Plate 14.1: *View of Field Boundary CO057-006---- from south*

Plate 14.2: *View of Enclosure CO057-007---- from east*

Plate 14.3: *View of potential basal remains of hut site from southeast*

Plate 14.4: *View of potential standing stone from north*

Plate 14.5: *View of 19th-century farmhouse from west*

Plate 14.6: *View towards location of Turbine 1 from west*

Plate 14.7: *View towards location of Turbine 2 from east*

Plate 14.8: *View towards location of Turbine 3 from southwest*

Plate 14.9: *View towards location of Turbine 4 from south*

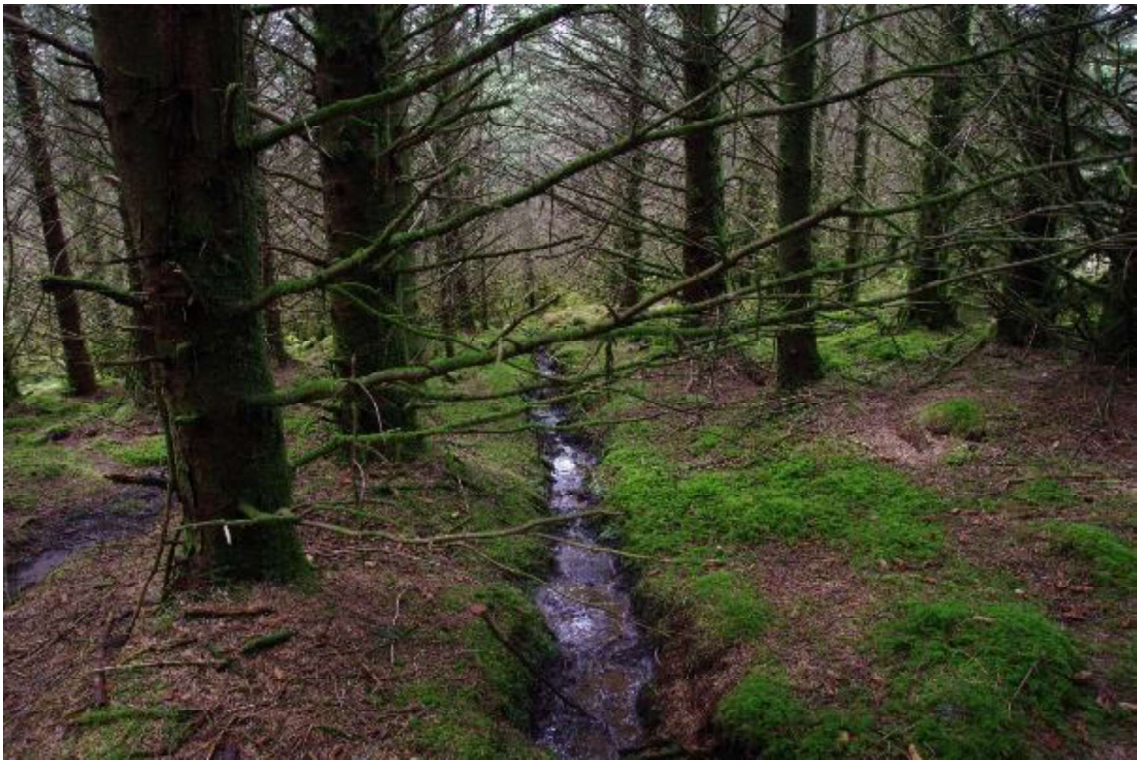

Plate 14.10: *View towards location of Turbine 5 from east*

Plate 14.11: *View towards location of onsite substation from east*

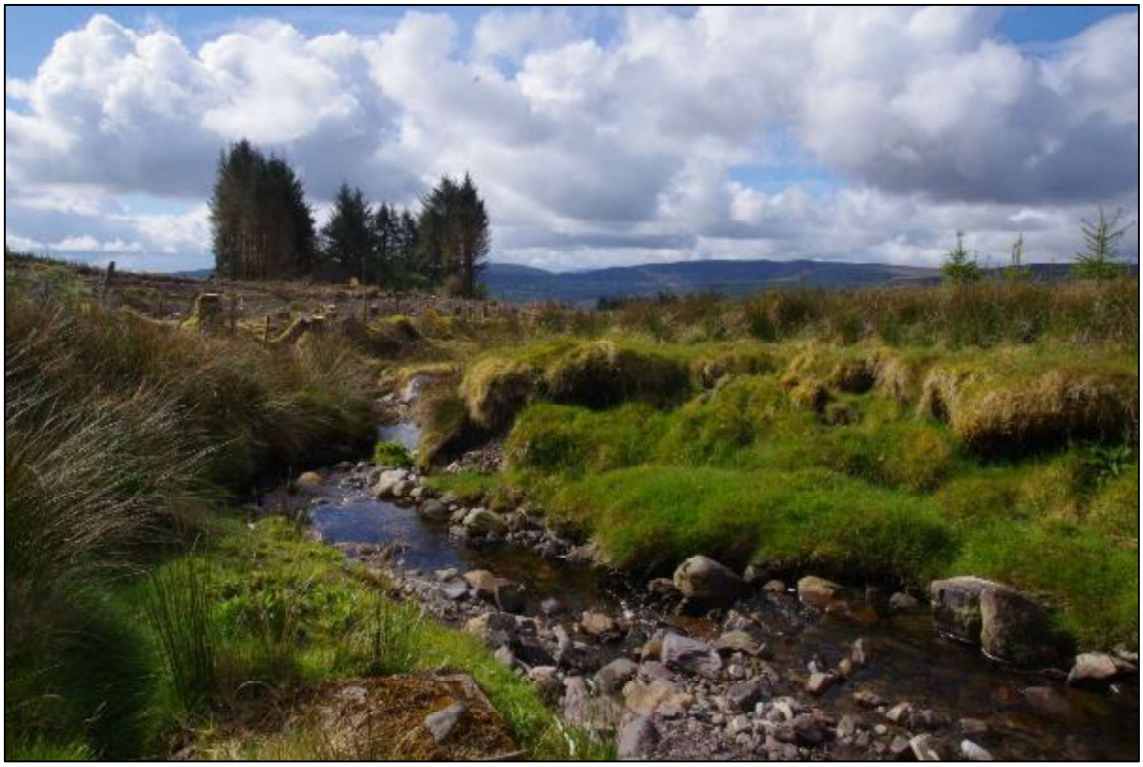

Plate 14.12: *View of stream forming townland boundary between Inchamore and Milleeny from north*

Plate 14.13: *View of borrow pit location from west showing disturbed area in foreground*

Plate 14.14: *View of existing forestry track extending to N22 road from south. The location of redundant record SMR KE076-071---- is within the west end of forestry plantation visible on left side*

COLLETT

EXPERTS IN MOTION

Primary Route Assessment – Inchamore Wind Farm, County Cork

343154

Thursday, 10 October 2022 Prepared for Inchamore Wind DAC

38 Locations Assessed

REPORT DETAILS

REPORT FOR

FuturEnergy LTD
Ettington Park Business Centre
Stratford-upon-Avon
CV37 8BT

ATTENDEES OF THE SURVEY

Steven Mangham and Spencer Budgen

DATE AND TIME OF THE SURVEY

Tuesday 12th October

GENERAL WEATHER CONDITIONS

Mixed

ISSUED BY

Spencer Budgen

APPROVED BY

Steven Mangham

DOCUMENT REVISIONS

No	Date	Details

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Heavy Lift
General Haulage
Warehousing
Test Station (DVSA-authorised)
SHEQ Training





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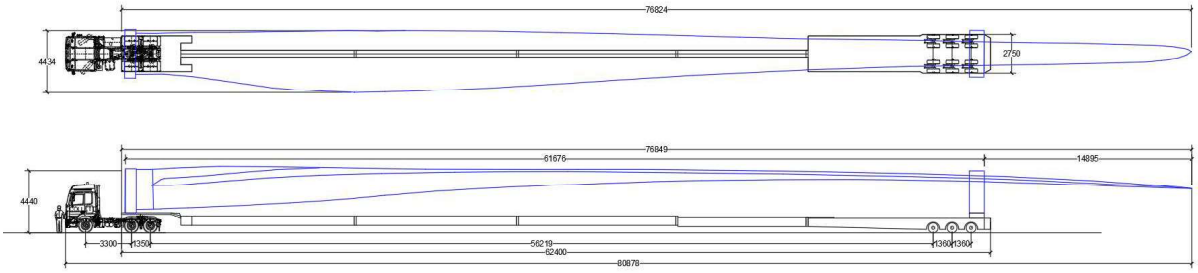
Fax: +44 (0) 8456 255244
renewables@collett.co.uk
www.collett.co.uk

ROUTE ASSESSMENT OVERVIEW

This section of the report illustrates the route assessed for the delivery of a SG155 blade component to the proposed Inchamore Wind Farm, County Cork, Ireland.

All the routes surveyed in this report have been identified by Inchamore Wind DAC and have been detailed in this report based on the following maximum dimensions instructed by Inchamore Wind DAC:



Route

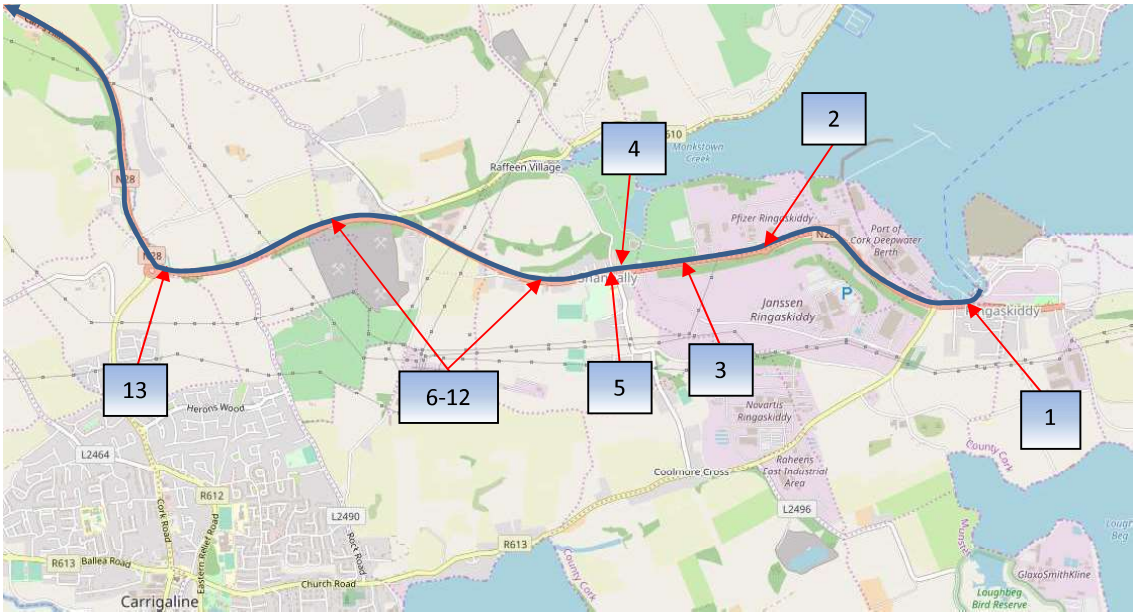
Start Location	N28	Distance of Route	Km	Miles
Max Load Dims:	76.8m Rigid Length Approx. 4.4m width		91.6	56.9

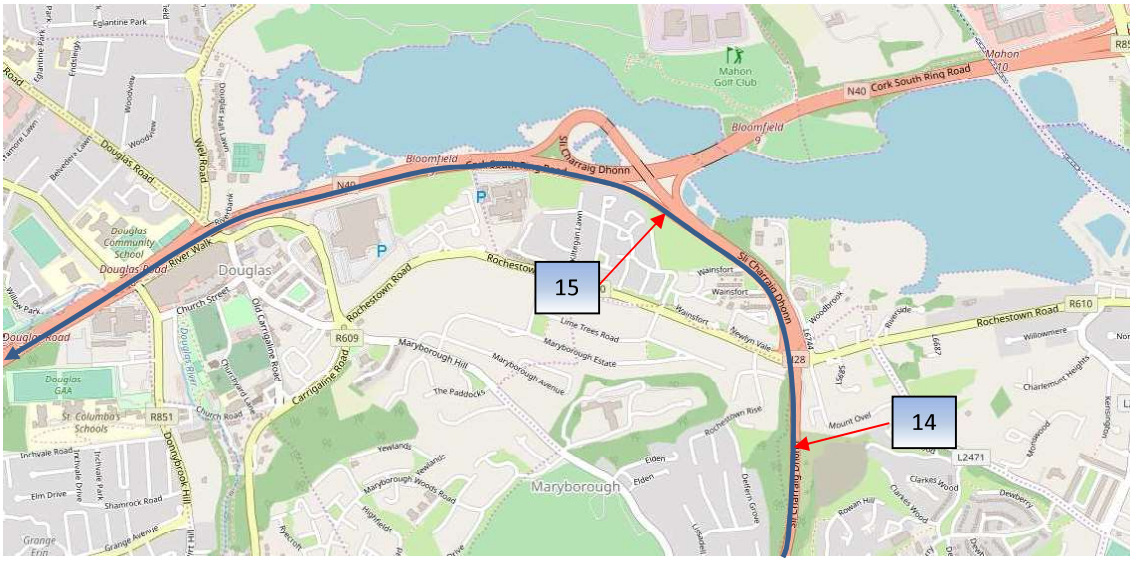
- Exit Ringaskiddy Port onto N28
- At the roundabout, continue onto N28
- At the roundabout, continue onto N28
- At the roundabout, take the 2nd exit onto N28
- Continue on N28, then take the slip road onto N40
- Continue on N22.
- *Merge onto the Macroom bypass and continue.*
- *Re-join the N22, leaving the Macroom bypass.*
- Continue on N22 for 2.9 miles to the proposed site entrance. W 13983 80602

