Figure 3-4. It is important to note that the full extent of each habitat as mapped in the full habitat map will be used for any BNG assessments following a worst-case scenario approach assuming these areas to be consistent with the condition of the highest rated parcel of land.

In general, the habitats identified on site were of low to moderate condition. This is because the site is extensively drained, with high instances of scrub encroachment prevalent throughout, and invasive species such as Rhododendron and Prickly Heath present throughout the site. The areas where moderate habitat condition was identified were due to a higher abundance of Sphagnum that in other areas, as can be seen in Table 3.2 – and Appendix B.

Table 3.1 Habitat condition assessment results as per the UK habitats process for each of the locations in Figure 3-2 – full details are in Appendix B

Condition Area	Condition Index Value	Passes
Location 1	<i>Moderate (2)</i>	<i>3 Core, 1 Additional</i>
Location 2	<i>Low (1)</i>	<i>3 Core Only</i>
Location 3	<i>Low (1)</i>	<i>3 Core Only</i>
Location 4	<i>Low (1)</i>	<i>3 Core Only</i>
Location 5	<i>Moderate (2)</i>	<i>3 Core, 1 Additional</i>
Location 6	<i>Moderate (2)</i>	<i>3 Core, 1 Additional</i>
Location 7	<i>Low (1)</i>	<i>3 Core Only</i>
Location 8	<i>Moderate (2)</i>	<i>3 Core, 1 Additional</i>

As expected, none of the monitoring stops passed the criteria for Blanket Bog [7130]. See Appendix C full details.

4.0 Overrun Areas Site 1 Results

This habitat is assessed as Favourable condition. Vegetation composition and structure are consistent with Annex I blanket bog, with a well-developed hummock–hollow microtopography and a characteristic assemblage of bog indicator species. Sphagnum mosses are frequent (up to c.30% cover, highest in the south), supporting active peat-forming processes. Although overall cover remains below the ≥40% threshold required to qualify as priority active peatland.

Hydrological condition is broadly intact: drainage features are shallow, discontinuous and largely infilled by Sphagnum, indicating limited functional impact, despite the site appearing drier than expected in winter, particularly toward the north. Lichen diversity is notable and there is limited evidence of severe degradation. Areas of standing water with near-complete Sphagnum cover in the southern extent are interpreted as re-vegetated, likely anthropogenic pools and have been mapped separately to reflect their wetter character.

Condition scoring under the DEFRA metric indicates Good (3) condition - 5 Core and 1 additional criterion. All monitoring stops pass the IWM blanket bog criteria. Overall, the habitat is in favourable ecological condition and, while not currently qualifying as priority active blanket bog, it is considered close to that threshold and retains clear potential for restoration through enhanced water retention and further Sphagnum development.

5.0 Overrun Areas Site 3 Results

This area is assessed as Unfavourable - Bad (current condition) based on field evidence. The habitat has been subject to recent and extensive anthropogenic disturbance, including



rotavation and levelling, resulting in widespread exposure of bare peat (c.70%), loss of peatland vegetation structure, absence of Sphagnum, and a disrupted hydrological regime characterised by deep perimeter drains and internal scars. Vegetation present is indicative of early recolonisation and secondary succession, dominated by rushes and competitive grasses, with community composition aligning more closely with wet grassland on deep peat than functioning blanket bog. Both IWM and DEFRA condition assessments fail across all relevant criteria, confirming severe degradation and very low current ecological functionality as blanket bog.

For biodiversity accounting purposes only, the habitat is treated as Favourable / Good based on its designation as an Article 17 Favourable Reference Area for blanket bog. This does not reflect the present ecological state.



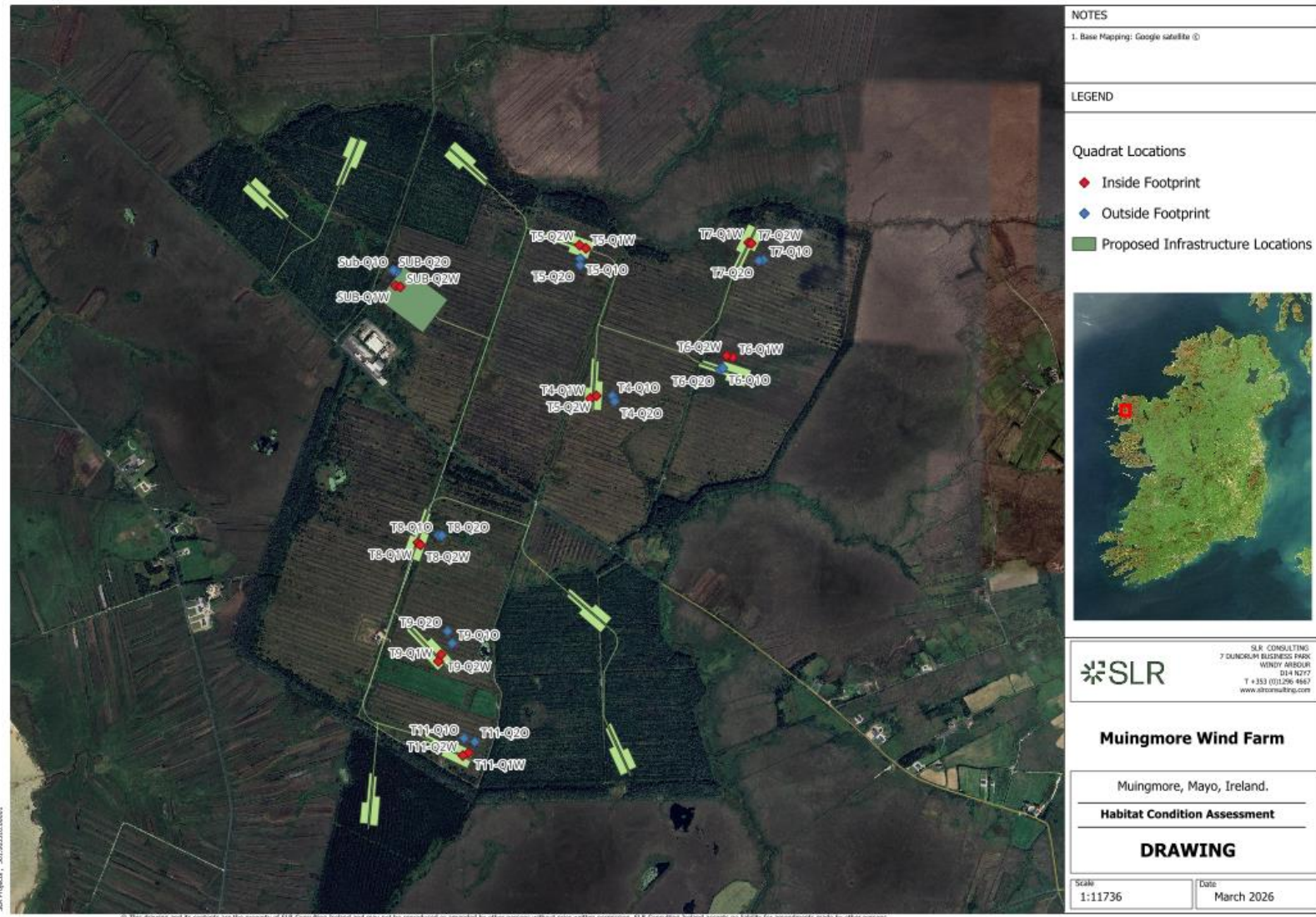


Figure 5-1 Layout of quadrat locations on Proposed Development Site





Figure 5-2 Layout of Quadrats at TDR 1





Figure 5-3 Layout of Quadrats at TDR 3



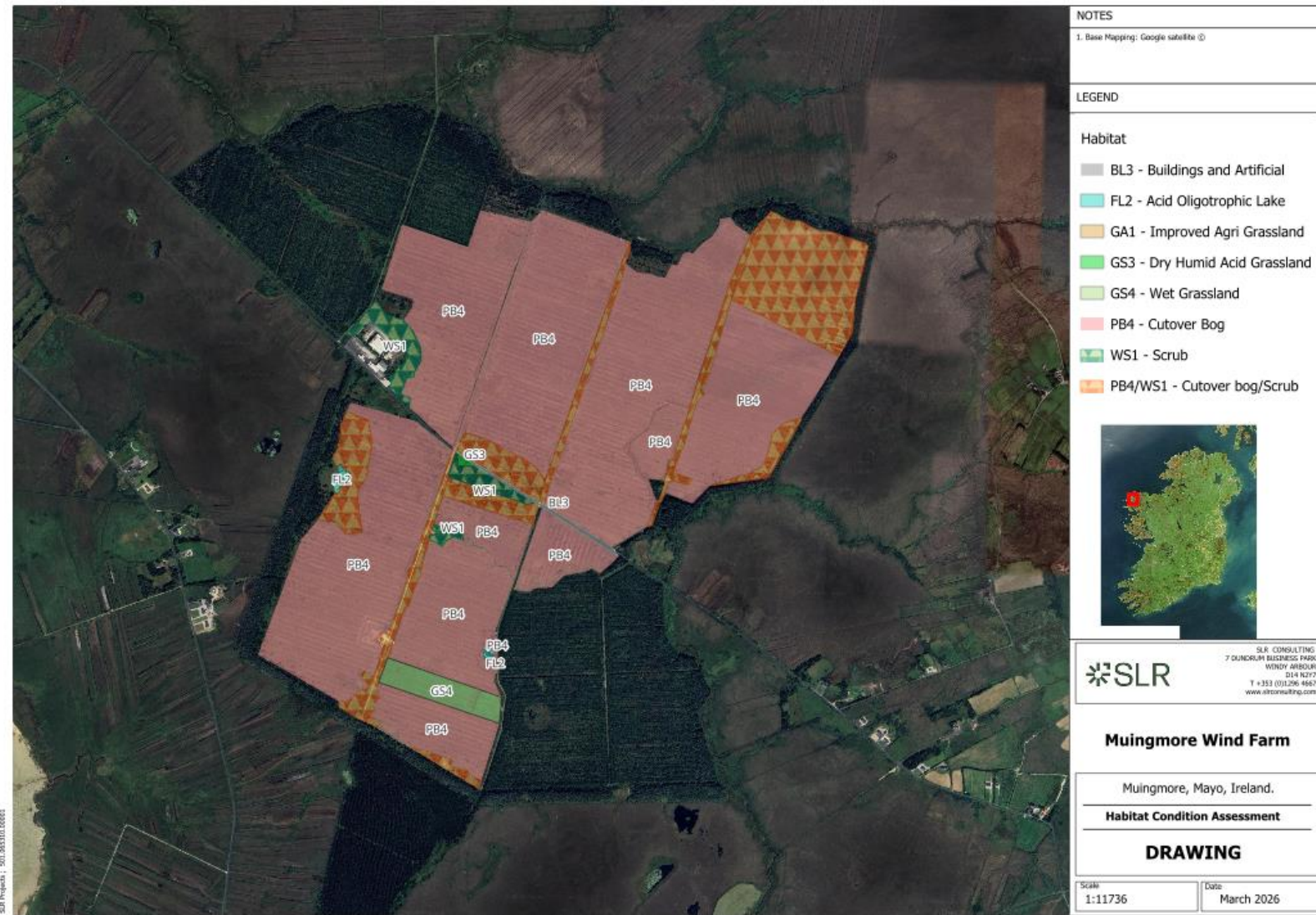


Figure 5-4 Peatland Habitat Map for the Main Windfarm Site



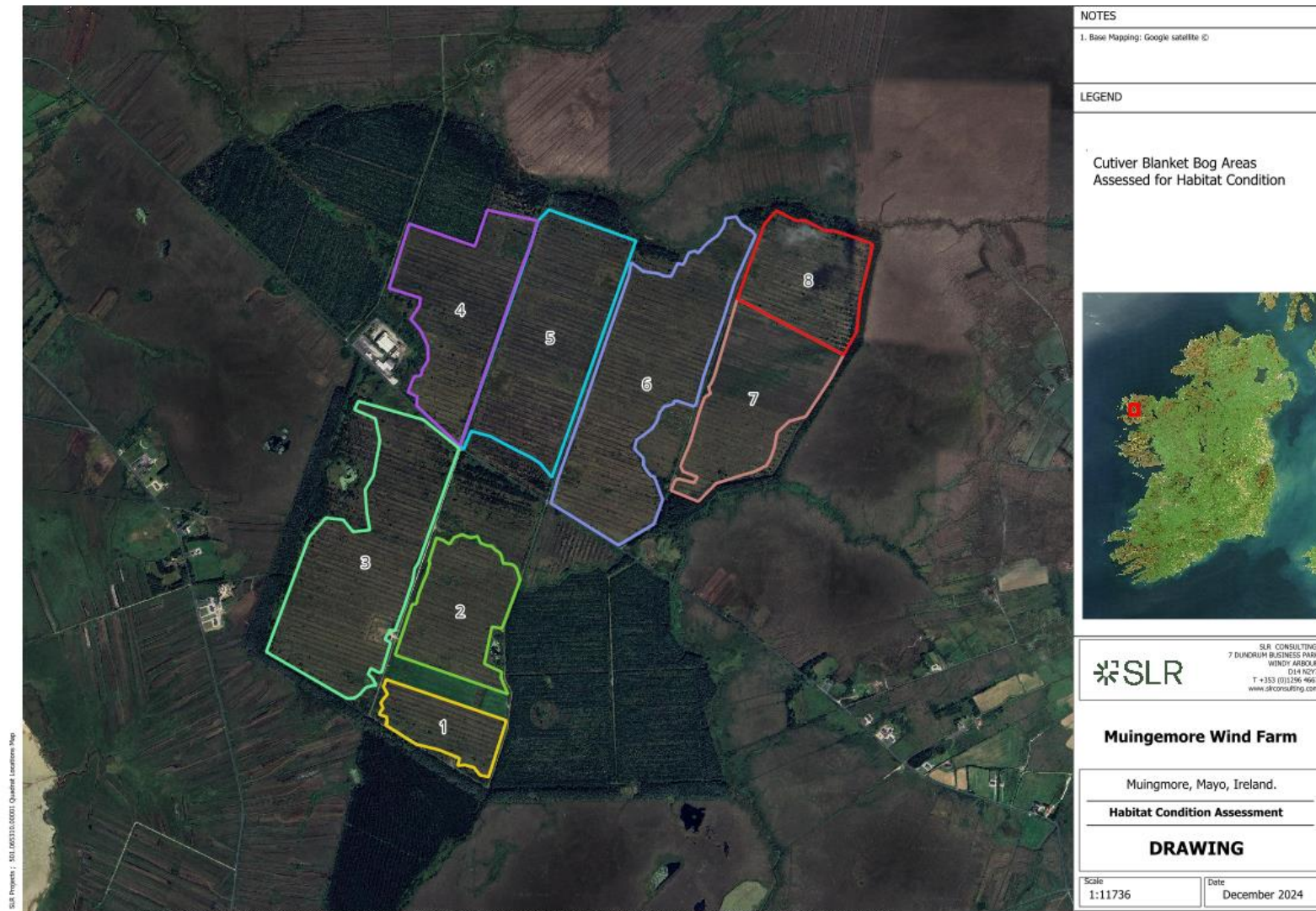


Figure 5-5 Areas of cutover lowland blanket bog assessed for habitat condition





Figure 5-4 Peatland Habitat Map for TDR 1 and TDR 3



6.0 Conclusion

The habitats recorded across the Proposed Development Site comprise blanket bog (PB3) and cutover bog (PB4), corresponding to Annex I Lowland Blanket Bog [7130]. No areas meet the criteria for priority active blanket bog, as Sphagnum cover remains below the $\geq 40\%$ threshold required to demonstrate sustained active peat formation.

Current habitat condition across much of the site is constrained by historic and ongoing anthropogenic pressures, most notably extensive artificial drainage, scrub and woodland encroachment, and the widespread presence of invasive non-native species, particularly *Rhododendron ponticum*. These pressures have resulted in disrupted hydrological function, altered vegetation structure, and reduced peatland integrity, such that large areas fail to meet condition criteria for favourable blanket bog despite moderate within-plot species diversity.

Notwithstanding this, peat depth remains substantial across the Proposed Development Site and remnants of characteristic blanket bog communities persist, particularly where Sphagnum is locally frequent and drainage features are partially infilled. This indicates that the site retains high restoration potential. Targeted measures focused on hydrological restoration, scrub and invasive species control, and the promotion of Sphagnum recovery are likely to deliver substantial ecological gains. With appropriate management intervention, improvement to Good (3) condition is considered achievable, though this should not be assumed to occur rapidly or uniformly across the site.

Overall, the Proposed Development Site represents a degraded but recoverable peatland system, where current condition reflects management history rather than inherent ecological limitation.





Appendix A Plot data – Species Composition and Habitat Classification

Muingmore Windfarm

RWE Renewables Ireland

Glasshouses 2, 92 George's Street Lower Dún Laoghaire, Co. Dublin, A96 VR66

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin,
D14 N2Y7

SLR Project No.: 501.V00727.00008

Species list and relative composition of each quadrat – part 1 of 4

Species (Scientific Name)	T11-Q1W	T11-Q2W	T11-Q1O	T11-Q2O	SUB-Q1W	SUB-Q2W	SUB-Q1O	SUB-Q2O	T4-Q1W	T4-Q2W	T4-Q1O	T4-Q2O
Golden-head Moss (<i>Breutelia chrysocoma</i>)	12	5	3	2	15	8	12	4	5	0	4	0
Heather* (<i>Calluna vulgaris</i>)	65	35	55	18	75	50	60	60	8	6	5	30
Sedges (<i>Carex</i> spp.)	2	30	8	2	8	15	15	18	75	5	3	20
Cross-leaved heath (<i>Erica tetralix</i>)	5	1	5	3	1	0	0	0	0	0	0	3
Common Cottongrass (<i>Eriophorum angustifolium</i>)	20	18	8	30	2	3	2	0	3	0	10	40
Bog-myrtle (<i>Myrica gale</i>)	2	12	0	0	0	0	0	0	0	0	4	0
Bog Asphodel (<i>Narthecium ossifragum</i>)	2	0	0	0	0	0	0	0	0	0	0	0
Non-crustose lichens (Noncrustose lichens)	0	3	3	5	4	2	4	15	21	0	1	0
Lousewort (<i>Pedicularis sylvatica</i>)	0	0	0	0	0	0	0	0	0	5	0	0
Heath Milkwort (<i>Polygala serpyllifolia</i>)	0	0	1	0	0	2	0	2	0	1	2	3
Tormentil (<i>Potentilla erecta</i>)	0	0	0	0	2	2	2	1	3	1	1	2
Black Bog-rush (<i>Schoenus nigricans</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Sphagnum Moss (<i>Sphagnum</i> spp.)	20	4	22	22	8	11	25	5	3	25	70	40
Devil's-bit Scabious (<i>Succisa pratensis</i>)	0	1	0	0	0	0	0	0	0	0	0	0
Deergrass (<i>Trichophorum germanicum</i>)	0	0	0	0	0	0	4	2	0	12	2	0
Bearberry (<i>Arctostaphylos uvaursi</i>)	20	5	6	30	2	1	0	0	0	0	2	0
Bristly Swan-neck Moss (<i>Campylopus atrovirens</i>)	0	1	0	0	0	0	0	0	0	0	0	0
Soft Rush (<i>Juncus effusus</i>)	20	15	50	20	20	5	35	20	2	76	75	0
Pine sp.	5	0	3	0	0	0	0	0	0	0	0	0
Ragwort (<i>Jacobaea vulgaris</i>)	3	1	2	0	0	0	0	0	0	0	0	0
Hard Fern (<i>Blechnum spicant</i>)	1	1	0	0	5	2	2	3	3	0	5	0
Autumn hawkbit (<i>Scorzoneroides autumnalis</i>)	5	2	4	2	2	5	5	4	3	17	10	2
Bog pimpernel (<i>Anagallis tenella</i>)	1	0	0	0	0	0	0	0	0	0	0	0
Creeping buttercup (<i>Ranunculus repens</i>)	2	2	2	4	4	3	3	4	3	2	4	3
Blue sedge (<i>Carex flacca</i>)	0	30	6	0	0	3	3	12	0	0	0	0



Species (Scientific Name)	T11-Q1W	T11-Q2W	T11-Q10	T11-Q20	SUB-Q1W	SUB-Q2W	SUB-Q10	SUB-Q20	T4-Q1W	T4-Q2W	T4-Q10	T4-Q20
Marsh hair moss (<i>Polytrichum commune</i>)	0	2	0	0	0	0	0	0	0	0	0	0
Other moss	0	11	2	0	0	0	0	0	0	0	0	0
Soft Shield Fern (<i>Polystichum setiferum</i>)	0	0	2	2	0	0	0	0	0	6	0	0
Poa sp.	0	1	2	3	0	0	0	0	0	0	0	0
Fescue (<i>Festuca rubra</i>)	2	2	0	5	0	4	4	3	0	0	2	12
Prickly Heath (<i>Gaultheria mucronata</i>)	0	0	0	0	0	1	1	8	0	0	0	0
Great wood-rush (<i>Luzula sylvatica</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Yorkshire fog (<i>Holcus lanatus</i>)	0	0	0	0	0	0	0	0	0	0	3	0
Cocksfoot (<i>Dactylis glomeratus</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Heath Bedstraw (<i>Galium saxatile</i>)	0	0	0	0	0	0	0	0	0	0	1	0
Bare Gound	0	0	0	0	0	0	0	0	0	0	0	0
Purple Moore Grass (<i>Molinia caerulea</i>)	0	0	0	0	0	0	0	0	2	0	0	0
False oatgrass (<i>Arrhenatherum elatius</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Thistle sp.	0	0	0	0	0	0	0	0	0	0	0	0
Field Wood-rush (<i>Luzula campestris</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Common Sedge (<i>Carex Nigra</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Field sorrel (<i>Rumex acetosella</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Crested hair-grass (<i>Koeleria macrantha</i>)	0	0	0	0	0	0	0	0	0	0	0	0
White clover (<i>Trifolium ripens</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Brambles (<i>Rubus fruticosus</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Rhododendron (<i>Rhododendron ponteticum</i>)	0	0	0	0	0	0	0	0	13	7	0	0



Species list and relative composition of each quadrat – part 2 of 4

Species (Scientific Name)	T5-Q1W	T5-Q2W	T5-Q1O	T5-Q2O	T6-Q1W	T6-Q2W	T6-Q1O	T6-Q2O	T7-Q1W	T7-Q2W	T7-Q1O	T7-Q2O
Golden-head Moss (<i>Breutelia chrysocoma</i>)	2	20	5	35	0	0	1	11	90	40	3	16
Heather* (<i>Calluna vulgaris</i>)	45	25	30	12	8	28	5	4	0	18	50	50
Sedges (<i>Carex</i> spp.)	11	11	12	2	4	9	11	3	0	3	2	2
Cross-leaved heath (<i>Erica tetralix</i>)	4	12	7	0	1	3	2	1	0	0	2	1
Common Cottongrass (<i>Eriophorum angustifolium</i>)	11	6	0	0	4	0	0	0	0	0	0	0
Bog-myrtle (<i>Myrica gale</i>)	0	0	0	0	0	0	5	5	0	0	0	0
Bog Asphodel (<i>Narthecium ossifragum</i>)	0	0	0	0	2	1	0	0	0	0	0	0
Non-crustose lichens (Noncrustose lichens)	2	2	4	3	60	8	0	0	3	3	5	2
Lousewort (<i>Pedicularis sylvatica</i>)	0	0	0	0	2	1	0	0	0	0	1	1
Heath Milkwort (<i>Polygala serpyllifolia</i>)	1	1	0	2	1	1	3	2	0	2	2	2
Tormentil (<i>Potentilla erecta</i>)	0	2	1	2	1	1	3	2	0	1	1	2
Black Bog-rush (<i>Schoenus nigricans</i>)	0	0	0	0	11	12	0	0	0	0	0	0
Sphagnum Moss (<i>Sphagnum</i> spp.)	28	25	65	85	8	16	0	0	10	45	55	45
Devil's-bit Scabious (<i>Succisa pratensis</i>)	0	0	0	0	0	0	1	1	0	0	0	0
Deergrass (<i>Trichophorum germanicum</i>)	0	0	0	0	10	30	0	15	0	0	0	0
Bearberry (<i>Arctostaphylos uvaursi</i>)	16	2	4	7	0	2	0	0	1	2	0	0
Bristly Swan-neck Moss (<i>Campylopus atrovirens</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Soft Rush (<i>Juncus effusus</i>)	3	1	0	60	0	0	0	0	100	75	3	12
Pine sp.	1	0	2	1	0	0	0	0	0	8	0	0
Ragwort (<i>Jacobaea vulgaris</i>)	0	0	0	0	1	1	0	0	0	1	0	0
Hard Fern (<i>Blechnum spicant</i>)	5	5	1	16	0	0	0	0	0	1	0	2
Autumn hawkbit (<i>Scorzoneroides autumnalis</i>)	2	3	3	4	0	0	0	0	3	3	2	2
Bog pimpernel (<i>Anagallis tenella</i>)	0	1	0	0	0	0	0	0	0	0	0	0
Creeping buttercup (<i>Ranunculus repens</i>)	2	2	2	2	2	2	2	2	1	2	2	2
Blue sedge (<i>Carex flacca</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Marsh hair moss (<i>Polytrichum commune</i>)	0	0	0	0	0	0	0	0	0	0	0	0



Species (Scientific Name)	T5-Q1W	T5-Q2W	T5-Q10	T5-Q20	T6-Q1W	T6-Q2W	T6-Q10	T6-Q20	T7-Q1W	T7-Q2W	T7-Q10	T7-Q20
Other moss	0	0	0	0	0	0	0	0	0	0	0	0
Soft Shield Fern (<i>Polystichum setiferum</i>)	1	0	0	4	0	0	2	0	10	2	0	0
Poa sp.	0	0	0	0	0	0	0	0	0	0	0	0
Fescue (<i>Festuca rubra</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Prickly Heath (<i>Gaultheria mucronata</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Great wood-rush (<i>Luzula sylvatica</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Yorkshire fog (<i>Holcus lanatus</i>)	0	0	0	0	0	0	0	0	2	0	0	0
Cocksfoot (<i>Dactylis glomeratus</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Heath Bedstraw (<i>Galium saxatile</i>)	0	0	0	1	0	0	0	0	2	0	0	0
Bare Gound	0	0	0	0	15	6	0	12	0	0	0	0
Purple Moore Grass (<i>Molinia caerulea</i>)	30	16	20	4	8	4	100	85	3	6	25	45
False oatgrass (<i>Arrhenatherum elatius</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Thistle sp.	0	0	0	0	0	0	0	0	0	0	0	0
Field Wood-rush (<i>Luzula campestris</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Common Sedge(<i>Carex Nigra</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Field sorrel (<i>Rumex acetosella</i>)	0	0	0	0	0	0	0	0	2	0	0	0
Crested hair-grass (<i>Koeleria macrantha</i>)	0	0	0	0	0	0	0	0	0	0	0	0
White clover (<i>Trifolium ripens</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Brambles (<i>Rubus fruticosus</i>)	0	0	0	3	0	0	0	0	5	0	0	0
Rhododendron (<i>Rhododendron ponteticum</i>)	2	0	0	0	0	0	0	0	0	0	0	0



Species list and relative composition of each quadrat – part 3 of 4

Species (Scientific Name)	T8-Q1W	T8-Q2W	T8-Q1O	T8-Q2O	T9-Q1W	T9-Q2W	T9-Q1O	T9-Q2O
Golden-head Moss (<i>Breutelia chrysocoma</i>)	10	2	0	0	18	12	25	11
Heather* (<i>Calluna vulgaris</i>)	0	0	0	0	28	6	35	21
Sedges (<i>Carex</i> spp.)	3	2	0	0	8	70	22	5
Cross-leaved heath (<i>Erica tetralix</i>)	0	0	0	0	0	0	0	0
Common Cottongrass (<i>Eriophorum angustifolium</i>)	0	0	0	0	0	0	22	25
Bog-myrtle (<i>Myrica gale</i>)	0	0	0	0	0	0	0	0
Bog Asphodel (<i>Narthecium ossifragum</i>)	0	0	0	0	0	0	0	0
Non-crustose lichens (Noncrustose lichens)	1	2	0	0	5	3	3	4
Lousewort (<i>Pedicularis sylvatica</i>)	0	0	0	0	0	0	0	0
Heath Milkwort (<i>Polygala serpyllifolia</i>)	2	0	0	0	0	0	0	0
Tormentil (<i>Potentilla erecta</i>)	0	0	0	0	0	0	2	2
Black Bog-rush (<i>Schoenus nigricans</i>)	0	0	0	0	0	0	0	0
Sphagnum Moss (<i>Sphagnum</i> spp.)	0	8	0	0	75	3	3	12
Devil's-bit Scabious (<i>Succisa pratensis</i>)	0	0	0	0	0	0	0	0
Deergrass (<i>Trichophorum germanicum</i>)	0	0	0	0	0	17	2	6
Bearberry (<i>Arctostaphylos uvaursi</i>)	0	0	0	0	1	0	0	0
Bristly Swan-neck Moss (<i>Campylopus atrovirens</i>)	0	0	0	0	0	0	0	0
Soft Rush (<i>Juncus effusus</i>)	20	50	100	100	55	1	25	2
Pine sp.	0	0	0	0	0	0	0	0
Ragwort (<i>Jacobaea vulgaris</i>)	0	0	0	0	0	0	0	0
Hard Fern (<i>Blechnum spicant</i>)	0	0	4	0	0	0	1	2
Autumn hawkbit (<i>Scorzoneroides autumnalis</i>)	2	5	0	0	7	4	4	5
Bog pimpernel (<i>Anagallis tenella</i>)	0	0	0	0	0	5	0	0
Creeping buttercup (<i>Ranunculus repens</i>)	2	2	0	7	3	2	1	2
Blue sedge (<i>Carex flacca</i>)	0	0	0	0	8	70	21	3
Marsh hair moss (<i>Polytrichum commune</i>)	0	0	0	0	0	0	2	0



Species (Scientific Name)	T8-Q1W	T8-Q2W	T8-Q10	T8-Q20	T9-Q1W	T9-Q2W	T9-Q10	T9-Q20
Other moss	0	0	0	0	0	0	0	0
Soft Shield Fern (<i>Polystichum setiferum</i>)	0	0	0	0	0	0	0	0
Poa sp.	70	30	2	0	0	0	0	0
Fescue (<i>Festuca rubra</i>)	12	15	0	0	40	20	18	2
Prickly Heath (<i>Gaultheria mucronata</i>)	0	0	0	0	0	0	0	0
Great wood-rush (<i>Luzula sylvatica</i>)	2	2	0	0	11	0	0	0
Yorkshire fog (<i>Holcus lanatus</i>)	2	2	0	7	3	2	1	2
Cocksfoot (<i>Dactylis glomeratus</i>)	1	0	0	0	0	0	0	0
Heath Bedstraw (<i>Galium saxatile</i>)	0	0	0	0	0	0	0	0
Bare Gound	0	0	0	0	0	0	0	0
Purple Moore Grass (<i>Molinia caerulea</i>)	0	0	0	0	0	0	0	0
False oatgrass (<i>Arrhenatherum elatius</i>)	0	0	0	0	6	0	0	2
Thistle sp.	1	0	0	0	0	2	0	0
Field Wood-rush (<i>Luzula campestris</i>)	0	0	0	0	0	3	0	0
Common Sedge(<i>Carex Nigra</i>)	0	0	0	0	0	0	2	0
Field sorrel (<i>Rumex acetosella</i>)	2	3	6	2	0	0	0	0
Crested hair-grass (<i>Koeleria macrantha</i>)	6	2	0	0	0	0	0	0
White clover (<i>Trifolium ripens</i>)	20	3	0	0	0	0	0	0
Brambles (<i>Rubus fruticosus</i>)	0	30	7	45	0	0	0	0
Rhododendron (<i>Rhododendron ponteticum</i>)	0	0	0	0	0	0	0	0



Species list and relative composition of each quadrat – part 4 of 4 (overrun area 1 and 3)

Species (Scientific Name)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Bog rosemary (<i>Andromeda polifolia</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Golden-headed moss (<i>Breutelia chrysocoma</i>)	0	0	0	0	0	0	0	7	10	10	3	4
Heather / Ling (<i>Calluna vulgaris</i>)	0	2	0	0	0	0	0	20	40	20	20	30
Bigelow's sedge (<i>Carex bigelowii</i>)	0	0	0	0	0	0	0	0	0	0	2	0
White earwort (<i>Diplophyllum albicans</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Sundews (count separately) (<i>Drosera</i> spp.)	0	0	0	0	0	0	0	0	0	0	0	0
Crowberry (<i>Empetrum nigrum</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Cross-leaved heath (<i>Erica tetralix</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Common cottongrass (<i>Eriophorum angustifolium</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Hare's-tail cottongrass (<i>Eriophorum vaginatum</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Bogbean (<i>Menyanthes trifoliata</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Bog myrtle / Sweet gale (<i>Myrica gale</i>)	0	0	0	0	0	0	0	0	0	20	2	0
Bog asphodel (<i>Narthecium ossifragum</i>)	0	0	0	0	0	0	1	1	0	1	1	0
Various leafy/shrubby lichens (Non-crustose lichens)	0	0	0	0	0	0	0	20	20	25	40	60
Bog notchwort (<i>Odontoschisma sphagni</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Lousewort (<i>Pedicularis sylvatica</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Pale butterwort (<i>Pinguicula lusitanica</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Purple pouchwort (<i>Pleurozia purpurea</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Heath milkwort (<i>Polygala serpyllifolia</i>)	0	0	0	0	5	5	5	7	1	2	0	0
Woolly fringe-moss (<i>Racomitrium lanuginosum</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Beak-sedges (count separately) (<i>Rhynchospora</i> spp.)	0	0	0	0	0	0	0	0	0	0	0	0
Slender earwort (<i>Scapania gracilis</i>)	0	0	0	6	0	0	6	0	0	0	0	0
Black bog-rush (<i>Schoenus nigricans</i>)	0	0	0	0	0	0	2	3	4	4	4	2
Bog mosses (count separately) (<i>Sphagnum</i> spp. (excl. <i>S. fallax</i>))	0	0	0	0	0	0	0	0	20	30	5	0



Species (Scientific Name)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Deergrass (<i>Trichophorum germanicum</i>)	0	2	30	35	10	15	20	20	3	40	30	25
Bilberry (<i>Vaccinium myrtillus</i>)	0	0	0	0	0	0	0	0	0	0	0	0
Hard rush (<i>Juncus inflexus</i>)	0	0	0	0	80	70	30	0	0	0	0	0
Soft rush (<i>Juncus effusus</i>)	1	2	1	4	6	3	20	15	20	2	2	3
Yorkshire fog (<i>Holcus lanatus</i>)	2	0	0	0	20	20	18	0	0	0	0	0
Bare ground - Non indicator (Bare ground - Non indicator)	90	90	70	65	0	3	50	60	0	0	7	7
Sparse dead veg (Sparse dead veg)	8	8	4	6	0	2	4	5	0	0	0	0
Glaucous sedge (<i>Carex flacca</i>)	0	1	2	0	0	0	4	2	4	0	0	0
Creeping buttercup (<i>Ranunculus repens</i>)	0	0	0	0	3	3	4	2	0	0	0	0
Poa sp (<i>Poa</i> sp)	0	0	0	0	2	10	2	0	0	0	0	0
Bittercress sp (<i>Cardamine</i> sp)	0	0	0	0	0	2	5	0	0	0	0	0
Lesser burdock (<i>Arctium minus</i>)	0	0	0	0	0	0	4	0	0	0	0	0
Purple mooregrass (<i>Molinia caerulea</i>)	0	0	0	0	0	0	0	0	40	2	12	10
Bog moss (<i>Sphagnum fallax</i>)	0	0	0	0	0	0	0	0	10	5	5	0



Habitat Classification matrix of each quadrat relative to Fossit the Irish Vegetation Classification and the IWM Cutover Raised Bog Classification systems

Quadrat	IVC Code	IVC Category	Sphagnum Level	IWM Cutover Habitat Type Code	IWM Cutover Habitat Type Category	Fossit Code
T11-Q1W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
T11-Q2W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T11-Q1O	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
T11-Q2O	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
SUB-Q1W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
SUB-Q2W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
SUB-Q1O	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
SUB-Q2O	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T4-Q1W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T4-Q2W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
T4-Q1O	BG2E	Calluna vulgaris–Eriophorum spp. bog	High Sphagnum	HS1	Sphagnum subnitens - Erica tetralix	PB4 - Cutover Bog
T4-Q2O	BG2E	Calluna vulgaris–Eriophorum spp. bog	High Sphagnum	HS1	Sphagnum subnitens - Erica tetralix	PB4 - Cutover Bog
T5-Q1W	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	Moderate Sphagnum	MS3	Molinia caerulea – Polygala serpyllifolia	PB4 - Cutover Bog
T5-Q2W	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	Moderate Sphagnum	MS3	Molinia caerulea – Polygala serpyllifolia	PB4 - Cutover Bog
T5-Q1O	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	High Sphagnum	HS3	Sphagnum palustre – Molinia caerulea	PB4 - Cutover Bog
T5-Q2O	BG2E	Calluna vulgaris–Eriophorum spp. bog	High Sphagnum	HS1	Sphagnum subnitens - Erica tetralix	PB4 - Cutover Bog
T6-Q1W	BG2D	Erica tetralix–Schoenus nigricans bog	Low Sphagnum	LS5	Schoenus nigricans	PB4 - Cutover Bog
T6-Q2W	BG2D	Erica tetralix–Schoenus nigricans bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog



Quadrat	IVC Code	IVC Category	Sphagnum Level	IWM Cutover Habitat Type Code	IWM Cutover Habitat Type Category	Fossit Code
T6-Q10	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	Low Sphagnum	LS3	Molinia caerulea	PB4 - Cutover Bog
T6-Q20	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	Low Sphagnum	LS3	Molinia caerulea	PB4 - Cutover Bog
T7-Q1W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
T7-Q2W	BG2E	Calluna vulgaris–Eriophorum spp. bog	High Sphagnum	HS1	Sphagnum subnitens - Erica tetralix	PB4 - Cutover Bog
T7-Q10	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	High Sphagnum	HS3	Sphagnum palustre – Molinia caerulea	PB4 - Cutover Bog
T7-Q20	BG2C	Erica tetralix–Molinia caerulea–Cladonia portentosa bog/heath	High Sphagnum	HS3	Sphagnum palustre – Molinia caerulea	PB4 - Cutover Bog
T8-Q1W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T8-Q2W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T8-Q10	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T8-Q20	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T9-Q1W	BG2E	Calluna vulgaris–Eriophorum spp. bog	High Sphagnum	HS1	Sphagnum subnitens - Erica tetralix	PB4 - Cutover Bog
T9-Q2W	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T9-Q10	BG2E	Calluna vulgaris–Eriophorum spp. bog	Low Sphagnum	LS1	Calluna vulgaris	PB4 - Cutover Bog
T9-Q20	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB4 - Cutover Bog
Q1	BG1C	Schoenus nigricans – Eriophorum angustifolium bog	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q2	BG1C	Schoenus nigricans – Eriophorum angustifolium bog	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q3	BG2F	<i>Trichophorum cespitosum/germanicum</i> – <i>Eriophorum angustifolium</i> peatland	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q4	BG2F	<i>Trichophorum cespitosum/germanicum</i> – <i>Eriophorum angustifolium</i> peatland	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q5	BG1C	Schoenus nigricans – Eriophorum angustifolium bog	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q6	BG1C	Schoenus nigricans – Eriophorum angustifolium bog	None	N/A	Calluna vulgaris	PB4 - Cutover Bog



Quadrat	IVC Code	IVC Category	Sphagnum Level	IWM Cutover Habitat Type Code	IWM Cutover Habitat Type Category	Fossit Code
Q7	BG2F	<i>Trichophorum cespitosum/germanicum</i> – <i>Eriophorum angustifolium</i> peatland	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q8	BG2F	<i>Trichophorum cespitosum/germanicum</i> – <i>Eriophorum angustifolium</i> peatland	None	N/A	Calluna vulgaris	PB4 - Cutover Bog
Q9	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB3 – Blanket Bog
Q10	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB3 – Blanket Bog
Q11	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB3 – Blanket Bog
Q12	BG2E	Calluna vulgaris–Eriophorum spp. bog	Moderate Sphagnum	MS1	Calluna vulgaris - Sphagnum subnitens	PB3 – Blanket Bog





Appendix B Plot data – DEFRA Condition Assessment

Muingmore Windfarm

RWE Renewables Ireland

Glasshouses 2, 92 George's Street Lower Dún Laoghaire, Co. Dublin, A96 VR66

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin,
D14 N2Y7

SLR Project No.: 501.V00727.00008

Condition Sheet: WETLAND Habitat Type		LOCATION 1																												
Habitat Types																														
<p>Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide.</p> <p>Wetland - Blanket bog</p> <p>Wetland - Depression on peat substrates (H7150)</p> <p>Wetland - Fens (upland and lowland)</p> <p>Wetland - Lowland raised bog</p> <p>Wetland - Oceanic valley mire [1] (D2.1)</p> <p>Wetland - Purple moor grass and rush pastures</p> <p>Wetland - Reedbeds</p> <p>Wetland - Transition mires and quaking bogs (H7140)</p>																														
Habitat Description																														
<p>Cutover bog which has recolonised. There are regular drains cut every 5m which run the full length of the habitat. These drains are deep and show the peat depth is greater than 50cm indicating the habitat does not align with Heathland habitat. The vegetation shows signs of some hummock formation and there is encroachment from trees such as Pine sp. throughout in low enough density.</p> <p>Species identified on site within the PB4 - Cutover bog habitat with their relative abundance as per the DOMIN scale; as of 04 November 2024</p> <table border="1"> <thead> <tr> <th>Common Name</th> <th>Scientific Name</th> <th>Category</th> </tr> </thead> <tbody> <tr> <td>Heather</td> <td><i>Calluna vulgaris</i></td> <td>Dominant</td> </tr> <tr> <td>Soft-rush</td> <td><i>Juncus effusus</i></td> <td>Dominant</td> </tr> <tr> <td>Cross-leaved Heath</td> <td><i>Erica tetralix</i></td> <td>Frequent</td> </tr> <tr> <td>Hard-fern</td> <td><i>Blechnum spicant</i></td> <td>Occasional</td> </tr> <tr> <td>Great Wood-rush</td> <td><i>Luzula sylvatica</i></td> <td>Occasional</td> </tr> <tr> <td>Devil's-bit Scabious</td> <td><i>Succisa pratensis</i></td> <td>Rare</td> </tr> <tr> <td>Bog Pimpernel</td> <td><i>Anagallis tenella</i></td> <td>Rare</td> </tr> <tr> <td>Bog Asphodel</td> <td><i>Narthecium ossifragum</i></td> <td>Rare</td> </tr> </tbody> </table>				Common Name	Scientific Name	Category	Heather	<i>Calluna vulgaris</i>	Dominant	Soft-rush	<i>Juncus effusus</i>	Dominant	Cross-leaved Heath	<i>Erica tetralix</i>	Frequent	Hard-fern	<i>Blechnum spicant</i>	Occasional	Great Wood-rush	<i>Luzula sylvatica</i>	Occasional	Devil's-bit Scabious	<i>Succisa pratensis</i>	Rare	Bog Pimpernel	<i>Anagallis tenella</i>	Rare	Bog Asphodel	<i>Narthecium ossifragum</i>	Rare
Common Name	Scientific Name	Category																												
Heather	<i>Calluna vulgaris</i>	Dominant																												
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Bog Pimpernel	<i>Anagallis tenella</i>	Rare																												
Bog Asphodel	<i>Narthecium ossifragum</i>	Rare																												
<p>For Oceanic valley mires - see EUNIS</p> <p>See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below:</p> <p>Coastal and floodplain grazing marsh UK BAP Priority Habitat description</p> <p>Priority Habitat Inventory (England) - data.gov.uk</p> <p>All other wetland habitats - see UK Habitat Classification (UKHab):</p>																														
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney																											



	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	476575 821833	Habitat parcel reference	LOCATION 1
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - must be assessed for all wetland habitat types:			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criteria is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.



E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	Yes	Sphagnum is less than 20-22% and dwarf shrubs are less than 75%.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A



Essential criterion achieved (required for Good condition) Yes or No:		No	
Number of criteria passed		4	
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/√	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.	Good (3)	N/A	
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.	Moderate (2)	N/A	
• Passes 2 or fewer core criteria.	Poor (1)	N/A	
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			
• Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type).	Good (3)	-	
• Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type).	Moderate (2)	3 Core 1 Additional	



• Passes 3 or fewer criteria.	Poor (1)	-	
Suggested enhancement interventions to improve condition score			
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Condition Sheet: WETLAND Habitat Type		LOCATION 2	
Habitat Types			
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)			
Habitat Description			
<p>Cutover peatland that has regularised drainage ditches every 5m which run the full length of the site. The ditches are between 1.5 and 2 m deep showing the depth of remaining peat is far greater than 50cm (indicative of heathland habitat). This area is notable drying than the area to the south and the encroachment from trees is less pronounced but there are tracks of brambles in some of the ditches.</p>			
<p>For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):</p>			
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	476476 822187	Habitat parcel reference	LOCATION 2
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)



Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.



Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	No	Sphagnum is less than 10% and dwarf shrubs are less than 75%.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			3
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A



<ul style="list-style-type: none"> • Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A. 	Moderate (2)	N/A	
<ul style="list-style-type: none"> • Passes 2 or fewer core criteria. 	Poor (1)	N/A	
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			
<ul style="list-style-type: none"> • Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type). 	Good (3)	-	
<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	-	
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	3 Core only	
Suggested enhancement interventions to improve condition score			
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Condition Sheet: WETLAND Habitat Type		LOCATION 3	
Habitat Types			
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)			
Habitat Description			
Cutover peatland with recolonised species which are consistent with the rest of the site. Drainage ditches are regularised with higher instances of heather in the ditches than between indicating extensive drying. Scrub encroachment is evident throughout.			
For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):			
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	476178 822633	Habitat parcel reference	LOCATION 3
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)



Core Criteria - must be assessed for all wetland habitat types :			
A	<p>The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above.</p> <p>Note - this criterion is essential for achieving Good condition.</p>	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpnel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.



Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	No	Sphagnum is less than 10% and dwarf shrubs are less than 75%.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			3
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.		Moderate (2)	N/A
• Passes 2 or fewer core criteria.		Poor (1)	N/A



Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			
<ul style="list-style-type: none"> • Passes 5 or 6 core criteria including criterion A; AND <ul style="list-style-type: none"> • Passes additional criterion G, H, I or J (choose the one specified for the habitat type). 	Good (3)	-	
<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR <ul style="list-style-type: none"> • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	-	
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	3 Core only	
Suggested enhancement interventions to improve condition score			
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Condition Sheet: WETLAND Habitat Type		LOCATION 4	
Habitat Types			
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)			
Habitat Description			
<p>There is a clear dominance of <i>Juncus effusus</i> with heather struggling to take hold. Signs of heather being restricted to drainage ditches which are extensive, spanning the full width of the site and regular every 5m. Heather becomes more dominant as you move north within the land parcel. The heather in this section of lands is notably more mature than in the other sections of land and there is a large sheep herd grazing within.</p>			
<p>For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):</p>			
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	476311 823520	Habitat parcel reference	LOCATION 4
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)



Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpnel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A



Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	No	Sphagnum is less than 15% and dwarf shrubs are less than 75%. There are some areas with as high as 20% but over the whole polygon this is not frequent.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			3
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.		Moderate (2)	N/A
• Passes 2 or fewer core criteria.		Poor (1)	N/A
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			



<ul style="list-style-type: none"> • Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type). 	Good (3)	-	
<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	-	
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	3 Core only	
Suggested enhancement interventions to improve condition score			
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Habitat Types

Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide.

Wetland - Blanket bog

Wetland - Depression on peat substrates (H7150)

Wetland - Fens (upland and lowland)

Wetland - Lowland raised bog

Wetland - Oceanic valley mire [1] (D2.1)

Wetland - Purple moor grass and rush pastures

Wetland - Reedbeds

Wetland - Transition mires and quaking bogs (H7140)

Habitat Description

Cutover bog that has been recolonised; the drainage ditches are regular roughly 5m apart spanning the width of the habitat. There is a grass track along the western boundary with no hard core and well vegetated. Scrub encroachment present with willow sp. and pine sp. less than 10% grading higher as you go south – distinct separation in southern polygon. Some species such as thistle and hawksbit are more abundant along track.

Species identified on site within the PB4 - Cutover bog habitat with their relative abundance as per the DOMIN scale; as of 04 November 2024

Common Name	Scientific Name	Category
Soft-rush	<i>Juncus effusus</i>	Dominant
Heather	<i>Calluna vulgaris</i>	Dominant
Purple Moor-grass	<i>Molinia caerulea</i>	Dominant
Moss Sp.	<i>Moss Sp.</i>	Abundant
Autumn Hawkbit	<i>Scorzoneroides autumnalis</i>	Occasional
Glaucous Sedge	<i>Carex flacca</i>	Occasional
Thistle Sp.	<i>Thistle Sp.</i>	Occasional
Tormentil	<i>Potentilla erecta</i>	Occasional
Cross-leaved Heath	<i>Erica tetralix</i>	Occasional
Purple Moor-grass	<i>Molinia caerulea</i>	Occasional
Hard-fern	<i>Blechnum spicant</i>	Occasional
Prickly Heath	<i>Gaultheria mucronata</i>	Rare
Heath Bedstraw	<i>Galium saxatile</i>	Rare
Creeping Buttercup	<i>Ranunculus repens</i>	Rare
Cock's-foot	<i>Dactylis glomerata</i>	Rare



Brambles	<i>Rubus fruticosus</i>	Rare
Rhododendron	<i>Rhododendron ponticum</i>	Rare
Hard-fern	<i>Blechnum spicant</i>	Rare
Purple Moor-grass	<i>Molinia caerulea</i>	Rare
Autumn Hawkbit	<i>Scorzoneroides autumnalis</i>	Rare
Cross-leaved Heath	<i>Erica tetralix</i>	Rare

[For Oceanic valley mires - see EUNIS](#)

See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below:

[Coastal and floodplain grazing marsh UK BAP Priority Habitat description](#)

[Priority Habitat Inventory \(England\) - data.gov.uk](#)

All other wetland habitats - see UK Habitat Classification (UKHab):

On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	476999 823655	Habitat parcel reference	LOCATION 5
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.



B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	Yes	Sphagnum is as high as 65% in some areas and dwarf shrubs are less than 75%. There are some areas with as high as 20% but over the whole polygon this is not frequent.
Additional Criterion - must be assessed for Reedbed habitats only:			



I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			4
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/√	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.		Moderate (2)	N/A
• Passes 2 or fewer core criteria.		Poor (1)	N/A
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			
• Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type).		Good (3)	-
• Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type).		Moderate (2)	3 Core 1 Additional



• Passes 3 or fewer criteria.	Poor (1)	-	
Suggested enhancement interventions to improve condition score			
Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description.</p> <p>Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.</p> <p>Footnote 3 – Wildlife and Countryside Act 1981 (as amended).</p> <p>Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site.</p> <p>Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare.</p> <p>Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site.</p> <p>Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Condition Sheet: WETLAND Habitat Type		LOCATION 6	
Habitat Types			
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)			
Habitat Description			
<p>The cutover peatland is notable compacted to the south with instances of rhododendron invasion dotted throughout but most extensive to the east. The area is relatively consistent with the other peatlands around.</p>			
<p>For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):</p>			
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	477015 823113	Habitat parcel reference	LOCATION 6
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)



Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			



G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	Yes	Sphagnum is as high as 75% in some areas and dwarf shrubs are less than 75%. There are some areas with as high as 20% but over the whole polygon this is not frequent.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			4
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/√	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.		Moderate (2)	N/A
• Passes 2 or fewer core criteria.		Poor (1)	N/A



Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):		
<ul style="list-style-type: none"> • Passes 5 or 6 core criteria including criterion A; AND <ul style="list-style-type: none"> • Passes additional criterion G, H, I or J (choose the one specified for the habitat type). 	Good (3)	-
<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR <ul style="list-style-type: none"> • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	3 Core 1 Additional
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	-
Suggested enhancement interventions to improve condition score		
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>		
Footnotes		
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>		



Condition Sheet: WETLAND Habitat Type		LOCATION 7	
Habitat Types			
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)			
Habitat Description			
The cutover peatland with instances of rhododendron invasion dotted throughout but most extensive to the east. The area is relatively consistent with the other peatlands around.			
For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):			
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	477508 823267	Habitat parcel reference	LOCATION 7
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - must be assessed for all wetland habitat types :			



A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			



H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	No	Sphagnum is less than 10% and dwarf shrubs are less than 75%. There are some areas with as high as 20% but over the whole polygon this is not frequent.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			3
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/√	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.		Moderate (2)	N/A
• Passes 2 or fewer core criteria.		Poor (1)	N/A
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			
• Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type).		Good (3)	-



<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	-	
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	3 Core Only	
Suggested enhancement interventions to improve condition score			
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Condition Sheet: WETLAND Habitat Type		LOCATION 8	
Habitat Types			
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)			
Habitat Description			
Area to the NE of the site is the wettest with high levels of sphagnum. The drains have been revegetated by reeds causing extra water retention so it appears to be naturally regenerating/recovering.			
For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):			
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	4 th November 2024 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference	477642 823614	Habitat parcel reference	LOCATION 8
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)



Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	There are regular drains cut every 5m which run the full length of the habitat. The area is intensively drained.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site – the drainage ditches are free from contaminants, but they are stagnant/no flow. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	No	Prevalent and pervasive scrub encroachment form the surrounding conifer plantation. As much as 20-25%.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are recorded in the quadrat data and surrounding area.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A



Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	Yes	Sphagnum is as high as 75% in some areas and dwarf shrubs are less than 75%. There are some areas with as high as 20% but over the whole polygon this is not frequent.
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I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			4
Condition Assessment Result	Condition Assessment Score	Score Achieved *//	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.		Good (3)	N/A
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.		Moderate (2)	N/A
• Passes 2 or fewer core criteria.		Poor (1)	N/A
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			



<ul style="list-style-type: none"> • Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type). 	Good (3)	-	
<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	3 Core 1 Additional	
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	-	
Suggested enhancement interventions to improve condition score			
<p>Block drains. Remove and manage invasive species. Remove and manage scrub encroachment.</p>			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description. Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement. Footnote 3 – Wildlife and Countryside Act 1981 (as amended). Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site. Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare. Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site. Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			





Location of the areas assessed for condition relative to the DEFEA and UK Habitats Process



Condition Sheet: WETLAND Habitat Type	Overrun Area 1																									
Habitat Types																										
<p>Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide.</p> <p>Wetland - Blanket bog</p> <p>Wetland - Depression on peat substrates (H7150)</p> <p>Wetland - Fens (upland and lowland)</p> <p>Wetland - Lowland raised bog</p> <p>Wetland - Oceanic valley mire [1] (D2.1)</p> <p>Wetland - Purple moor grass and rush pastures</p> <p>Wetland - Reedbeds</p> <p>Wetland - Transition mires and quaking bogs (H7140)</p>																										
Habitat Description																										
<p>Really variable topography with lots of hammocks and hollows. No pools except surrounding the scrubland patch to the south which looks like deep mechanical cuts which have vegetated over. The site is less wet than would be expected in winter - and gets notably drier as you move north. The Sphagnum coverage is consistent with the highest percentage cover being in the south at about 30%. This is not identified to be priority active peatland as the Sphagnum cover is less than 40%. However, the site is in good condition and has potential to be restored to priority active status. There are some drainage ditches, but these are shallow and have Sphagnum blockages, so it is not clear from the site visit why the water retention profile seems weak. There is a notable coverage of non-customs lichens. The floral diversity aligns well with the indicator species of the blanket bog hammer I habitat - however it was identified to be species poor. This is partially due to the timing of the surveys. This is identified to be an annex I blanket bog in favourable condition which is not priority due to the Sphagnum cover. Nonetheless it is noted that it is close to priority status. The area towards the south of the site which is marked separately is the same species composition as the blanket bog to the north - however, there are large standing pools with 100% Sphagnum cover as can be seen in the photo. Therefore, it is mapped separately to denote the wetter area. These pools look like there are man-made and well revegetated.</p>																										
<p>Species identified in the habitat are listed in the table below according to their relative abundance.</p>																										
<table border="1"> <thead> <tr> <th>Common Name</th> <th>Scientific Name</th> <th>Category</th> </tr> </thead> <tbody> <tr> <td>Heather</td> <td><i>Calluna vulgaris</i></td> <td>Dominant</td> </tr> <tr> <td>Deergrass</td> <td><i>Trichophorum cespitosum</i></td> <td>Dominant</td> </tr> <tr> <td>Bog-myrtle</td> <td><i>Myrica gale</i></td> <td>Occasional</td> </tr> <tr> <td>Purple Moor-grass</td> <td><i>Molinia caerulea</i></td> <td>Occasional</td> </tr> <tr> <td>Soft-rush</td> <td><i>Juncus effusus</i></td> <td>Occasional</td> </tr> <tr> <td>Moss Sp.</td> <td><i>Moss Sp.</i></td> <td>Occasional</td> </tr> <tr> <td>Black Bog-rush</td> <td><i>Schoenus nigricans</i></td> <td>Rare</td> </tr> </tbody> </table>	Common Name	Scientific Name	Category	Heather	<i>Calluna vulgaris</i>	Dominant	Deergrass	<i>Trichophorum cespitosum</i>	Dominant	Bog-myrtle	<i>Myrica gale</i>	Occasional	Purple Moor-grass	<i>Molinia caerulea</i>	Occasional	Soft-rush	<i>Juncus effusus</i>	Occasional	Moss Sp.	<i>Moss Sp.</i>	Occasional	Black Bog-rush	<i>Schoenus nigricans</i>	Rare		
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Heath Milkwort	<i>Polygala serpyllifolia</i>	Rare
Glaucous Sedge	<i>Carex flacca</i>	Rare
Gorse	<i>Ulex europaeus</i>	Rare
Rhododendron	<i>Rhododendron ponticum</i>	Rare
Stiff Sedge	<i>Carex bigelowii</i>	Rare

[For Oceanic valley mires - see EUNIS](#)

See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below:

[Coastal and floodplain grazing marsh UK BAP Priority Habitat description](#)

[Priority Habitat Inventory \(England\) - data.gov.uk](#)

All other wetland habitats - see UK Habitat Classification (UKHab):

On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	7 th January 2026 Dr Andrew Torsney
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A
Grid reference		Habitat parcel reference	Over-run Area 1
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	Yes	There are no drains on site – there is a ditch that is vegetated over on either side of the fence through the site. The south of the field has a ditch all the way along the road along the southern end. But other than these there is good water retention on site.



B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	Yes	This is a well representative community composition however, most of the indicator species of higher value such as bog cotton, bog pimpernel etc are at low abundances. The site is notably dominated by soft rush and heather. There is scrub encroachment prevalent throughout.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	There are no water courses throughout the site. This criterion is passed due to lack of water supply through the site.
D	Cover of scrub and scattered trees are less than 10%.	Yes	There is scrub to the north and south of the site over 10%. However, there is no scrub throughout the main body of the site beyond a few saplings.
E	Cover of bare ground is less than 5%.	Yes	Limited bare ground, full sward coverage.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	No	Invasive species are not recorded in the quadrat data and surrounding area. The area to the north has extensive rhododendron stands.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	Yes	Sphagnum is less than 20-22% and dwarf shrubs are less than 75%.
Additional Criterion - must be assessed for Reedbed habitats only:			



I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A
Essential criterion achieved (required for Good condition) Yes or No:			Yes
Number of criteria passed			5
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/√	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.	Good (3)	N/A	
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.	Moderate (2)	N/A	
• Passes 2 or fewer core criteria.	Poor (1)	N/A	
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			



<ul style="list-style-type: none"> • Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type). 	Good (3)	5 Core 1 Additional	
<ul style="list-style-type: none"> • Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type). 	Moderate (2)	-	
<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	-	
Suggested enhancement interventions to improve condition score			
Unknown due to good condition.			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description.</p> <p>Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.</p> <p>Footnote 3 – Wildlife and Countryside Act 1981 (as amended).</p> <p>Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site.</p> <p>Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare.</p> <p>Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site.</p> <p>Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			



Condition Sheet: WETLAND Habitat Type		Overrun Area 3													
Habitat Types															
Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide. Wetland - Blanket bog Wetland - Depression on peat substrates (H7150) Wetland - Fens (upland and lowland) Wetland - Lowland raised bog Wetland - Oceanic valley mire [1] (D2.1) Wetland - Purple moor grass and rush pastures Wetland - Reedbeds Wetland - Transition mires and quaking bogs (H7140)															
Habitat Description															
<p>This habitat has been recently rotavated and is recognising bare peat. The peat depth is over 3m deep as observed from the deep drainage ditches around the edge of the site. There are several shallow ditches/scars through the main habitat area. The main species which are decolonising first are deer grass, soft rush, and grass species such as false oatgrass and/or purple moor grass. Overall, the habitat is in extremely poor condition with roughly 70% bare ground and no evidence of Sphagnum.</p> <p>Species identified in the habitat are listed in the table below according to their relative abundance.</p> <table border="1"> <thead> <tr> <th>Common Name</th> <th>Scientific Name</th> <th>Category</th> </tr> </thead> <tbody> <tr> <td>Soft-rush</td> <td><i>Juncus effusus</i></td> <td>Frequent</td> </tr> <tr> <td>Deergrass</td> <td><i>Trichophorum cespitosum</i></td> <td>Frequent</td> </tr> <tr> <td>Timothy</td> <td><i>Phleum pratense</i></td> <td>Rare</td> </tr> </tbody> </table>				Common Name	Scientific Name	Category	Soft-rush	<i>Juncus effusus</i>	Frequent	Deergrass	<i>Trichophorum cespitosum</i>	Frequent	Timothy	<i>Phleum pratense</i>	Rare
Common Name	Scientific Name	Category													
Soft-rush	<i>Juncus effusus</i>	Frequent													
Deergrass	<i>Trichophorum cespitosum</i>	Frequent													
Timothy	<i>Phleum pratense</i>	Rare													
<p>For Oceanic valley mires - see EUNIS See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below: Coastal and floodplain grazing marsh UK BAP Priority Habitat description Priority Habitat Inventory (England) - data.gov.uk All other wetland habitats - see UK Habitat Classification (UKHab):</p>															
On-site or off-site, site name and location	Muingmore Windfarm	Survey date and Surveyor name	7 th January 2026 Dr Andrew Torsney												
	Assessment was undertaken during the winter period – sub optimal. However vegetative ID was used.	Survey reference (if relating to a wider survey)	N/A												



Grid reference		Habitat parcel reference	
		Overrun Area 3	
Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - must be assessed for all wetland habitat types :			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. Note - this criterion is essential for achieving Good condition.	No	Completely cutover and rotovated.
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present. ¹	No	Devoid of species – some areas with 90% reed and grass cover and other areas with 96% bare peat.
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	No	No water supply to the site. Stream to the north is fast flowing not thought to be flowing into the site.
D	Cover of scrub and scattered trees are less than 10%.	Yes	Only because the site is devoid of species.