MAP OVERVIEW

ROUTE ASSESSMENT

LOCATION OVERVIEW



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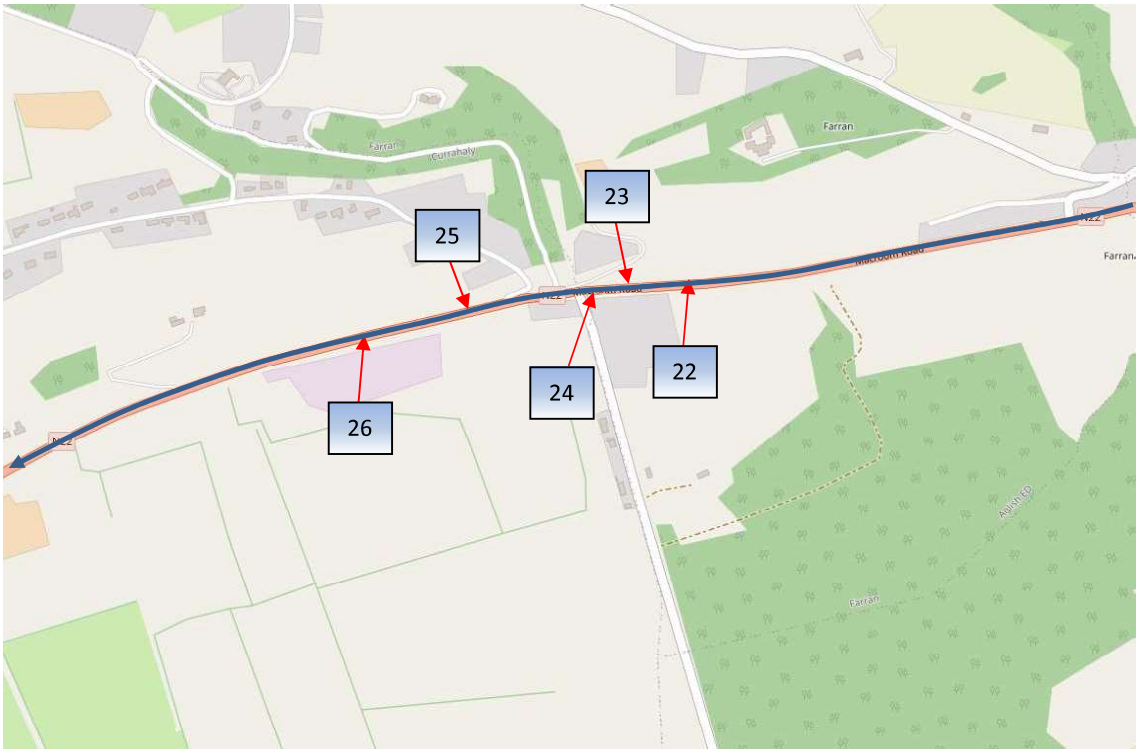
Ovens
Éire Óg GAA
L2209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Farran
Currahaly


Warrenscourt
Cannaway ED
Warrenscourt
Moviddy
L2002
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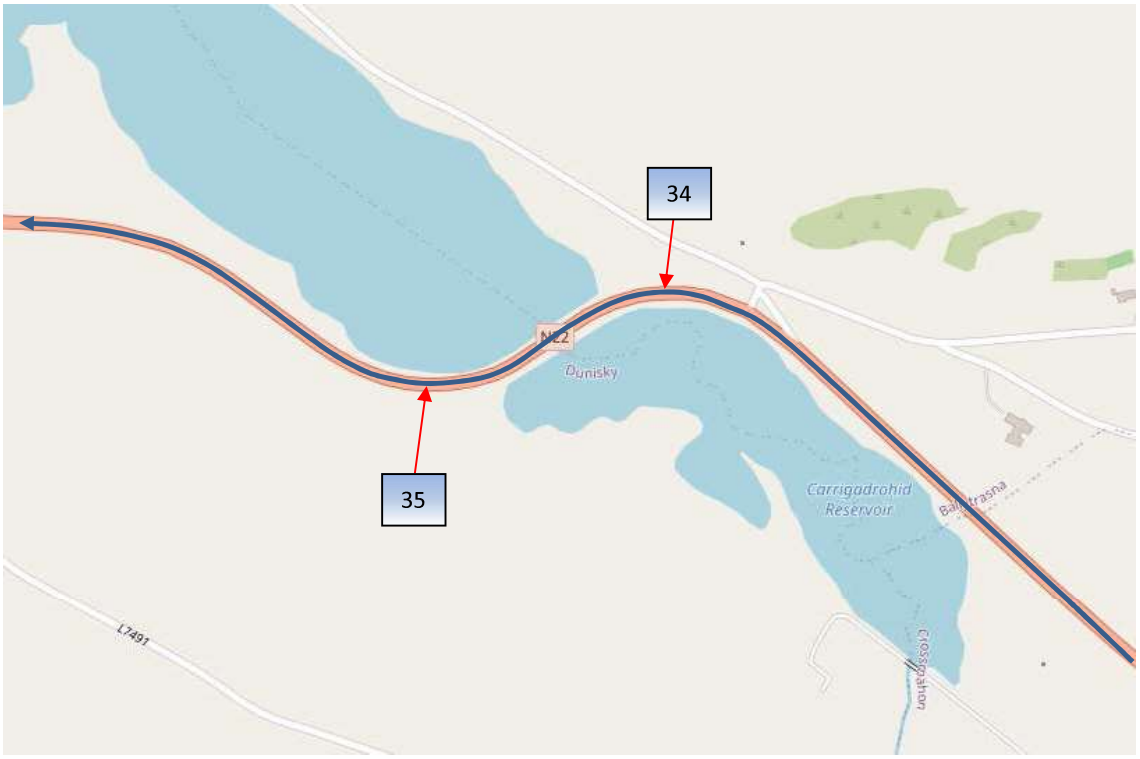
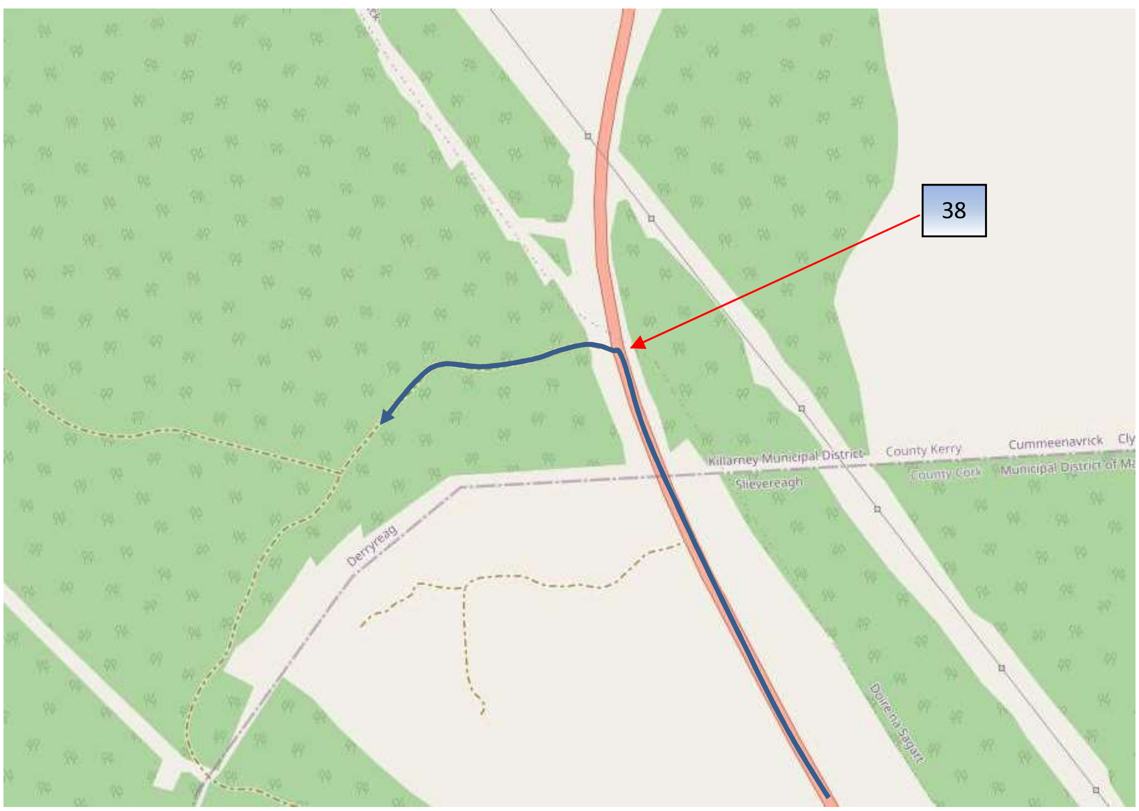

34
N22
Dunisky
Carrigadrohid
Reservoir
L7491
35


37
36
Baile Bhuirne
Baile Mhic Íre
L3409
R582
N22
Sullane River
Macroom
L3414
R584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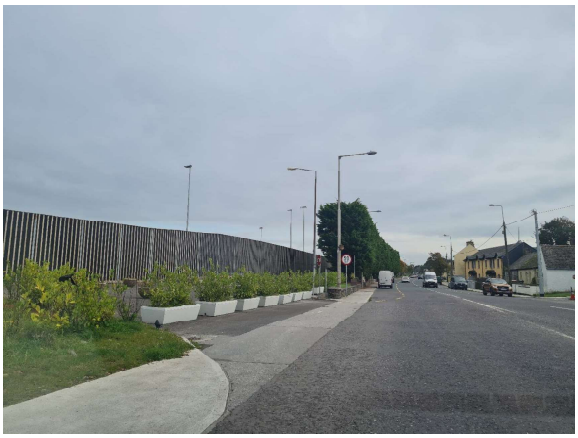
Killarney Municipal District
County Kerry
Cummeenavrick
County Cork
Slievereagh
Derryreag
Doirenasagart



Location 1 - Exit From Ringaskiddy Port

Direction - Turn Right Onto N28

Visual inspection indicates that the fencing and flower pits are to be removed to allow access from the port.

Manual steering required to assist navigation.

Swept Path Analysis recommended to ensure no further modifications are required.

Location 2 - N28 Roundabout

Direction - Continue Straight On N28

Visual inspection indicates that the loaded blade vehicle is to run on hardstanding central island of the roundabout and the exit Splitter Island.

Street furniture in these locations to be removed.

Swept Path Analysis recommended to confirm modifications.

Location 3 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 4 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 5 - N28 Roundabout

Direction - Continue Straight On N28

Visual inspection indicates that a contraflow manoeuvre is required at this roundabout.

Loaded vehicle is required to run on hardstanding area in front of the shop on the offside of the roundabout.

Street furniture in this area to be removed.

Manual steering required to assist navigation.

Swept Path Analysis recommended to confirm modifications.

Location 6 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 7 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 8 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 9 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 10 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 11 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 12 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 13 - N28/R611 Roundabout

Direction - Turn Right On N28

Visual inspection indicates that a contraflow manoeuvre is required to navigate this roundabout.

Street furniture on the entry Splitter Island to be removed due to rear projection of the blade components.

Manual steering required to assist navigation.

Swept Path Analysis recommended to confirm modifications.

Location 14 - Splitter Island On N28

Direction - Continue Straight On N28

Visual inspection indicates that there are no issues at this location.

Location 15 - N28/N40 Junction

Direction - Turn Left Onto N40

Visual inspection indicates that there are no issues at this location.

Location 16 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 17 - Splitter Island On N22

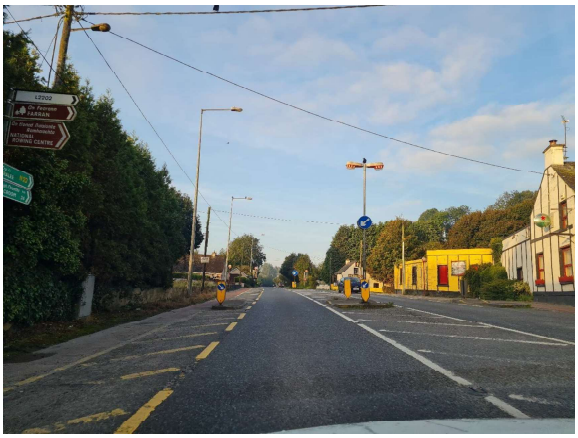
Direction - Continue Straight On N22

Visual inspection indicates that flexi bollards to be flattened to allow loaded vehicle to navigate.