E	Cover of bare ground is less than 5%.	No	96% bare.
F	There is an absence of invasive non-native plant species ² (as listed on Schedule 9 of WCA ³) and species indicative of suboptimal condition ⁴ make up less than 5% of ground cover.	Yes	Only because the site is devoid of species.
Additional Criterion - must be assessed for Fen and Purple moor grass and rush pasture habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.	N/A	N/A
Additional Criterion - must be assessed for Bog habitats only:			
H	Sphagnum moss <i>Sphagnum</i> spp. and cottongrasses <i>Eriophorum</i> spp. are at least Frequent ⁵ . Cover of ericaceous dwarf shrubs ⁶ is less than 75%.	No	Zero percent sphagnum.
Additional Criterion - must be assessed for Reedbed habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds <i>Phragmites australis</i> . Other areas may include open water (at least 10%), species-rich fen and or wet woodland.	N/A	N/A
Additional Criterion - must be assessed for Floodplain wetland mosaic and CFGM only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.	N/A	N/A




Essential criterion achieved (required for Good condition) Yes or No:			No
Number of criteria passed			4
Condition Assessment Result	Condition Assessment Score	Score Achieved ×/√	
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):			
• Passes 5 or 6 core criteria, including criterion A.	Good (3)	N/A	
• Passes 3 or 4 core criteria; OR • Passes 5 core criteria but fails criterion A.	Moderate (2)	N/A	
• Passes 2 or fewer core criteria.	Poor (1)	N/A	
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):			
• Passes 5 or 6 core criteria including criterion A; AND • Passes additional criterion G, H, I or J (choose the one specified for the habitat type).	Good (3)	-	
• Passes 4 or 5 of 7 criteria; OR • Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type).	Moderate (2)	-	



<ul style="list-style-type: none"> • Passes 3 or fewer criteria. 	Poor (1)	For assessment purposes it is viewed to be fully failing. Only 2 passes which was just the absence of scrub but this is due to the absence of any vegetation.	
Suggested enhancement interventions to improve condition score			
Block drains. Remove inappropriate management. Allow to recolonise.			
Footnotes			
<p>Footnote 1 – Professional judgement should be used alongside the UKHab description.</p> <p>Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.</p> <p>Footnote 3 – Wildlife and Countryside Act 1981 (as amended).</p> <p>Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle <i>Cirsium arvense</i>, spear thistle <i>Cirsium vulgare</i>, common nettle <i>Urtica dioica</i>, docks <i>Rumex</i> spp., and common ragwort <i>Jacobaea vulgaris</i>. There may be additional relevant species local to the region and or site.</p> <p>Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare.</p> <p>Footnote 6 – Ericaceous dwarf shrubs include: crowberry <i>Empetrum nigrum</i>, cowberry <i>Vaccinium vitis-idaea</i>, bilberry <i>Vaccinium myrtillus</i>, cranberry <i>Vaccinium oxycoccos</i>, heather <i>Calluna vulgaris</i>, cross-leaved heath <i>Erica tetralix</i>, and bell heather <i>Erica cinerea</i>. There may be additional relevant species local to the region and or site.</p> <p>Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.</p>			





Appendix C Plot data – IWM Blanket Bog [7130] Condition Assessment

Muingmore Windfarm

RWE Renewables Ireland

Glasshouses 2, 92 George's Street Lower Dún Laoghaire, Co. Dublin, A96 VR66

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin, D14 N2Y7

SLR Project No.: 501.V00727.00008

Condition Assessment Criteria results for Blanket Bog [7130] from the Irish Wildlife Manuals, No. 79 – Part 1 of 3

Criteria	T11-Q1W	T11-Q2W	T11-Q1O	T11-Q2O	SUB-Q1W	SUB-Q2W	SUB-Q1O	SUB-Q2O	T4-Q1W	T4-Q2W	T4-Q1O	T4-Q2O	T5-Q1W	T5-Q2W	T5-Q1O	T5-Q2O
Number of positive indicator species present \geq 7 (Appendix VI)	1	1	1	0	0	0	0	0	0	0	1	0	1	1	0	0
Cover of bryophyte or lichen species, excluding <i>Sphagnum fallax</i> \geq 10%	1	0	1	1	0	0	0	0	0	1	1	1	1	1	1	1
Cover of each of the following species: <i>Calluna vulgaris</i> , <i>Eleocharis multicaulis</i> , <i>Eriophorum vaginatum</i> , <i>Molinia caerulea</i> , <i>Schoenus nigricans</i> , <i>Trichophorum germanicum</i> individually $<$ 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus repens</i> collectively $<$ 1%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover of non-native species $<$ 1% (local)	0	0	0	0	1	1	0	1	1	0	0	1	0	0	0	0
Cover of non-native species $<$ 1% (20m vicinity)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Cover of scattered native trees and scrub $<$ 10% (20m vicinity)	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0
Crushed, broken and/or pulled up <i>Sphagnum</i> species $<$ 10% of <i>Sphagnum</i> cover	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1
Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of browsing collectively $<$ 33% (Assess a minimum of 10 shoots distributed across the plot)	1	0	1	1	0	0	0	0	1	0	0	1	1	1	1	1
No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No signs of burning inside boundaries of sensitive areas† (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover of disturbed bare ground $<$ 10% (local)	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
Cover of disturbed bare ground $<$ 10% (20m vicinity)	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting $<$ 10% (20m vicinity)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cover of erosion gullies and eroded areas within the greater bog mosaic‡ $<$ 5%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Fail	6	8	6	7	10	10	9	8	6	7	6	5	5	5	6	6



Condition Assessment Criteria results for Blanket Bog [7130] from the Irish Wildlife Manuals, No. 79 – Part 2 of 3

Criteria	T6-Q1W	T6-Q2W	T6-Q1O	T6-Q2O	T7-Q1W	T7-Q2W	T7-Q1O	T7-Q2O	T8-Q1W	T8-Q2W	T8-Q1O	T8-Q2O	T9-Q1W	T9-Q2W	T9-Q1O	T9-Q2O
Number of positive indicator species present \geq 7 (Appendix VI)	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0
Cover of bryophyte or lichen species, excluding <i>Sphagnum fallax</i> \geq 10%	0	1	0	0	1	1	1	1	0	0	0	0	1	0	0	1
Cover of each of the following species: <i>Calluna vulgaris</i> , <i>Eleocharis multicaulis</i> , <i>Eriophorum vaginatum</i> , <i>Molinia caerulea</i> , <i>Schoenus nigricans</i> , <i>Trichophorum germanicum</i> individually $<$ 75%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus repens</i> collectively $<$ 1%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover of non-native species $<$ 1% (local)	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
Cover of non-native species $<$ 1% (20m vicinity)	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1
Cover of scattered native trees and scrub $<$ 10% (20m vicinity)	1	1	1	1	0	0	1	1	0	0	0	0	1	0	1	1
Crushed, broken and/or pulled up <i>Sphagnum</i> species $<$ 10% of <i>Sphagnum</i> cover	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of browsing collectively $<$ 33% (Assess a minimum of 10 shoots distributed across the plot)	1	1	1	1	1	1	1	1	0	0	1	1	1	0	0	0
No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No signs of burning inside boundaries of sensitive areas† (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover of disturbed bare ground $<$ 10% (local)	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Cover of disturbed bare ground $<$ 10% (20m vicinity)	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting $<$ 10% (20m vicinity)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cover of erosion gullies and eroded areas within the greater bog mosaic‡ $<$ 5%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Fail	8	5	6	7	6	7	4	4	8	8	7	7	4	7	6	5



Condition Assessment Criteria results for Blanket Bog [7130] from the Irish Wildlife Manuals, No. 79 – Part 3 of 3

Criteria	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Number of positive indicator species present \geq 7 (Appendix VI)	0	0	0	0	0	0	0	1	1	1	1	1
Cover of bryophyte or lichen species, excluding <i>Sphagnum fallax</i> \geq 10%	0	0	0	0	0	0	0	0	1	1	0	0
Cover of each of the following species: <i>Calluna vulgaris</i> , <i>Eleocharis multicaulis</i> , <i>Eriophorum vaginatum</i> , <i>Molinia caerulea</i> , <i>Schoenus nigricans</i> , <i>Trichophorum germanicum</i> individually $<$ 75%	1	1	1	1	1	1	1	1	1	1	1	1
Cover of the following negative indicator species: <i>Agrostis capillaris</i> , <i>Holcus lanatus</i> , <i>Phragmites australis</i> , <i>Pteridium aquilinum</i> , <i>Ranunculus repens</i> collectively $<$ 1%	1	1	1	1	1	1	1	1	1	1	1	1
Cover of non-native species $<$ 1% (local)	1	1	1	1	1	1	1	1	1	1	1	1
Cover of non-native species $<$ 1% (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1
Cover of scattered native trees and scrub $<$ 10% (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1
Crushed, broken and/or pulled up <i>Sphagnum</i> species $<$ 10% of <i>Sphagnum</i> cover	0	0	0	0	0	0	0	0	1	1	1	1
Last complete growing season's shoots of ericoids, <i>Empetrum nigrum</i> and <i>Myrica gale</i> showing signs of browsing collectively $<$ 33% (Assess a minimum of 10 shoots distributed across the plot)	0	0	0	0	0	0	0	0	1	1	1	1
No signs of burning into the moss, liverwort or lichen layer or exposure of peat surface due to burning (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1
No signs of burning inside boundaries of sensitive areas† (20m vicinity)	1	1	1	1	1	1	1	1	1	1	1	1
Cover of disturbed bare ground $<$ 10% (local)	0	0	0	0	1	1	0	0	1	1	1	1
Cover of disturbed bare ground $<$ 10% (20m vicinity)	0	0	0	0	1	1	0	0	1	1	1	1
Area showing signs of drainage resulting from heavy trampling or tracking or ditches or peat cutting $<$ 10% (20m vicinity)	0	0	0	0	0	0	0	0	1	1	1	1
Cover of erosion gullies and eroded areas within the greater bog mosaic‡ $<$ 5%	1	1	1	1	1	1	1	1	1	1	1	1
Total Fail	8	8	8	8	5	5	7	7	0	1	1	1





Appendix D Plot data – Photomontage

Muingmore Windfarm

RWE Renewables Ireland

Glasshouses 2, 92 George's Street Lower Dún Laoghaire, Co. Dublin, A96 VR66

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin, D14
N2Y7

SLR Project No.: 501.V00727.00008



Plate 1 Photo record of T4-Q1O as at location (ITM) X - 477095, Y - 823122; 14th November 2024



Plate 2 Photo record of T4-Q2O as at location (ITM) X - 477103, Y - 823102; 14th November 2024





Plate 3 Photo record of T4-Q1W as at location (ITM) X – 477015, Y – 823113; 14th November 2024

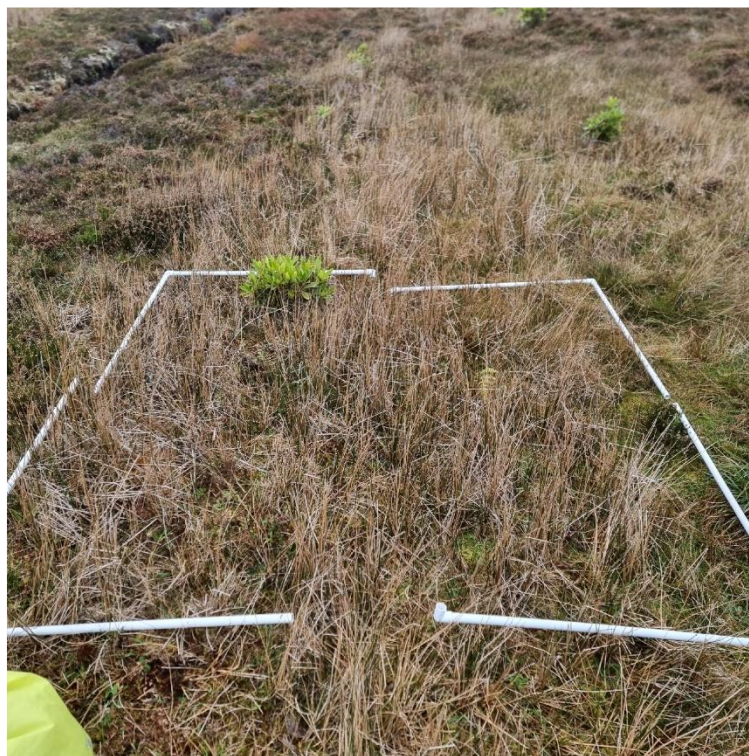


Plate 4 Photo record of T4-Q2W as at location (ITM) X – 476979, Y – 823618; 14th November 2024





Plate 5 Photo record of T5-Q10 as at location (ITM) X – 476999, Y – 823655; 14th November 2024



Plate 6 Photo record of T5-Q20 as at location (ITM) X – 476976, Y – 823667; 14th November 2024



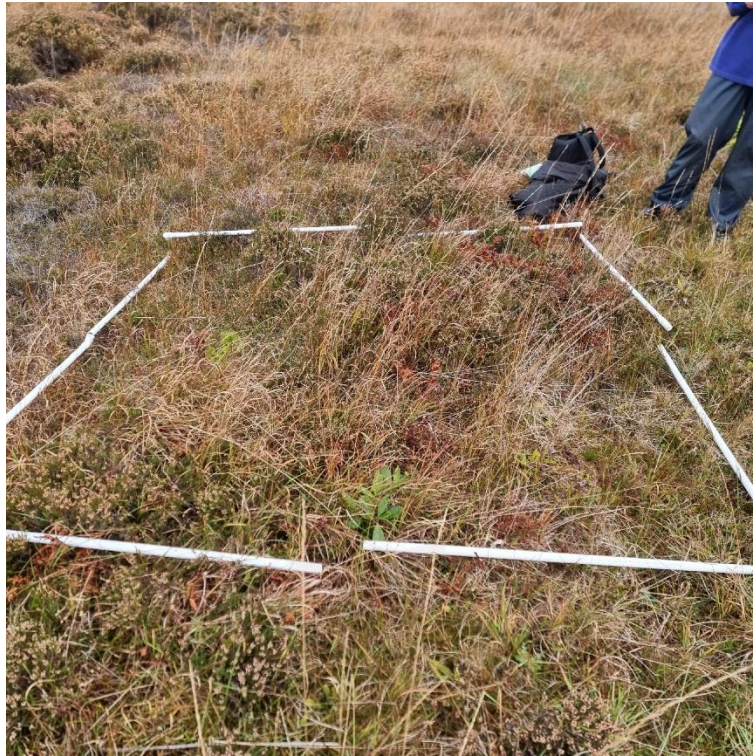


Plate 7 Photo record of T5-Q1W as at location (ITM) X - 476979, Y - 823594; 14th November 2024



Plate 8 Photo record of T5-Q2W as at location (ITM) X - 477037, Y - 823122; 14th November 2024





Plate 9 Photo record of T6-Q1O as at location (ITM) X – 477495, Y – 823222; 14th November 2024



Plate 10 Photo record of T6-Q2O as at location (ITM) X – 477484, Y – 823218; 14th November 2024





Plate 11 Photo record of T6-Q1W as at location (ITM) X – 477530, Y – 823261; 14th November 2024



Plate 12 Photo record of T6-Q2W as at location (ITM) X – 477508, Y – 823267; 14th November 2024





Plate 13 Photo record of T7-Q10 as at location (ITM) X – 477642, Y – 823614; 14th November 2024



Plate 14 Photo record of T7-Q20 as at location (ITM) X – 477625, Y – 823610; 14th November 2024





Plate 15 Photo record of T7-Q1W as at location (ITM) X – 477587, Y – 823676; 14th November 2024



Plate 16 Photo record of T7-Q2W as at location (ITM) X – 477598, Y – 823673; 14th November 2024





Plate 17 Photo record of T8-Q1O as at location (ITM) X – 476467, Y – 822618; 14th November 2024



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Plate 19 Photo record of T8-Q1W as at location (ITM) X – 476392, Y – 822592; 14th November 2024



Plate 20 Photo record of T8-Q2W as at location (ITM) X – 476402, Y – 822583; 14th November 2024





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Plate 26 Photo record of T11-Q20 as at location (ITM) X – 476598, Y – 821872; 14th November 2024



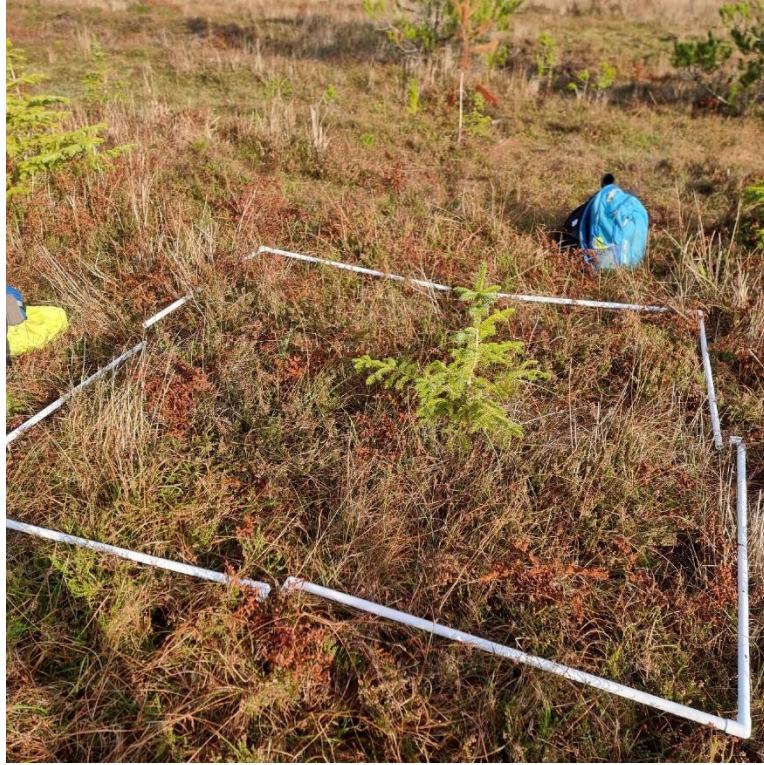


Plate 27 Photo record of T11-Q1W as at location (ITM) X – 476575, Y – 821833; 14th November 2024



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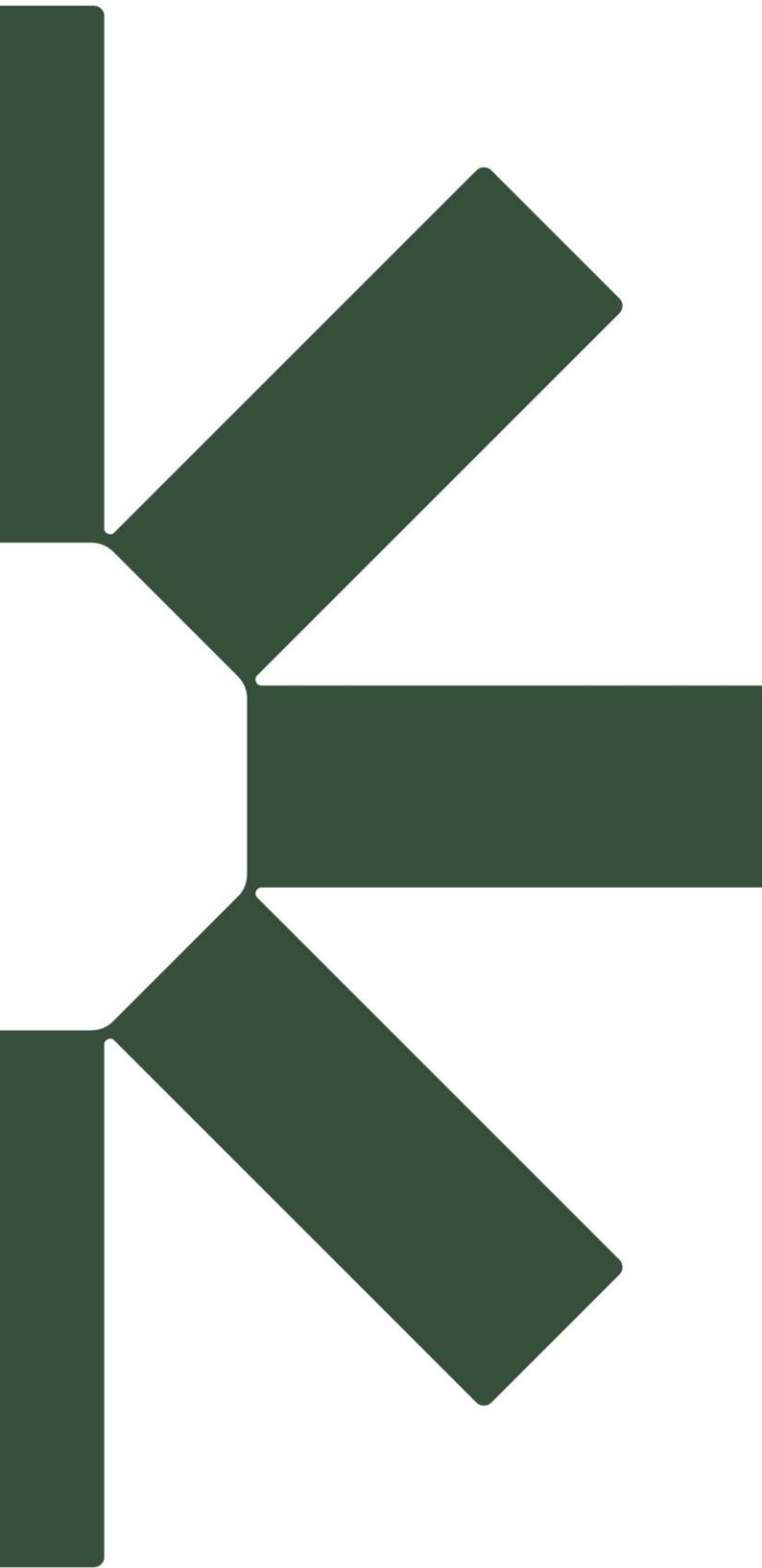


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Making Sustainability Happen

Appendix 5 Construction and Environmental Management Plan

AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001





Muingmore Wind Farm

Construction Environmental Management Plan (CEMP)

RWE Renewables Ireland Limited

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin, D14
N2Y7

SLR Project No.: 501.000571.065301

27 April 2026

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Revision	Date	Prepared By	Checked By	Authorised By
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1	16 March 2026	TM	LH	GH
2	27 April 2026	LH / RA	AOB	GH
	Click to enter a date.			
	Click to enter a date.			

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Acronyms and Abbreviations

AIL	Abnormal Indivisible Load
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CMS	Construction Method statement
CMT	Construction Management Team
CTMP	Construction Traffic Management Plan
ECow	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIERP	Environmental Incident and Emergency Response Plan
EPA	Environmental Protection Agency
EPPP	Emergency Pollution Prevention Plan
EPS	European Protected Species
EQS	Environmental Quality Standards
GPP	Guidance for Pollution Prevention
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HGV	Heavy Goods Vehicle
HMP	Habitat Management Plan
MCC	Mayo County Council
MW	Megawatt



PPE	Personal Protective Equipment
PPIP	Pollution Prevention and Incident Plan
PRP	Peatland Restoration Plan
PSCS	Project Supervisor Construction Stage
PSDP	Project Supervisor Design Process
QA	Quality Assurance
RAMS	Risk Assessment Method Statements
SAC	Special Area of Conservation
SHPP	Species & Habitat Protection Plan
SPA	Special Protection Area
SuDS	Sustainable Drainage System
SWMP	Site Waste Management Plan
SHWWR 2013	Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended
TCC	Temporary Construction Compound
TDR	Turbine Delivery Route
WMP	Waste Management Plan
WQMP	Water Quality Monitoring Plan



1.0 Introduction

1.1 Background

This document presents a Construction Environmental Management Plan (CEMP) for RWE Renewables Ireland Limited (the “Applicant”), which sets out the principles and procedures for mitigation measures to achieve environmental management during construction of a proposed renewable energy development within the town lands of Muingmore (An Mhoing Mhór) and Doolough (Dumha Locha), County Mayo. The development comprises a 74.1 to 91 Megawatt (MW) wind farm, with 13 no. turbines and associated infrastructure (including 33kV collector cables), a Turbine Delivery Route (TDR), onsite substation, and battery energy storage system (BESS), which, in consistency with the terminology of the wider planning application documentation, is referred to as the “Proposed Development”.

Should consent be granted, this CEMP will be revised and updated to a final version with the appointed Contractor, which will be agreed upon with Mayo County Council (MCC) prior to the commencement of development. The Contractor will use the CEMP to ensure proper environmental management throughout the construction phase of the Proposed Project and will be expanded to cater for any additional management measures required by planning conditions attached to the permission.

The document should be read in conjunction with **Chapter 2: Project Description** and **Chapter 17: Schedule of Mitigation Measures** of the Environmental Impact Assessment Report (EIAR) submitted with the planning application.

The CEMP is a live document that will evolve during the different phases of the Proposed Project. As such it will be subject to ongoing review in order to:

- address relevant conditions required in the approved consent;
- ensure it reflects best practice at the time of construction;
- ensure it incorporates the findings of pre-construction site investigations;
- address changes resulting from the construction methods used by the contractor(s); and
- address unforeseen conditions encountered during construction.

The CEMP will be a key contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment, are implemented.

1.2 Aims and Objectives

The CEMP will be maintained and updated on site and will be supported by associated design specifications and relevant documentation prepared in accordance with S.I. No. 291/2013 – Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended (SHWWR 2013), including the Project Supervisor Construction Stage’s (PSCS) Construction Phase Plan.

Where appropriate, the CEMP, or plans within the CEMP, will form part of the site induction which will be mandatory for all employees, contractors and visitors attending the Main Wind Farm Development Site. All employees and contractors will need to familiarise themselves with the relevant contents of the CEMP and supporting appendices as directed.

Management practices and mitigation measures have been developed for those aspects of the construction works that have been identified as having the potential to adversely affect the environment.

The objectives of the CEMP are to:

- identify the proposed mechanisms for ensuring the delivery of environmental mitigation measures to avoid or reduce potential environmental effects;

- ensure procedures are in place so that there is a prompt response to effects requiring remediation, including reporting and any additional mitigation measures needed to prevent a recurrence;
- provide an outline of the content that will be supplied in the construction method statements and strategies that will be prepared in order to secure mitigation measures in relation to different design aspects of the Proposed Development;
- ensure compliance with legislation and identify where it will be necessary to obtain authorisation from relevant statutory bodies;
- ensure that appropriate monitoring and reporting will be in place;
- provide a framework for reporting, compliance auditing and inspection to ensure environmental aims will be met; and
- set out the Applicant's expectations to guide contractors on their requirements with regards to environmental commitments and environmental management.

1.3 Definition of Terms

For the purposes of assessment, the following terms (Capitalised) are utilised throughout the EIAR:

- **Proposed Project:** Refers to the Proposed Development including the GCR.
- **Proposed Development:** Refers to the elements of the Proposed Project for which planning consent is being sought. This encompasses the wind farm and associated infrastructure (including the 33kV collector cables), Habitat Enhancement Area in the north-west quadrant (NWQ), any development associated with the Turbine Delivery Route (TDR), onsite substation, and battery energy storage system (BESS).
- **Proposed Development Site:** The site where the Proposed Development is located, as defined by the Planning Application Boundary.
- **Main Wind Farm Development Site:** part of the Proposed Development Site which includes the proposed wind turbines and associated infrastructure.

The Northern Cluster of the Main Wind Farm Development Site is comprised of a geographical area to the north of the local road, the L5252. Elements of the Proposed Development which will be located in the Northern Cluster comprise.

- 7 no. turbines (turbine nos. 1-7) and their associated access tracks, hardstandings and foundations.
- 1 no. 110kV substation.
- 1 no. temporary construction compound (TCC1).
- 1 no. BESS.
- 2 no. site access points (AP1 and AP2).
- Internal underground 33kV collector cables which connects both clusters to the onsite substation which is located within the Northern Cluster.
- Habitat Enhancement Area in the north-west quadrant (NWQ).

The Southern Cluster of the Main Wind Farm Development Site is defined by the area to the south of the local road, the L5252. Elements of the Proposed Development which will be located in the Southern Cluster comprise:

- 6 no. turbines (turbine nos. 8-13) and their associated access tracks, hardstandings and foundations.

- 1 no. temporary construction compound (TCC2).
- 1 no. meteorological mast.
- 1 no. site access point (AP3).
- Internal underground 33kV collector cables, connecting to the onsite substation which is located within the Northern Cluster.

Turbine Delivery Route (TDR): Refers to the proposed turbine delivery route from Killybegs Port to the Main Wind Farm Development Site and includes the 3 no. Over-run Areas.

Over-run Areas: Refers to the 3 no. areas (Over-run Areas 1, 2 & 3) along the TDR where temporary accommodation works on private lands are required.

Grid Connection Route (GCR): The designated route for the 110kV Underground Electricity Cable from the Proposed Development onsite substation to the national grid connection point at Bellacorick 110 kV Substation. The GCR will be the subject of a separate planning application.

Habitat Enhancement Area in the NWQ: An area to the north-west of the Main Wind Farm Development Site which will not include any infrastructure related to the Proposed Project other than that to enhance habitat.

1.4 Main Wind Farm Development Site

The Main Wind Farm Development Site and its surrounding area are described in **Chapter 1** and topic specific chapters of the EIAR but a summary is provided here for ease of reference.

The Main Wind Farm Development Site is situated within a coastal region of County Mayo and occupies a relatively condensed area of around 3km in a north-east to south-west orientation, encompassing 2 cluster areas. The surrounding area is predominantly rural in character but there are several small settlements within a 5km radius of the Main Wind Farm Proposed Development Site. The Main Wind Farm Proposed Development Site is also located c. 8km west of Bangor Eris and c.0.5km north of the village of Gweesalia.

Geographically, the Main Wind Farm Development Site lies north of the intersection of roads L1205 and L1206. The L1206 borders the southern edge of the Main Wind Farm Proposed Development Site, while the L1205 runs westward and leads to the R313, located c. 4km north of the Main Wind Farm Proposed Development Site. The R313 provides connections to more extensive road networks, as indicated below.

A local road (L5252) bisects the Main Wind Farm Development Site east to west. This local road branches off from the L1206. This road runs longitudinally through the Main Wind Farm Proposed Development Site, spanning from north-west to south-east, connecting the L1205 and L1206. Notably straight and offering good lines of sight, this road will provide access to the Main Wind Farm Development Site, both north and south of the road.

The Main Wind Farm Development Site predominately consists of cutover lowland blanket bog, conifer plantation and peatland. There is no built development within the Main Wind Farm Proposed Development Site, however a vacant industrial facility is located adjacent to the Northern Cluster but outside the planning application boundary.

The Main Wind Farm Proposed Site is less than 1 km from the Atlantic coastline and is located on low-lying terrain, ranging from approximately 3 m AOD at the southern end to approximately 33 m AOD at the northeastern portion.

A number of small streams are present within the Main Wind Farm Development Site and along the boundaries, such as along the northern boundary, flowing west, the lower portion of the east boundary, flowing south.

There are 109 residential properties indicated in **Figure 4-4 of the EIAR** as being located within 1km of the Main Wind Farm Development Site. The nearest residential property is located c. 740m from the nearest wind turbine (T10). There are 282 residential properties within 500m of the GCR.

1.5 Project Description

Planning permission is sought for a period of 10 years, for a renewable energy development comprising of the construction of a 13 no. turbine wind farm development, with associated 110 kV substation, battery storage, and all associated works on land within the townlands of Muingmore (An Mhoing Mhór), Doolough (Dumha Locha), Tristia (Troiste), Moneynierin (Moing an Iarainn) and Bangor (Baingear) County Mayo.

The planning application area is approximately 454 ha in size. Certain details of the proposed development are unconfirmed in this planning application and an opinion on unconfirmed details from An Coimisiún Pleanála (Case Reference: ABP -321948-25) pursuant to section 37CD of the Planning and Development Act 2000 (as amended) accompanies this planning application. The details unconfirmed in this application are the turbine tip height, rotor diameter and hub height. The range of parameters under which the turbine dimensions will fall are specified on this site notice and in the design flexibility opinion that accompanies this application.

The Proposed Development will consist of:

- Construction of 13 no. wind turbines, each with an overall blade tip height between 179-180m inclusive, rotor diameter between 149-163m inclusive, hub height between 98.5-105m inclusive, in two clusters.
- Battery energy storage system (BESS) compound to include control building with welfare facilities, all associated plant and equipment, security fencing and gates, underground cabling, and all ancillary structures, drainage works, as well as storage and parking.
- Construction of crane hardstands, laydown areas and turbine foundations.
- Construction of permanent internal site access roads including passing bays and all associated drainage infrastructure.
- Construction of a permanent 110 kV onsite electricity substation and onsite IPP (Independent Power Producer) substation to include control buildings with welfare facilities, all associated electrical plant and equipment, security fencing and gates, all associated underground cabling, wastewater holding tanks, and all ancillary structures and works.
- Construction of 33kV underground electricity cabling and communications cabling, including joint bays and ancillary works, to connect the windfarm and battery energy storage system to the proposed onsite substation.
- Construction of two temporary construction compounds with associated temporary site offices, parking areas, welfare facilities and security fencing.
- Development of an internal site drainage network and sediment control systems.
- Temporary works as part of road improvements to facilitate the delivery of abnormal loads and turbine component deliveries from Killybegs Port to site, to include 3 no. over-run areas along the turbine delivery route, (No. 1 in the townland of Tristia onto the L1206, No. 2 in the townland of Moneynierin at the junction of the N59 and the R312, and, No. 3 in the townland of Bangor off the R313).
- Construction of 1 no. new site entrance and the construction/ upgrade of 2 no. additional site entrances (all off local road L5252, west of the L1206),
- Ancillary forestry felling to facilitate construction of the development.

- All associated site development works including landscaping, lighting, soil management and the ongoing maintenance and management of the biodiversity measures in accordance with the Habitat Management Plan and the Peat Restoration Plan.
- The replacement of felled trees with the planting of new trees, and;
- The erection of a permanent meteorological mast 100m in height

A 35-year operational life from the date of full commissioning of the entire wind farm and battery storage is being sought for all works (other than temporary and permanent works specified above), and the subsequent decommissioning. The proposed substation will continue to exist on a permanent basis. Permanent planning permission is being sought for this element.

2.0 Schedule of Mitigation Measures and Implementation

2.1 Schedule of Mitigation Measures

The EIAR has identified the mitigation measures which will avoid or minimise the potential impacts of the Proposed Project

For each mitigation measure identified, the EIAR has detailed the specific mechanism by which it will be adopted, implemented, or enforced, as well as the timeframe within which the mitigation measure is to be carried out.

It will be mandatory for these mitigation measures to be implemented either before or during the construction phase of the Proposed Project, as set out in **Chapter 17** of the EIAR.

2.2 Implementation and Control

Compliance with the CEMP is the key control measure required during construction to ensure mitigation measures necessary to protect the environment are implemented. The CEMP documents the principles and processes to be followed to implement these environmental mitigation measures.

The PSCS will prepare a series of method statements in accordance with the Schedule of Mitigation Measures. These method statements will detail how the contractor intends to implement the mitigation measures set out in the CEMP and will be integrated with their detailed Construction Method Statements.

If any significant changes are required to the Schedule of Mitigation Measures due to changing environmental sensitivities, results of pre-construction confirmatory surveys, unforeseen events or for any other reason, these will be discussed and agreed with statutory bodies in advance of any amended works being carried out. The Schedule of Mitigation Measures will be revised with any approved changes required resulting from the discussions with the relevant statutory bodies. Any such agreed revisions will be submitted to and receive the written approval of the Planning Authority prior to being implemented.

3.0 Roles and Responsibilities

During construction there will be key responsibilities for the Applicant, the PSCS and their teams. Establishing roles and responsibilities in relation to construction will be important in order to ensure the successful construction of the Proposed Project, including the implementation of the CEMP. The personnel who will implement, monitor and respond to the CEMP will be the Applicant's construction team and the PSCS.

3.1 Health and Safety

The construction works will be undertaken in accordance with health and safety legislation, namely:

- Safety, Health and Welfare at Work Act 2005 S.I. No. 10 of 2005) (as amended); and
- Safety, Health and Welfare at Work (Construction) Regulations 2013 S.I. No. 291 of 2013 (as amended) (SHWWR 2013).

The construction works for the Proposed Project will fall under the Safety, Health and Welfare at Work (Construction) Regulations 2013 S.I. No. 291 of 2013 (as amended). As such, the PSCS will provide a Construction Phase (Health and Safety) Plan in accordance with the requirements of the legislation. This Construction Phase (Health and Safety) Plan will provide a blueprint for managing and co-ordinating health and safety during construction. It will contain details of the project description and key information, key personnel and responsibilities, construction management, health and safety arrangements, emergency procedures, control of high-risk activities and record keeping. An induction programme will be implemented to include both the PSCS's site-specific rules and the Applicant's requirements, and it will include instructions for all staff regarding the Emergency Pollution Prevention Plan (EPPP) and relevant procedures.

A mandatory induction will be required for all personnel on site including permanent/temporary contractor/subcontractor, site visitors, client representatives and other 3rd parties. Inductions will be documented.

All site activities will follow a safe system of work, with specific tasks having Risk Assessment Method Statements (RAMS) detailing:

- how the task will be carried out.
- identifying potential hazards and evaluating the risk on the basis of how likely hazards are to occur and what the consequences could be in the event of an incident.
- mitigation measures to be implemented to reduce the risks of the task, which will follow a hierarchy of controls in the following order, with elimination being the most effective and PPE being the least effective:
 - Elimination – physically remove the hazard.
 - Substitution – replace the hazard.
 - Engineering controls – isolate people from the hazard.
 - Administrative controls – change the way people work.
 - PPE – protect the worker with equipment.

RAMS will be recorded, monitored and reviewed in advance of all works and any changes in work procedures. If works change in a manner not anticipated by RAMS, works will be stopped until the risk can be appropriately evaluated. and changes will be implemented accordingly.



Plant operators and construction staff will be trained by the PSCS with regard to spill prevention/mitigation measures and procedures and in the use of relevant mitigation material (e.g. spill kits).

Staff and subcontractors employed by the PSCS will be trained and have to prove certification for all plant, vehicle and use of specialist equipment such as electrical and hot works. Training will be tailored to cover site-specific technology, in particular the BESS and substation, and they will be instructed on the Battery Safety Management Plan.

3.2 Construction Management Team

The Applicant will appoint a Construction Management Team (CMT). The CMT will be led by the designated Project Supervisor for the Design Process (PSDP), which is a legal requirement under the SHWWR 2013 (as amended). The team will include, as a minimum, a Resident Engineer (usually a Health and Safety Manager for the works), a subcontracted Environmental Clerk of Works (ECoW), and a Planning Monitoring Officer.

As the CEMP is a live document, the PSCS will update and implement the document throughout the construction stage. Both the PSDP and PSCS roles are integral to the successful and safe completion of construction projects. While the PSDP lays the foundation for a safe working environment by addressing potential risks in the design phase, the PSCS ensures that the following safety measures are effectively put into practice on-site.

- regular liaison with the PSCS's Site Manager;
- maintaining environmental risk registers;
- communicating with regulators and consultees such as Mayo County Council (MCC) regarding any additions or updates that need to be made to the CEMP including the Schedule of Mitigation Measures; and
- ensuring that any required changes are approved and updated within the CEMP.

The PSCS and Resident Engineer will have the power to stop works at any stage should it be deemed necessary or recommended by the ECoW, i.e., if there were environmental, transport, or health and safety risks from construction that could not be mitigated immediately.

3.3 Ecological Clerk of Works (ECoW)

An ECoW will be appointed during the period of construction and post-construction restoration. The appointment of the ECoW will be approved by MCC.

The role of the ECoW will be to provide environmental advice and monitor compliance with mitigation measures. The ECoW will have tasks (as outlined in **Chapter 17: Schedule of Mitigation Measures**) to carry out during construction and prior to the outset of each construction phase. They will be required to keep an active register of all issues that arise during the works and report as required to MCC.

The ECoW will have sufficient powers to:

- oversee construction work and identify where mitigation measures are required;
- recommend temporary stoppage of works if required; and
- to review working methods and advise whether alternative or more appropriate working methods require to be adopted.

The ECoW will undertake the following activities:

- to work with the PSCS and PSDP to induct all site personnel with regards to key environmental sensitivities and mitigation measures to be applied during construction;



- Toolbox talks shall be given by the ECoW throughout the construction period in the event that additional unforeseen issues arise that require alternative working methods;
- undertaking site walkovers, monitor implementation of the water management measures as stipulated in the Schedule of Mitigation Measures (see **Chapter 17**);
- liaising with contractors during the construction phase;
- inspecting working areas and ensuring compliance with the CEMP;
- undertaking water quality monitoring;
- providing advice on sediment and drainage management;
- communicating with all site personnel regarding any environmental issues and mitigation measures;
- overseeing that all necessary licenses regarding protected species are obtained, if required and facilitating with the support of suitably qualified and experienced Ecologists; and
- documenting and reporting any environmental issues and incidents as required to the applicant and MCC.

3.4 Resident Engineer

The Applicant will appoint a Resident Engineer for the construction of the Proposed Development. The Resident Engineer will provide support to the Construction Management Team and have day to day responsibility for monitoring the Proposed Development onsite on behalf of the PSCS, PSDP and Applicant.

The Resident Engineer will have a wide range of duties including but not limited to:

- overseeing construction works to ensure conformance with the specification, monitoring quality and progress and most importantly ensure that health, safety and the environment is given a high priority at all times. The Resident Engineer will effectively be the Applicant's eyes and ears on the Proposed Development Site and will report directly to the Construction Management Team;
- authority to stop the construction works in the case of a health and safety, environmental or quality issue. This applies when delays may lead to increased risk or damage;
- daily visual inspections of working areas to identify possible construction issues from a quality, environmental, programme and safety perspective. Any issues will be raised directly with the contractor;
- If any pollution is observed, all works will be halted until the source of the pollution has been managed;
- working closely with the ECoW to ensure that ecological and environmental requirements dictated by the CEMP, best practice and the planning conditions are adhered to by the works contractor;
- reviewing construction related documents from all contractors – including method statements and risk assessments and providing comments directly onsite to the PSCS; and
- reporting all environmental or health and safety incidents and near misses to the PSCS in a form and timescale required by the Construction Management Team.



3.5 Project Supervisor Construction Stage (PSCS)

The PSCS will be required to comply with and continually review the CEMP throughout the construction period. Trigger-based reviews will be undertaken should an environmental incident occur, a significant change in construction activity, following audit findings and when method statements are updated. This will include being aware of any changes or updates to the CEMP following the identification of any new environmental sensitivity or any changes to the Proposed Development. These changes will be controlled and implemented by the Applicant's Construction Management Team, as required.

The PSCS and their team (including any sub-contractors) will be responsible for:

- undertaking their duties in accordance with SHWWR 2013 (as amended);
- liaising with the Applicant's Construction Management Team;
- completing the construction of the Proposed Development in a manner which complies with all relevant laws, rules, regulations and supporting guidance;
- acquiring licenses and permits as necessary for their works;
- ensuring that all method statements in line with the principles set out in the CEMP have been provided;
- planning, managing, monitoring and coordinating all pertinent activities relating to construction;
- liaising with and providing justification to the competent authority if any significant changes are required from the Schedule of Mitigation Measures;
- developing and implementing a Pollution Prevention and Incident Plan (PPIP) and ensuring that all personnel (including sub-consultants and sub-contractors) understand and are aware of procedures to be undertaken should an environmental incident occur. This will sit as an additional appendix in the updated CEMP;
- ensuring that all personnel receive training and are aware of the potential to damage sensitive environmental receptors and procedures required to be implemented to avoid, minimise and mitigate against such damage;
- verifying the competence and resources of all personnel working on the Proposed Development and any sub-consultants and sub-contractors that were engaged on the Proposed Development; and
- implementing the Schedule of Mitigation Measures.

3.6 Project Supervisor Design Process (PSDP)

The PSDP can be an individual or body, and generally the role is fulfilled by a firm of architects, chartered surveyors, consulting engineers or project managers. In all cases, the person or company undertaking the role must have the necessary competence to carry out the relevant duties. The PSDP must be appointed before construction design work commences to ensure effectiveness in addressing and coordinating safety and health matters from the very early stages of a project.

The PSDP is responsible for:

- Identifying hazards arising from the design or from the technical, organisational, planning or time-related aspects of the project.
- Where possible, eliminating hazards or reducing the risks.



- Communicating necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the safety and health plan.
- Ensuring that the work of designers is coordinated to ensure safety.
- Organising co-operation between designers.
- Preparing a written health and safety plan for any project where construction will take more than 500 person days or 30 working days, or there is a particular risk and deliver it to the client prior to tender.
- Preparing a safety file for the completed structure and giving it to the Client/Applicant.
- Notifying the Health and Safety Authority and the client of non-compliance with any written directions issued.
- The PSDP may issue directions to designers, contractors or others.

3.7 Site Personnel

All Site personnel, including all members of the Applicant and PSCS's teams, all sub-contractors and sub-consultants are required to:

- attend all inductions and site-specific training including toolbox talks carried out by the ECoW; and
- implement control measures throughout the Proposed Development Site, as required.

3.8 Communication

Prior to the commencement of construction, the Applicant will set up a community liaison strategy. The objective of community liaison will be to keep the community informed of progress of construction of the Proposed Development. The community liaison strategy will be designed to establish processes to keep the community informed, reviewing incidents that have occurred and how these have been resolved and discussing the forthcoming programme of work. The Applicant has already established a Community Liaison programme through the appointment of a Community Liaison Officer, who has undertaken door to door consultation, scheduled meetings and delivered project updates with named contact details since 2023. Prior to any construction starting on the Proposed Development Site, the community liaison strategy will be updated and communication will be maintained on a monthly basis until construction is complete, and the Proposed Development is operational. Through a programme of community meetings, leaflet drops and a project website, the Applicant will provide contact details of:

- the Resident Engineer – who will be on the Proposed Development Site for the majority of the construction phase;
- the Applicant's Community Liaison Officer; and
- the Applicant's Public Relations Officer.

Any resident who has a question regarding the construction of the Proposed Development will be directed to one of these contacts. All questions will be logged and an auto response will be provided with an anticipated timeframe for a reply.

Once construction has started, the Applicant will provide details of any construction activity that will impact on the local community, such as deliveries.

Careful logging and monitoring of any complaints received, including recording details of the location of the affected party, time of the disturbance and nature of the issue will be reviewed in sequential stages of work programming to reduce the likelihood of further incidents.



4.0 Phasing

4.1 Construction

The construction works will take place over a 24-month period. Construction activities are proposed to occur during standard working hours, from 07:00 to 19:00, Monday to Friday, and 07:00 to 13:00 on Saturdays. While work on Sundays and public holidays is not expected, out of hours works may be required for certain critical activities, such as abnormal load deliveries, concrete pours for turbine foundations, and the lifting of turbine components. These exceptions will only occur with prior approval from MCC.

Through the provisions of the Community Liaison Strategy, the PSCS will keep local residents informed about the proposed working schedule, including the times and duration of any abnormally noisy activity that may cause concern.

The following activities will be carried out during the construction work phases:

- Phase 1 – Site set-up:
 - site preparation, including tree felling and vegetation clearance where necessary;
- access road improvements, including widening and drainage adjustments;
 - establishment of site compounds, including installation of welfare facilities and temporary storage areas;
- Phase 2 – Construction:
 - construction of new site access tracks and upgrades to existing tracks;
 - excavation and construction of turbine foundations;
- preparation and installation of crane hardstanding areas; and
- construction of the substation and BESS.
- Phase 3 – Commissioning:
 - turbine delivery and construction;
- wind farm commissioning;
- substation and BESS testing and commissioning; and
 - turbine and wind farm reliability run;
- Phase 4 – Demobilisation:
 - take over;
 - snagging; and
 - decommissioning of temporary compound / structures and restoration of the Site.

A proposed construction programme is shown in **Table 4-1** for information. The construction phase of the Proposed Development, which includes civil, electrical, grid works, and turbine assembly is anticipated to take 24 months once the proposed turbines are acquired via a competitive tender process. Prior to construction, a final construction programme will be provided to MCC by the PSCS.



Table 4-1: Proposed Construction Programme

Construction Activity	Months																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mobilisation & site set up	█																							
Site clearance and felling		█	█	█	█																			
Site access and internal access tracks			█	█	█	█	█	█																
Turbine hardstands					█	█	█	█	█	█	█	█												
Turbine foundations							█	█	█	█	█	█	█											
Turbine Delivery & Installation													█	█	█	█	█	█	█	█	█			
On Site Cabling										█	█	█	█	█	█	█								
Onsite substation, BESS and Grid connection cable works									█	█	█	█	█	█	█	█	█	█	█	█				
Commissioning and Testing																					█	█	█	
Landscaping, reinstatement and demobilisation																							█	█



4.2 Post Construction Reinstatement

Good practice techniques for vegetation and habitat reinstatement such as the Draft Wind Energy Development Guidelines (Rev December 2019) and Best Practice Guidelines for the Irish Wind Energy Industry (2012) will be adopted and implemented on areas subject to disturbance during construction as soon as practicable.

The following reinstatement works will be implemented as appropriate:

- re-use of turves;
- re-use of topsoil/peat where appropriate; and
- reseeding with appropriate species.

For clarity, the following are definitions for the different plant and peat make-up of the natural ground between the surface and rockhead (from top down):

a) Vegetation:

This is typically plant matter that can be removed/stripped above the ground level (i.e. does not include roots/topsoil). This can vary depending on the nature of the vegetation encountered on site.

b) Turf/Turves:

Turf (turves) refers to the surface layer comprising grass and a matrix of interwoven roots and organic soil. The thickness of turves varies depending on ground conditions and vegetation type, and is typically carefully stripped to maintain integrity for potential reuse.

c) Peat:

The near-surface organic ground formed from partially decomposed vegetation. Thickness is highly variable across the site. The upper peat is typically fibrous with a vegetation mat, underlain by more decomposed, saturated peat. Peat can be excavated as intact turves where reinstatement is required, or otherwise segregated and placed in temporary storage in line with the Peat Management Plan.

d) Superficial Soils:

This is a generic term used for all material between topsoil/peat and rockhead. This can vary in depth and content throughout the depth profile at any location.

e) Weathered Rock:

This is a layer that may exist above rockhead that is neither rock nor superficial material but a mixture of both. It can be mostly fractured rockhead as a result of physical and chemical weathering processes. When excavated it may have elements of fractured rock and superficial material as the boundary can be difficult to distinguish.

In some cases, this can provide suitable engineering material for the construction of foundations, embankments, tracks, etc.

f) Rockhead:

This is a naturally occurring solid aggregate of minerals which lies beneath the superficial soils.

The above terms are defined for clarity as they may be referred to in the CEMP in relation to soil management.



5.0 General Construction Good Practice

References to Good Practice guidance on which the Schedule of Mitigation Measures is based are provided at the rear of this CEMP. Site access will be controlled throughout the construction process by means of secure gated entrances and appropriate site boundary controls, in order to prevent unauthorised access, illegal dumping and use by off-road vehicles.

All backfilling and construction-phase activities will be undertaken in accordance with relevant best practice environmental guidance published by the Environmental Protection Agency and CIRIA C741 – Environmental Good Practice on Site (4th Edition). All waste management activities will comply with the provisions of the Waste Management Act 1996 (as amended).

The main requirements in relation to the Proposed Project are set out below.

5.1 Invasive Species Management

Mitigation measures to safeguard against the introduction or spread of invasive species to or from the Proposed Development Site will be implemented as follows:

- Strict plant and machinery clean-down procedures (high-pressure wash, disinfect, dry).
- Check-Clean-Dry protocol to prevent crayfish plague.
- Imported material is certified to be clean inert and is sourced from reliable suppliers and sites.
- The resident engineer holds power to reject contaminated loads and can be supported by the ECoW.
- Clean down procedures such as wheel washes upon entry and exit of site.

5.2 Peat Management

A detailed Peat Management Plan (PMP) has been developed based on ground investigations undertaken across the Main Wind Farm Development Site as well as a Peat Landslide Hazard Risk Assessment.

The PMP will be followed by all involved in peat excavation and management works. The ECoW will oversee the works and provide guidance where necessary on the excavation, transportation and storage of peat.

A Geotechnical Risk Register will be developed and maintained by the appointed geotechnical engineer.

Undercutting of peat slopes will be avoided. Where this cannot be avoided, a more detailed geotechnical stability assessment of the area of concern by the geotechnical engineer will be undertaken to include review of site-specific ground investigation data and site inspection.

Floating tracks will be access tracks across in areas with excess of 1m deep peat (as described in Section 9.4). Floating tracks will be used for access track construction in areas where peat depths exceed 1 m (as described in Section 9.4). The temporary TDR overrun areas will also primarily use floated construction to minimize excavation in peat and to preserve the existing ground and hydrological conditions.

The established drainage pattern regime will be protected and hydrological management will be implemented to ensure that no areas will receive surcharge. This will ensure that the current level of stability of the peat mass, will be retained if not improved. All drainage channels constructed on site along infrastructure will be 'shallow' drainage ditches to maintain stability of both the peat and infrastructure.



Construction activities in peat will be undertaken with due regard to prevailing ground and weather conditions. Peat stability, water content and rainfall will be continuously monitored, and construction methodologies will be adapted as necessary to minimise disturbance to peat and reduce the risk of instability and erosion.

Cut and fill will be avoided in areas of peat greater than 1 m in depth where practicable. Where this cannot be avoided, the following measures will be implemented:

- Excavation will be to a sound stratum / peat substrate.
- Where the depth of cut is deemed unstable, a stepped or benched surface will be implemented with the intention of minimising the exposed surface of the up-slope cut face. Where groundwater becomes a construction issue, sheet piles or cofferdams will be installed.
- All exposed peat surfaces will be protected from erosion and desiccation, by ensuring the integrity and moisture content of the peat is maintained.
- A small bund will be formed at the top of cut slopes to retain moisture within the peat, thereby preventing desiccation and maintaining slope stability.

To minimise the risk of potentially inducing peat landslides during construction of the Proposed Development, the following will be implemented:

- Raise health and safety awareness of the peat environment for construction staff by incorporating the issue into the site induction.
- Include peat slide risk assessment information (e.g. peat instability indicators, best practice and emergency procedures) in toolbox talks with relevant operatives e.g. plant operatives.
- Carry out confirmatory pre-construction surveys and ground investigations prior to the commencement of works.
- Minimise off-track plant movements within areas of peat, use trackways once constructed.

5.3 Handling of Excavated Materials

The construction of tracks, turbine foundations, crane hardstanding areas and the substation and BESS compound will require excavation and handling of peat and substrate material. In order to reduce the risk of localised erosion during excavation and infilling, the area of bare or exposed soils and rock will be kept to a minimum, insofar as practicable.

Excavated materials will be reused or placed in temporary storage. Arisings will be mainly peat, with minor quantities of soil and rock. Description of the existing land, soils and geological setting is provided in EIAR **Chapter 6: Land, Soils and Geology**. Soils and peat will be used for reinstatement works or reuse associated with access tracks, cable trenches, turbine foundations, crane hardstandings and the temporary construction compounds. The priority of the peat material is for reposition and reuse as per the PMP. The upper vegetated turves (where available) will be stored and be used to dress infrastructure edges and to be replaced on areas which have been temporarily stripped.

Excavated material will be used as soon as practicable and as close as possible to the area it was excavated from; however some temporary storage will be required.

5.4 Materials Storage

Excavated, granular, non-organic material required to be stored temporarily will be compacted to reduce the potential for erosion and transfer of sediment and stockpiled in designated areas



at least 50 m from any watercourse. Material placement will be managed to avoid compaction of sensitive habitats and prevent encroachment beyond the defined working area.

Temporary stockpiles will be appropriately sited away from marshy grassland, bog or heath, with the locations agreed in advance with the ECoW. Where required, stockpiled soils (pending re-use) or exposed surfaces (pending further backfilling to final ground level) will be temporarily covered. They will be evaluated and monitored during and following rainfall events and kept stable for safety and to minimise erosion.

Where excavated material cannot be transferred immediately to an appropriate restoration area, short-term storage will be required. In this case, the following good practice will apply:

- peat will be stored in line with the PMP measures;
- local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes will be avoided for storage;
- stored upper turves (incorporating vegetation) will be reinstated adjacent to similar habitats as advised by the ECoW;
- monitoring of stockpiles/excavation areas will occur during and following rainfall events; and
- if material is stockpiled on a slope, silt fences will be utilised to reduce sediment transport in accordance with CIRIA Control of Water Pollution from Construction Sites. Guidance for consultants and contractors (C532)'. Additional measures will be implemented where necessary to control flow of water and sediment transport on site in accordance with this guidance.

Material excavated during new and upgraded access track construction will be stored adjacent to the track and granular, non-organic material compacted in order to limit instability and erosion potential. Peat will not be allowed to dry out, through rewetting and monitored irrigation.

To prevent sediment entrainment and habitat degradation the following will be applied:

- Stockpiles will be stored >50 m from watercourses and stabilised by covering or seeding.
- Silt fencing will be installed at the downslope edges of stockpiles.
- Fine sediment handling will avoid periods of heavy rainfall.
- Material placement will be managed to avoid compaction of sensitive habitats and prevent encroachment beyond the defined working area.

5.5 The Management and Movement of Concrete

5.5.1 Accidental Spillage

Appropriately sized spill kit(s) will be provided and maintained onsite, consideration will be given to suitable locations across the active areas of the Proposed Development Site and to having vehicles, including plant, carry a spill kit. This kit will contain materials, such as absorbent granules and pads, absorbent booms and collection bags. These are designed to halt the spread of spillages and will be deployed, as necessary, should a spillage occur within the construction site.

In the event of any spillage or pollution of any watercourse, the emergency spill procedures as described in the Environmental Incident and Emergency Response Plan (EIERP) will be implemented immediately (refer to Section 6.1).



A speed limit of 24 kph will apply for vehicles onsite and will be monitored and enforced by the PSCS. Maximum vehicle load capacities will not be exceeded.

5.5.2 Vehicle Washing

To avoid mud and debris being tracked onto the public road there will be wash-out facilities within the construction compounds or at the exit points to the L5252, consisting of a sump overlain with a geosynthetic membrane. The geosynthetic membrane will filter out the concrete fines leaving water to pass through to the sump. The sump water will be pumped to a licenced carrier and taken offsite for approved disposal. No washing of concrete-associated vehicles will be undertaken outside the wash out facility, and the area will be signposted, with all site contractors informed of the locations.

Wheel wash facilities will be situated a minimum of 50m away from any watercourse on site and will be placed on an impermeable surface.

Wash facilities will be inspected routinely, with sediment removed and disposed of appropriately to maintain effectiveness.

5.5.3 Concrete Pouring for Turbine Foundations

To prevent pollution, all concrete pours will be planned, and specific procedures adopted in accordance with CIRIA C532 Guidance. These procedures will include:

- ensuring that all excavations are sufficiently dewatered before concrete pours begin and that dewatering continues while the concrete cures. Construction good practice will be followed to ensure that fresh concrete is isolated from the dewatering system;
- ensuring that covers are available for freshly placed concrete to avoid the surface of the concrete washing away during heavy precipitation; and
- perimeter drains will include silt traps where necessary.

The excavated area will be back-filled with compacted layers of graded material from the original excavation, where this is suitable, and capped with peat or soil. The finished surface around the base of the turbine, will be capped with crushed aggregate providing a walkway to allow for safe personnel access.

5.6 Surplus and Waste Material

5.6.1 Introduction

A Waste Management Plan (WMP) will be prepared and submitted to Mayo County Council for agreement prior to the commencement of construction works. The WMP will be prepared in accordance with relevant national and regional waste management policy and guidance, and will apply the principles of the European Waste Hierarchy as set out in the Waste Management Act 1996 (as amended).

The WMP will detail how all waste materials will be managed, including the management and definition of excavated materials.

The PSCS will take all reasonable steps to ensure that all waste from the site is dealt with in accordance with the requirements under the above Act and that materials will be handled efficiently, and waste managed appropriately.

Appropriate waste management, disposal and waste carrier documentation and licences will be obtained (e.g. complete waste transfer notes prior to waste leaving site, ensure all waste carriers have a valid waste carrier's registration certificate, ensure wastes are disposed of at a correctly licensed site, complete notification for hazardous waste to the EPA).



Waste streams will include wastes generated by plant, machinery and construction workers over the period of the works, for example waste oils, sewage, refuse (paper, carton, plastic etc.), wooden pallets, waste batteries, fluorescent tubes etc.

5.6.2 Hazardous and Other Wastes

Table 5-1 lists the types of waste that are anticipated to be generated during the construction works. Although some waste types may be generated in locations other than the construction compounds, such waste materials will be stored within the construction compounds only. Waste materials generated outside the construction compounds will be taken to the compounds on a daily basis to be managed thereafter.

No oils, greases, hydraulic fluids or other hazardous substances (or associated wastes) will be stored outside designated areas within the Main Wind Farm Development Site. All such materials will be stored only within designated COSHH storage areas located in the construction compounds, substation and BESS compounds. These storage areas will comprise impermeable surfaces, be covered where appropriate, and include fuel spill trays and/or bunded containers.

Table 5-1: Common Construction Wastes

EWC Code	Description
13 01 10*	Used mineral hydraulic oil (non-chlorinated)
13 02 08*	Other waste engine, gear or lube oil
13 02 05*	Waste engine, gear or lube oil (non-chlorinated)
13 02 08*	Other waste engine, gear or lube oil
16 01 07*	Oil filters
20 01 23*	Discarded equipment containing CFCs e.g. waste fridges
16 06 01*	Lead batteries
16 07 08*	Oily waste from transport and storage tanks
16 10 01*	Hazardous liquid wastes to be treated off-site
20 01 21*	Fluorescent tubes and other mercury-containing waste
20 01 33*	Hazardous batteries and accumulators that are collected separately
15 02 02*	Absorbents, filter materials, wiping cloths, clothing contaminated by dangerous substances
15 01 01	Cardboard or paper packaging
15 01 02	Plastic packaging e.g. toner and ink cartridges, polythene sheeting
15 01 03	Wooden packaging e.g. timber pallets
15 01 04	Metallic packaging e.g. drink cans, paint tins
16 01 03	Tyres
16 01 15	Antifreeze fluids that do not contain dangerous substances e.g. Coolants
16 01 17	Ferrous metal from vehicles e.g. car parts
16 02 14	Non-hazardous waste electricals e.g. washing machines, power tools
16 05 05	Gases in pressure containers i.e. gas cylinders
17 01 01	Concrete



EWC Code	Description
17 02 01	Wood from construction or demolition e.g. timber trusses, supports, frames, doors
17 04 11	Cables that do not contain dangerous substances e.g. electric cabling
20 01 01	Paper and card similar to that from households e.g. office paper, junk mail
20 01 30	Non-hazardous detergent e.g. flushing agent/universal cleaner
20 01 39	Separately collected plastics e.g. plastic containers, bottles
20 03 01	Mixed waste similar to that from households e.g. mixed office, kitchen and general waste
20 03 04	Septic tank sludge

*Denotes Hazardous Waste, as categorised by the European Waste Catalogue.

Foul water from the onsite facilities at the construction compounds will be removed from the Proposed Development Site by an appropriately licensed contractor.

5.6.3 Regulatory Compliance

Waste will be transferred to a licensed waste management site or site with a waste exemption. The PSCS will check that the site is licensed and that the licence permits the site to take the type and quantity of waste involved. Copies of the waste management licence or waste exemption license will be held on file.

A 'Waste Transfer Note' must be completed by all parties involved and must be retained for a period of two years. Sub-contractors excavating and hauling waste offsite must complete their own Waste Transfer Notes and copy them to the PSCS. It is not necessary to have a Waste Transfer Note for each load of waste and a Waste Transfer Note can be issued weekly or monthly as a season ticket.

It will be the responsibility of the PSCS to ensure that other parties involved in the transport, storage and disposal of waste are legally entitled to carry out their duties.

5.7 Dust Mitigation

Good practice measures as listed in **Table 5-2** will be adopted during construction to control the generation and dispersion of dust to ensure that significant impacts on neighbouring habitats will not occur. The hierarchy for mitigation will be prevention – suppression – containment.

Table 5-2: Dust Mitigation Measures

Task	Mitigation Measures
Phasing and grading of works	<ul style="list-style-type: none"> - Internal access roads will be constructed prior to the commencement of other major construction activities. These roads will be finished with graded aggregate. - Grading and reinstatement will be completed progressively. - Double handling of materials is to be avoided. - Dust generating activities will be contained, suppressed or stopped during periods high winds.



Task	Mitigation Measures
Stockpiling of loose materials	<ul style="list-style-type: none"> - Earthworks and exposed areas/soil stockpiles will be revegetated to stabilise surfaces as soon as practicable. - Materials likely to cause dust will be sealed over and covered. - Material stockpiles will be located away from the site boundary, sensitive receptors, watercourse and surface drains.
Management measures	<p>A water bowser will be used to spray work areas (wind turbine area and cable route) and haul roads, especially during periods of excavation works coinciding with dry periods of weather, to suppress dust migration from the site.</p> <ul style="list-style-type: none"> - All loads which could cause a dust nuisance will be covered to minimise the potential for fugitive emissions during transport. - The access and egress of construction vehicles will be controlled to designated locations, along defined routes, with all vehicles required to comply with onsite speed limits. - Wheel wash stations will be implemented where vehicles exit on to public roads.

5.8 Noise Management

The sources of construction noise are temporary and vary both in location and their duration as the different elements of the Proposed Development are constructed, and arise primarily through the operation of large items of plant and equipment such as bulldozers, diesel generators, vibration plates, concrete mixer trucks, rollers etc. Noise also arises due to the temporary increase in construction traffic near the Main Wind Farm Development Site. The level of noise varies depending on the different elements of the Proposed Development being constructed.

BS 5228-1:2009 'Noise control on construction and open sites; Part 1 – Noise' will be relied on for guidance on appropriate methods for minimising noise from construction activities.

All construction activities will adhere to good practice as set out in BS 5228-1 as current best practice in the absence of any Ireland specific guidance.

Mitigation measures will be implemented to reduce noise levels with due regard to practicality and cost as per the concept of 'best practicable means' as defined in Section 5 of the Air Pollution Act 1987 (as amended).

During construction, a temporary 2.5 m high solid close-boarded wooden fence, or equivalent noise barrier, will be installed on the north section of overrun area 1 as this was identified within **Chapter 9** of the EIAR as having a potential temporary noise impact on the neighbouring dwelling.

Noise management mitigation measures will consider the following:

- Adherence to core working hours.
- Use of low noise or silenced plant.
- Use of prefabrication off site to reduce site activities.
- Avoiding, where possible, multiple activities simultaneously.
- Progressive working away from sensitive receptors rather than static prolonged works.
- Properly maintain plant and prevent unnecessary revving, idling.



- Careful positioning of static plant such as generators, compressors within compounds.
- Use of temporary acoustic screens or barriers or earth bunds.
- Speed restrictions and no unnecessary use of reversing alarms.
- Communication with local residents.

5.9 Site Lighting

Temporary site lighting will be required for specific activities to ensure safe working conditions during winter working and periods of limited natural light.

Sources of artificial lighting will include vehicle and plant headlights; construction and compound lighting; office complex lighting; and localised floodlights/mobile lighting units. The requirement for artificial lighting will be minimised, and unnecessary nighttime working will be avoided where practicable, in accordance with the mitigation measures set out in **Chapter 5** of the EIAR.

During the summer months, natural lighting during normal working hours will reduce the need for artificial lighting.

Where artificial lighting is required, it will be kept to the minimum necessary to safely undertake the works. The timing, duration and positioning of lighting will be considered as part of the construction method statement to minimise potential effects on ecological receptors.

Lighting will be directional and time-limited to reduce disturbance to bats and birds.

Artificial lighting will only be used within the limits of the permissible working hours and will be shielded/hooded to negate or minimise any effect to local residents or ecological species.

Directional lighting will be employed to minimise light pollution. This includes angled downward lighting, focused lighting on working areas only and avoiding light spill beyond the site boundary.

5.6 Shadow Flicker

a programmable shadow flicker control module, consisting of bespoke software, a clock, a timer, a switch, a wind direction sensor and a light sensor will be installed on all wind turbines. The module allows for programmed shut down on specific dates at specific times when the sun is bright enough, there is sufficient wind to rotate the blades, and the wind direction is such that nuisance shadow flicker could occur at a specified at-risk receptor. During operation of the proposed turbines, any complaints relating to shadow flicker will be fully investigated by the Applicant and the shadow flicker control system updated accordingly.

5.7 Contractor Parking and Access Arrangements

Parking - parking areas located at the site construction compound will have safe and secure barriers to segregate all personnel from site plant and vehicle routes. No parking will be allowed on internal or public roads; all cars that are directed to the site parking area will be required to reverse park for health and safety reasons.

Each construction compound will have sufficient parking spaces to accommodate workers for the construction period. The Proposed Project Manager/s will ensure that sufficient space is provided within the compounds for vehicles to park, whilst maintaining sufficient space for material and plant storage, loading and unloading and turning of HGVs.



5.8 Construction Traffic Routing

The proposed construction traffic routes are set out in **Chapter 14** of this EIAR and shown on **Figure 14-4** of that chapter. All contractor and delivery traffic will be required to follow these routes. Haulage contractors undertaking deliveries associated with the Proposed Project will be informed of the relevant routes by the Proposed Project Manager/s or delegated representative/s as part of their delivery instructions (and signage along the route will reinforce this information). Contractor staff will be given the construction routes and minibus travel to work arrangements as part of their joining instructions. It is the responsibility of the Proposed Project Manager/s to ensure that all visitors to the Main Wind Farm Development Site are aware of the construction traffic routes prior to travelling to the Main Wind Farm Development Site.

Driver training and Delivery Management Plan delivery instructions to drivers (at Section 5 of the CTMP in **Technical Appendix 14-4** of the EIAR) will reinforce the following:

- Avoidance of parking on the public road except at laybys;
- Not to use residential driveways, farm accesses, or other private accesses for turning; and
- Consideration for pedestrians, cyclists and equestrians on local roads.



6 Pollution Prevention Measures

6.1 Environmental Incident and Emergency Response Plan

The PSCS will be responsible for continuing to develop and implement an Environmental Incident and Emergency Response Plan (EIERP). The plan will provide reference to procedures to be followed in the event of a specific incident. In general, if an environmental incident was to occur, the following will take place immediately:

- mitigation will be implemented to stop or reduce impacts from the incident;
- if these are ineffective, work in the area will cease immediately;
- if necessary, monitoring will be undertaken to identify the source of the incident;
- work will only recommence once it is considered that it will not continue to adversely impact sensitive environmental receptors; and
- provision of a full report by the PSCS and separately by the ECoW to the Applicant following an incident occurring.