Location 18 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that flexi bollards on the nearside to be flattened to allow loaded vehicle to navigate and avoid Splitter Island.



Location 19 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 20 - Splitter Island On N22

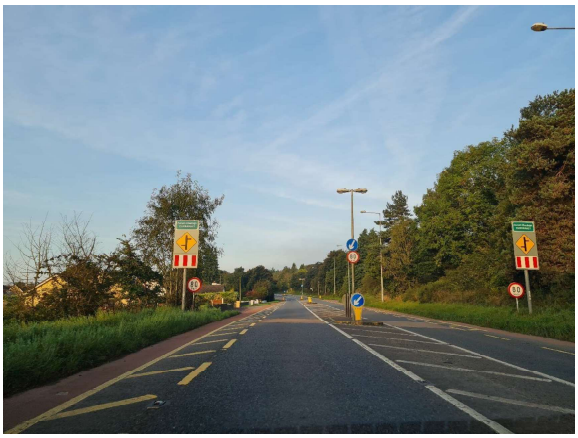
Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 21 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.



Location 22 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 23 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 24 - Splitter Island On N22

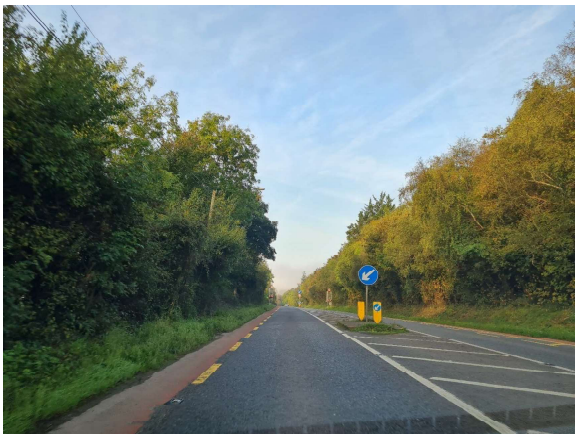
Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 25 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.



Location 26 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 27 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 28 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the flexi bollards to be flattened to allow loaded vehicle to navigate.

Location 29 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 30 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 31 - Splitter Island on N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 32 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 33 - Splitter Island On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location without any issues.

Location 34 - Left Bend On N22

Direction - Continue Straight On N22

Visual inspection indicates that the loaded vehicle will navigate this location utilising manual steering.

Location 35 - Right Bend On N22

Direction - Continue Straight On N22

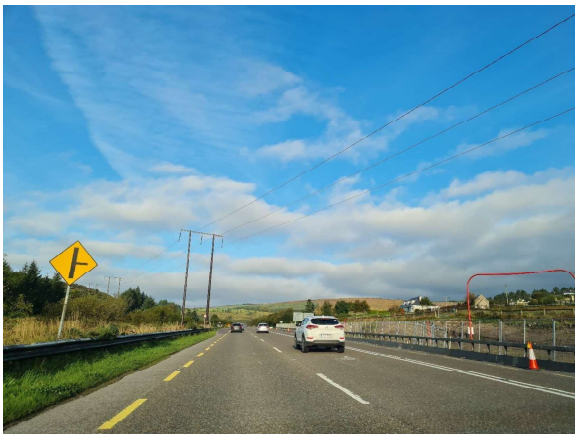
Visual inspection indicates that the loaded vehicle will navigate this location utilising manual steering.

Location 36 - Macroom Bypass Interchange

Direction - Leave N22 And Join Bypass

Loaded vehicles are to use the new Macroom Bypass which has now completed construction.

Visual inspection indicates that the street furniture within the red circles is required to be removed to allow blade projections to oversail.



Location 37 - N22 / Macroom Bypass Interchange At Ballyvourney

Direction - Rejoin N22

Loaded vehicles are to use the new Bypass, to navigate to Ballyvourney, to avoid the town of Macroom.

The overhead line at this location will not be an issue for any of the loaded vehicles.

Location 38 – Site road entrance

Direction – Turn left onto site road

Visual inspection indicates that third party land is required on the nearside of the junction.

The raised banking on the nearside is required to be excavated to allow the trailer body to oversail.

The third-party fence on the nearside is required to be removed.

The site access road to the wind farm site from this junction on the N22 will be upgraded to allow the loaded vehicle to navigate without issu

IMPORTANT NOTES

- Pilot car will be required to negotiate the route, in order to assist with traffic control and control oncoming traffic flow.
- The information contained in this report is privileged and confidential and is for the exclusive use of the client nominated herein.
- All access diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- All route assessment, proposed land-take and removal/re-instatement of nominated street furniture is deemed accurate by Collett & Sons Ltd at the date that this report is created. We cannot be held responsible for the development of future road schemes or alterations to the routes surveyed that may leave this report inaccurate.
- As this report is based on a generic turbine blade component, reassessment is recommended once a specific turbine has been selected.

COLLETT

Primary Route Assessment - Port Of Foynes / Inchamore

343154

Wednesday, 23 November 2022

Prepared For FuturEnergy Ltd

43 Locations Assessed

REPORT DETAILS

REPORT FOR

FuturEnergy LTD
Etington Park Business Centre
Stratford-upon-Avon
CV378BT

ATTENDEES OF THE SURVEY

Jacob Halstead and Spencer Budgen

DATE AND TIME OF THE SURVEY

Wednesday 23rd September

GENERAL WEATHER CONDITIONS

Sunny

ISSUED BY

Spencer Budgen

APPROVED BY

Steven Mangham

DOCUMENT REVISIONS

No	Date	Details

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Fax: +44 (0) 8456 255244
renewables@collett.co.uk
www.collett.co.uk

ROUTE ASSESSMENT OVERVIEW

This section of the report illustrates the route assessed for the delivery of a generic 77.5m blade component to the proposed Inchamore Wind Farm, Coolea, Co. Cork, Ireland.

All the routes surveyed in this report have been identified by Collett Consulting and have been detailed in this report based on the following maximum dimensions instructed by FuturEnergy Ltd.

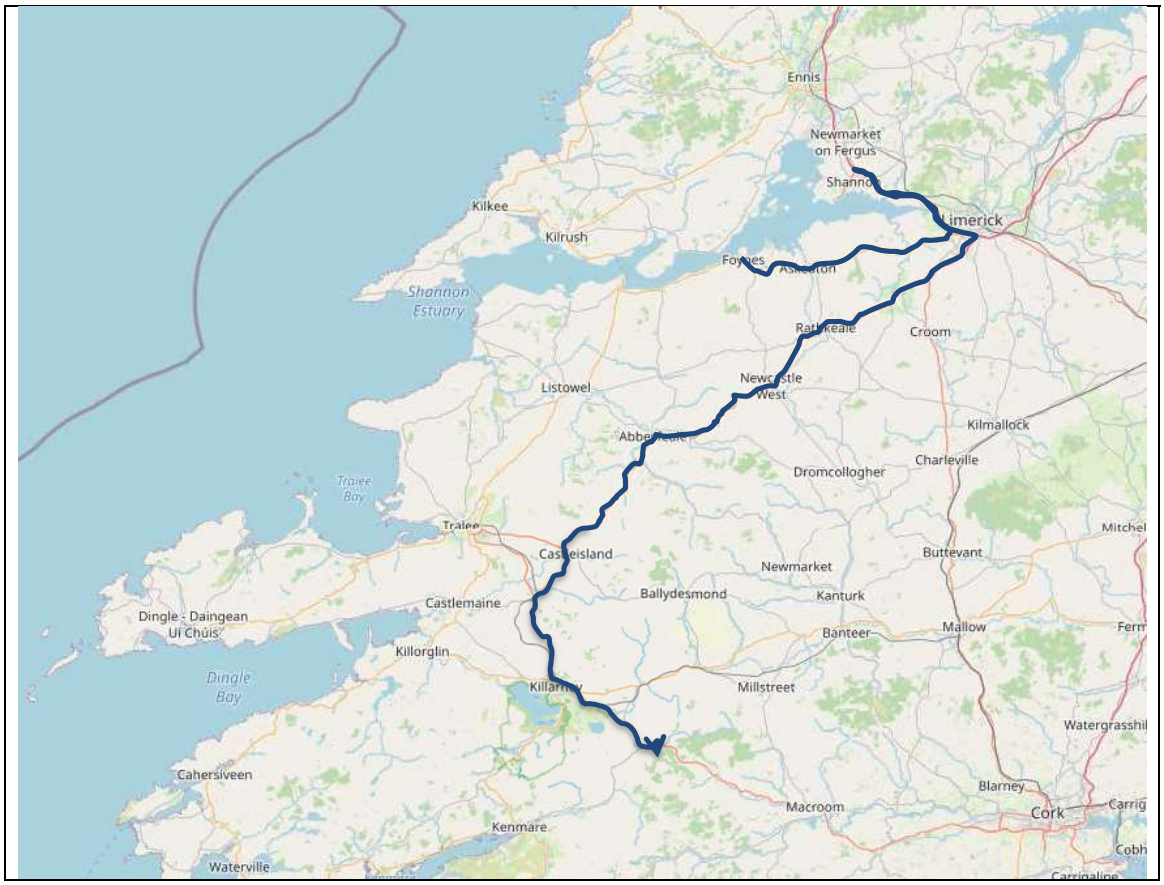
Loaded blade is required to travel through the Limerick Tunnel, with the current loaded height at 4.44m the blade will navigate through, although this is a generic blade and once a blade is chosen this should be revisited.

Route

Start Location	Port of Foynes	Distance of Route	Km	Miles
Max Load Dims:	77.5m Rigid Length Approx. 4m width		216	135

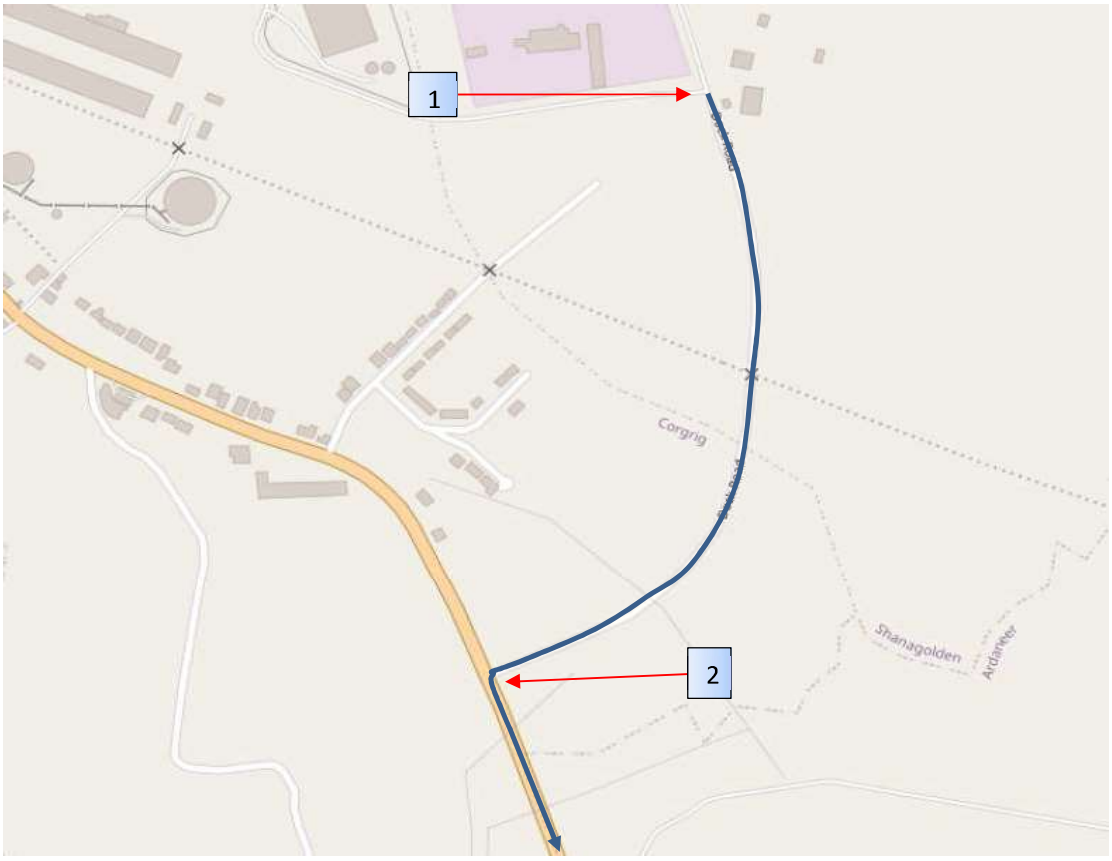
- Exit Foynes port onto N69,
- Continue on N69 through roundabout at Cois Crarraig.
- At roundabout continue on N69
- At N69/N18 roundabout proceed on the N18 northbound
- Continue on N18 northbound to the roundabout at junction with N19
- Circumnavigate N18/N19 roundabout to re-join the N18 southbound
- Take the exit from N18 to the M20
- Take the exit from M20 to N21
- At the roundabout with L1420, take the 2nd exit and continue on N21
- At Main Street roundabout take 1st exit and continue on N21
- At Cork Road roundabout in Newcastle West, continue straight on the N21
- Continue on N21 at unnamed roundabout at junction with unnamed road.
- At N21/N23 roundabout, proceed onto N23
- At Sandville Roundabout with the L2040, take the 2nd exit and continue on N23
- At N23/N22 junction, turn left onto the N22
- At Cleeney roundabout, take the first exit onto the N22
- At the roundabout take the 2nd exit onto Bypass Rd/N22
- At roundabout in Lis Daire, take the 2nd exit and stay on the N22
- Continue on the N22 for 11.8 miles
- At the junction, turn right onto the road towards site. - W 13984 80599

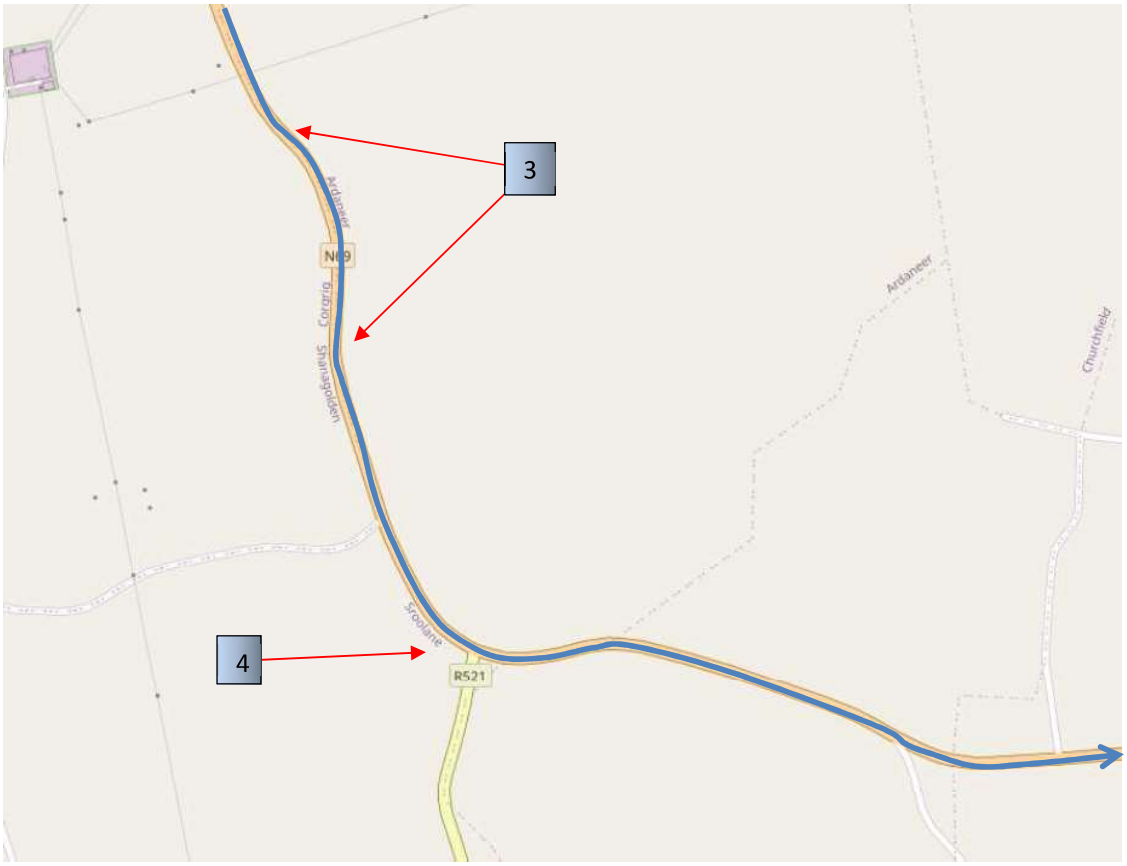
MAP OVERVIEW



ROUTE ASSESSMENT

LOCATION OVERVIEW

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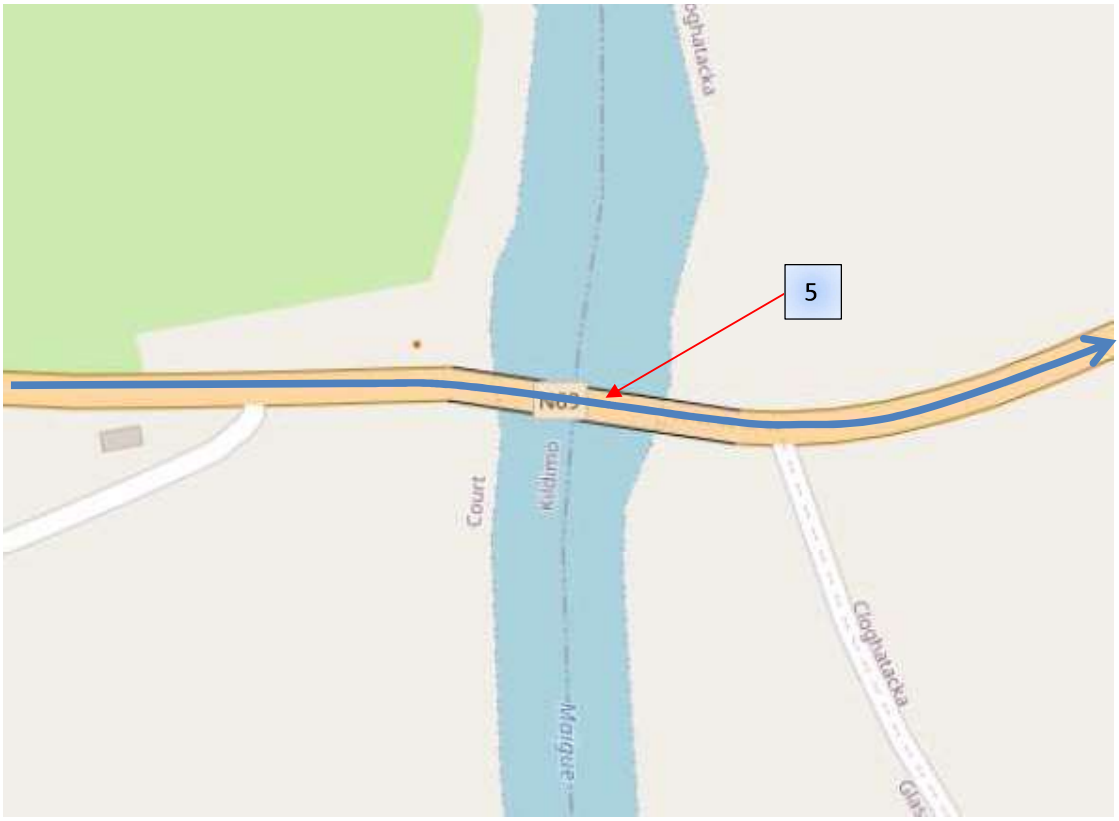
N69
R521
Ardaneer
Churchfield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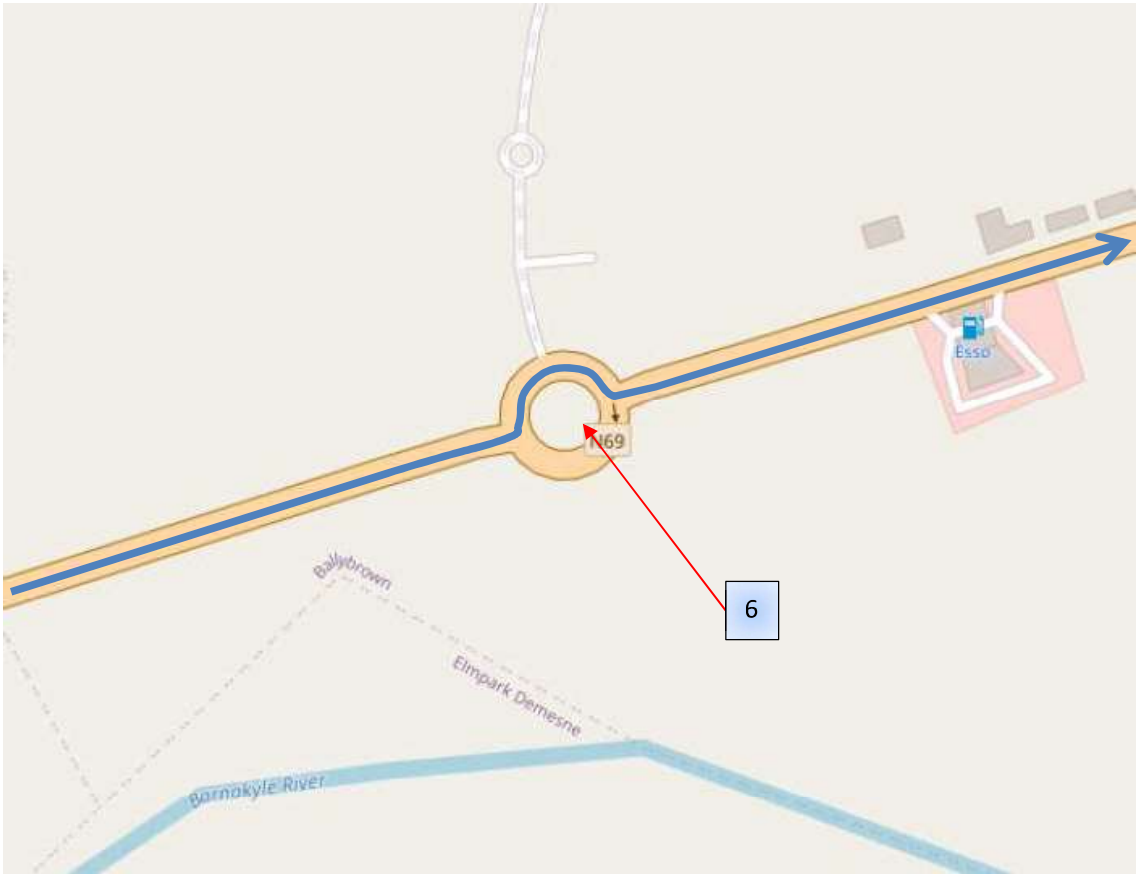
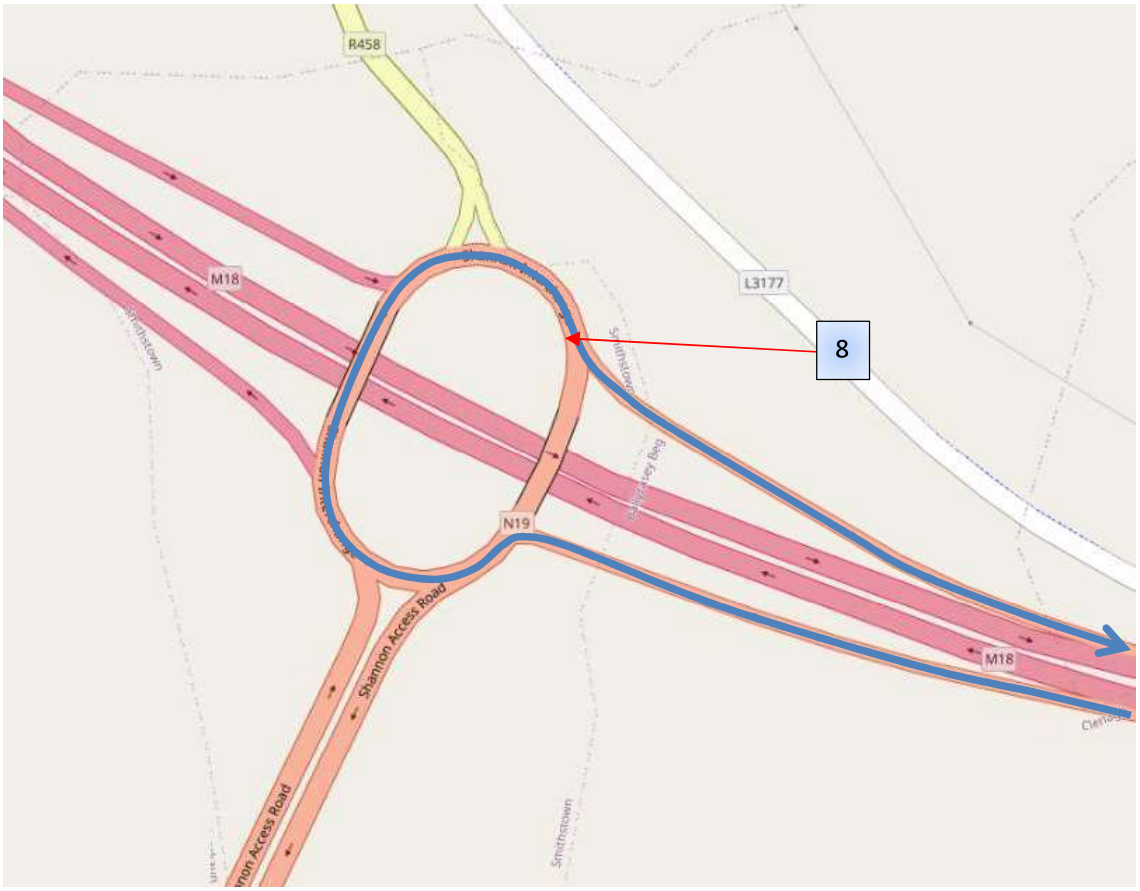
N69
Court
Cloghatacka