The EIERP will reflect site-specific conditions/issues. The PSCS will submit the detailed Plan to the Applicant and PSDP for approval prior to any construction works commencing onsite. The plan will provide:

- a summary of the key actions required as part of the Battery Safety Management Plan (BSMP);
- a summary of local environmental sensitivities, e.g. environmentally designated areas, protected species or habitats and high amenity areas;
- a description of the construction works and appropriate references to other environmental plans and construction method statements;
- an inventory of stored materials and emergency response spill kits;
- details on training requirements, evidence of training of site staff / plant operators in emergency response procedures including inclusion of EIERP training in site inductions and tool box talks; and key staff contacts for environmental management and emergency response;
- detailed procedures to be taken in the event of an incident or emergency (including procedures for positioning and movement of plant) and identification of relevant personnel who will be responsible for implementing such procedures; and
- contact telephone numbers for emergency services and the EPA Pollution out-of-hours telephone number (0818 33 55 99).

A plan of the site will also be provided, detailing:

- all areas of potential pollution sources including the locations of car parks, delivery and fuel / chemical storage areas, oil separator equipment, excavations, and any other high risk areas that could give rise to pollution;
- the location of potential sensitive environmental receptors, including sensitive habitats or species, surface watercourses, drains or culverts where pollution may travel to; and
- the location of spill kits and other pollution control or emergency response equipment.

The procedures for responding to a major pollution incident will be a regular topic at onsite tool box talks and management meetings in order to ensure that the incident response plan is fully understood by all personnel, and that all involved know their role in it. Any lessons learnt



from any response to real incidents will be fed back into the plan to ensure that best practice is followed.

6.2 Re-Fuelling of Vehicles, Plant and Machinery

Vehicle re-fuelling will take place either within the compound at a dedicated impermeable refuelling pad or by mobile double skinned bowsers with a 50 m buffer from watercourses as recommended by OPW (2019). Drainage from the compound will be passed through oil interceptors prior to discharge.

Oils, greases, hydraulic fluids or hazardous substances (or any associated wastes) will be stored under cover, over fuel spill trays / bunded containers within designated storage areas within the construction compounds. There will be no fuel storage outside the compounds. Plant will be maintained in good operational order and any fuel/oil leaks recorded for attention. Absorbent pads/granules in the case of an accidental leak/spillage will be available at the temporary construction compounds.

Good site management practices will be implemented to reduce risks of spills, including regular monitoring and inspection of storage vessels and regular maintenance and servicing of construction plant and equipment. The Applicant will ensure that necessary plant and resources are provided and operated in accordance with best waste management practice and that activities comply fully with environmental management systems and planning consents. The EIERP will include contingency plans / procedures to deal with potential leaks and spills. Emergency spill response kits will be held on Site at strategic locations including refuelling areas and within plant. Refuelling procedures and risk assessments and method statements will be provided by the PSCS to the Applicant for approval prior to work commencing.

6.3 Spillage

All other fuels, oils and potential contaminants, as well as waste oils, will be stored in secure, fit for purpose containers within bunded containment as appropriate and in accordance with the EPA guidance¹. The refuelling pad would have an impermeable base and bund with a capacity of 110% with sumps provided such that they do not drain directly into the surface water drains. Maintenance of mobile plant will take place within the construction compounds only and will comply with relevant the EPA guidance².

6.4 Other Storage

Stockpiles for stone material for the construction of tracks, compounds and hardstandings will be limited to within work areas. Stone deliveries will be aligned with the construction programme, with materials either offloaded and temporarily stored close to the working area or placed, spread, and compacted shortly after delivery. Short-duration storage will be used where immediate use upon delivery is not possible, with temporary stockpiles located within pre-developed areas in close proximity to the working area.

Low mounded stockpiles will be formed from excavated material, adjacent to access tracks, turbine areas and compound areas, away from open drains.

¹ Guidance Note on Storage and Transfer of Materials for Scheduled Activities (EPA, 2004)

² Guidance Note on Storage and Transfer of Materials for Scheduled Activities (EPA, 2004)



6.5 Prevention of Mud and Debris on Public Roads

Plant and wheel washing facilities and road sweepers will be provided as required to prevent mud and deposits from being transferred from the Proposed Development Site onto the public highway. Wheel washing facilities will be located at site exits with each vehicle passing through the process before accessing the public road.

Such facilities will be located within a designated hardstanding at least 50m from the nearest watercourse or surface water drain. Runoff from the facilities will be captured within the attenuation basin network described in Section 7.0. Settled solids will be regularly removed and buried along with other silty fines collected from silt fences (see Section 7.4).

Open backed lorries or tippers delivering or removing material to/from the Proposed Development Site will be sheeted where there is a risk of loose or deleterious material being deposited on the local public road network.

Weather responsive management will be conducted by the Principal Contractor where controls will be increased in periods of wet conditions and high vehicle movement volumes.

6.6 Cement / Concrete

Ready-mixed concrete will be brought onto the construction site from an offsite source for use as required.

Any bagged cement will be stored within a soil bunded area on pallets above the ground and covered with secured plastic sheeting to minimise the risk of wind-blown cement and uncontrolled washout occurring.

Any spilled cement will be removed by shovelling/excavator and suitably disposed offsite.

No washing of concrete-associated vehicles would be undertaken outside the designated wash out facility, and the area would be signposted, with all site contractors informed of the locations.

6.7 Silt

Silt laden runoff could be expected from any areas of recently exposed soil or rock and from access tracks in regular use. There will be no discharge or disposal of any material directly into any river, stream or drainage ditch. The measures that will be implemented to control potential silt entrainment in surface water runoff are identified in Section 7.4.

6.8 Waste and Litter

Construction waste is discussed in Section 5.6.

With respect to the control of litter on site, there is little potential for waste generation other than construction waste. A fully authorised and licenced waste management contractor will be appointed prior to the commencement of construction works. This contractor will provide the appropriate receptacles for the collection of the various waste streams, including from domestic/canteen style waste, and will ensure regular emptying and/or collection of these receptacles.

6.9 Hydrocarbon Contamination

6.9.1 Vehicle Maintenance

As noted in Section 5.0, plant and machinery will be regularly maintained to ensure that the potential for fuel or oil leaks/spillages is minimised. All maintenance will be conducted on suitable absorbent spill pads to minimise the potential for groundwater and surface water



pollution. All machinery will be equipped with drip pans to contain minor fuel spillage or equipment leakages.

6.9.2 Chemical Storage

All fuels, oils and other chemicals will be stored in the construction compound in secure, fit for purpose containers within bunded containment as appropriate. The bunded containment will have a capacity of 110% of the volume to be stored and will have impervious, secured walls and base.

The bunded areas will be within the temporary construction compounds and will be underlain by an impermeable ground membrane layer to reduce the potential pathways for contaminants to enter watercourses and groundwater.



7 Drainage and Surface Water Management

7.1 Introduction

Control of water is of great importance during construction to prevent exposed peat and soils eroding and silting up surrounding drainage channels and watercourses. It is essential that the works have little or no impact on the existing hydrology in order to minimise potential impact on ecology and environmental quality of the surrounding area.

The EOW will conduct daily inspections of watercourses and the measures identified in Sections 7.0 and 8.0 below will be implemented across the site to adequately protect hydrological, and related, resources. The measures will be finalised in detail prior to commencement of construction, which will provide the same or greater protection for the water environment as those described in this document. The measures are proportionate to the risk and, where greater risk is highlighted at specific locations prior to construction, specific mitigation measures will be agreed for those locations.

7.2 Site Induction and Training

All employees and contractors will undergo a site induction to ensure that they are familiar with the site rules prior to any work commencing on site. In addition, the PSCS will ensure that all operatives and contractors responsible for handling fuel, oil, concrete or cement or other potential pollutants undergo a thorough induction programme with respect to the relevant proposed pollution control measures. The relevant programme will include, as a minimum, the following:

- waste management;
- emergency response procedures;
- materials management;
- habitat and species protection,
- surface water management;
- potential sources of pollution and their effects on the environment;
- requirements of the contract and legislation with respect to pollution;
- the PSCS's pollution avoidance plan;
- traffic management and routing, including areas where access is not permitted; and
- training in the use of pollution control equipment.

7.3 Site Drainage

During the construction phase of the Proposed Development, measures will be adopted in order to prevent silt, chemicals and/or other contaminants from being washed into existing watercourses. Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, so areas will be reinstated as soon as possible to minimise this effect.

Some temporary dewatering may be required during excavations. The measures for sediment control identified in Section 6.0 will provide protection of watercourses from any potential infiltration of sediment. Dewatering activities will be temporary and ditches and existing peat drains will remain in place to convey surface water flows during the operational life of the Proposed Development. Prior to main earthwork activities, interceptor drains, or diversion ditches will be created to minimise the pooling water in areas of development. The employed



diversion method will flow into the existing peat drainage channels. The diversion method will follow the topography of the site and installation shall commence up gradient of all construction to commence. The clean surface water will be collected and diverted to the existing ditches via the peat channels.

A drainage system for the Proposed Development Site will be developed to comprise:

- The excavation of in channel rock drainage channels approx. 2 m in width and 275 mm in depth from the edge of the Proposed Development Site's access tracks.
- Silt fence textile will be laid within the channel. The silt fence textile will be Hy-tex Terrastop premium or similar and will be fixed to the upslope side of the supporting slope within the main drainage channel.
- Support posts for silt fence support and for channel supports will be inserted at the edge of the drainage channel at 1,500 mm intervals.
- Silt fence textile will be anchored using clean drainage stone.

The proposed drainage system will be based on the following methods:

- The first method will involve protecting existing water quality by avoiding disturbance to natural drainage features, minimising any works in or around drainage features, and diverting clean surface runoff around excavations and construction areas.
- The second will involve collecting any drainage water from works areas that might carry silts or sediments, and to route them towards attenuation basins prior to controlled diffuse release over vegetated natural surfaces. To achieve this, shallow surface water drains will be excavated around areas of earthworks to prevent surface water runoff into the working area and thereby protect the wider water network from siltation.

The drainage design for the Proposed Development shall utilise the existing peat drains and drainage ditches.

Perimeter drainage channels will be installed around the compounds and surface water drainage pipework will be installed within trenches in the stone platform, with downpipes from the buildings discharging to the surface water network.

Separate surface water and foul drainage networks will be provided. The network will include manholes located at junctions and directional changes in the drainage pipework as appropriate.

Oil separators will be installed where required, particularly in transformer or plant areas, to prevent hydrocarbons entering the surface water system. Discharge from the built compounds and turbine hardstandings will be directed to a network of associated attenuation basins, which will be connected by a series of underground pipes, as shown on Planning Drawing Number 501.065301.00001.D14.

7.4 Management of Sediment and Surface Waters

Good practice construction techniques³ will be adopted for the management of sediment and surface water run-off generated during the construction phase of the Proposed Development. Sustainable Drainage Systems (SuDS) will be used where applicable.

Drainage from the Site will include elements of SuDS design. SuDS replicate natural drainage patterns and have several benefits:

³ CIRIA (2015). The SuDS Manual (C753). London: Construction Industry Research and Information Association (CIRIA).



- SuDS will attenuate run-off, thus reducing peak flow and any flooding issues that might arise downstream;
- SuDS will treat run-off, which can reduce sediment and pollutant volumes in run-off before discharging back into the water environment; and

In addition, a wet weather protocol will be implemented by the PSCS to manage activities during periods of heavy and prolonged precipitation.

Heavy or prolonged rainfall during construction and operation may lead to sediment transport or vegetation causing blockage to infrastructure drainage channels or watercourse crossing structures. Regular monitoring and prompt maintenance of these assets will ensure that the drainage system continues to function as designed.

These measures prevent sediment release, hydrocarbon contamination, alkaline leachate from concrete, and altered hydrological pathways that could impact aquatic habitats, fish spawning areas, macroinvertebrate communities, peatland vegetation and downstream designated nature conservation sites.

7.5 Sustainable Drainage Systems (SuDS)

During drainage design runoff pollutants, such as silt, will be treated within the development, such that the surrounding environment is not harmed, and local drainage connections are not overloaded. SuDS are a sustainable method of reducing the quantity and improving the quality of runoff into local water courses and connecting drainage network systems. They are inspired by natural systems and aim to improve the local amenity and biodiversity.

SuDS are desirable and easily constructible at a large scale for wind farms. Additionally, wind farm sites usually have established vegetation which can act as a form of SuDS, naturally intercepting pollutants and allowing for slow infiltration. Thus, the use of SuDS for wind farm sites can assist in reducing the risk of polluting the local environment and/or overwhelming drainage systems to a non-significant level. There are several forms of SuDS, however the methods set out below will be used:

- Permeable surfaces such as gravelled areas, drain water through voids within the gravel, into the layers below. The access tracks to the wind turbines will be constructed using porous materials, encouraging a natural and slow infiltration process.
- Filter strips are a method of source control constructed by providing a gently sloping vegetated area over which runoff can flow. As runoff passes over the vegetation, pollutants such as silt are intercepted, and flow velocities are reduced, allowing infiltration into the underlying soil or peat. Filter strips are typically located between development areas (e.g. access tracks) and nearby watercourses to provide a buffer for surface water runoff. Their effectiveness depends on appropriate gradients and ground conditions,
- Swales are a source control and a method of deterring runoff from accumulating into one large drainage area. Swales are typically broad but shallow and can be created by excavating a small trench alongside the source of runoff, for example access tracks. Swales assist water into a storage or discharge system to reduce flood risk and encourage slow infiltration.
- Silt fences, which are constructed using a closely woven synthetic geotextile material, are a quick and easy form of SuDS which can be used from the construction stage. They can be established along the leading runoff routes, intercepting high runoff flows and pollutants. Both methods have high capabilities of intercepting the mass of pollutants during the construction stage, with further use of being temporary check dams if required, for example within swales.



- Attenuation basins will be constructed down slope of a wind farm site by constructing a depression within the ground where water from the drainage network and runoff collects. Basins reduce flood risk while encouraging slow infiltration into the ground below.

7.6 Location of Silt Traps

Silt traps will be utilised to trap and filter sediment-laden run-off (in very small quantities) from isolated areas of excavation works at the Proposed Development.

Silt fences will be employed where required, at the downslope edges of stockpile, to minimise sediment levels in run-off. Fine sediment handling will avoid periods of heavy rainfall.

All attenuation basins will be actively managed, with regular inspections and removal of silt build up to control water levels and ensure that any run-off is contained, especially during times of rainfall.

Attenuation basin outflow will be regularly inspected, and discharge may be pumped, when required, for maintenance purposes.

Sediment traps will be installed at the three TDR overrun areas to ensure there is no impact on the water environment from these.

7.7 Location of Attenuation Basins

All attenuation basins will be actively managed, with regular inspections and removal of silt build up to control water levels and ensure that any run-off is contained, especially during times of rainfall. If required to achieve the necessary quality of the final run-off, further measures will be carried out, including increasing the depth of basins, and the use of silt busters.

7.8 Outflow Monitoring from Attenuation Basins

Attenuation basin outflow will be regularly inspected, and discharge may be pumped, when required, for maintenance purposes. Any pumping activities will be supervised and authorised by the PSCS and Site ECoW.

Treated water will be discharged with care in accordance with the following principles:

- water to be discharged in planar sheet flow way rather than as a single point discharge in order to slow and spread the flow and minimise potential scour;
- use of many small/mid diameter off lets, rather than collecting larger volumes of drainage flows to discharge to a smaller number of larger capacity outlet points;
- not allowing direct, contaminated ditch discharge into watercourses, loughs and sensitive wetlands or grasslands; and
- not diverting natural flows, unless under prior agreement with EPA and MCC.

7.9 Foul Drainage

Separate surface water and foul drainage networks will be provided. The network will include manholes located at junctions and directional changes in the drainage pipework as appropriate.

A separate system consisting of foul water drainage pipework, manholes and a foul water holding tank will be installed. The foul water holding tank contents will be tankered off-site by a permitted waste collector to a wastewater treatment plant.



Foul water holding tanks will be provided within the substation and IPP compounds. The foul water holding tank will be a sealed storage tank with all foul water tankered offsite as required by an authorised waste collector to a wastewater treatment plant. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007, will be employed to transport foul water away from the Proposed Development Site. The proposed foul water storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. The foul water storage tank alarm will be part of a continuous stream of data from the Proposed Development's turbines, wind measurement devices and electricity substation that will be monitored 24 hours a day seven days per week. This approach for managing foul water onsite has become a standard practice in wind farm sites. Foul water within the construction compounds will consist of integral holding tanks or external sealed tanks which form part of the site cabins (toilets and canteen). These will be self-contained units and emptied regularly by licensed waste contractors.

The system will be designed for approval by EPA and MCC prior to the construction phase of the Proposed Development.

8 Water Quality Monitoring and Contingency

8.1 Water Quality Monitoring

Water quality monitoring during the construction phase will be undertaken for the surface water catchments that serve the Proposed Development Site, to ensure that none of the tributaries of the main channels are carrying pollutants or suspended solids. Monitoring will be carried out on a weekly or monthly basis as required on these catchments.

With regard to the protection of the water environment the following risks will be addressed:

- siltation of watercourses;
- discolouration of raw water;
- potential pollution from construction traffic due to diesel spillage or similar;
- alteration of raw water quality resulting from imported track construction material;
- excavation and earthworks;
- use of large quantities of concrete; and
- construction compound and associated drainage/foul drainage and diesel spill issues.



The PSCS will compile a monitoring and maintenance plan for the drainage system and surface water runs for use by the ECoW which will as a minimum include:

- visual monitoring/inspections; and
- During site works, including water crossing construction works, the relevant drainage/surface water runs potentially being impacted by these works will be inspected daily by the ECoW while works are ongoing in this area.

A Water Quality Monitoring Plan (WQMP) is already in place by the Applicant, and this will be submitted to MCC prior to construction and development. The WQMP will be continued to monitor surface water quality, fish populations and macroinvertebrate community prior to, during and post-construction. A robust baseline of water quality in surface watercourses/drainage channels downstream of construction works has already been established prior to construction commencing and can be used as a benchmark of water quality for the construction phase monitoring.

Groundwater monitoring standpipes have been installed at locations BH01, BH06 and BH07 within the Main Wind Farm Development Site, and screened in the bedrock to facilitate groundwater quality monitoring.

The purpose of the WQMP is to:

- ensure that the commitments put forward in the EIA Report are fulfilled with regards to identified ground and surface water receptors;
- provide a specification for monitoring prior to, during and after construction;
- provide a record of water quality across the Proposed Development Site that can be compared to rainfall and site activities;
- provide reassurance of the effectiveness of pollution prevention measures installed to protect surface watercourses throughout the construction period; and
- provide data to identify any potential pollution incidents, and to inform a structured approach to manage and control such incidences.

The WQMP records data on water chemistry and ecological indicators (fish, macroinvertebrates) to enable monitoring of surface watercourses down gradient of works areas including watercourse crossings, access tracks, turbine foundations and at control sites (up gradient of works areas), and includes:

- monitoring locations;
- frequency of monitoring prior to, during and after construction;
- parameters for field hydrochemistry testing and laboratory analysis including as a minimum pH, electrical conductivity, suspended solids, dissolved metals, nutrients and hydrocarbons;
- sampling and analysis protocols;
- relevant environmental quality standards (EQS);
- responsibilities for monitoring; the ECoW will be responsible for daily inspections of watercourses particularly around active works areas and watercourse crossings. Further monitoring on a less frequent basis (i.e. monthly) may be done by an external party; and
- procedures to be followed in the event of an environmental incident; and recording and communicating of results.



Any deviation from expected trends will trigger inspection, corrective action and reporting under the EIERP.

Monitoring will involve laboratory analysis of water samples taken at agreed locations (agreed by MCC prior to construction) across the Proposed Development Site and will continue throughout the construction phase and immediately following construction.

8.2 ECoW WQMP Duties

In addition to the monitoring and analysis, regular watercourse inspections (frequency depending on nature and proximity of works to the watercourse) will be undertaken by the ECoW in areas selected in the field and where construction is taking place. As daily inspection points, they will be readily accessible points close to infrastructure.

The regular inspections will include, but not be limited to:

- regular visual inspection of the sediment control structures;
- investigation of problem areas (e.g., those causing silty run-off) to try to establish the cause and locate the source;
- management of the PSCS to comply with method statement activities;
- development of a clear line of communication with site staff to address issues promptly;
- prioritisation of issues so that site staff know how to react to incidents; and
- regular hydrological reporting - daily records and monthly reports.

8.3 Incident Response

Drainage networks provide a conduit for rapid transport of silty water and potential contamination from surface spills of fuels/oils, concrete or chemicals. A pollution incident will include any discharge to the drainage network that could potentially cause environmental damage. Examples of pollution incidents include:

- fuel drips or spills during refuelling;
- leaking plant or equipment;
- leaks from fuel or chemical containers;
- contaminated water or sediment/silt entering a watercourse or drainage network;
- windblown dust and waste;
- excess silt deposition in drainage ditches, channels, culverts following heavy rainfall events;
- operational failures of pumps and pipelines; and
- failures of treatment or sediment controls.

The PSCS will prepare a Pollution Prevention and Incident Plan (see Section 3.5) which will provide emergency response contacts, reporting procedures, and procedures for dealing with all potential pollution incidents during the construction of the Proposed Development.



9 Construction Phase

9.1 Introduction

This section describes in more detail the key components of construction and specific mitigation measures to be incorporated to reduce potential impacts.

The overall site design has been developed in accordance with the mitigation measures identified during the technical assessments of the EIA, and to reflect the requirements and specifications for transporting wind turbine components to the proposed turbine locations.

9.2 Temporary Compounds

The construction project involves establishing two Temporary Construction Compounds (TCC) to support the works. One compound is proposed to be located adjacent to the primary access road which runs through the middle of the Main Wind Farm Development Site, with a second compound located to the north of this near the proposed substation. The construction compounds will consist of:

- temporary modular building(s) to be used as security and site offices;
- welfare facilities;
- parking for construction staff, visitors and construction vehicles;
- laydown areas for the storage of large items;
- secure storage for tools, small parts and oils;
- waste storage facilities;
- a receiving area for incoming vehicles; and
- a sealed bunded area where fuel and oil storage tanks will be situated, to prevent potential contamination.

Welfare facilities will be provided for the duration of the construction period in accordance with the SHWWR 2013 (as amended). Facilities for waste management, refuelling, power, water supply (imported containers of potable water) and chemical/material storage will be provided.

All compound lighting will be designed and positioned to minimise disturbance to the surrounding environment, in accordance with the mitigation measures set out in **Chapter 5**. All temporary construction compound lights will be time-limited, directional, shielded and faced away from surrounding habitats.

The construction methodology for the compounds is outlined below:

The compound boundaries will be set out and marked prior to any works commencing. Any significant surface undulations or irregularities will be trimmed and the removed peat placed in designated peat storage areas for reuse or reinstatement, subject to ECoW approval. Otherwise, surface vegetation is to remain intact to increase founding strength.

Where the fibrous top layer is weak or saturated, a geotextile or geocomposite material will be placed directly upon the ground surface to improve load distribution, separation, filtration and drainage.

A base geosynthetic layer, to be specified pending the specific site conditions identified at the pre-construction stage, will be installed across the full compound footprint. Overlaps, anchorage, and tensile orientation will conform to manufacturer requirements.



Imported well-graded granular fill will be tipped incrementally across the compound footprint, progressing outward from the floating access track, and spread by a wide tracked dozer. The initial stone layer will be compacted utilising non vibration methods as determined by the Contractor.

Where required, an intermediate geogrid layer will be installed. This will be placed upon the first stone layer and will be overlapped and tensioned in accordance with the manufacturer's specification.

A second layer of granular fill will be placed upon the intermediate geogrid to the designed thickness. Where very low California Bearing Ratio (CBR) values are encountered, a third geogrid layer may be required.

A final compacted wearing layer of appropriately graded stone will be installed to accommodate construction traffic and pedestrian use.

Where necessary, pressure berms (stabilising berms) will be constructed around the perimeter of the compounds to enhance stability and reduce lateral displacement.

Ongoing consolidation and localised settlement of the compound surface should be expected throughout the construction period. The Contractor will be responsible for maintaining the compound to required standards, including remediation of rutting, settlement, or lateral spread using additional granular fill and localised geogrid repairs where appropriate.

Shallow drainage ditches will be excavated at a safe offset from the compound to prevent undercutting of peat. Existing field drains will be connected where appropriate and protected using silt-management measures such as silt fences or settlement features.

The drainage across the compound will be directed in to an attenuation basin.

Once all construction works are complete, the work areas will be reinstated with excavated peat or soil and either seeded out with native species, allowed to vegetate naturally, or reinstated with excavated grass turves and will be restored to their original condition (in consultation with EPA). The ground surface will be restored in line with the PMP should damage occur during the construction or decommission of the construction compounds.

9.3 Transport Routes (including TDR)

Both construction personnel and materials for the Proposed Project will use defined transport routes set out in the Construction Traffic Management Plan (CTMP) See **Technical Appendix 14-4** of the EIAR.

Primary access to the Proposed Project will be via the TDR originating at Killybegs Port. From Killybegs the route follows the R263 to the N56 north of the port, continues south through Dunkineely, the Mountcharles Bypass and Donegal Bypass, then merges onto the N15. The route continues for approximately 65 km through Ballyshannon and Bundoran before joining the N4 at Sligo. From Sligo the route continues to the N59, passing Ballysadare, Dromore West, Ballina and Crossmolina to reach Bangor Erris. At Bangor Erris, traffic diverts to the R313 and then connects to the L1206, with final approach to the Main Wind Farm Development Site via the L5252 which serves the proposed three access points. These links constitute the agreed abnormal indivisible load (AIL) corridor for turbine components.

Conventional HGVs importing stone, concrete and equipment will also primarily use the national road network from Co. Donegal to Co. Mayo. All of the below licenced quarries and concrete are suitably located so that they can deliver material to their existing customers and for the Proposed Project works. All locations are capable of quickly joining the N59 or are located on the N59.



- A - Barretts Quarry, Bangor Erris
 - 12.2km Haul from origin to Main Wind Farm Development Site
- B - Killala Rock Quarry, Killala
 - 66.1km Haul from origin to Main Wind Farm Development Site
- C - Coolturk Quarries Ltd., Crossmolina
 - 42.8km Haul from origin to Main Wind Farm Development Site
- D - Harringtown Concrete & Quarries, Abbeytown
 - 105.0km Haul from origin to Main Wind Farm Development Site
- E - Molloy Concrete Limited, Ballina
 - 64.9km Haul from origin to Main Wind Farm Development Site

Haul route origin A from Barretts Quarry will egress the origin in a right turn onto the N59 proceeding west for approximately 600m before joining the R313 and continuing west for another 400m. Vehicles on the haul route will turn left onto the L1206 and proceed south for 8km, where they will turn right on to the L5252 proceeding west and entering the Main Wind Farm Development Site through a right turn into AP 1, and AP 2 or a left turn into AP 3.

Haul route origin B from Killala Rock Quarry will egress the origin in a left turn onto the L1111 proceeding east for approximately 2.5km. Vehicles on the haul route will turn right onto the R314 and proceed south for 9km where they will join the N59 in Balina. The haul route continues south on the N59 for 500m before undertaking a turn to the right to continue moving west on the N59 for 42.6km before joining the R313 and continuing west for another 400m. Vehicles on the haul route will turn left onto the L1206 and proceed south for 8km, where they will turn right on to the L5252 proceeding west and entering the Main Wind Farm Development Site through a right turn into AP 1, and AP 2 or a left turn into AP 3.

Haul route origin C from Coolturk Quarries Ltd., Crossmolina, will egress the origin in a right turn onto the N59 proceeding west for approximately 31.1kmm before joining the R313 and continuing west for another 400m. Vehicles on the haul route will turn left onto the L1206 and proceed south for 8km, where they will turn right on to the L5252 proceeding west and entering the Main Wind Farm Development Site through a right turn into AP 1, and AP 2 or a left turn into AP 3.

Haul route origin D from Harringtown Concrete & Quarries, Abbeytown, will egress the origin in a right turn onto the N59 proceeding west for approximately 92.6km before joining the R313 and continuing west for another 400m. Vehicles on the haul route will turn left onto the L1206 and proceed south for 8km, where they will turn right on to the L5252 proceeding west and entering the Main Wind Farm Development Site through a right turn into AP 1, and AP 2 or a left turn into AP 3.

Haul route origin E from Molloy Concrete Limited, Ballina, will egress the origin in a left turn onto the L1321 proceeding north for approximately 10km before making a left turn and joining the R294 and continuing west for another 640m and joining the N59. On the N59 the route proceeds west for approximately 42.6km before joining the R313 and continuing west for another 400m. Vehicles on the haul route will turn left onto the L1206 and proceed south for 8km, where they will turn right on to the L5252 proceeding west and entering the Main Wind Farm Development Site through a right turn into AP 1, and AP 2 or a left turn into AP 3.

For day-to-day Main Wind Farm Development Site access, all staff light vehicles and HGV deliveries will approach using the regional network via the N59 and R313 before routing onto the L1206 and L5252 to reach the 3 no. proposed access points. Internal movements will be managed to minimise queuing at the proposed access points and to keep local junctions clear



during peak periods. Where the grid connection works will require trenching within the public road, traffic management will be implemented in line with the CTMP, including clear temporary signage, phased working and localised lane closures or controlled diversions to maintain safe passage for residents and businesses while cable ducts are installed and reinstated.

Construction traffic management will be undertaken in accordance with the CTMP, including advance route condition surveys on key links, road works required on the three TDR overrun areas, coordinated planning, timing and Garda escort of ALL convoys, temporary signage and escorts where required to safeguard other road users. Passing opportunities and temporary traffic controls will be installed at constrained locations, particularly along the L1206 and L5252, to allow safe interaction between construction vehicles and local traffic. Engagement with Mayo County Council and Transport Infrastructure Ireland will be maintained throughout delivery windows to confirm restrictions, notify any short-term traffic management, and agree reinstatement. Post construction, road condition will be reviewed against pre-works records to identify and rectify any project related damage.

Access to the Main Wind Farm Development Site will be via the public road network, connecting to newly constructed internal access tracks explicitly designed for the Proposed Development. The main site access will be from the L5252 using APs 1-3 for the northern and southern clusters as required. This plan will ensure the safe transport of construction materials, equipment, and turbine components to all work sites.

For day-to-day site access, all staff light vehicles and HGV deliveries will approach from the regional network via the N59 and R313 before routing onto the L1206 and L5252 to reach the northern and southern clusters. Internal movements will be managed to minimise queuing at access points and to keep local junctions clear during peak periods. Where the grid connection works require trenching within the public road, traffic management will be implemented in line with the CTMP, including clear temporary signage, phased working and localised lane closures or controlled diversions to maintain safe passage for residents and businesses while cable ducts are installed and reinstated.

Overall, adherence to the CTMP will ensure that HGV movements and turbine deliveries follow approved routes and that appropriate mitigation measures are in place to minimise disruption, protect road infrastructure and maintain safety for all users along the R263, N56, N15, N4, N59, R313, L1206 and L5252 during the construction period.

Full detail of the assessment of effects on the road network is provided in **Chapter 14: Traffic and Transport** of the EIAR.

9.4 Access Tracks

Internal access tracks, spanning approximately 8.75 km, will be constructed to link turbine locations, the substation, BESS, crane hardstandings, and temporary compounds, providing continuous connectivity for construction and future maintenance activities.

The access tracks on this site will primarily use floated construction to minimize excavation in peat and to preserve the existing ground and hydrological conditions. Furthermore, there will be existing tracks which will be enhanced and built upon as well as founded, cut trucks where there is no peat or very shallow peat. The floated tracks will consist of geogrid(s), geotextile and granular stone build constructed on top of the ground surface. The existing track enhancement will utilise the existing makeup and be enhanced through geogrid, geotextile and granular stone widening and thickening to specification. Finally, where there is no peat or shallow peat, cut access tracks will be founded on suitable strata and will receive a geogrid and granular build. This specification provides robust bearing capacity and controls rutting under heavy trafficking, including abnormal indivisible load deliveries. The finished running width will be approximately 6 m, with localised widening at bends, junctions, and passing places to accommodate turbine transport and installation vehicles.



Access tracks will be formed from a sub-base of general fill and finished off with a cap- stone / wearing course of graded crushed rock to provide a nominal Type-B (Series 800) finish. Wearing course stone will be of a suitable material that is not susceptible to breaking down / weathering to a high fines content material.

Maintenance of the running surface on all access tracks will be carried out on a regular basis, as required, to prevent undue deterioration. Loose track material generated during the use of access tracks will be prevented from reaching watercourses by maintaining an adequate cross fall on the tracks. Periodic maintenance of tracks by way of brushing or scraping will be carried out to minimise the generation of wheel ruts, which could lead to some track material being washed away.

On-site signage will be positioned to identify access points, one-way systems, speed limits, and designated parking and laydown areas, ensuring clear route guidance and safe vehicle movements throughout the construction phase. Traffic management measures will regulate entry to and egress from the public road network, reduce queuing at site entrances, and protect local road users. Within the site, route discipline will be enforced to separate construction traffic from sensitive working areas and to maintain clear approaches to crane pads, turbine hardstandings, and laydown zones.

9.5 Floating Tracks

Internal access across the Main Wind Farm Development Site will be provided predominantly by floating tracks constructed over peat and soft soils to avoid excavation and preserve the existing hydrological regime.

Floating tracks will vary dependent on the peat's CBR value which will be obtained during detailed site investigations for each track section. The range of the depth can be between 400mm and 1500mm thickness with a varied depth and quantity of geocomposite layer placement. A standard floating track incorporates two geogrid layers, or similar.

A general construction methodology of floating tracks will be followed and will consists of the following procedures where applicable:

- The designed alignment of the track will be marked out and clearly indicated prior to any construction works.
- The ground surface will receive a base geogrid, placed directly along the track alignment, in line with the geogrid manufacturer's specification. Where the ground surface lacks a fibrous surface layer, a geotextile or geocomposite (typically bonded geogrid and geotextile) will be placed to improve strength, separation, filtration and drainage.
- The makeup of the track will follow the designed requirement which may differ across the Main Wind Farm Development [Site](#) subject to the grounds CBR values. General methodology consists of an initial layer of specified, well-graded, granular fill being tipped in sections, typically 10m, on the base geogrid and spread using a suitable dozer, followed by a second geogrid, topped with the same specified fill and completed with a surface layer to accommodate construction traffic requirements.
- The stone buildup can range with interchangeable geogrid depths and quantities subject to the ground condition requirements. Very low CBR values may require up to three geogrid installations throughout its depth.
- In sections of floating tracks where lateral support is deemed necessary, pressure berms or stabilising berms will be constructed either side of the track. This is an



unlikely requirement due to the flat topography on site but may be beneficial for the reuse of excavated material. The berms act as a counterweight which widens the base of an embankment load to increase the factor of safety against slip failure.

- Shallow drainage ditches will be excavated and will tie into the existing field drains where applicable.
- Both drainage ditches and cable trenches will follow the alignment of the access tracks and will be suitably distanced to ensure track stability is maintained.

9.6 Upgrading existing tracks

The existing on-site tracks are incorporated into the Proposed Development design and will form a foundation for the construction of upgraded floating roads, or cut roads where ground conditions permit. In both cases, the existing tracks will have their depth increased as well as their width to ensure track specifications are met. The historic peat compaction and drainage caused by the continued use of the tracks will benefit the founding of the upgraded floating tracks.

The improvement and extension of the existing floating tracks will follow the same methodology of the floating track construction where existing tracks are located on deep peat. The upgraded track will have interlocking geogrids installed over and around the existing track to form a base in which the upgraded track will utilise.

Where existing tracks are located on shallow peat or soils, the methodology of cut access tracks will be used. The width of the existing track and the required distance on either side of the track, will be extended to suit the requirement.

9.7 Cut Access Tracks

Cut access tracks will be formed on suitable underlying material (superficial soil or rock with sufficient bearing capacity) in the following manner:

- Stripping of surface vegetation (turves) and careful stockpiling of this material.
- Excavating the remaining superficial soil materials and stockpiling this material.
- Where different superficial materials are present these will be stored according to type. This material will be retained for reinstatement purposes.
- The exposed suitable track formation will receive a geogrid prior to rock fill material being tipped from dumper trucks directly onto the proposed access track alignment.
- This material will then be either spread by a dozer or placed by a hydraulic excavator and compacted in layers, typically using vibratory rollers.

9.7.1 Drainage, sediment control and peat-sensitive measures

Existing drainage infrastructure will be retained and utilised where possible, and improved where required, with new drainage provided along new access tracks. Drainage measures will be developed at the construction design stage to favour shallow, peat-sensitive and discontinuous features rather than continuous deep V-ditches, and will tie into existing field drains where appropriate. Frequent cross-drains, check structures and SuDS features will be used where needed to manage runoff rate and quality and to avoid undercutting peat at the track margins. Drainage ditches and cable trenches will follow the track alignment and be set at a suitable distance to maintain track stability.



During the initial post-construction period, temporary silt management measures (such as sediment traps and silt control features) will be implemented where appropriate until natural regeneration or reseeded is established. Trackside and slope conditions will be monitored, and any unexpected, localised erosion or sediment mobilisation will be addressed promptly through regrading, reinstatement and additional drainage or silt controls as necessary, consistent with the EIAR and Peat Management Plan commitments.

9.7.2 Materials and maintenance

Stone for new internal access tracks will be sourced from suitable quarries in the vicinity of the site. Finished surfaces will be formed to provide a robust running course (for example, a Type B Series 800 style finish where appropriate), and the Resident Engineer will undertake routine inspection and maintenance to manage settlement, rutting and surface degradation. This will include maintaining adequate crossfall, periodic brushing/scraping to control rut formation, and dust suppression during dry weather if required.

9.7.3 Onsite Vehicle Movements

Access tracks will be designed to be single track with a 6m running track and space for stone shoulders where required.

During the periods of delivery of the large components, the Contractor will use appropriate site communications and access control techniques to enable safe one-way operation of the tracks.

The presence of crane pads within the construction compound will facilitate traffic movement onsite. Internal track junctions will also be used to facilitate multiple options for construction traffic movement. This will allow vehicles to move more directly between construction locations and double as passing places.

9.8 Turbines and Foundations

The wind turbines will have a maximum blade-tip height of approximately 179-180 m (depending on the final turbine model selected within the assessed range). Each turbine will be supported by a reinforced concrete foundation designed to provide stability under construction, operational and extreme environmental loading, including overturning, fatigue and settlement criteria.

The final foundation solution for each turbine will be confirmed at construction stage following completion of the confirmatory ground investigation and the turbine supplier's requirements. Given the prevalence of peat and soft ground across the site, piled foundations are anticipated to be the predominant solution, with gravity foundations used only where competent founding strata and settlement performance allow.

In locations where piling is deemed necessary, reinforced piles will support a reinforced concrete foundation, measuring 22 meters in diameter. In areas suitable for gravity foundations, diameters will be 27 meters, with depths reaching 3.5 meters, all situated below the finished ground level. For gravity foundations, an assumed concrete volume of 1,000 cubic meters has been used for assessment purposes. Any turbine-specific adjustments will be made where piling is required, based on the measured depth to competent strata influencing the pile schedule.

An overview construction methodology for piled foundations is outlined below.

- The turbine location, foundation footprint and associated working area shall be set out and marked prior to commencement of works.



- Access to each turbine location shall be via the pre-constructed floating access track. A temporary working area shall be established at the end of the track using geogrid(s) and granular stone to provide a stable platform for excavators, piling rigs and ancillary construction plant.
- A controlled excavation cell shall then be formed to the designed foundation formation level. Excavation will proceed through peat and soft soils until the specified piling platform formation is reached. Excavated peat shall be stored in accordance with the PMP for reposition or reuse.
- Shallow surface water drains will be excavated around the working area to prevent surface water runoff into the working area.
- Subject to peat depth, water ingress and stability conditions, excavation support shall be provided through one of the following methods:
 - Sheet Pile, Rock or Modular Cofferdam - Used where peat is saturated or unstable. A method will be chosen based on ground conditions with sheet piled and modular cofferdams being temporary and rock cofferdams being left in situ.
 - Benched Excavation - Used where peat has sufficient shear strength to maintain stable slopes, subject to geotechnical approval and slope toe support where required.
- A designed piling pad will be constructed at formation layer consisting of geogrid and stone build up to the specified requirement based on the piling rig used.
- Piling shall be carried out in accordance with the detailed foundation design and the appointed piling contractor's method statement. The final pile type and installation method shall be determined by ground investigation results, accounting for peat characteristics, underlying strata and environmental constraints. Piling methods may include:
 - Bored Piles with Temporary Casing – Suitable in saturated or unstable peat to prevent ingress or instability.
 - Continuous Flight Auger – Typically used where bore stability can be maintained and groundwater inflow is manageable.
- Pile casings shall be advanced through peat to prevent wall collapse and ensure clean concrete placement. Piles shall be installed to a competent bearing layer.
- A steel reinforcement case will be slotted down the casing prior to concrete pouring through a tremie pipe or similar.
- Once the piles have been cured, they will be cut to the designed pile-cut level ensuring uniform height across the foundation footprint. The top of the piles will be cleaned and prepared for the foundation construction.
- A blinding layer shall be placed across the foundation footprint to provide a level, clean surface for the foundation reinforcement installation. Reinforcement steel, including anchor ring and pedestal reinforcement, shall be fixed in accordance with the structural design.
- Duct routes will be set out along the designated cable entry side of the foundation, typically at 90 degrees to the proposed door entry. The ducts are installed through the



formwork openings, tied to the reinforcement, sealed and end capped to prevent concrete ingress.

- Temporary formwork will be installed prior to concrete pouring.
- The foundation slab will be poured in a continuous pour and vibrated using high-frequency vibrators to remove entrapped air. The concrete will be placed using appropriate methods such as pump lines.
- Following curing of the foundation slab, the pedestal will receive its specified concrete pour within erected formwork. Once all concrete has cured and been verified, the formwork can be removed.
- Backfill material, specified upon bulk density, will be placed around the foundation to near existing ground level where a final, graded surface layer will be placed.
- Temporary excavation supports (sheet piles, modular cofferdams or slopes) shall be removed or restored and reinstated.

Gravity foundations will generally follow the same enabling and preparatory construction sequence described for piled foundations, including set-out, access arrangements, establishment of the working platform, surface water management and excavation controls.

The primary difference is that gravity foundations do not require piling operations or associated piling platforms. Instead, following excavation to the designed formation level and installation of any required excavation support measures (e.g. cofferdams or benched slopes), the foundation is constructed directly on competent bearing strata or engineered replacement fill, subject to ground conditions confirmed during excavation.

Once the formation has been prepared and accepted, the construction sequence continues with blinding, reinforcement installation (including anchor and pedestal reinforcement), ducting provision, formwork installation, concrete placement, curing, and subsequent backfilling and reinstatement in line with the same principles adopted for piled foundations.

These procedures comply with the guidelines established in **Chapter 2** of the EIAR and will be carried out in accordance with the Peat Management Plan to properly handle and segregate peat, and sensitively reinstate disturbed ground.

9.9 Crane Pads

Adjacent to each turbine foundation, crane pads (hardstandings) will be constructed to provide stable working areas for turbine delivery, erection, maintenance and component replacement. The pads will comprise geotextile-separated, compacted granular build-ups with geosynthetic reinforcement as required, and the final arrangement will be confirmed in line with the final turbine model and in response to local ground conditions, peat depth and crane loading requirements. In areas of deeper peat and low bearing capacity, the crane pad will incorporate a piled solution. Where the peat is shallower and competent formation can be achieved, excavation will be undertaken to the required formation level for construction.

The construction methodology for the crane pads located in deep peat will be as follows:

- Temporary geosynthetic-reinforced working platforms, or piling pads, for piling rigs shall be constructed on top of the ground surface to a specified requirement based on the piling rig proposed. The platforms will consist of geogrid(s) and granular stone.
- The specified piling method shall be carried out across the crane pad area to a detailed design schedule and in accordance with the specified number, spacing, and



arrangement of piles as indicated in the design documentation. Should construction stage determine that crane loading on auxiliary pads require piles, these areas will also be piled to the same methodology.

- The piling type and installation method will follow the same principles as the piled foundation with piles installed to a competent bearing layer.
- The piles will receive a reinforcement cage and specified concrete.
- Once cured, each pile will be cut down to specified elevation to create a uniform cap level and cleaned prior to pile caps being constructed.
- High-strength specified geogrids will be installed over the set pile caps to the manufacturer's specification and quantity. A well-graded granular material will be placed and compacted in controlled layers over the geogrids to completion.
- Blade laydowns, assembly areas, and temporary storage areas will generally be constructed as floating hardstands. These will consist of a designed stone depth with interchangeable geosynthetic quality and quantity based on ground conditions.
- The Contractor will be responsible for maintaining the hardstands to required standards, including remediation of rutting, settlement, or lateral spread using additional granular fill and localised geogrid repairs where appropriate.
- Peripheral, shallow drainage ditches will be formed around the hardstand to intercept surface runoff and protect peat stability.

The construction methodology for the crane pad and hardstand on competent bearing strata will be as follows:

- Topsoil and unsuitable material within the hardstand footprint will be stripped to the required depth and stockpiled or reused in accordance with the PMP. Subgrade preparation will include proof-rolling, localised excavation of soft spots, and replacement with engineered fill where necessary.
- Where ground conditions require improvement, a base geogrid layer will be installed.
- Stone placement upon the excavated formation level will be carried out in layers with each layer being suitable compacted until specified thickness is achieved.
- The crane pad will be constructed to the design platform level and bearing capacity specified by final crane model.
- Peripheral drainage, such as shallow ditches, will be formed around the hardstand to intercept surface water runoff and to prevent water ingress.
- Surplus topsoil will be placed along the side of the hardstanding and dressed to blend in with surrounding landscaping.

Crane pads will be constructed to facilitate the installation of turbine components. Their location and orientation have been optimised to utilise the existing topography, minimise land take and avoid environmental constraints where applicable.

Crane pads will remain in place for the operational life of the development. Following construction, adjacent laydown and assembly areas will be reinstated where practicable, using stored peat and soils to soften platform edges and integrate the hardstanding with surrounding ground levels. Surface water drainage will be incorporated to manage runoff and prevent erosion while maintaining peat-sensitive hydrological conditions, and pad orientation will be optimised to make use of local topography and minimise land take.



9.10 Substation

The turbines will be connected by underground collector cabling to a newly constructed 110 kV on-site substation within the Main Wind Farm Development Site. The substation will provide the interface between the wind farm, BESS and the national grid and will include the switchgear, protection and metering equipment required for export. The substation compound will measure 84.5m wide on the southwest width and 82m wide on the northeast width by 149m long on the northwest length and 147.5m on the southeast length. The compound will accommodate two control buildings alongside the necessary electrical equipment for grid connection. The Customer Switchgear Room (IPP building) will be operated by the Applicant and is designed at 22.1 m x 12.7 m with an overall height of 6.17 m, while the Transmission System Operator Control Building (EirGrid building) will measure 27 m x 20 m with an overall height of 7.85 m.

The compound will be enclosed by a 2.6 m high steel palisade fence with internal segregation fencing where required, and lighting will be provided by pole-mounted fittings and external wall lights to support safe operation and maintenance. Staff welfare will be provided within the control buildings, with a proposed rainwater harvesting system supplying limited water for toilet flushing and handwashing through a tank installed adjacent to the buildings.

The substation and IPP compound will be constructed in line with the following principles:

- The Substation and BESS compound boundary and layout will be set out and marked prior to any works commencing.
- All peat within the footprint of the Substation and BESS compound shall be excavated in accordance with the design model. Excavated peat shall be stored in accordance with the PMP, and only with ECoW approval, for reuse around the Substation and BESS compounds and in accordance with the wider peat restoration plans for the Proposed Site.
- Following peat removal, the exposed formation will be inspected and proof-rolled.
- Any significant undulations or irregularities within the compound footprints following the removal of peat will be excavated or trimmed.
- Localised soft spots will be excavated and backfilled with engineering fill as directed by the project engineer or stabilised using a geogrid and engineering fill.
- A geotextile separator layer will be installed over the prepared formation surface to prevent contamination of the structural fill.
- Geogrid reinforcement layers will be installed in accordance with the design and subject to the ground conditions to provide load distribution and stability.
- Imported crushed stone will be placed in layers of specified thickness and compacted using suitable plant to achieve required density and bearing capacity.
- The depth of stone and number of geogrid layers will be subject to ground conditions and design requirements.
- Finished levels will be graded where required to promote surface water runoff towards the drainage systems.
- Tracks across the compounds will be constructed in stages to allow for temporary access, intermediate access and the final access standard once all major works are complete.

Drainage measures will be implemented to control surface water runoff and prevent ingress into working areas, including the use of shallow perimeter drains and localised drainage



features. All drainage will be constructed in accordance with the site drainage strategy and integrated with site infrastructure.

Cable infrastructure will be installed in accordance with the project layout, including ducting, trenching and cable routing from the turbines to the wider network. Installation will be coordinated with foundation and civil works to ensure correct positioning, protection and segregation.

A range of concrete foundations will be constructed across the substation and IPP compound. Raft foundations will be constructed for major buildings within the compound including the EirGrid control building and the MV switchgear building. Other concrete foundations will include concrete plinths, base slabs and post foundations.

Electrical infrastructure, including internal turbine connections and associated equipment, will be installed following completion of the civil works.

Fencing, access gates, CCTV and lighting will be installed as required to protect infrastructure and restrict unauthorised access during construction and operation.

Any oil-containing equipment will be installed with appropriate containment, and site activities will follow good housekeeping, designated refuelling arrangements and spill response procedures. The substation will be a permanent installation and, upon completion of construction and commissioning, will be handed over to EirGrid for operation.

9.11 BESS

It is proposed to construct one onsite BESS compound with a capacity to reflect the generation capacity of the proposed wind farm. The BESS will have the future ability to store excess power being generated locally on the grid and will release it back into the grid when there is a demand for it. The BESS will comprise 120 Battery Containers and 15 Inverter Containers in total, within a compound measuring 156m long on the northwest length, 153m long on the southeast length and 99m wide either side, secured by a 2.6m high palisade fence.

Each of the 120 battery container units will measuring 2.9m in overall height, 2.54m in width and 6m in overall length. Each of the 15 inverter units will measure 2.9m in overall height, 2.7m in width and 6m in overall length.

Prior to construction of the BESS, an area incorporating a drainage system surrounding it will be marked out by a qualified engineer prior to excavation and installation of the drainage system. Peat is present at a depth from 1.8m to up to 3m across the proposed BESS and substation compound area and will be excavated in accordance with the proposed design, including details on slope excavation of peat. This will remove the need for piled foundations.

The construction methodology, drainage, cabling and security for the BESS compound will follow the same principles as the substation and IPP compound.

The BESS MW switchgear building will be set upon a raft foundation with BESS PCS units on concrete slabs and battery container units on concrete plinths.

The associated BESS equipment will be connected to the substation via underground cables. Marker tape and cable tiles will be placed above the buried services.

9.12 Internal Collector Cable Layout

The cable layout for the Proposed Development will involve underground cabling that connects each turbine to the on-site substation, facilitating efficient energy transfer to the national grid. Wherever feasible, cables will be installed in trenches alongside the internal access tracks, minimizing ground disturbance and reducing the environmental footprint. The trenches will be



carefully prepared, with cables laid in protective conduits surrounded by a bedding layer of sand or cement-bound material (CBM) to ensure durability and stability.

Appropriate buffers and environmental management measures will be implemented to avoid impacts on sensitive areas and habitats. The design will incorporate measures to manage drainage and protect watercourses, particularly in areas where cables need to cross such features.

When installing cables a standoff distance will be agreed with the ECoW with silt control measures being implemented such as silt fences, sediment traps or the use of the attenuation basins.

Cable trenching backfill material will consist of suitable, non-contaminated, inert material ensuring that no pollutants or deleterious substances are introduced to the ground and surrounding environment.

9.13 Watercourses

9.13.1 General

The Main Wind Farm Development Site is drained by a network of small peat and forestry drains that connect into larger “main” peat drains running along the existing access road and, in places, along the site boundary. The main drains in the northern part of the site ultimately discharge to the Doolough Stream and the An Mhoing Mhór Stream, while drainage from the central and southern parts of the site flows via unnamed drains to the Irish Sea.

Watercourses in the northern area of the site are classified as “At Risk” with a current WFD status of “Poor”, while those in the southern area are “Under Review” with a “Good” status. Protection of these receiving waters is therefore a key environmental constraint during construction. As part of the project design, all wind turbines and associated infrastructure on the Main Wind Farm Development Site have been sited outside the 50m watercourse buffer zone.

In relation to over-run areas 2 and 3 of the TDR, the temporary tracks will encroach on the 50m buffer to the nearby streams. Appropriate construction mitigation measures will be implemented to prevent surface run-off of sediment or potential pollutants into these watercourses. These include:

- No refuelling of vehicles / machinery and no storage of stockpile material within 50 m of nearby drains and streams;
- No discharge from the temporary construction works at the over-run areas to nearby drains or river channels;
- Silt fences will be installed between any construction works and the river channel and any drains within the 50 m buffer to ensure no silt will enter the water course;
- Daily visual inspections will be undertaken at all drains and river channels; and
- If any pollution is observed, all works will be halted until the source of the pollution has been managed.
- Upon completion of works, the Proposed Development Site will be restored to its existing land use without delay.

Tracks have been routed to minimise any crossing of the watercourses. There are two new and two upgraded watercourse crossings proposed within the internal access track network. The new crossings (WCX1 and WCX2) will be provided as culverts according to typical specifications identified in Planning Drawing Number 501.065301.00001.D19.



New crossings are designed to convey 1% Annual Exceedance Probability Mid-range Future Scenario (AEP MRFS) storm event, with a minimum 300mm freeboard level. This is in line with the Office of Public Works (OPW) requirements. A Section 50 application will be required to obtain the consent of the OPW for the construction of the crossings.

The two existing watercourse crossings on the access tracks (WCX3 and WCX4) will be upgraded to accommodate the new loads posed by construction traffic and operation. Upgrades will include the strengthening of existing structures, installation of appropriately sized culverts.

All instream works are to be minimised and carried out in low flow conditions where feasible. Silt control measures are to be implemented and all disturbed areas are to be reinstated promptly to prevent sediment runoff and protect the water quality.

There is only one water crossing associated with the TDR over-run areas. Overrun area 2 crosses the Moneynierin (WFD ID MUIING_010) and a temporary crossing will be required here. No instream works, modification of the river channel or obstruction of flow will be required and on completion of works, the site will be restored to its existing land use without delay.

Although Overrun area 1 is located within the vicinity of an unnamed stream (WFD ID OWENMORE (MAYO)_060), there will be a 50 m buffer between this stream and any proposed construction or infrastructure related to this over-run area. There will be no construction works required on the crossing structures to facilitate the turbine delivery.

The GCR will not require any new watercourse crossings

All construction works on the Proposed Development Site, and specifically construction works to be undertaken within and in the vicinity of the watercourse, will be completed in compliance with current legislation and best practice as detailed through sections 5 to 8 and in the reference list contained within this CEMP.

The ECoW will be consulted on all watercourse crossing works. Surveys by the ECoW will be carried out immediately prior to construction of the crossing to identify areas of ecological interest and more specifically, mammal and fish activity in watercourses to ensure that adequate mitigation measures are built into the design.

9.13.2 Design Philosophy

Good practice set out in NRA (2008) and Inland Fisheries Ireland (2016) guidance has been incorporated to watercourse crossing design, including the measures detailed below:

- where appropriate, the watercourse will be routed through culverts appropriately sized and designed not to impede the flow of water and will allow safe passage for wildlife, such as fish, water voles, otters etc. (i.e. the crossings will have a capacity well in excess of the design flow);
- when installing culverts, care will be taken to ensure that the construction does not pose a permanent obstruction to migrating species of fish, or riparian mammals (i.e. the crossing will make provision for fish and wildlife migration);
- culverts will be sized so that they do not interfere with the bed of the stream during construction, (i.e. the crossing will leave the watercourse in as natural condition as possible);
- culverts with a single orifice will be used in preference to a series of smaller culverts that may be more likely to become blocked with flotsam and create erosion (i.e. the crossing will not constrict the channel);
- ease and speed of construction are important to minimise disruption to the watercourse and surrounding habitat;



- culverts will be designed for the life of the project;
- culverts will be low maintenance; and
- culverts will be visually in keeping with the surroundings.

In accordance with guidance and the requirements of an Office of Public Works (OPW) in Section 50 application licence under the Arterial Drainage Act, 1945, the watercourse crossings have been designed to be appropriate for the width of watercourse being crossed, and the prevailing ecological and hydrological situation (i.e. the “sensitivity” of the watercourse). Environmental factors including the ecological sensitivity of the watercourse, water quality protection and hydrological processes as well as engineering factors include the width, depth, gradient of the channel, flow characteristics, ground conditions and anticipated loading will influence the selection of structure type and the design of the crossing.

The watercourse crossings will be designed to convey a minimum 1 in 200 years plus climate change return period flood event, and individually sized and designed to suit the specific requirements and constraints of its location.

The watercourse crossing will include splash boards and run-off diversion measures to prevent direct siltation of watercourses.

9.13.3 Culverts

Culverts are used where a closed crossing is required and where this can be achieved without unacceptable hydraulic or ecological effects. Culvert type and size will be confirmed at construction stage, informed by the local drain geometry, flow conditions and constructability. For this site, crossings will be required over both small and main peat drains (typically circa 0.5 m wide by 0.75 m deep for smaller drains, and up to circa 2 m wide at the top and about 1.5 m deep for main drains).

General culvert requirements will include:

- sizing and alignment to minimise blockage risk and prevent backwatering and local flooding;
- integration with existing peat drainage so that flows are not diverted into new preferential pathways;
- inlet and outlet detailing to protect embankments and reduce erosion potential, using appropriately selected protection measures compatible with peatland settings;
- inspection and maintenance access so that accumulated sediment and vegetation can be removed promptly, particularly following heavy rainfall events.

Temporary crossing arrangements, where required, will be controlled through method statements and will include measures to prevent direct discharge of sediment-laden runoff to the drain or watercourse during the works.

9.13.4 Relevant Mitigation Measures

The following is a summary of the relevant mitigation measures and general good practice associated with the development of watercourse crossings:

- site track crossings will be constructed with granular materials, which will limit the production of surface runoff and the direct discharge of sediment into the watercourse;
- the methods of drainage described for the site tracks in Section 9.4.3 will prevent the significant discharge of surface runoff and suspended solids into the watercourse adjacent to the tracks. This is owing to the runoff being collected within the upslope ditch, the presence of peat dams and culverts at appropriate intervals so as to limit



longitudinal flow and the discharging of water to the downslope ground. There will therefore be no long runs of ditches that directly discharge into watercourses;

- the watercourse crossing will be designed to avoid disruption and/or habitat loss to aquatic systems or to affect free passage of fish; and
- where possible, a minimum buffer strip of 50 m will be kept free from development from the top of the banks of any watercourse/waterbody.

9.14 GCR

Prior to the GCR installation works within public roads (subject to a separate planning application), all access points (domestic, business, farm) will be considered when finalising the temporary road closures and diversions, to maintain local access and avoid impacts on various land uses.

The construction of the GCR installation shall consist of a mixture of trench excavation and inline horizontal directional drilling (HDD) where trench excavation is not suitable within the public corridor, such as at watercourses, culverts, bridges and existing utilities.

Invasive species such as Japanese Knotweed have been identified along the route and will need to be treated in accordance with the European Communities (Bird and Natural Habitats) Regulation 2011, S.I. No. 477 of 2011 and EU Invasive Alien Species Regulations (EU) No. 1143/2014.

Measures in this CEMP will also apply to the GCR.



10 Pre-Construction Confirmatory Surveys, Protected Species and Monitoring

10.1 Pre-Construction Confirmatory Surveys

Detailed site investigations that can only be undertaken at the construction stage will be undertaken prior to ground works to confirm the findings of the pre application surveys. This will enable the designers/engineers to confirm the suitability of engineering methods. Preconstruction habitat and protected/ notable mammal surveys will be required to confirm management plans, in recognition of the constant evolution of ecological habitats. Confirmatory surveys for protected species will be undertaken by the ECoW in line with the locations and programme of works. Survey outcomes will inform the designers/engineers in selecting appropriate working methods.

10.2 Water Quality Monitoring

Prior to the works commencing, baseline water quality monitoring will be undertaken by an appropriately qualified and experienced independent consultant to establish the water quality prior to any interference from the works.

This will be undertaken in accordance with the proposed water quality monitoring developed by the PSCS and as detailed within Section 8.0.

This water quality monitoring is to be agreed and reviewed by the Applicant in advance of the works commencing to ensure that the conditions during the monitoring and the testing undertaken are representative and allow a suitable benchmark to be established.

10.3 Archaeology

The Proposed Development Site has undergone an assessment to identify any potential archaeological or cultural heritage features within the development area. Only one statutory archaeological or cultural heritage designations has been identified within the Main Wind Farm Development Site boundary, with several recorded archaeological features and sites of interest exist in the surrounding area, particularly within a 5 km radius. These include protected structures, architectural conservation areas, and regionally significant heritage assets that are identified in **Chapter 12** of the EIAR. Construction works at Turbine 11 have been designed to avoid an archaeological zone located c.0.23 km away from the zone of protection of national monument (crannog registered as Site and Monument Record MA025-004).

10.4 Ecology and Biodiversity

The Proposed Development Site does not contain any statutory ecological designations; however, it is located near several sensitive ecological features and habitats of high conservation value. Full details of any potential ecological resources in and around the Proposed Development Site are provided in **Chapter 5: Biodiversity** of the EIAR.

The closest statutory designations include the Blacksod Bay/Broadhaven Special Protection Area (SPA) and the Mullet/Blacksod Bay Complex Special Area of Conservation (SAC), both situated less than 1 km from the Proposed Development Site boundary. These areas support important habitats, such as mudflats, salt marshes, and machair systems, as well as protected species, including otters (*Lutra lutra*), petalwort (*Petalophyllum ralfsii*), and various bird species such as light-bellied Brent geese and red-breasted mergansers.

Baseline ecological information has been informed by a desk study and targeted field surveys. A high-level ecological constraints survey for the TDR (including overrun areas) was



completed on **26 July 2023**, with additional survey work and reporting completed on **18 July 2025** to cover parcels not confirmed at the time of the 2023 survey.

The desk study for the 2025 work drew on publicly available datasets (including EPA mapping, NPWS resources, the NBDC database, I-WeBS data and relevant planning portals), and the field surveys mapped habitats in accordance with Fossitt classifications and best-practice habitat survey guidance, recording invasive species and notable/protected flora and fauna where observed. Please see **Table 5-5** in **Chapter 5** for dates and timing of completed ecology surveys.

While works are not proposed within European site boundaries as part of the turbine delivery route elements assessed, a number of European sites occur within the surrounding receiving environment, and some locations have hydrological connectivity to designated sites via drains, ditches and watercourses. For example, European sites within the wider area of assessed turbine delivery route work locations include Blacksod Bay/Broad Haven SPA, Broadhaven Bay SAC, Mullet/Blacksod Bay Complex SAC and Owenduff/Nephin Complex SAC/SPA (among others), with distances varying by location.

10.5 General Pre-Construction Confirmation Surveys

To prevent accidental disturbance to resting places of mammals (badgers, red squirrel, pine marten, otter and hedgehog), a confirmatory ecological walkover survey will be undertaken prior to any construction activities within the development footprint.

Similarly, trees and structures within the works corridor will be re-assessed for bat roosting potential, with any inspections or emergence surveys carried out as required under licence.

Confirmatory checks for nesting birds will be carried out for construction undertaken during the bird breeding season. If nests are recorded, ongoing monitoring and appropriate exclusion zones will be implemented to determine when and where works can proceed. If exclusion zones cannot be implemented, NPWS will be contacted and based on their advice, additional mitigation will be implemented, with relevant licences applied for if required – although at this point it is important to note that no licences are required based on the results of the surveys.

10.6 Peatland and Habitat Management

A detailed Habitat Management Plan has been prepared to ensure the overall improvement of the condition of the cutover blanket bog within the Proposed Development Site. Prior to any construction work taking place, activities will be planned against the strategic management plan and vegetation clearance will be planned to avoid the main bird breeding season from March to September, inclusive. The ECoW will provide specific advice regarding timings and micro-siting of construction activities to minimise disturbance to mammals, birds and aquatic fauna.

If unforeseen site clearance and construction activities are required to take place during the main breeding bird season, pre-commencement confirmatory surveys will be undertaken to ensure that nest destruction and disturbance is avoided. This will include the implementation of disturbance-free buffers for common snipe (400 m).

10.7 Construction

10.7.1 Vegetation Clearance, Earthworks and Excavations

The Habitat Management Plan has identified measures to remove and control invasive species such as Rhododendron and Prickly Heath which have been discovered on site.



Temporary works areas will be sited on previously disturbed or low-value habitats where possible and reinstated post-construction. Drainage controls, settlement measures and buffers (as described in Section 7.0) will be implemented to prevent runoff from entering sensitive habitats. Lighting will be directional and time-limited to reduce disturbance to bats and birds.

The following management measures will be taken to minimise general habitat loss, fragmentation and disturbance:

- Vegetation clearance will be limited to the minimum footprint required.
- Woodland, treeline and hedgerow trimming will follow seasonal constraints to protect nesting birds and roosting bats.
- Root protection zones and exclusion fencing will be implemented to prevent unnecessary encroachment into retained habitats.
- Excavations for cables and turbine bases will incorporate silt fences, cut-off drainage and rapid reinstatement to prevent sediment release to watercourses.
- Stockpiles and construction zones will be fenced to avoid accidental overspill into adjacent habitats.
- Amphibian-proof fencing will be implemented around any basins/pools that may attract frogs or smooth newts while construction work is ongoing in close proximity.

General good practice construction techniques to control invasive species that will be implemented are identified in Section 5.0. Measures set out in Section 5.2 on stockpiling and material handling will be implemented to prevent sediment entrainment and habitat degradation.

Measures set out in Section 6.0 will be implemented to protect vegetation, prevent smothering of bryophytes and lichens, and reduce the risk of dust entering aquatic systems.

Measures set out in Section 7.0 will be implemented to prevent sediment release, hydrocarbon contamination, alkaline leachate from concrete, and altered hydrological pathways that could impact aquatic habitats, fish spawning areas, macroinvertebrate communities, peatland vegetation and downstream designated nature conservation sites.

The Peatland Restoration (PRP) and Habitat Management Plan (HMP) (see **Technical Appendix 5-5 of the EIAR**) includes management of key species and will ensure that all required protection measures are undertaken with regard to protected species and the habitat which they rely upon.

The HMP will ensure all required precautions are taken to safeguard protected species from disturbance, injury and death and to protect any structure, place or habitat, which any such protected species uses for growth, breeding, resting, shelter or protection during the construction and, operation of the Proposed Development (with emphasis on the construction phase).

Good practice measures to protect sensitive ecological receptors during the construction phase will be implemented, including the erection of temporary protective fencing demarcating the working footprint, to be monitored and supervised by the ECoW with advice on remedial actions where necessary – as per the PRP and HMP (see **Technical Appendix 5-5 of the EIAR**).

The HMP will be fulfilled by adopting the following objectives throughout the construction of the Proposed Development:

- objective A – Implement a monitoring and protection plan for protected species;



- objective B – Follow an approved procedure if a sensitive ecological receptor is suspected/identified; and
- objective C – Ensure adequate education and awareness of site personnel.