Esso
N69
6
Ballybrown
Elmpark Demesne
Bornakyle River


Limerick Southern Ring Road
Dock Road East Roundabout
Dock Road
N18
7
N69
Dock Road West Roundabout
R510
Limerick Southern Ring Road


R458
M18
L3177
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N19
Shannon Access Road
M18
Smithstown


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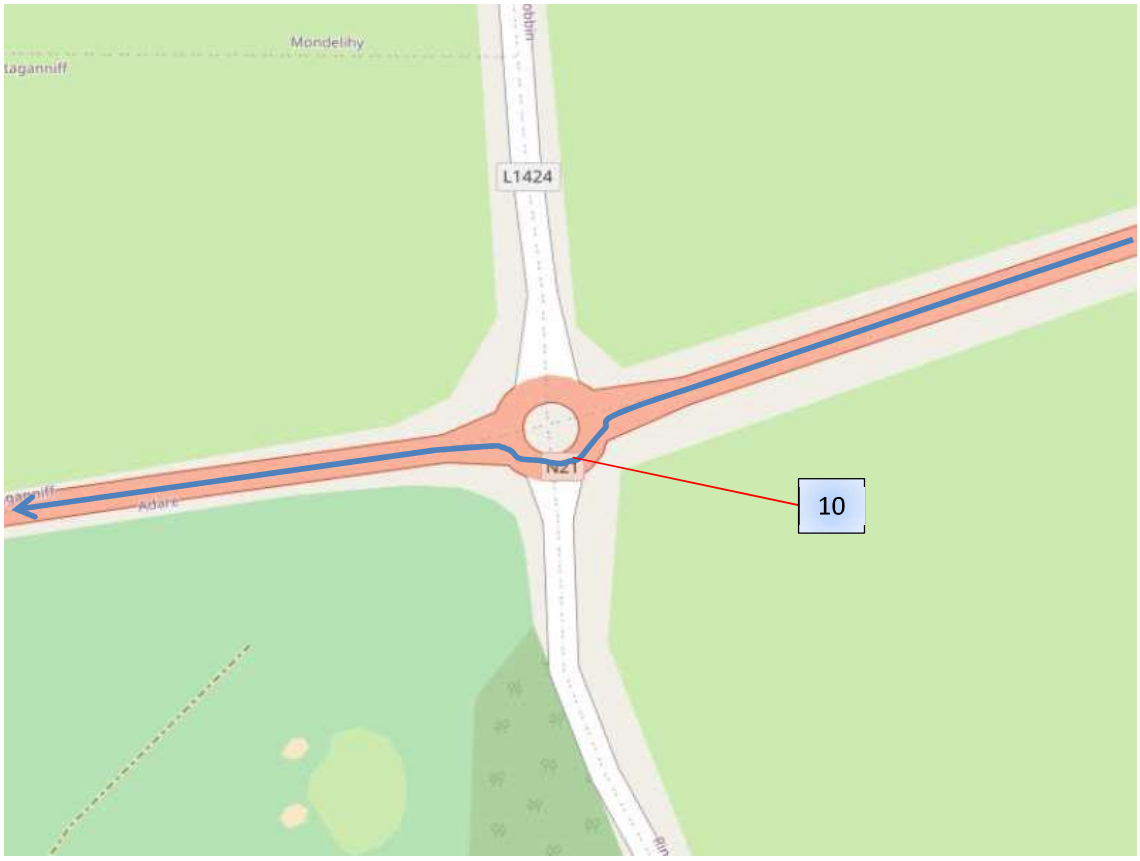
M7
Limerick Southern Ring Road
M7
Limerick Southern Rin
Rathbane North


Mondelihy
L1424
N21
Adare
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AIB
BareNakedBikes
Aunty Lena
Blackabbey
Centra
Adare Garda Station
Main Street
Adare Pharmacy
The Village Bistro
Adare Community Hall
Pat Collins Bar
Sean Collins & Sons
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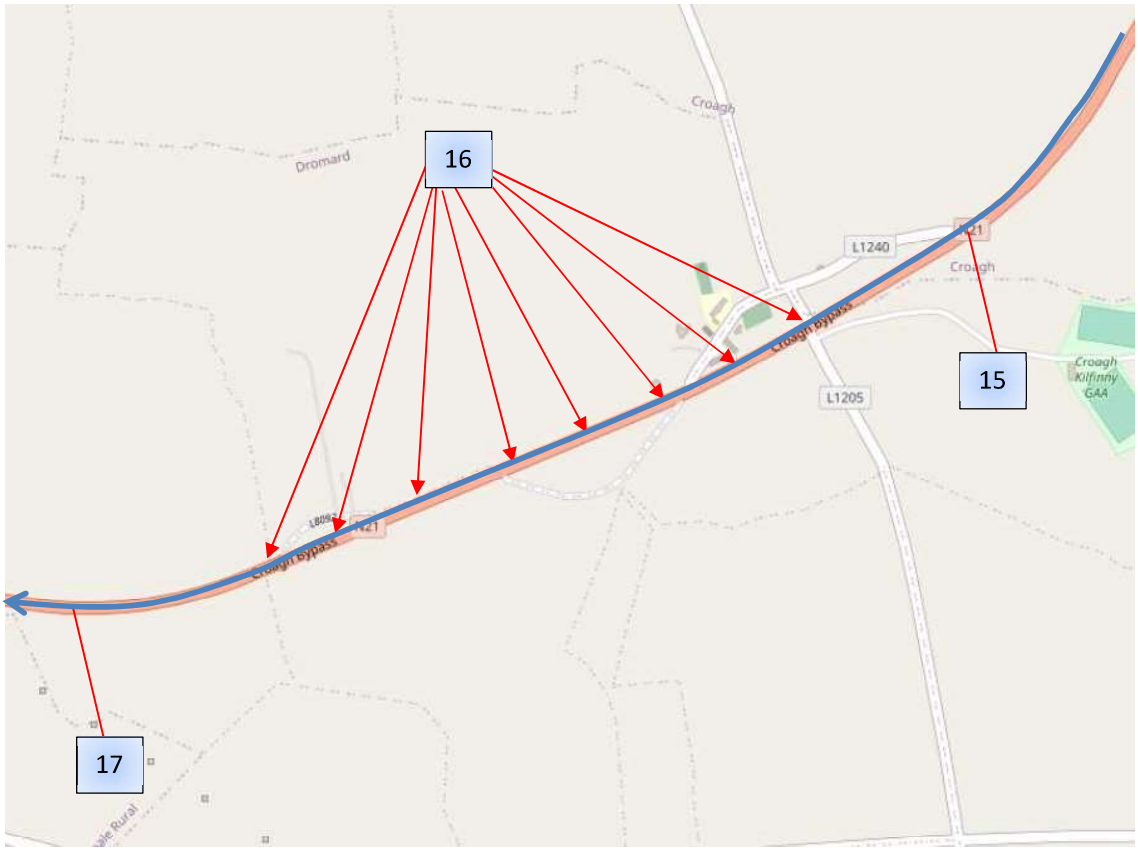
N21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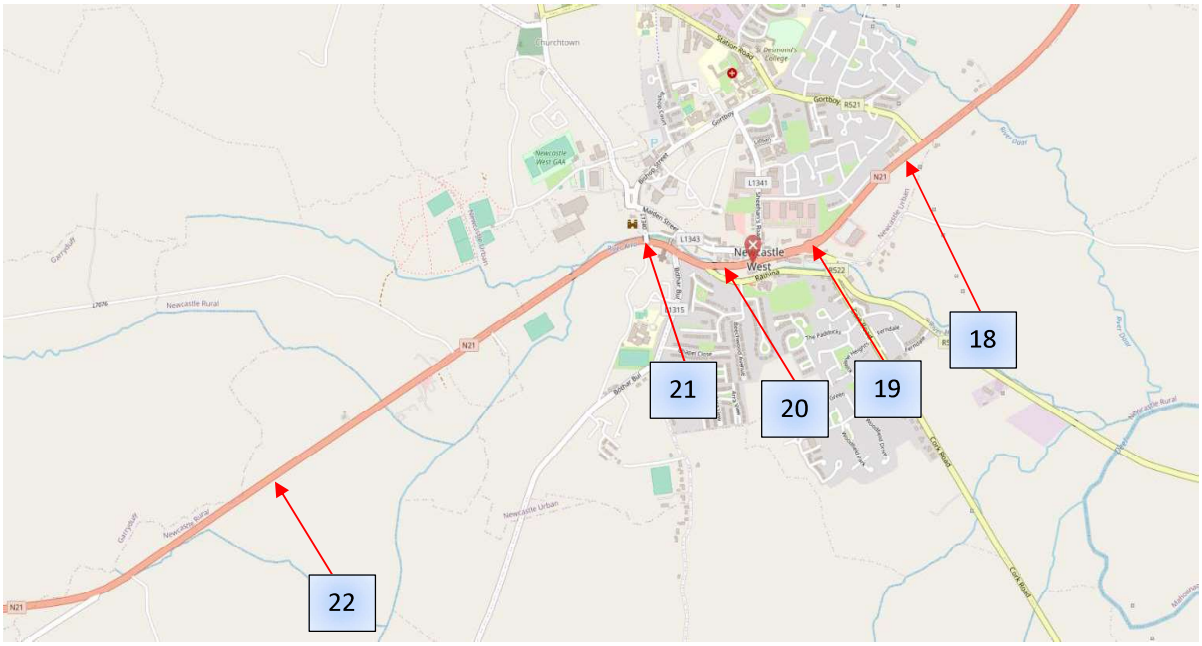
Dromard
Croagh
L1240
L1205
N21
Croagh Bypass
Croagh Kilfinny GAA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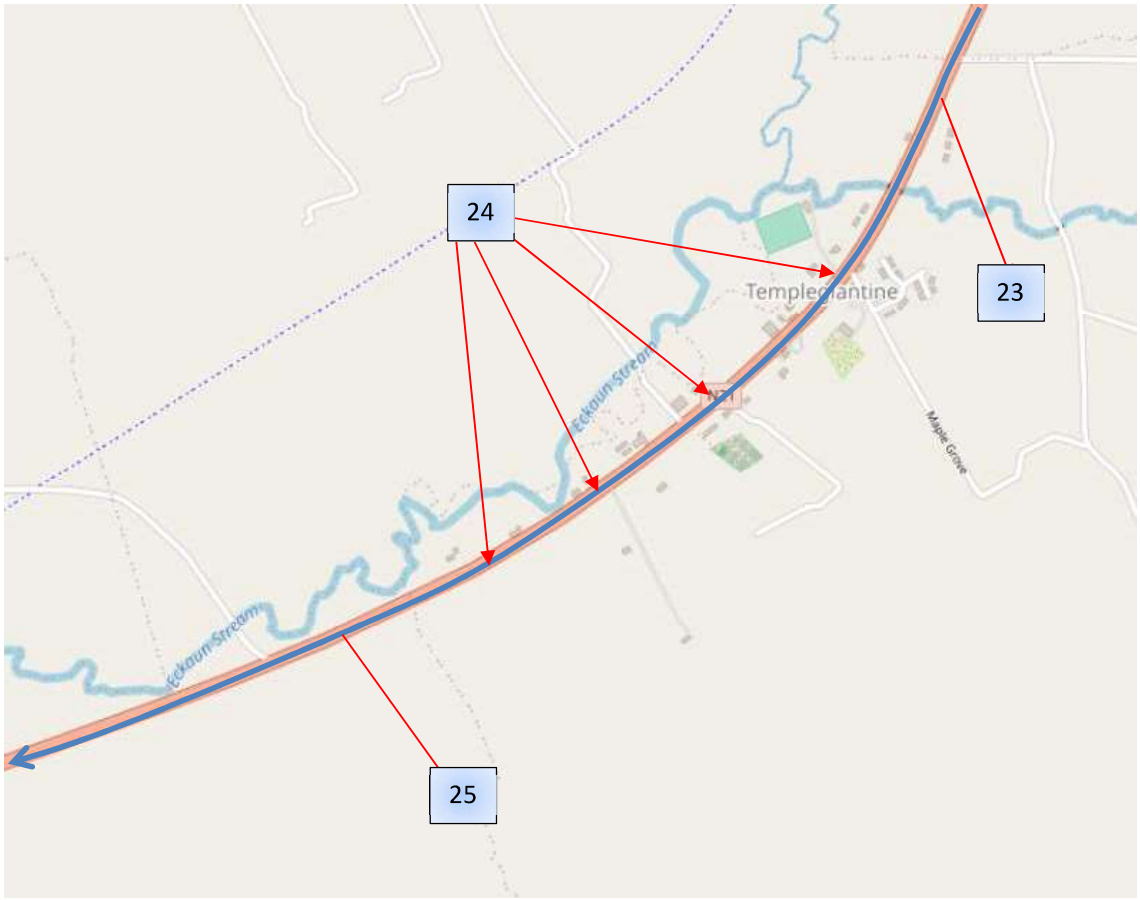
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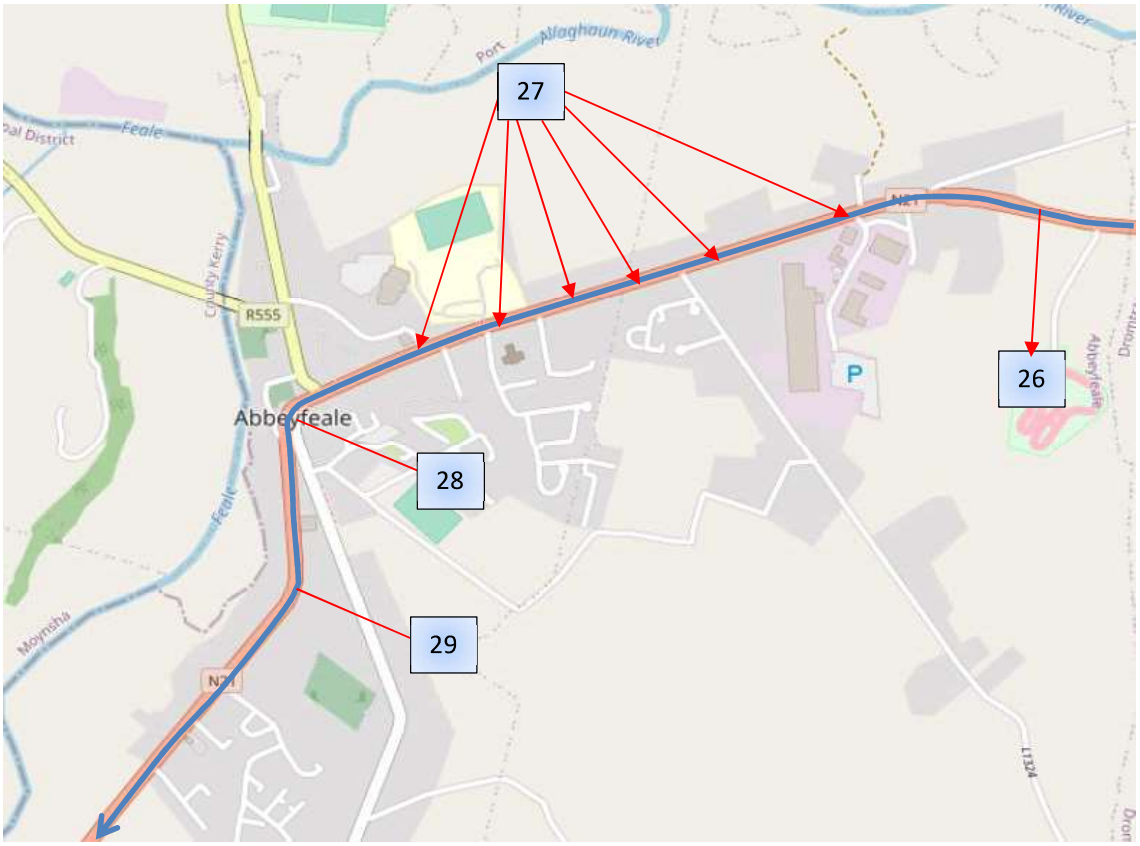
Eckoun Stream
Eckoun Stream
Maple Grove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Port
Moynsha
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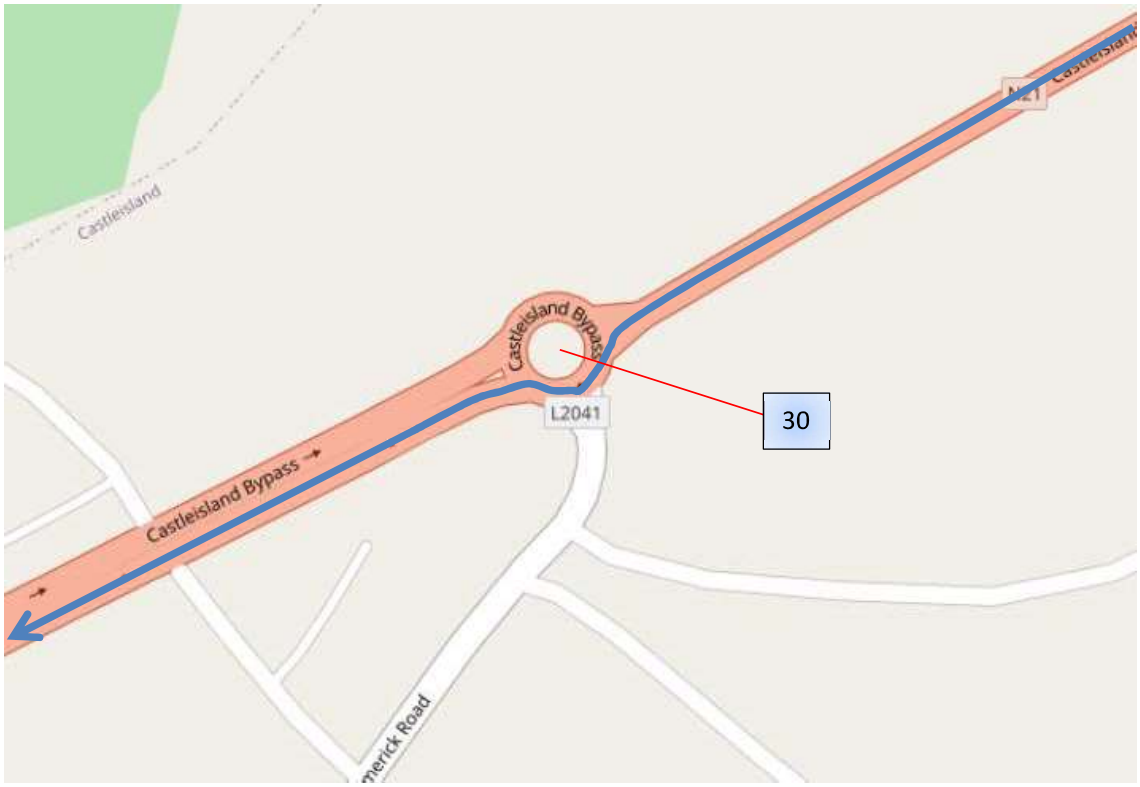
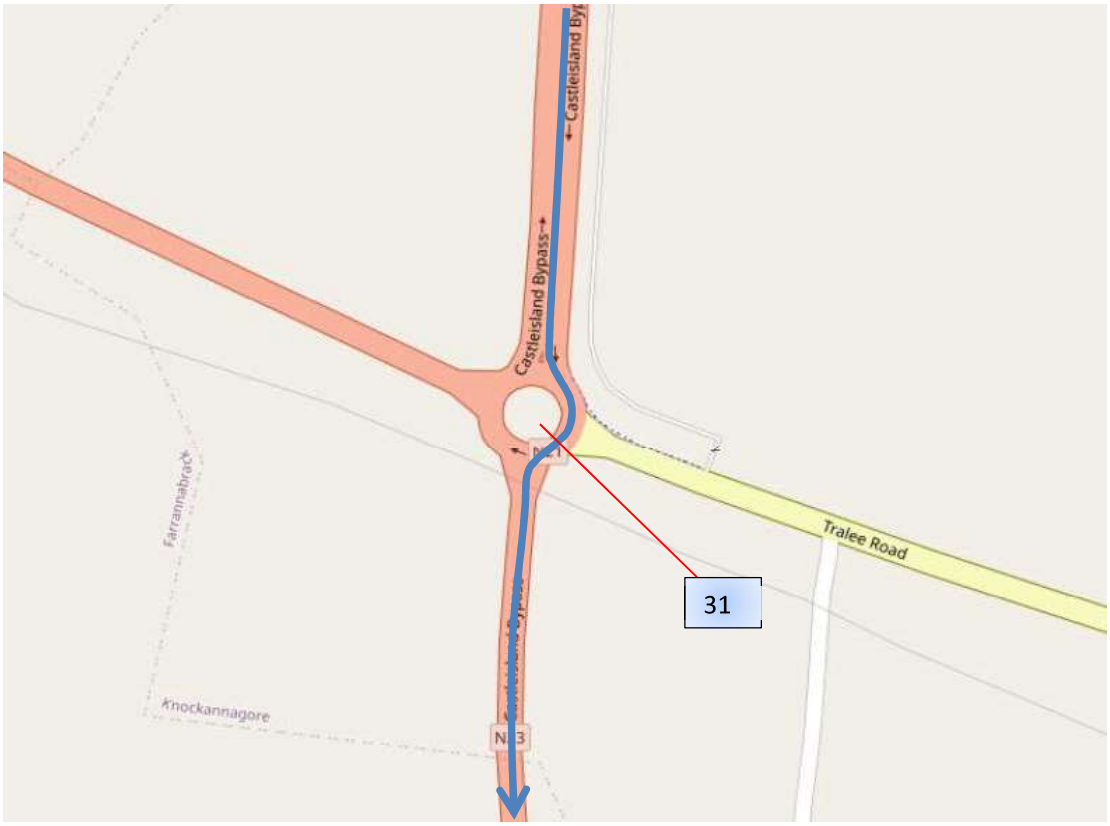

30
L2041
Castleisland Bypass
Castleisland
N21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Tralee Road
Farrannabrack
Knockannagore
N 3
31


N 3
L2040
32


Tralee Road
N23
Farranfore
N22
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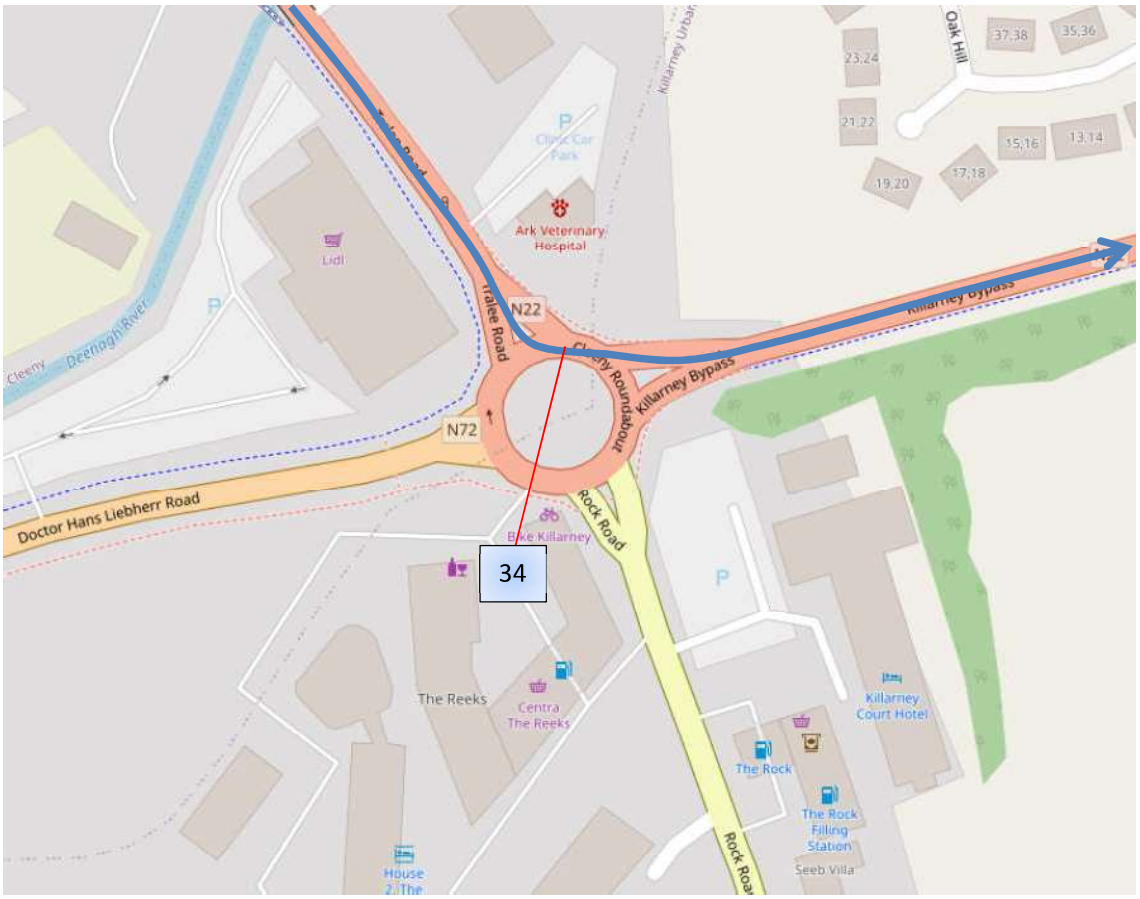

Oak Hill
37,38
35,36
23,24
21,22
15,16
13,14
19,20
17,18
Killarney Unban
P
Clinic Car Park
Ark Veterinary Hospital
Lidl
Tralee Road
N22
Killarney Bypass
Killarney Bypass
Cleeny
Deenaght River
N72
Cleeny Roundabout
Doctor Hans Liebherr Road
Rock Road
Bike Killarney
34
The Reeks
Centra The Reeks
Killarney Court Hotel
The Rock
The Rock Filling Station
Seeb Villa
Rock Road
House 2 The


35
36
Buddies Indoor Playground
Woodlands Industrial Estate
Woodlands Road
Sports Centre Car Park
Killarney Sports & Leisure Centre
Pinewood Estate
Culleary House
Muire Linn
Coolcarrig House
Windsmoor
Glenhaven
Clancy Dental
R876
Park Road
N22
Upper Park Road
SuperValu Car Park
Tesla Destination Charger
Texaco
Park Lodge
Oakfield
Castlepark
3 Lakes Hostel
Hotel Killarney


37
38
39
40
41
42
N72
Flesk


43
Clydagh ED
County Kerry
County Cork
Municipal District of Macroom
Killarney Municipal District
Stievenagh

Location 1 - Port Exit

Visual inspection indicates that the Loaded blade is required to Contraflow the security gate house. Swept path analysis recommended to confirm.