The ECoW will have the specific remit of monitoring compliance with the PRP and HMP (See **Technical Appendix 5-5 of the EIAR**) during the construction phase and report any breaches to the Construction Project Management Team. The ECoW's role will involve direct monitoring of all activities on the Proposed Development Site to the extent the ECoW considers this to be required, and/or training of nominated personnel to carry these out in a manner likely to minimise the potential for impact on the protected species. The ECoW will also agree changes to construction operations to prevent breaches of the HMP.

10.8 Tree Felling

The proposed method of tree felling near infrastructure will be limited to:

- 10 m wide exclusion zone to be established from the edges of any aquatic zones or water hotspots as per Standards for Felling & Reforestation (Department of Agriculture, Food and the Marine (DAFM), 2019).
- 5 m wide exclusion zone to be established from the edges of any relevant watercourses (DAFM, 2019).
- Construction works at Turbine 11 have been designed to avoid an archaeological zone located c.0.23 km away from the zone of protection of national monument (crannog registered as Site and Monument Record MA025-004).
- In the event that an unrecorded archaeological feature is found during tree felling, the discovery must be immediately reported to the National Museum of Ireland or the Garda Síochána. A minimum exclusion zone of 20m must be established around the feature until the site of the find has been investigated (Forest Service, 2000).
- All mitigation measures that are required under the standards, guidelines and conditions in place at the time of issue of the felling licence by the Minister for the Department of Agriculture, Food and the Marine (DAFM).

10.8.1 Species Specific Control Measures

The HMP also includes specific measures for species management for species such as Kestrel for agreement with MCC, in advance of works commencing on Main Wind Farm Development Site. The HMP will set out in sufficient detail the measures and procedures that will be followed to ensure the protection of sensitive species as well as legally protected species during construction.

10.8.1.1 Construction-type Works

The ECoW will oversee activity during the construction and reinstatement periods (at a frequency to be agreed with MCC), to ensure natural heritage interests are safeguarded. The role of the ECoW will include the following specific roles with regard to the ornithology interest of the Main Wind Farm Development Site:

- clearance of woodlands and uncultivated vegetation i.e. trees (including vegetation removal for creation/maintenance of requisite bat mitigation buffers around the wind turbines), will be undertaken outside the main breeding season from March to September inclusive.



- the ECoW will undertake pre-construction confirmatory surveys for nesting birds throughout the construction period that falls within the nesting season and set up and monitor appropriate exclusion areas whilst nests of relevant species are in use.
- once vegetation has been removed from the works corridor, these areas will be retained in a condition that limits suitability for nesting birds for the remainder of the construction phase. Cover for ground nesting species will be made unsuitable by cutting vegetation or tracking over with an excavator.

10.8.1.2 Operation of Wind Turbines

Mitigation measures to limit foraging interest for common kestrel will be implemented to avoid risk of collision with the operational wind turbines. These will focus on reducing prey availability in an area of 91.4 m to 105.5 m surrounding each turbine for conifer and 72.1 m to 90.4 m for scrub (depending on the final choice of turbine model selected):

- creation of uniformly short vegetation heights via infrequent mowing or trimming of vegetation.
- removal of timber/brush from felling and chipping of tree stumps to ground level.
- spread and compaction of chipped wood and spoil to create a flat surface to prevent rapid colonisation of new vegetation.
- piping/filling over of open field/forestry drains.

10.8.1.3 Species Monitoring

Based on current best-practice guidelines (SNH, 2009 and NatureScot, 2021) and in accordance with EC Recommendation (C/2022/3219), a targeted range of flight activity surveys and collision monitoring (carcass searching) will be undertaken for birds and bats will be undertaken in years 1, 2 and 3 post construction, to monitor the rate of avian/bat turbine collisions and identify any significant effects.

Should the bird monitoring programme indicate that there is a significant effect on bird populations during operation of the wind turbines, a curtailment procedure for turbine operation will be implemented where appropriate during 'at-risk' time periods and weather conditions, and as discussed and agreed with the National Parks and Wildlife Service (NPWS).

Should the bat monitoring programme indicate that the implemented bat buffer areas around turbines are not sufficiently effective in avoiding a significant effect on bat populations during operation of the wind turbines, additional measures such as feathering of blades and/or curtailment of turbines will be investigated.



11 Reinstatement

During the construction of infrastructure elements (as detailed in Section 9.0), excavation will be necessary for locations such as turbine foundations, substations, BESS platforms, and localized cut sections. The vegetated peat layer will be carefully lifted intact as turves, with the growing side facing up, and stored adjacent to the work area. The underlying catotelm peat will be excavated to the required depth and stored separately to prevent mixing.

To minimize peat movement, direct placement into restoration areas will be prioritized whenever possible. Storage areas will be located at least 50m away from water features and arranged as low, stable mounds not exceeding 1m in height. If short-term storage is necessary, the peat will be irrigated as needed to prevent drying out and placed on separation layers to maintain stability.

Following construction, reinstatement will proceed as soon as practicable, working progressively with the build. Restored profiles will be graded to blend with surrounding ground, with excavated peat used to batter platform edges and soften the interface with adjacent habitats. Intact turves will be relaid to maximise vegetative recovery, and, where needed, supplementary revegetation or brash spreading will be applied in line with the habitat restoration approach in the EIAR. On floated track margins and other areas without excavation, the existing vegetated mat will be retained and protected during construction, limiting the need for reinstatement to local repairs.

Drainage features will be reinstated to peat-sensitive layouts that preserve natural flow paths and avoid concentrated drawdown, with small check structures used where required to control velocities during the early establishment period. Temporary silt controls will be maintained until vegetation has re-established and runoff is demonstrably clean. Where erosion is observed on embankments or cut faces, local re-grading and re-turfing will be undertaken promptly to stabilise surfaces and protect water quality.

Quality assurance and aftercare will include immediate post-reinstatement inspection of each area, followed by routine monitoring by the Resident Engineer and ECoW to confirm vegetation take, peat surface condition and the effectiveness of drainage and silt controls. Any deficiencies will trigger corrective actions such as additional turf placement, irrigation, minor re-grading, or temporary sediment fencing. Peat mass balance records will be maintained and updated through construction to evidence that excavated peat is reused on site for restoration, consistent with the PMP, which anticipates no surplus peat requiring off-site disposal.



12 References

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Safety, Health and Welfare at Work Act 2005 S.I. No. 10 of 2005) (as amended)

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Wind Energy Ireland (2025) 'Position Paper on Amplitude Modulation Planning Conditions'





Making Sustainability Happen

Appendix 6 Supporting Information for the European Sites

AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001



European sites with functional connectivity (ecological pathways) to the area including their Qualifying Interests, known threats and pressures

Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
000466	Bellacorick Iron Flush SAC	Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528]	D01.01, C01.03.02, K01.03	Paths, tracks, cycling tracks, Mechanical removal of peat, Drying out
000470	Mullet/Blacksod Bay Complex SAC	Fixed coastal dunes with herbaceous vegetation - grey dunes [2130], Large shallow inlets and bays [1160], <i>Salicornia</i> and other annuals colonising mud and sand [1310], Machairs * in Ireland [21A0], Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) [2150], Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation [3150], Otter (<i>Lutra lutra</i>) [1355], Mudflats and sandflats not covered by seawater at low tide [1140], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> - white dunes [2120], Petalwort (<i>Petalophyllum ralfsii</i>) [1395], Alkaline fens [7230], Reefs [1170]	A02.01, J02.12.01, E03.01, G01, C01.01.02, G05.09, A08, X, A05.02, C01.02, F02, A04.01.02, A04.01.01	Agricultural intensification, Sea defense or coast protection works, tidal barrages, Disposal of household or recreational facility waste, Outdoor sports and leisure activities, recreational activities, Removal of beach materials, Fences, fencing, Fertilisation, No threats or pressures, Stock feeding, Loam and clay pits, Fishing and harvesting aquatic resources, Intensive sheep grazing, Intensive cattle grazing
000472	Broadhaven Bay SAC	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330], Submerged or partially submerged sea caves [8330], Large shallow inlets and bays [1160], Reefs [1170], Mudflats and sandflats not covered by seawater at low tide [1140]	A02.01, E03, F01, C01.01.02, A04.01, F02.02.05, J02.02.02, J02.12, A05.02, X, E03.01	Agricultural intensification, Discharges, Marine and Freshwater Aquaculture, Removal of beach materials, Intensive grazing, Benthic dredging, Estuarine and coastal dredging, Dykes, embankments, artificial beaches, general, Stock feeding, No threats or pressures, Disposal of household or recreational facility waste



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
000476	Carrowmore Lake Complex SAC	Slender green feather-moss (<i>Hamatocaulis vernicosus</i>) [6216], Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528], Blanket bogs * if active bog [7130], Depressions on peat substrates of the Rhynchosporion [7150]	A04, B01, C01.03.01, D01.01, C01.03.02, E01.03, D01.02, F02.03, I01	Grazing, Forest planting on open ground, Hand cutting of peat, Paths, tracks, cycling tracks, Mechanical removal of peat, Dispersed habitation, Roads, motorways, Leisure fishing, Invasive non-native species
000495	Duvillaun Islands SAC	Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) [1349], Grey Seal (<i>Halichoerus grypus</i>) [1364]	X, D03.01.01, E01, E06.02, A04.03, F02, D02, H06.01	No threats or pressures, Slipways, Urbanised areas, human habitation, Reconstruction, renovation of buildings, Abandonment of pastoral systems lack of grazing, Fishing and harvesting aquatic resources, Utility and service lines, Noise nuisance, noise pollution
000500	Glenamoy Bog Complex SAC	<i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130], Depressions on peat substrates of the Rhynchosporion [7150], Slender green feather-moss (<i>Hamatocaulis vernicosus</i>) [6216], Petalwort (<i>Petalophyllum ralfsii</i>) [1395], Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Atlantic salmon (<i>Salmo salar</i>) [1106], Blanket bogs * if active bog [7130], Machairs * in Ireland [21A0], Transition mires and quaking bogs [7140], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Natural dystrophic lakes and ponds [3160]	G05.01, G01, G05.09, B05, E03.01, A04.01.02, B02.02, E01.03, B01, C01.01.02, A02.01, C01.03.02, J02.12, C01.03.01, D01.02	Trampling, overuse, Outdoor sports and leisure activities, recreational activities, Fences, fencing, Use of fertilizers (forestry), Disposal of household or recreational facility waste, Intensive sheep grazing, Forestry clearance, Dispersed habitation, Forest planting on open ground, Removal of beach materials, Agricultural intensification, Mechanical removal of peat, Dykes, embankments, artificial beaches, general, Hand cutting of peat, Roads, motorways



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
000534	Owenduff/Nephin Complex SAC	Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachion</i> vegetation [3260], <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130], Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110], Atlantic salmon (<i>Salmo salar</i>) [1106], Blanket bogs * if active bog [7130], Transition mires and quaking bogs [7140], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Alpine and Boreal heaths [4060], Otter (<i>Lutra lutra</i>) [1355], Slender green feather-moss (<i>Hamatocaulis vernicosus</i>) [6216], Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528], Natural dystrophic lakes and ponds [3160]	C01.03, F02.03, F03.01, B, E01.03, X, D01.02, A04, J01, A08	Peat extraction, Leisure fishing, Hunting, Sylviculture, forestry, Dispersed habitation, No threats or pressures, Roads, motorways, Grazing, Fire and fire suppression, Fertilisation
000542	Slieve Fyagh Bog SAC	Blanket bogs * if active bog [7130]	B01, E01.03, C01.03.01, K01.01, D01.02, A04, C01.03.02	Forest planting on open ground, Dispersed habitation, Hand cutting of peat, Erosion, Roads, motorways, Grazing, Mechanical removal of peat
001497	Doogort Machair/Lough Doo SAC	Petalwort (<i>Petalophyllum ralfsii</i>) [1395], Machairs * in Ireland [21A0]	G02.08, G05.01, L07, G01.08, G01.03, A10, G01.02, G02, A04, C01.03, K01.01	Camping and caravans, Trampling, overuse, Storm, cyclone, Other outdoor sports and leisure activities, Motorised vehicles, Restructuring agricultural land holding, Walking, horseriding and non-motorised vehicles, Sport and leisure structures, Grazing, Peat extraction, Erosion



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
001501	Erris Head SAC	Alpine and Boreal heaths [4060], Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]	C01.03.01, A04.02.02, C01.02, D01.01, F05.05, E03.01, X, G01.02, G05.09, D05	Hand cutting of peat, Non intensive sheep grazing, Loam and clay pits, Paths, tracks, cycling tracks, Shooting, Disposal of household or recreational facility waste, No threats or pressures, Walking, horseriding and non-motorised vehicles, Fences, fencing, Improved access to site
001922	Bellacorick Bog Complex SAC	Geyer`s whorl snail (<i>Vertigo geyeri</i>) [1013], Depressions on peat substrates of the Rhynchosporion [7150], Alkaline fens [7230], Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Natural dystrophic lakes and ponds [3160], Blanket bogs * if active bog [7130]	A04, C01.03.02, E02, I01, D05, F03.01, E01.03, D02.01, D01.02, B01, C01.03.01	Grazing, Mechanical removal of peat, Industrial or commercial areas, Invasive non-native species, Improved access to site, Hunting, Dispersed habitation, Electricity and phone lines, Roads, motorways, Forest planting on open ground, Hand cutting of peat
001955	Croaghaun/Slievemore SAC	European dry heaths [4030], Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110], Blanket bogs * if active bog [7130], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Alpine and Boreal heaths [4060]	I01, A04, D01.01, A10, C01.03, C01.01.01, G01	Invasive non-native species, Grazing, Paths, tracks, cycling tracks, Restructuring agricultural land holding, Peat extraction, Sand and gravel quarries, Outdoor sports and leisure activities, recreational activities
002144	Newport River SAC	Atlantic salmon (<i>Salmo salar</i>) [1106], Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) [1029]	B, G05.09, A08, A10, G01.01.02, C01.03, I01, F02.03, E01.03, A04	Sylviculture, forestry, Fences, fencing, Fertilisation, Restructuring agricultural land holding, Non-motorized nautical sports, Peat extraction, Invasive non-native species, Leisure fishing, Dispersed habitation, Grazing



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
002177	Lough Dahybaun SAC	Slender naiad (<i>Najas flexilis</i>) [1833]	X, C01.03	No threats or pressures, Peat extraction
002298	River Moy SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Degraded raised bogs still capable of natural regeneration [7120], Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) [6510], Otter (<i>Lutra lutra</i>) [1355], Sea lamprey (<i>Petromyzon marinus</i>) [1095], Brook lamprey (<i>Lampetra planeri</i>) [1096], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0], Depressions on peat substrates of the Rhynchosporion [7150], Active raised bogs [7110], Atlantic salmon (<i>Salmo salar</i>) [1106], Alkaline fens [7230], White-clawed crayfish (<i>Austroptamobius pallipes</i>) [1092]	B01, H01.05, C01.03, F03.02, J02.04, B05, I01, D04.02, A02.01, F03.02.04, F02.03	Forest planting on open ground, Diffuse pollution to surface waters due to agricultural and forestry activities, Peat extraction, Taking and removal of animals (terrestrial), Flooding modifications, Use of fertilizers (forestry), Invasive non-native species, Aerodrome, heliport, Agricultural intensification, Predator control, Leisure fishing
002998	West Connacht Coast SAC	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	H06.01, D03.02, E03, H03, X, F02, E03.01	Noise nuisance, noise pollution, Shipping lanes, Discharges, Marine water pollution, No threats or pressures, Fishing and harvesting aquatic resources, Disposal of household or recreational facility waste
004004	Inishkea Islands SPA	Turnstone (<i>Arenaria interpres</i>) [A169], Arctic tern (<i>Sterna paradisaea</i>) [A194], Common Gull (<i>Larus canus</i>) [A182], Little Tern (<i>Sterna albifrons</i>) [A195], Dunlin (<i>Calidris alpina</i>) [A149], Herring Gull (<i>Larus argentatus</i>) [A184], Ringed Plover (<i>Charadrius hiaticula</i>) [A137],	A04, G01.02, X	Grazing, Walking, horseriding and non-motorised vehicles, No threats or pressures



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
		Sanderling (<i>Calidris alba</i>) [A144], Barnacle goose (<i>Branta leucopsis</i>) [A045], Shag (<i>Phalacrocorax aristotelis</i>) [A018], Purple Sandpiper (<i>Calidris maritima</i>) [A148]		
004036	Killala Bay/Moy Estuary SPA	Dunlin (<i>Calidris alpina</i>) [A149], Sanderling (<i>Calidris alba</i>) [A144], Ringed Plover (<i>Charadrius hiaticula</i>) [A137], Redshank (<i>Tringa totanus</i>) [A162], Curlew (<i>Numenius arquata</i>) [A160], Wetland and Waterbirds [A999], Grey Plover (<i>Pluvialis squatarola</i>) [A141], Golden Plover (<i>Pluvialis apricaria</i>) [A140], Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	G01.02, F02.03, A08, E01	Walking, horseriding and non-motorised vehicles, Leisure fishing, Fertilisation, Urbanised areas, human habitation
004037	Blacksod Bay/Broad Haven SPA	Ringed Plover (<i>Charadrius hiaticula</i>) [A137], Dunlin (<i>Calidris alpina</i>) [A149], Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046], Sandwich Tern (<i>Sterna sandvicensis</i>) [A191], Red-throated Diver (<i>Gavia stellata</i>) [A001], Common Scoter (<i>Melanitta nigra</i>) [A065], Wetland and Waterbirds [A999], Red-breasted Merganser (<i>Mergus serrator</i>) [A069], Great Northern Diver (<i>Gavia immer</i>) [A003], Sanderling (<i>Calidris alba</i>) [A144], Curlew (<i>Numenius arquata</i>) [A160], Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157], Slavonian Grebe (<i>Podiceps auritus</i>) [A007]	F02.03.01, G01.02, E01, F01, A08, F02.03	Bait digging or collection, Walking, horseriding and non-motorised vehicles, Urbanised areas, human habitation, Marine and Freshwater Aquaculture, Fertilisation, Leisure fishing
004052	Carrowmore Lake SPA	Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]	F02.03, K03.04, B	Leisure fishing, Predation, Sylviculture, forestry



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
004072	Stags of Broad Haven SPA	Leach's Storm-petrel (<i>Oceanodroma leucorhoa</i>) [A015], Storm Petrel (<i>Hydrobates pelagicus</i>) [A014]	X, F02	No threats or pressures, Fishing and harvesting aquatic resources
004074	Illanmaster SPA	European storm petrel (<i>Hydrobates pelagicus</i>) [A014]	X	No threats or pressures
004084	Inishglora and Inishkeeragh SPA	Herring Gull (<i>Larus argentatus</i>) [A184], Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183], Barnacle goose (<i>Branta leucopsis</i>) [A045], Cormorant (<i>Phalacrocorax carbo</i>) [A017], Storm Petrel (<i>Hydrobates pelagicus</i>) [A014], Arctic tern (<i>Sterna paradisaea</i>) [A194], Shag (<i>Phalacrocorax aristotelis</i>) [A018]	A04, G01.02	Grazing, Walking, horseriding and non-motorised vehicles
004093	Termoncarragh Lake and Annagh Machair SPA	Dunlin (<i>Calidris alpina</i>) [A149], Barnacle goose (<i>Branta leucopsis</i>) [A045], Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346], Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395], Corncrake (<i>Crex crex</i>) [A122], Whooper Swan (<i>Cygnus cygnus</i>) [A038], Wetland and Waterbirds [A999], Lapwing (<i>Vanellus vanellus</i>) [A142]	E01.03, D01.02, A04, A10, A08	Dispersed habitation, Roads, motorways, Grazing, Restructuring agricultural land holding, Fertilisation
004098	Owenduff/Nepin Complex SPA	Merlin (<i>Falco columbarius</i>) [A098], Golden Plover (<i>Pluvialis apricaria</i>) [A140]	B, F03.01, A04, C01.03, F02.03, A08, J01, D01.02, E01.03	Sylviculture, forestry, Hunting, Grazing, Peat extraction, Leisure fishing, Fertilisation, Fire and fire suppression, Roads, motorways, Dispersed habitation
004111	Duvillaun Islands SPA	Fulmar (<i>Fulmarus glacialis</i>) [A009], Barnacle goose (<i>Branta leucopsis</i>) [A045], Storm Petrel (<i>Hydrobates pelagicus</i>) [A014]	A04	Grazing



Site Code	Site Name	Qualifying Feature	Pressures Codes	Known Threats and Pressures
004227	Mullet Peninsula SPA	Corncrake (<i>Crex crex</i>) [A122]	A01, A04, A03, E01.02	Cultivation, Grazing, Mowing or cutting of grassland, Discontinuous urbanisation
004228	Lough Conn and Lough Cullin SPA	Common Gull (<i>Larus canus</i>) [A182], Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395], Common Scoter (<i>Melanitta nigra</i>) [A065], Tufted Duck (<i>Aythya fuligula</i>) [A061], Wetland and Waterbirds [A999]	B, A08, F02.03, I01	Sylviculture, forestry, Fertilisation, Leisure fishing, Invasive non-native species
004235	Doogort Machair SPA	Dunlin (<i>Calidris alpina</i>) [A149]	A04, M02, X	Grazing, Changes in biotic conditions, No threats or pressures



Further information on the Qualifying Interests of SACs that have undergone assessment

Qualifying Interests of SACs that have undergone assessment including summaries of current threats and sensitivities

EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
[1013]	Geyer's Whorl Snail (<i>Vertigo geyeri</i>)	The main pressures facing this species are associated with abandonment of land, and both undergrazing and overgrazing by livestock.	A06, A09, A10, K04	Abandonment of grassland management (e.g. cessation of grazing or of mowing), Intensive grazing or overgrazing by livestock, Extensive grazing or undergrazing by livestock, Modification of hydrological flow	Changes to ground vegetation condition, groundwater dependent and is highly sensitive to hydrological changes.
[1029]	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>)	The pressures facing this species come from a wide variety of sources (e.g. pollution from urban wastewater, development activities, farming and forestry), often quite removed from the species' habitat. Flow changes, caused by land drainage are also a significant pressure facing the species.	A26, A31, B23, B27, C05, D02, F12, F28, F31, F33	Agricultural activities generating diffuse pollution to surface or ground waters, Drainage for use as agricultural land, Forestry activities generating pollution to surface or ground waters, Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams), Peat extraction, Hydropower (dams, weirs, run-off-the-river), including infrastructure, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Modification of flooding regimes, flood protection for residential or recreational development, Other modification of hydrological conditions for residential or recreational development, Abstraction of ground and surface waters (including marine) for public water supply and recreational use	Surface water dependent. Highly sensitive to hydrological change. Very highly sensitive to pollution.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
[1092]	White-clawed Crayfish (Austropotamobius pallipes)	The main pressures facing this species is related to the non-indigenous crayfish species (NICS) and Crayfish Plaque, a waterborne disease specific to freshwater crayfish.	I01, I05	Invasive alien species of Union concern, Plant and animal diseases, pathogens and pests	Invasive species, disease, surface water dependent. Highly sensitive to hydrological change. Very highly sensitive to pollution.
[1095]	Sea Lamprey (Petromyzon marinus)	Most of the pressures on Sea Lampreys are associated with hydropower infrastructure, reduction of prey populations due to overharvesting, drainage and the use of both natural and synthetic fertilisers. Changes in rainfall due to climate change is also considered a significant pressure on the species.	A19, A20, A31, D02, G01, N01, N02, N03, Xo	Application of natural fertilisers on agricultural land, Application of synthetic (mineral) fertilisers on agricultural land, Drainage for use as agricultural land, Hydropower (dams, weirs, run-off-the-river), including infrastructure, Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Temperature changes (e.g. rise of temperature & extremes) due to climate change, Increases or changes in precipitation due to climate change, Threats and pressures from outside the Member State	Marine water dependent. Low sensitivity to hydrological changes. Coastal development, trampling from recreational activity.
[1096]	Brook Lamprey (Lampetra planeri)	Most of the pressures on Brook Lampreys are associated with drainage	A19, A20, A31, B09, D02, F11,	Application of natural fertilisers on agricultural land, Application of synthetic (mineral) fertilisers on agricultural land, Drainage for use as agricultural land,	Surface water dependent. Highly sensitive to



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
		for agriculture, the use of both natural and synthetic fertilisers, tree removal. Infrastructure related to hydropower along with pollution to ground and surface water and the discharge of waste water are also considered pressures.	F12, N01, N02	Clear-cutting, removal of all trees, Hydropower (dams, weirs, run-off-the-river), including infrastructure, Pollution to surface or ground water due to urban runoffs, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Temperature changes (e.g. rise of temperature & extremes) due to climate change	hydrological change. Availability of suitable spawning ground is a considerable issue for the species.
[1106]	Salmon (<i>Salmo salar</i>)	Known pressures include exploitation at sea in commercial fisheries, interceptory fisheries in coastal waters, aquaculture and predation. In addition, the negative influence of climate change on prey structure as well as alterations in habitat and water quality are also pressures on the species.	A25, A26, B23, D02, F12, F28, G11, G19, G20, I02, J01, K05, L06, N01	Agricultural activities generating point source pollution to surface or ground waters, Agricultural activities generating diffuse pollution to surface or ground waters, Forestry activities generating pollution to surface or ground waters, Hydropower (dams, weirs, run-off-the-river), including infrastructure, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Modification of flooding regimes, flood protection for residential or recreational development, Illegal harvesting, collecting and taking, Other impacts from marine aquaculture, including infrastructure, Abstraction of water, flow diversion, dams and other modifications of hydrological conditions for freshwater aquaculture, Other invasive alien species (other than species of Union concern), Mixed source pollution to surface and ground waters (limnic and terrestrial),	Disease, parasites and barriers to movement.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
				Physical alteration of water bodies, Interspecific relations (competition, predation, parasitism, pathogens), Temperature changes (e.g. rise of temperature & extremes) due to climate change	
[1140]	Mudflats and sandflats not covered by seawater at low tide	Pressures on mudflats and sandflats are partly caused by pollution from agricultural, forestry and wastewater sources, as well as impacts associated with marine aquaculture, particularly the Pacific oyster (<i>Magallana gigas</i>).	A28, F20, G16	Agricultural activities generating marine pollution, Residential or recreational activities and structures generating marine pollution (excl. marine macro- and micro- particular pollution, Marine aquaculture generating marine pollution	Surface and marine water dependent. Moderately sensitive to hydrological change. Moderate sensitivity to pollution. Changes to salinity and tidal regime. Coastal development.
[1160]	Large shallow inlets and bays	Pressures on the habitat include nutrient enrichment, dredging and invasive alien species.	A28, B23, F20, G01, G16, I02	Agricultural activities generating marine pollution, Forestry activities generating pollution to surface or ground waters, Residential or recreational activities and structures generating marine pollution (excl. marine macro- and micro- particular pollution, Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine aquaculture generating marine pollution, Other invasive alien species (other than species of Union concern)	Inappropriate development, changes in turbidity, surface water runoff, discharge etc. On site management activities.



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[1170]	Reefs	The main pressures on reefs come from fishing methods that damage the seafloor.	G01, G03	Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats	Sensitive to disturbance and pollution.
[1230]	Vegetated sea cliffs of the Atlantic and Baltic coasts	A number of significant pressures were identified, including trampling by walkers, invasive non-native species, gravel extraction, and sea-level and wave exposure changes due to climate change.	C01, E01, F07, F08, I02, N03, N04	Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell), Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defence or coast protection works and infrastructures), Other invasive alien species (other than species of Union concern), Increases or changes in precipitation due to climate change, Sea-level and wave exposure changes due to climate change	Land use activities such as tourism and/or agricultural practices. Direct alteration to the habitat or effects such as burning or drainage.
[1310]	Salicornia and other annuals colonising mud and sand	Pressures on salicornia mud are caused by alien species and overgrazing by livestock	A09, I02	Intensive grazing or overgrazing by livestock, Other invasive alien species (other than species of Union concern)	Marine water dependent. Medium sensitivity to hydrological change. Changes in salinity and tidal regime. Infilling, reclamation, invasive species.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
[1330]	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	The main pressures on Atlantic salt meadows are from agriculture, including ecologically unstable grazing regimes and land reclamation, and the invasive non-native species common cord-grass (<i>Spartina anglica</i>).	A09, A33, A36, F07, F08, I02	Intensive grazing or overgrazing by livestock, Modification of hydrological flow or physical alternation of water bodies for agriculture (excluding development and operation of dams), Agriculture activities not referred to above, Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defence or coast protection works and infrastructures), Other invasive alien species (other than species of Union concern)	Marine and groundwater dependent. Medium sensitivity to hydrological change. Changes in salinity and tidal regime. Overgrazing, erosion and accretion.
[1349]	Bottlenose Dolphin (<i>Tursiops truncatus</i>)	Pressures on this species in Irish waters mainly involve commercial vessel-based activities such as impacts arising from geophysical seismic exploration or from local/regional prey removal by fisheries.	C09, G01	Geotechnical surveying, Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species	Large vessel movement effecting distributions. Prey availability, reduction in available habitat and water quality.
[1355]	Otter (<i>Lutra lutra</i>)	There are no pressures facing this species	Xxp, Xxt	No pressures, No threats	Surface and marine water dependent. Moderately sensitive to hydrological change. Sensitivity to pollution.



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[1364]	Grey Seal(<i>Halichoerus grypus</i>)	Pressures on this species in Irish waters mainly involve commercial vessel-based activities such as impacts arising from geophysical seismic exploration or from local/regional prey removal by fisheries or by-catch in fisheries.	C09, G01	Geotechnical surveying, Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species	Prey availability, reduction in available habitat and water quality.
[1395]	Petalwort(<i>Petalophyllum ralfsii</i>)	There are no pressures facing this species.	Xxp, Xxt	No pressures, No threats	None identified.
[1528]	Marsh Saxifrage(<i>Saxifraga hirculus</i>)	Land abandonment, modification, land drainage and peat extraction are also considered pressures facing this species.	A06, A31, B27, C05	Abandonment of grassland management (e.g. cessation of grazing or of mowing), Drainage for use as agricultural land, Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams), Peat extraction	None identified.
[1833]	Slender Naiad(<i>Najas flexilis</i>)	The species is pressured by enrichment (eutrophication), acidification, peatland damage and the physical alteration of water bodies.	A25, A26, B23, C05, F12, F33, I02, K04, K05	Agricultural activities generating point source pollution to surface or ground waters, Agricultural activities generating diffuse pollution to surface or ground waters, Forestry activities generating pollution to surface or ground waters, Peat extraction, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground	Changes in management. Changes in nutrient or base status. Moderately sensitive to hydrological change.



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				water, Abstraction of ground and surface waters (including marine) for public water supply and recreational use, Other invasive alien species (other than species of Union concern), Modification of hydrological flow, Physical alteration of water bodies	
[2120]	Shifting dunes along the shoreline with white dunes(Ammophila arenaria)	Most of the pressures on marram dunes are caused by the interference on sediment dynamics due to recreation and coastal defences.	E01, E03, F01, F06, F07, F08, I02, L01	Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions), Development and maintenance of beach areas for tourism and recreation incl. beach nourishment and beach cleaning, Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defence or coast protection works and infrastructures), Other invasive alien species (other than species of Union concern), Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, salinization)	Overgrazing, and erosion. Changes in management.
[2130]	Fixed coastal dunes with herbaceous vegetation (grey dunes)	Pressures on fixed dunes are associated with recreation and	A02, A09, A10, F07, F08, I02, L02	Conversion from one type of agricultural land use to another (excluding drainage and burning), Intensive grazing or overgrazing by livestock, Extensive grazing or undergrazing by livestock, Sports, tourism and leisure	Overgrazing, and erosion. Changes in management.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
		ecologically unsuitable grazing practices.		activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defence or coast protection works and infrastructures), Other invasive alien species (other than species of Union concern), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices)	
[2150]	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	The majority of pressures of this habitat are due to land abandonment, recreational activities and also bracken encroachment.	A06, F07, I04	Abandonment of grassland management (e.g. cessation of grazing or of mowing), Sports, tourism and leisure activities, Problematic native species	Overgrazing, and erosion. Changes in management.
[21A0]	Machairs (* in Ireland)	Pressures on the habitat include ecologically unsuitable grazing regimes and disturbance.	A02, A09, A10, A20, A30, F01, F07, L01	Conversion from one type of agricultural land use to another (excluding drainage and burning), Intensive grazing or overgrazing by livestock, Extensive grazing or undergrazing by livestock, Application of synthetic (mineral) fertilisers on agricultural land, Active abstractions from groundwater, surface water or mixed water for agriculture, Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions), Sports, tourism and leisure	Overgrazing, and erosion. Changes in management. Mismanaged recreational activity.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
				activities, Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, salinization)	
[3110]	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	This habitat is under significant pressure from eutrophication, and from drainage and other damage to peatland. Damage to peatland can result in hydrological changes in lakes, increased organic matter, water colour and turbidity, changes in sediment characteristics, acidification and enrichment.	A26, A31, B23, B27, C05, F12	Agricultural activities generating diffuse pollution to surface or ground waters, Drainage for use as agricultural land, Forestry activities generating pollution to surface or ground waters, Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams), Peat extraction, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water	Surface and groundwater dependant. Highly sensitive to hydrological changes. Highly sensitive to pollution.
[3150]	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	Most of the pressures on this habitat are as a result of pollution from agriculture, forestry activities and wastewater.	A25, A26, B23, C05, F11, F12, F13, K04, K05	Agricultural activities generating point source pollution to surface or ground waters, Agricultural activities generating diffuse pollution to surface or ground waters, Forestry activities generating pollution to surface or ground waters, Peat extraction, Pollution to surface or ground water due to urban runoffs, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Plants, contaminated or abandoned industrial sites generating pollution to surface or ground water,	Surface and groundwater dependant. Highly sensitive to hydrological changes. Highly sensitive to pollution.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
				Modification of hydrological flow, Physical alteration of water bodies	
[3160]	Natural dystrophic lakes and ponds	The pressures on this habitat are associated with pollution from agricultural and forestry activities and also from drainage.	A26, A31, B23, B27, C05, D08	Agricultural activities generating diffuse pollution to surface or ground waters, Drainage for use as agricultural land, Forestry activities generating pollution to surface or ground waters, Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams), Peat extraction, Energy production and transmission activities generating pollution to surface or ground waters	Surface and groundwater dependant. Highly sensitive to hydrological changes. Highly sensitive to pollution
[3260]	Water courses of plain to montane levels with vegetation(Ranunc ulion fluitantis and Callitricho-Batrachion)	The majority of pressures on this habitat are caused by damage through hydrological and morphological change, eutrophication and other water pollution.	A25, A26, B23, C05, F11, F12, F13, K01, K04, K05	Agricultural activities generating point source pollution to surface or ground waters, Agricultural activities generating diffuse pollution to surface or ground waters, Forestry activities generating pollution to surface or ground waters, Peat extraction, Pollution to surface or ground water due to urban runoffs, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Plants, contaminated or abandoned industrial sites generating pollution to surface or ground water, Abstraction from groundwater, surface water or mixed water, Modification of hydrological flow, Physical alteration of water bodies	Surface water dependent Highly sensitive to hydrological change and direct physical interactions.