Location 2 - Exit From Port Of Foynes/N16 Junction

Direction Turn Left Onto N69 Visual inspection indicates that third party land will be required on the nearside. Modifications to street furniture will be required Walls and hedges to be removed. Swept path analysis recommended to confirm.

Location 3- S Bend At Whitehouse On N69

Direction Continue On N69 Visual inspection indicates manual steering is required to avoid modifications. Swept path analysis recommended to confirm

Location 4 - Left Bend On N69 At Junction With L6062

Direction Continue On N69 Option 1- Visual inspection indicates loaded blade will oversail third party land on nearside. Wall on nearside may be required to be removed.

Option 2 - Road signs, hedges and possible telegraph pole required to be removed offside to allow rear projection of blade to oversail. Swept path analysis recommended to confirm

Location 5 - N69 Ferry Bridge

Direction Continue On N69

Visual inspection indicates that this bridge is to be assessed both vertically and horizontally Using Swept path analysis and vertical analysis

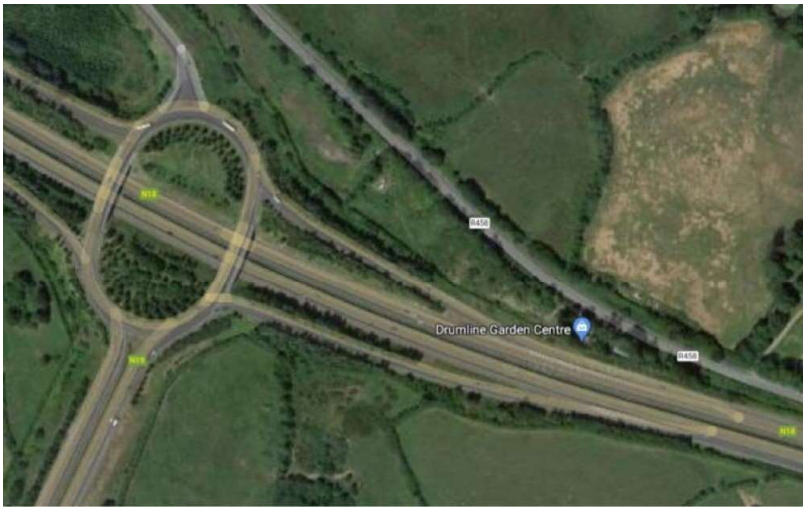
Location 6 - N69 Roundabout At Clarina

Direction Continue Straight On N69

Visual inspection indicates that widening is required on the on central island of roundabout and street furniture to be removed at this location. This is to avoid third party land. Swept path analysis recommended to confirm modifications

Location 7 - N69/N18 Roundabout Direction Turn Left Onto N18 Northbound

Visual inspection indicates that road widening on central island is required. Road signs on central island also to be removed Swept path analysis recommended to confirm



Location 8 - N18/N19 Roundabout Direction Circumnavigate Roundabout To Rejoin N18

Visual inspection indicates that modifiactions to street furniture will be required. Swept path analysis required to determine the extend of the modifications

Location 9 - N18/M20 Junction

Direction Turn Right Onto M20

Visual inspection indicates that loaded blade component will navigate with no issue

Location 10 - N21 L1420 L1424 Roundabout

Direction Continue Straight On N21

Visual inspection indicates Road widening required on offside of entering and exit of the roundabout Swept path analysis recommended to confirm this

Location 11 - Mini Roundabout In Adare

Direction Straight On N21

Visual inspection indicates that the Loaded blade will navigate this roundabout with no issues

Location 12 - Splitter Island Before Left Bend On Adare

Visual inspection indicates that street furniture on splitter island is to be removed due to left hand bend afterwards. Topographical survey is required throughougt Adare to ascertain accurate mapping data

Location 13 - Left Bend On N21 At Junction With L1422 In Adare

Direction Continue On N21

Parking restrictions on both side of the road Lamp posts and road signs required to be removed Topographical survey is required throughougt Adare to ascertain accurate mapping data

Location 14 - N21 Splitter Island And Right Bend At Rathkeale Road Junction

Direction Continue On N21 Visual inspection indicates that a contraflow manoeuvre will be required at this location as well as use of manual steering.

Location 15 - N21 Splitter Island At Entrance To Croagh

Direction Continue On N21

Visual inspection indicates there being no issues at this location *Note*

Nearside kerb road sign on splitter - 4.7m

Bollard to bollard - 5.0m

Location 16 - 8x Splitter Island On N21 In Croagh

Direction Continue On N21 Visual inspection indicates that road signs on all splitter islands to be removed as a precaution These road signs are removable *Note* 4.3m from nearside Kerb to road sign

4.7m from nearside bollard to sign

Location 17 - N21 Splitter Island At Exit From Croagh

Direction Continue On N21 Visual inspection indicates that there are no issues at this location.

Note

4.2m from nearside Kerb to road sign

Location 18 - N21 Splitter Island At Entry To Newcastle West

Direction Continue On N21

Visual inspection indicates that the removable road sign may be required to be removed. *Note*

4.1m from nearside Splitter Kerb to road signs on lamppost. 4.5m to lamppost

Location 19 - N21/R522

Roundabout In Newcastle West

Direction Continue Straight On N21

Visual inspection indicates that a contraflow manoeuvre is required at this location

Loaded vehicle to run on hard standing area of roundabout Tree and road sign on offside of exit are to be removed Swept path analysis required to determine extend of modifications

Location 20 - Newcastle West Centre

Topographical survey is required throughougt Newcastle west to ascertain accurate mapping data *note* photo in reverse view

Location 21- Splitter islands On Left Bend In Newcastle West.

Direction Continue On N21

Visual inspection indicates that street furniture on splitter island as well as the next to be removed due to blade and trailer oversail Swept path analysis recommended to determine the extent of the modifications

Location 22 - N21 Splitter Island At Exit From Newcastle West

Direction Continue On N21

Visual inspection indicates that no issues at this location

Note

Nearside Kerb to road sign on splitter island is 4.4m

Location 23 - N21 Splutter Island At Entry To Templeglantine

Direction Continue On N21 Visual inspection indicates that removable road sign is to be removed on splitter island due to blade cord

Note

Nearside kerb to road sign is 4.3m

Location 24 - 4x Splitter Island On N21 At Templeglantine

Direction Continue On N21 Visual inspection indicates that loaded vehicle to contraflow splitter islands 1-3 to avoid modifications. Splitter island 4 poses no issues

Location 25 - N21 Splitter Island At Exit From Templeglantine

Direction Continue On N21 Visual inspection indicates that road signs to be removed on splitter island due to blade chord. Road sign is removable - once a manufacturer has been chosen this should be re visited

Note Width measured at 4.1m from nearside kerb to road sign on splitter island.

Location 26 - N21 Splitter Island At Entry To Abbeyfeale

Direction Continue On N21 Visual inspection indicates that there are no issues at this location Width measured at 4.4m from nearside Kerb to road sign *Note* picture in reverse view

Location 27 - 6x Splitter Islands In N21 In Abbeyfeale

Direction Continue On N21 Visual inspection indicates that there are no issues with these splitter islands *note* picture in reverse view

Location 28 - Left Bend On N21 In Abbeyfeale

Direction Continue On N21 Visual inspection indicates that trees, road signs lamp posts are required to be removed. Parking restriction will be required throughout Abbeyfeale to allow loaded blade to utilise the full width of the road. Topographical survey is required throughout Abbeyfeale to ascertain accurate mapping data Swept path analysis required to confirm modifications

Location 29 - Right Bend In Abbeyfeale

Direction Continue On N21 Visual inspection indicates that loaded blade will require manual steering at this bed.

Location 30 - N21/L2041 Roundabout

Direction Continue On N21 Visual inspection indicates that widening and street furniture removal is required on central island. Swept path analysis recommended to confirm modifications

Location 31 - N21 R577 N23 Roundabout

Direction Straight Onto N23 Visual inspection indicates that widening and street furniture removal is required on central island. Swept path analysis recommended to determine the extent of the modifications

Location 32 - N23/L2040 Roundabout

Direction Turn Right Onto N23 Visual inspection indicates that road widening and lamp post removal is required on the offside of the roundabout. Loaded blade is required to contraflow this roundabout. Swept path analysis recommended to confirm

Location 33 - N23 / N22 Junction
Direction Turn Left Onto N22
Visual inspection indicates that third party land is required on the nearside of the junction. Stop sign on nearside to be removed

Swept path analysis recommended to confirm modifications

Location 34 - N22/N71 Cleeny Roundabout
Direction Left Onto N22 Visual inspection indicates that widening and lamp posts, traffic lights and road sign removal is required. Street furniture on both the entry and exit splitter islands is to be cleared to allow blade and trailer to oversail.

Rear projection of blade will oversail 3rd party land on offside of entrance to roundabout Swept path analysis recommended to confirm this.

Location 35 - Micheal D'Oshea Roundabout

Direction Continue On N22 Visual inspection indicates that a contraflow manoeuvre is required at this roundabout. Blade vehicles to run on central island hard standing

Location 36 - N22/L3010 Park Roundabout

Direction Continue On N22

Manual steering required- No issues at this location Swept path analysis recommended to confirm

Location 37 - Splitter Island

Numerous After Roundabout

Direction Continue On N22 Visual inspection indicates that loaded blade will navigate this spiller island without issue *Note*

Road width - 4.5

Location 38 - N22 Splitter Island At Entry To Lissivigeen

Direction Continue On N22 Visual inspection indicates that loaded blade component will navigate with no issues. *Note*

Road width - 3.8

Sign to sign - 5.8

Location 39 - N22 Splitter Island In Lissivigeen

Direction Continue On N22 Visual inspection indicates that loaded blade will navigate through will no issues.

Location 40 - N22/N72 Roundabout

Direction Continue On N22

Visual inspection indicates that a Contraflow manoeuvre is required to allow navigation Swept path analysis recommended to confirm

Location 41
- N22 Splitter Island In
Lissivigeen
Direction Continue On N22 Visual inspection indicates loaded vehicle to contraflow splitter island to avoid modifications This is due to the roundabout prior to this.
Note
Road width - 3.7m

Location 42 - Lissivigeen Splitter Island Exit
Visual inspection indicates that loaded blade component will navigate through with no issues. *Note*
Road width - 5.0m

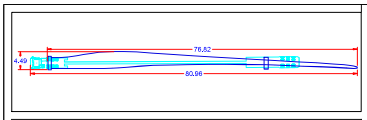
Location 43 – Site road entrance

Direction Turn Right Off The N22

Visual inspection indicates that road widening is required on the south side banking of the junction to allow the loaded vehicle to navigate this junction. Street furniture and vegetation on both sides of the junction are required to be removed to allow the loaded vehicle to oversail.