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[4010]	Northern Atlantic wet heaths with <i>Erica tetralix</i>	Overgrazing, burning, wind farm development and erosion are the main pressures associated with this habitat, along with nitrogen deposition from agricultural activities that generate air pollution.	A09, A11, A27, B01, D01, L01, N01, N02	Intensive grazing or overgrazing by livestock, Burning for agriculture, Agricultural activities generating air pollution, Conversion to forest from other land uses, or afforestation (excluding drainage), Wind, wave and tidal power, including infrastructure, Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, salinization), Temperature changes (e.g. rise of temperature & extremes) due to climate change	Surface and groundwater dependent. Highly sensitive to hydrological changes. Inappropriate management.
[4030]	European dry heaths	A number of significant pressures were recorded for this habitat in the current reporting period, particularly overgrazing by sheep and burning for agriculture with afforestation and wind farms also being recognised as pressures.	A09, A11, B01, D01, N01, N02	Intensive grazing or overgrazing by livestock, Burning for agriculture, Conversion to forest from other land uses, or afforestation (excluding drainage), Wind, wave and tidal power, including infrastructure, Temperature changes (e.g. rise of temperature & extremes) due to climate change	Moderately sensitive to hydrological change. Changes in management. Changes in nutrient status.
[4060]	Alpine and Boreal heaths	Overgrazing by livestock, tourism (hill walking) and agricultural activities that cause air pollution are considered significant pressures for this habitat.	A09, A27, F07, N01, N02	Intensive grazing or overgrazing by livestock, Agricultural activities generating air pollution, Sports, tourism and leisure activities, Temperature changes (e.g. rise of temperature & extremes) due to climate change	Changes in management. Changes in nutrient or base status. Moderately sensitive to hydrological change.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
[5130]	Juniperus communis formations on heaths or calcareous grasslands	The pressures associated with this habitat are associated with overgrazing, eroision and scrub removal.	Xxp, Xxt	No pressures, No threats	Changes in management such as grazing regime. Changes in nutrient or base status. Changes to vegetation composition. Introduction of alien species.
[6510]	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	The main pressures associated with this habitat are due to agricultural intensification (fertiliser application) and changes in agricultural practices.	A02, A06, A14, A19, A20	Conversion from one type of agricultural land use to another (excluding drainage and burning), Abandonment of grassland management (e.g. cessation of grazing or of mowing), Livestock farming (without grazing), Application of natural fertilisers on agricultural land, Application of synthetic (mineral) fertilisers on agricultural land	Changes in management such as grazing regime. Changes in nutrient or base status. Changes to vegetation composition. Introduction of alien species.
[7110]	Active raised bogs	The main pressures on active raised bog are peat extraction, drainage, afforestation and burning.	A11, B01, C05, K02, N01	Burning for agriculture, Conversion to forest from other land uses, or afforestation (excluding drainage), Peat extraction, Drainage, Temperature changes (e.g. rise of temperature & extremes) due to climate change	Surface water interactions. Groundwater isolated system with sensitivities related to the bog basin. Drainage and land use



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
					management are the key things.
[7120]	Degraded raised bogs still capable of natural regeneration	The main pressure on degraded bogs come from peat extraction, drainage, afforestation and burning.	A11, B01, C05, K02, N01	Burning for agriculture, Conversion to forest from other land uses, or afforestation (excluding drainage), Peat extraction, Drainage, Temperature changes (e.g. rise of temperature & extremes) due to climate change	Surface water interactions. Groundwater isolated system with sensitivities related to the bog basin. Drainage and land use management are the key things.
[7130]	Blanket bogs (* if active bog)	The main pressures on blanket bogs are overgrazing, burning, afforestation, peat extraction, and agricultural activities causing nitrogen deposition. Erosion, drainage and wind farm construction are also pressures relating to this habitat.	A09, A11, A27, B01, C05, D01, K02, L01, N01, N02	Intensive grazing or overgrazing by livestock, Burning for agriculture, Agricultural activities generating air pollution, Conversion to forest from other land uses, or afforestation (excluding drainage), Peat extraction, Wind, wave and tidal power, including infrastructure, Drainage, Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, salinization), Temperature changes (e.g. rise of temperature & extremes) due to climate change	Surface water interactions. Drainage and land use management are the key things.
[7140]	Transition mires and quaking bogs	The main pressures facing transition mires in	A06, A09, B01, C05,	Abandonment of grassland management (e.g. cessation of grazing or of mowing), Intensive grazing or	Surface water interactions.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
		Ireland are afforestation, water pollution, drainage and hydrological changes with grazing/agricultural management also being a pressure.	J01, K01, K02, K04, L02	overgrazing by livestock, Conversion to forest from other land uses, or afforestation (excluding drainage), Peat extraction, Mixed source pollution to surface and ground waters (limnic and terrestrial), Abstraction from groundwater, surface water or mixed water, Drainage, Modification of hydrological flow, Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices)	Groundwater isolated system with sensitivities related to the bog basin. Drainage and land use management are the key things.
[7150]	Depressions on peat substrates of the Rhynchosporion	The main pressures on the habitat are associated with impacts on the supporting bog habitats, especially overgrazing, burning, peat extraction, drainage and conversion to forestry.	A09, A11, B01, C05, K02, N01	Intensive grazing or overgrazing by livestock, Burning for agriculture, Conversion to forest from other land uses, or afforestation (excluding drainage), Peat extraction, Drainage, Temperature changes (e.g. rise of temperature & extremes) due to climate change	Surface and ground water interactions. Drainage and land use management are the key things.
[7230]	Alkaline fens	The main pressures facing this habitat are land abandonment (and associated succession), overgrazing, drainage and pollution.	A06, A09, A26, J01, K01, K02, K04, L02, N02, N03	Abandonment of grassland management (e.g. cessation of grazing or of mowing), Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Mixed source pollution to surface and ground waters (limnic and terrestrial), Abstraction from groundwater, surface water or mixed water, Drainage, Modification of hydrological flow, Natural succession resulting in species composition change (other than by direct changes of	Surface and groundwater dependent. Highly sensitive to hydrological changes. Inappropriate management.



EU Code	Qualifying Interests	Article 17 Report Summary - Threats and Pressures	Threats and Pressures Codes	Known Threats and Pressures	Sensitivity of Qualifying Interests
				agricultural or forestry practices), Temperature changes (e.g. rise of temperature & extremes) due to climate change, Increases or changes in precipitation due to climate change	
[8110]	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	The main pressures on siliceous scree come from overgrazing, undergrazing and succession.	A09, A10, L02	Intensive grazing or overgrazing by livestock, Extensive grazing or undergrazing by livestock, Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices)	Erosion, overgrazing and recreation.
[8330]	Submerged or partially submerged sea caves	There are no pressures facing this habitat.	Xxp, Xxt	No pressures, No threats	There are no pressures acting on this resource.
[91A0]	Old sessile oak woods with Ilex and Blechnum in the British Isles	The significant pressure facing this habitat are associated with invasive non-native species such as Rhododendron ponticum, cherry laurel (Prunus laurocerasus) and beech (Fagus sylvatica) and overgrazing by deer.	A09, B09, I02, I04, M07	Intensive grazing or overgrazing by livestock, Clear-cutting, removal of all trees, Other invasive alien species (other than species of Union concern), Problematic native species, Storm, cyclone	Changes in management. Changes in nutrient or base status. Introduction of alien species.





Further information on the Special Conservation Interests of SPAs that have undergone assessment

Special Conservation Interests and Vulnerabilities of SPAs that have undergone assessment

Species Code	Common Name	Scientific Name	Threats and Pressures Codes	Known Threats and Pressures
A003	Great northern diver	<i>Gavia immer</i>	C03, F02, G01, H03	Renewable abiotic energy use, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution
A009	Northern Fulmar	<i>Fulmarus glacialis</i>	C03, F02	Renewable abiotic energy use, Fishing and harvesting aquatic resources
A015	Leach's Storm Petrel	<i>Oceanodroma leucorhoa</i>	C03, I01	Renewable abiotic energy use, Invasive non-native species
A061	Tufted Duck	<i>Aythya fuligula</i>	C03, F03, G01, H01, H07, M02	Renewable abiotic energy use, Hunting and collection of wild animals (terrestrial), Outdoor sports and leisure activities, recreational activities, Pollution to surface waters (limnic & terrestrial, marine & brackish), Other forms of pollution, Changes in biotic conditions
A069	Red-Breasted Merganser	<i>Mergus serrator</i>	C03, F01, F02, G01, H03	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution
A098	Merlin	<i>Falco columbarius</i>	A02, B01, B02, C03, M02	Modification of cultivation practices, Forest planting on open ground, Forest and Plantation management & use, Renewable abiotic energy use, Changes in biotic conditions
A122	Corn Crane	<i>Crex crex</i>	A03.01, A04.01, K03.04, M01.03	Intensive Mowing or intensification, Intensive grazing, Predation, Flooding and rising precipitations



Species Code	Common Name	Scientific Name	Threats and Pressures Codes	Known Threats and Pressures
A137	Common Ringed Plover	<i>Charadrius hiaticula</i>	C03, F01, F02, G01, H03, J02, J03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Human induced changes in hydraulic conditions, Other Ecosystem Modifications, Changes in abiotic conditions
A140	European Golden Plover	<i>Pluvialis apricaria</i>	A02, A04, B01, C01, C03, F01, G01, H03, J01, K03, M02	Modification of cultivation practices, Grazing, Forest planting on open ground, Mining and quarrying, Renewable abiotic energy use, Marine and Freshwater Aquaculture, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Fire and Fire suppression, Interspecific faunal relations, Changes in biotic conditions
A141	Grey Plover	<i>Pluvialis squatarola</i>	C03, F01, F02, G01, H03, J02, J03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Human induced changes in hydraulic conditions, Other Ecosystem Modifications, Changes in abiotic conditions
A142	Northern Lapwing	<i>Vanellus vanellus</i>	A02, C03, F01, G01, H03	Modification of cultivation practices, Renewable abiotic energy use, Marine and Freshwater Aquaculture, Outdoor sports and leisure activities, recreational activities, Marine water pollution
A144	Sanderling	<i>Calidris alba</i>	C03, F01, G01, H03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Changes in abiotic conditions
A149	Dunlin	<i>Calidris alpina</i>	C03, F01, F02, G01, H03, J02, J03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Human induced



Species Code	Common Name	Scientific Name	Threats and Pressures Codes	Known Threats and Pressures
				changes in hydraulic conditions, Other Ecosystem Modifications, Changes in abiotic conditions
A157	Bar-Tailed Godwit	<i>Limosa lapponica</i>	C03, F01, F02, G01, H03, J02, J03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Human induced changes in hydraulic conditions, Other Ecosystem Modifications, Changes in abiotic conditions
A162	Common Redhank	<i>Tringa totanus</i>	C03, F01, F02, G01, H03, J02, J03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Fishing and harvesting aquatic resources, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Human induced changes in hydraulic conditions, Other Ecosystem Modifications, Changes in abiotic conditions
A169	Ruddy Turnstone	<i>Arenaria interpres</i>	C03, F01, G01, H03, J03, M01	Renewable abiotic energy use, Marine and Freshwater Aquaculture, Outdoor sports and leisure activities, recreational activities, Marine water pollution, Other Ecosystem Modifications, Changes in abiotic conditions
A182	Common Gull	<i>Larus canus</i>	A04, C03, F02, H03, J03, M01	Grazing, Renewable abiotic energy use, Fishing and harvesting aquatic resources, Marine water pollution, Other Ecosystem Modifications, Changes in abiotic conditions
A184	European Herring Gull	<i>Larus argentatus</i>	C03, F02, H03, J03	Renewable abiotic energy use, Fishing and harvesting aquatic resources, Marine water pollution, Other Ecosystem Modifications
A191	Sandwich Tern	<i>Sterna sandvicensis</i>	C03, I01	Renewable abiotic energy use, Invasive non-native species



Species Code	Common Name	Scientific Name	Threats and Pressures Codes	Known Threats and Pressures
A194	Arctic Tern	<i>Sterna paradisaea</i>	C03, D01, G01, I01, M01	Renewable abiotic energy use, Roads, paths and railroads, Outdoor sports and leisure activities, recreational activities, Invasive non-native species, Changes in abiotic conditions
A346	Red-Billed Chough	<i>Pyrhacorax pyrrhacorax</i>	A02, A04, E06, G01	Modification of cultivation practices, Grazing, Other urbanisation, industrial and similar activities, Outdoor sports and leisure activities, recreational activities
A395	Greater White-Fronted Goose	<i>Anser albifrons flavirostris</i>	A02, A04, A06, A11, B01, C03, D02, D05, F01, F03, G01, H03, H07, K03, M01, M02	Modification of cultivation practices, Grazing, Annual and perennial non-timber crops, Agriculture activities not referred to above, Forest planting on open ground, Renewable abiotic energy use, Utility and service lines, Improved access to site, Marine and Freshwater Aquaculture, Hunting and collection of wild animals (terrestrial), Outdoor sports and leisure activities, recreational activities, Marine water pollution, Other forms of pollution, Interspecific faunal relations, Changes in abiotic conditions, Changes in biotic conditions



Conservation objectives that have been considered by the assessment are included in the following NPWS/Department of Culture, Heritage and the Gaeltacht documents

- NPWS (2019) Conservation Objectives for Bellacorick Iron Flush SAC [IE0000466] Version 1.
- NPWS (2014) Conservation Objectives for Mullet/Blacksod Bay Complex SAC [IE0000470] Version 1.
- NPWS (2014) Conservation Objectives for Broadhaven Bay SAC [IE0000472] Version 1.
- NPWS (2017) Conservation Objectives for Carrowmore Lake Complex SAC [IE0000476] Version 1.
- NPWS (2013) Conservation Objectives for Duvillaun Islands SAC [IE0000495] Version 1.
- NPWS (2017) Conservation Objectives for Glenamoy Bog Complex SAC [IE0000500] Version 1.
- NPWS (2017) Conservation Objectives for Owenduff/Nephin Complex SAC [IE0000534] Version 1.
- NPWS (2016) Conservation Objectives for Slieve Fyagh Bog SAC [IE0000542] Version 1.
- NPWS (2017) Conservation Objectives for Doogort Machair/Lough Doo SAC [IE0001497] Version 1.
- NPWS (2016) Conservation Objectives for Erris Head SAC [IE0001501] Version 1.
- NPWS (2017) Conservation Objectives for Bellacorick Bog Complex SAC [IE0001922] Version 1.
- NPWS (2021) Conservation Objectives for Croaghaun/Slievemore SAC [IE0001955] Version 1.
- NPWS (2019) Conservation Objectives for Newport River SAC [IE0002144] Version 1.
- NPWS (2021) Conservation Objectives for Lough Dahybaun SAC [IE0002177] Version 1.
- NPWS (2016) Conservation Objectives for River Moy SAC [IE0002298] Version 1.
- NPWS (2015) Conservation Objectives for West Connacht Coast SAC [IE0002998] Version 1.
- NPWS (2022) Generic Conservation Objectives for Inishkea Islands SPA [IE0004004] Version 9.
- NPWS (2013) Conservation Objectives for Killala Bay/Moy Estuary SPA [IE0004036] Version 1.
- NPWS (2014) Conservation Objectives for Blacksod Bay/Broad Haven SPA [IE0004037] Version 1.
- NPWS (2022) Generic Conservation Objectives for Carrowmore Lake SPA [IE0004052] Version 9.
- NPWS (2022) Generic Conservation Objectives for Stags of Broad Haven SPA [IE0004072] Version 9.



- NPWS (2022) Generic Conservation Objectives for Illanmaster SPA [IE0004074] Version 9.
- NPWS (2022) Generic Conservation Objectives for Inishglora and Inishkeeragh SPA [IE0004084] Version 9.
- NPWS (2022) Generic Conservation Objectives for Termoncarragh Lake and Annagh Machair SPA [IE0004093] Version 9.
- NPWS (2022) Generic Conservation Objectives for Owenduff/Nephin Complex SPA [IE0004098] Version 9.
- NPWS (2022) Generic Conservation Objectives for Duvillaun Islands SPA [IE0004111] Version 9.
- NPWS (2022) Generic Conservation Objectives for Mullet Peninsula SPA [IE0004227] Version 9.
- NPWS (2022) Generic Conservation Objectives for Lough Conn and Lough Cullin SPA [IE0004228] Version 9.
- NPWS (2022) Generic Conservation Objectives for Doogort Machair SPA [IE0004235] Version 9.





Making Sustainability Happen

Appendix 7 Peatland Restoration Plan

AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001





Peatland Restoration Plan

RWE Renewables Ireland Limited

Prepared by: Ida Bailey

SLR Consulting Limited

No. 50 Stirling Business Centre, Wellgreen, Stirling,
FK8 2DZ

SLR Project No.: 501.065301.00001

15 April 2026

Revision: 2

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	27 February 2026	Ida Bailey	Andrew Torsney	Richard Arnold
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	Click to enter a date.			
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Executive Summary

The Muingmore Wind Farm Peatland Restoration Plan (PRP) and Habitat Management Plan (HMP – Appendix A) sets out a strategy to achieve a net-zero position for biodiversity and carbon impacts associated with the Proposed Development. The plans align with Irish, EU, and local policy frameworks, including the EU Nature Restoration Law (2024) and the National Peatland Strategy.

Purpose and Scope

The PRP report addresses the ecological and carbon implications of peatland habitats on-site, which include blanket bog (PB3), cutover bog (PB4), scrub (WS1) and Conifer Plantation (WD4) on deep peat. It is important to note that all PB3 and PB4 habitats align with the criteria for Annex I Blanket Bog [7130] – none of which was identified to be active/peat forming and therefore it is not priority status. Given the high carbon storage potential of peat soils, the Proposed Development aims to offset habitat loss and carbon emissions through extensive restoration by rewetting of previously drained and cutover bog habitats. The plan follows four key steps:

- Quantify biodiversity loss and restoration needs through detailed habitat surveys and metrics.
 - Assess carbon balance, including sequestration potential and re-use of excavated peat.
 - Determine restoration feasibility considering hydrology, infrastructure, and ecological constraints.
 - Define restoration areas and management actions in a Habitat Management Plan (HMP).

Key Findings

- Habitat Loss: 30 ha of Annex I blanket bog will be directly or indirectly affected by construction.
- Restoration Requirement: Current plans target ~200 ha, delivering 1:6 compensation (by restoration) ratio, resulting in an overall enhancement of biodiversity.
- Carbon Benefits: Reuse of excavated peat in bog restoration will mitigate the extent of CO₂e emissions released due to the Proposed Project via peat excavation by approximately c. 119.9 tCO₂e overall.
- Feasibility: Restoration of blanket bog is technically viable across most open ground and key-holed forestry areas, using ditch blocking, ground smoothing, scrub clearance, and hag / cutting-face re-profiling.
- Biodiversity Net Gain (BNG) Outcome: Application of the Scottish and Southern Energy (SSE) Biodiversity Metric¹ (see Section 3.4.2.3) indicates that considering all habitat losses and gains, a 32% net gain will be achieved overall, with additional gains for irreplaceable habitats.

¹ <https://www.sserenewables.com/sustainability/nature-positive/>



HMP

The HMP has the following Goals, and provides implementation and monitoring plans for the protection and restoration of nature and biodiversity on site in line with the mitigation measures set out in Chapter 5 of EIAR and PRP:

1. Minimise, as far as practicable, the removal of peat and bog vegetation from site during construction.
2. Compared to baseline, enhance the condition of peatlands outside afforested areas via restoration for the benefit of associated biodiversity, carbon storage and sequestration, and water management.
3. Eradicate, as far as practicable, invasive alien plant species from the site.
4. Maintain populations of breeding birds and bats, relative to natural variation.
5. Restore the over-run areas 1 and 2 to baseline or better habitat condition following the removal of temporary infrastructure.

The HMP is a live document that will be revised post planning consent to incorporate any relevant planning conditions to facilitate adaptive management of habitat restoration and enhancement work.



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Appendices

- Appendix A A. Habitat Management Plan**
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1.0 Introduction

The purpose of this report is to set out a Peatland Restoration (PRP) and Habitat Management Plan (HMP) that robustly demonstrates how the Proposed Project – as defined in **Chapter 2** of the associated EIAR, can achieve a net-zero position in terms of biodiversity in line with relevant policy and guidance. Net-zero in this context is linked to the impacts identified in **Chapter 5** of the EIAR which identifies the loss of degraded habitat such as cutover bogs (PB4) and lowland blanket bog (PB3) which aligns with Annex I Blanket bog in unfavourable condition and the requirement to restore similarly degraded habitats to a higher ecological condition and favourable conservation status.

This plan covers:

- The Proposed Development Site including:
 - The Main Wind Farm Development Site: part of the Proposed Development Site which includes the proposed wind turbines and associated infrastructure.
 - Three over-run areas along the turbine delivery route (TDR) to the Proposed Development Site, and
 - The Habitat Enhancement Area in the NWQ (HEA), a small separate triangular area to the northwest of the Main Wind Farm Development Site, which will not include any infrastructure related to the Proposed Project other than that to enhance habitat.

Muingmore Wind Farm is a proposed 13 turbine wind farm and associated infrastructure in Ireland (the Proposed Development). All elements are described in **Chapter 2** of this EIAR.

Based on habitat surveys completed, the dominant habitats on the Main Wind Farm Development Site are peatlands including areas planted with conifer plantation and blanket bog. Bog is predominantly degraded blanket bog with priority lowland blanket bog largely limited to the HEA. Other habitats include wet grassland and scrub.

The wider area surrounding the Main Wind Farm Development Site is a mix of blanket bog and degraded (drained) blanket bog which provides largely uninterrupted habitat connectivity to the Wild Nephin National Park, the exceptions are roads and watercourses.

Key terminology includes avoidance, mitigation, compensation and enhancement, these are defined as set out in CIEEM's Key Principals of EclA²:

- Avoidance: Seek options that avoid harm to ecological features (for example, by locating on an alternative site).
- Mitigation Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
- Compensation³ Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- Enhancement Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

² <https://cieem.net/wp-content/uploads/2018/08/EclA-Guidelines-v1.3-Sept-2024.pdf>

³ In this context compensation does not relate to compensation for the purposes of article 6 (4) of the Habitats Directive.

1.1 The Carbon Implications of Bog Habitats on Site

Peat is a carbon store and blankets the majority of the Main Wind Farm Development Site at >50cm depth. Even a thin peat layer of 30cm has a carbon store equivalent to tropical rainforest ha/ha⁴, and the 2006 IPPC guidance for National Greenhouse Gas Inventories considers organic soils (including peatlands) with a depth of >10cm. As the majority of the Main Wind Farm Development Site is peatland, it therefore contains significant stores of carbon.

As it stands, available national statistics suggest that near natural bog should remove 3.54tCO₂e per hectare from the atmosphere per year. However, as the bog on the Main Wind Farm Development Site is mostly drained (Figure 6) it could be a carbon source. Drained peat and peat planted with commercial forestry are often carbon sources as they dry the peat compared to its natural saturated state permitting oxidation of the stored carbon. Areas of priority Annex 1 bog, particularly those parts in good condition, where no peat extraction has been undertaken such as parts of the HEA may however be carbon sinks.

The construction of the Proposed Development will require some drainage and displacement of peat and peatland including blanket bog.

Therefore, in terms of land use change (not taking into account the carbon benefit of displacing fossil fuel electrical generation with wind), the Proposed Development would likely generate an increase in net greenhouse gas emissions, if it damages bog further, or a net sink, if bog condition is improved enough for peat forming to begin again as is planned via the PRP (see Section 3.5 for more details).

1.2 Level of Ambition

The Proposed Project will focus on peatland restoration in non-afforested areas. In summary, this involves considering restoration of all degraded/ drained peatland within the Main Wind Farm Development Site and HEA that is not currently under conifer plantation.

1.3 Scope

This peatland restoration study is split into four steps:

- **Step 1:** Determine the area of bog restoration required for compensation in terms of biodiversity (to reach at least no net loss for biodiversity), and therefore the potential for enhancement (net biodiversity gain) via restoration of additional areas; and detailed habitat surveys.
- **Step 1a:** Detailed habitat surveys.
- **Step 1b:** Calculation of biodiversity loss.
- **Step 1c:** Calculation of the area of peatland restoration required for biodiversity compensation and enhancement incl. which areas of the Main Wind Farm Development Site will be prioritised for this.
- **Step 2:** Accounting for carbon sequestration and storage by restored bog and re-use of excavated peat.
- **Step 3:** Determine the total area of bog that it is feasible to restore (re-wet) within the open ground on the Main Wind Farm Development Site and HEA, taking into account constraints such as infrastructure and ecological sensitivities.

⁴ ICUN Peatland Programme, 2020. Position statement: Peatland and trees: <https://www.iucn-uk-peatlandprogramme.org/sites/default/files/header-images/Resources/IUCN%20UK%20PP%20Peatlands%20and%20trees%20position%20statement%202020.pdf>

- **Step 4:** Define the area of bog to be restored and provide an associated Habitat Management Plan (HMP).

The methodology and results for these steps are set out in the following Sections.

1.4 Relevant Policy and Legislation

The following policy and legislation is relevant to this report, particularly in relation to biodiversity, Annex 1 habitats, and peatland re-wetting and restoration.

- EU Habitats Directive (Council Directive 92/43/EEC), which aims to ensure the conservation of biodiversity across Europe by safeguarding natural habitats and species, in particular Annex I habitats (as amended).
- The EIA Directive (2011/92/EU) in relation to projects that might significantly affect the environment, including impacts on Annex I habitats (as amended).
- Ireland’s national peatland strategy was published in 2015²⁵.
- The Mayo County Development Plan 2022-2028.
- The EU Nature Restoration Law³¹ - approved in June 2024 and has requirements in relation to peat re-wetting.
- Project Ireland 2040: National Planning Framework (First revision – April 2025)⁵.

1.5 The Project Team - Statement of Authority

This report was prepared by Ida Bailey, with support from SLR’s wider biodiversity, hydrogeology, carbon and GIS teams. Qualifications and experience for key team members are provided below:

1.5.1.1 Ida Bailey, PhD, ACIEEM, CERPIT (Natural Capital)

Ida leads SLR’s Nature and Natural Capital team in Europe. She has a PhD., and B.Sc. in biodiversity and natural sciences related fields. She is an Associate member of CIEEM, a certified ecological restoration practitioner in training (CERPIT) with the Society for Ecological Restoration and sits on the panel of academic specialist for the Biodiversity Futures Initiative. She has over 17 years of ecological consultancy and research experience both in the UK and overseas and specialises in innovative, multidisciplinary ecological restoration, nature positive, bio-credit and natural capital projects.

1.5.1.2 Andrew Torsney PhD, MRes, BSc. (Habitats and Ecology)

Andrew is a Technical Director in SLR’s Ecology and Biodiversity technical discipline and manages the Irish Ecology team. Andrew has over 12 years’ experience within the ecology and environmental sector. He has managed and undertaken ecological assessments at a range of scales including detailed Annex I habitat surveys. Andrew has also conducted research on the implications of habitat classification regarding conservation outcomes of Annex I habitats. Andrew is a technical botanical specialist with extensive planning experience regarding ecological assessments at all scales from local to national.

1.5.1.3 Adrian Cowe, MSc (Hydro-geology)

Adrian is an associate hydrologist. His key areas of experience and interest are in the areas of hydrological, hydrogeological and geological assessment for EIA and FRA, and quantitative water quality assessments. He holds expert knowledge and experience of

⁵ <https://cdn.npf.ie/wp-content/uploads/National-Planning-Framework-First-Revision-April-2025-1.pdf>

surface and ground water sampling methodology, water quality monitoring instrumentation and data analysis. He has worked for a wide range of clients across a number of sectors including power, mining, water utilities and transport.

1.5.1.4 Chris Marshall, PhD, MSc (Peatland restoration)

Chris is a Principal Consultant specialising in peatland risk management, monitoring and restoration design. Chris has extensive experience in the characterization of peatland condition and developing monitoring solutions from the site to the national scale. Chris has spent more than a decade working in academia and industry on a variety of research projects in areas such as hydrocarbon exploration, sedimentology, engineering geology, climate reconstruction, remote sensing and peatland science working collaboratively with Govt, NGO's and private sector clients to deliver peer reviewed publications, reports including as a member of scientific advisory committees.

1.5.1.5 Luke Moseley, MSc. (Carbon)

Luke is an experienced sustainability and carbon management professional with a strong track record in corporate and project-level climate strategy. He has led the management and analysis of sustainability data, authored climate chapters for Environmental Impact Assessments (EIAs), conducted GHG emissions inventories across Scope 1, 2 and 3, and developed a deep working knowledge of relevant policies, frameworks, and regulatory requirements for carbon reduction. With a specialism in land-based emissions, his MSc research focused on the opportunities and challenges of measuring and reporting emissions from land use and land use change.

1.5.1.6 Joe O'Reilly, MSc. (GIS)

Joe is a Senior GIS Analyst with over 6 years of experience in the development and implementation of spatial solutions. His experience includes desk-based assessments of ecosystem services and biodiversity; feasibility studies and opportunity mapping for renewable energy sources requiring the development of a bespoke assessment methodology based on best practice and the aims of the project; the synthesis and analysis of a wide array of social, economic and environmental datasets; and the visualisation of project outputs in dynamic decision-making tools.

2.0 Methods

This peatland restoration study is split into four steps, as detailed in the next sections. It aligns with commitments made in Chapter 5 as part of the ecology impact assessment and RWE's ambitions to have net-zero carbon emissions; and to work towards a nature positive impact⁶.

2.1 Step 1: Determine the area of bog restoration required for compensation in terms of biodiversity (to reach at least net zero); and detailed habitat surveys.

To reach no net biodiversity loss in terms of peatlands for the Proposed Development some bog restoration will be required. To give confidence of net zero, a calculated 10% net gain is required. The 10% threshold functions as a precautionary buffer, ensuring that developments deliver genuine, real-world- net gains once uncertainty in the accuracy of the metric is taken into account⁷. The same concept of a buffer beyond estimated net-zero before biodiversity gains can be claimed, is adopted by the ICUN⁸.

The first task in this study is to estimate the area of peatland restoration that is needed to reach robustly justifiable net zero impact. This requires firstly to establish a robust definition of bogs and peatlands and the parameters that should be included in biodiversity loss and gain calculations.

Based on our previous experience, for biodiversity the area of restoration should be in the region of 3-to-10-times the area lost. Irish guidance is absent however, more recent UK guidance and legislation such as the Statutory BNG metric and NatureScot policy (see Section 3.4.2.1), supports the higher compensation requirement of around 1:10 or higher. The recently released TII metric⁹ was not available in time to inform this project. The TII metric is Ireland specific and broadly based on the Statutory Biodiversity metric. It was released in December 2025. It is not a statutory requirement and was designed for linear infrastructure projects rather than large renewable or blanket bog areas such as the Proposed Development. For these reasons, and as at the time of its release BNG calculations for the Proposed Development were largely complete, we have not used in for our calculations assessment. We do however make reference to it where appropriate.

2.1.1 Defining Bog and Peatlands in Ireland

There are key differences between the definitions of bog (largely vegetation based with some consideration of peat depth) and peatland (based on peat depth/ soil carbon content). These terms are not fully interchangeable. The EU nature restoration law for example considers peatlands even where these have been converted to agriculture and no longer support bog vegetation.

Relevant literature has been relied upon to define the most appropriate definitions of peatlands, bogs and Annex 1 habitats in the context of the Proposed Development. Sources are set out in Table 3-1. These consist of:

- National Peatlands Strategy. 2015. National Parks & Wildlife Service. Dublin¹⁰;

⁶ <https://www.rwe.com/en/responsibility-and-sustainability/environmental-protection/biodiversity/>

⁷ <https://www.nao.org.uk/wp-content/uploads/2024/05/implementing-statutory-biodiversity-net-gain-summary.pdf>

⁸ <https://iucn.org/sites/default/files/2025-12/the-nature-positive-goal-and-the-mitigation-hierarchy.pdf>

⁹ <https://cdn.tii.ie/publications/GE-ENV-01112-01.pdf>

¹⁰ <https://www.npws.ie/sites/default/files/publications/pdf/NationalPeatlandsStrategy2015EnglishVers.pdf>