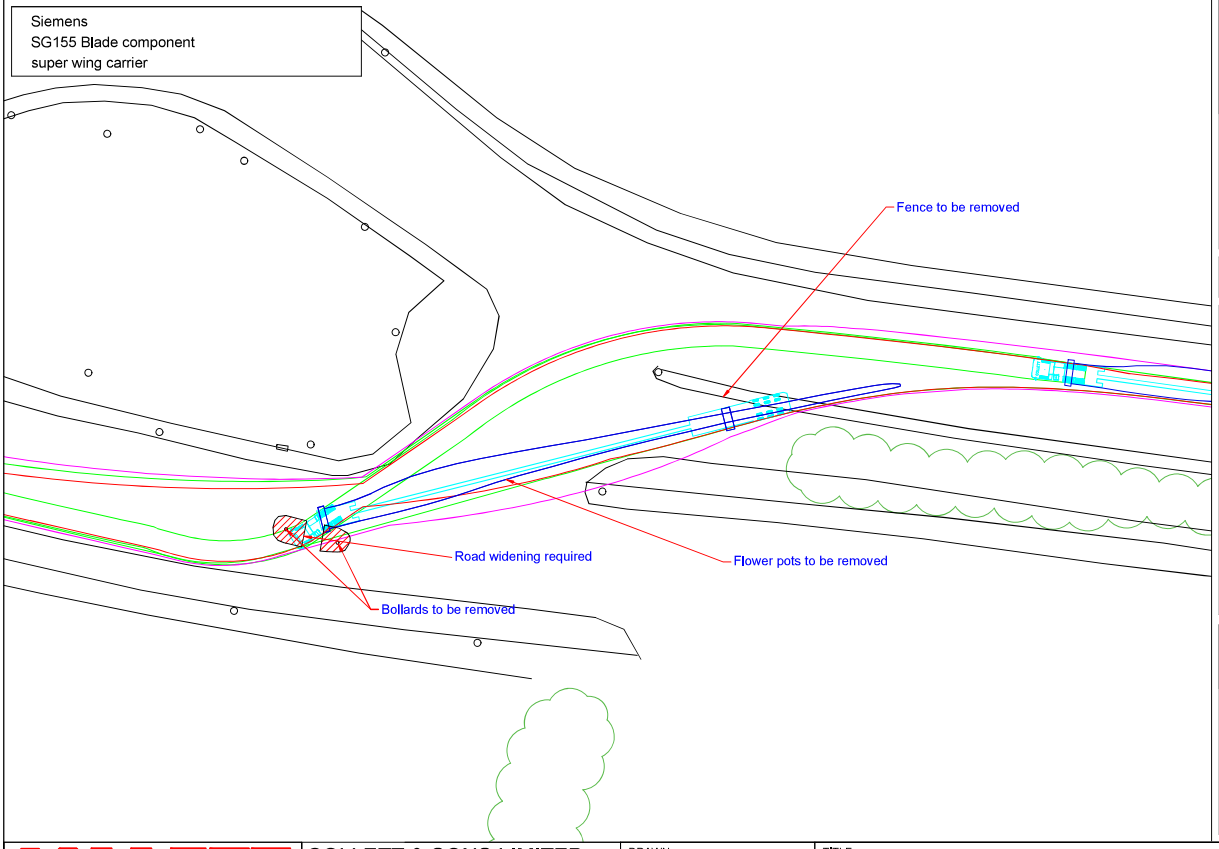
IMPORTANT NOTES

- Pilot car will be required to negotiate the route, in order to assist with traffic control and control oncoming traffic flow.
- The information contained in this report is privileged and confidential and is for the exclusive use of the client nominated herein.
- All access diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- All route assessment, proposed land-take and removal/re-instatement of nominated street furniture is deemed accurate by Collett & Sons Ltd at the date that this report is created. We cannot be held responsible for the development of future road schemes or alterations to the routes surveyed that may leave this report inaccurate.
- As this report is based on a generic turbine blade component, reassessment is recommended once a specific turbine has been selected.



Swept Path indicates trailer utilising MANUAL steering

Siemens
SG155 Blade component
super wing carrier



Exit Ringaskiddy Dock to junction with N28.
At junction turn right onto N28 westbound.

Caution

- Widening required to provide a useable road surface as indicated by the RED hatching.
- Indicated street furniture to be removed.
- Fence to be removed.
- Ground to be prepared to accept suitable axle loadings.
- Please note that the layout may have changed from the aerial imagery used.

Irish Grid Reference: W 77650 64273

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- The drawing has been produced from data created from aerial imagery.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
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- Garda escorts and permits will be required for the movement of all of the components. Permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Local Authorities (LA). Therefore, approval of these 'permits for movements' by the LA are a major consideration before the physical capability to deliver these components are undertaken.
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- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
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- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

COLLETT
EXPERTS IN MOTION

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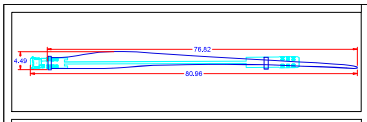
Albert Road FAX: +44(0)8456 255244
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN	G.MOHAMMADI	TITLE	PORT OF RINGASKIDDY/N28 JUNCTION				
DATE	16/06/2022	MAPPING	AERIAL IMAGERY	CUSTOMER	FUTURENERGY IRELAND		
SCALE	1:500	SIZE	A3	PINCH POINT IDENTIFIED BY	CLIENT	SITE	INCHAMORE	DWG. NO.	343154-10A1.1



Swept Path indicates trailer utilising MANUAL steering

Siemens
SG155 Blade component
super wing carrier

Take 2nd exit at N28 roundabout.
Caution

- Widening required to provide a useable road surface as indicated by the RED hatching.
- Indicated street furniture to be removed.
- Ground to be prepared to accept suitable axle loadings.

Irish Grid Reference: W 76551 64592

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- All dimensions in meters

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Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

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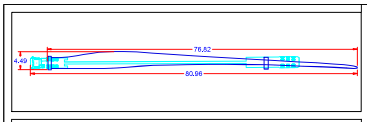
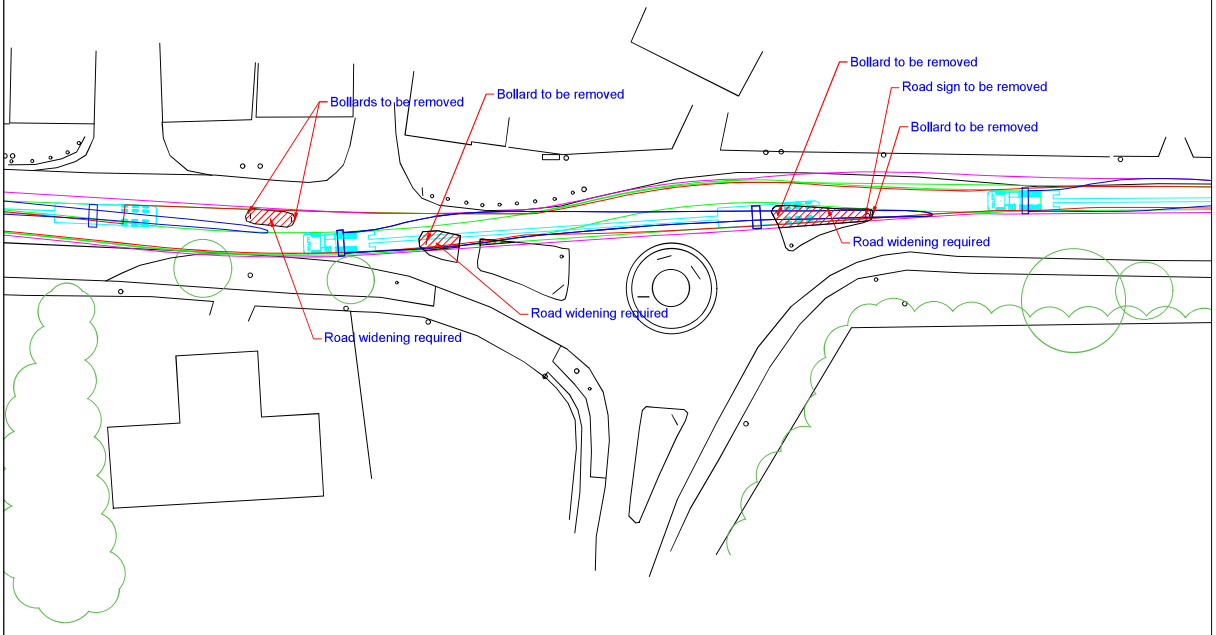
Albert Road FAX: +44(0)8456 255244
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN G.MOHAMMADI	TITLE N28 ROUNDABOUT WITH PFIZER IRELANDPHARMACEUTICALS				
DATE 16/06/2022	MAPPING TOPOGRAPHICAL SURVEY	CUSTOMER FUTURENERGY IRELAND			
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY CLIENT	SITE INCHAMORE	DWG. NO. 343154-20A1.1	



Swept Path indicates trailer utilising MANUAL steering

Siemens
SG155 Blade component
super wing carrier



Take 2nd exit and continue straight on N28.

Caution

- Widening required to provide a useable road surface as indicated by the RED hatching.
- Loaded vehicle to contraflow this location.
- Indicated street furniture to be removed.
- Fence to be removed.
- Ground to be prepared to accept suitable axle loadings.
- Please note that the layout may have changed from the aerial imagery used.

Irish Grid Reference: W 75699 64455

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Area within green outline will be oversailed by trailer body

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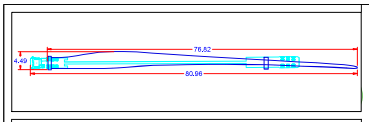
DRAWN	G.MOHAMMADI	TITLE	N28 ROUNDABOUT WITH MARIAN TERRACE		
DATE	16/06/2022	MAPPING	AERIAL IMAGERY	CUSTOMER	FUTURENERGY IRELAND
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY	CLIENT	SITE	INCHAMORE
				DWG. NO.	343154-30A1.1



Swept Path indicates trailer utilising MANUAL steering

Siemens
SG155 Blade component
super wing carrier

Take 3rd exit at N28 roundabout with R611.

Caution

- A contraflow manoeuvre is required at this location.
- Indicated street furniture to be removed.
- Tree to be pruned.
- Please note that the layout may have changed from the aerial imagery used.

Irish Grid Reference: W 73022 64480

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Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

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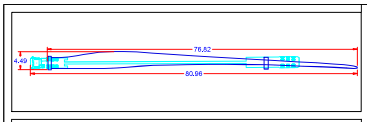
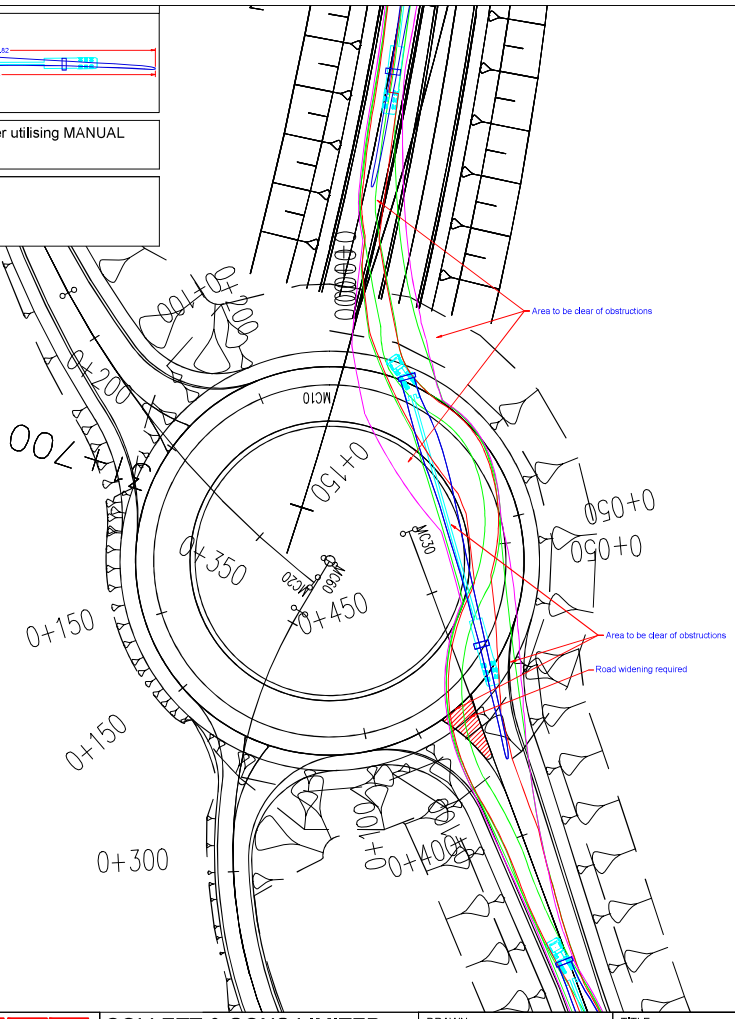
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN	G.MOHAMMADI	TITLE	N28/R611 ROUNDABOUT		
DATE	16/06/2022	MAPPING	AERIAL IMAGERY	CUSTOMER	FUTURENERGY IRELAND
SCALE 1:500	SIZE A3	PINCH POINT IDENTIFIED BY	CLIENT	SITE	INCHAMORE
				DWG. NO.	343154-40A0.1



Swept Path indicates trailer utilising MANUAL steering

Siemens
SG155 Blade component
super wing carrier



Take exit from N22 to Bypass.

Caution

- Loaded vehicles are to use the new Bypass, to navigate to Ballyvourney, which is currently under construction to avoid the town of Macroom.
- A contraflow manoeuvre is required to avoid removing further furnitures.
- Widening required to provide a useable road surface as indicated by the RED hatching.
- Any obstructions within the swept area to be removed.
- Ground to be prepared to accept suitable axle loadings.

UK Grid Reference:

- The swept path analysis provided is produced from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive.
- The drawing has been produced from data created from aerial imagery.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- Garda escorts and permits will be required for the movement of all of the components. Permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Local Authorities (LA). Therefore, approval of these 'permits for movements' by the LA are a major consideration before the physical capability to deliver these components are undertaken.
- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
- The information is privileged and confidential and is for the exclusive use of the nominated client.
- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

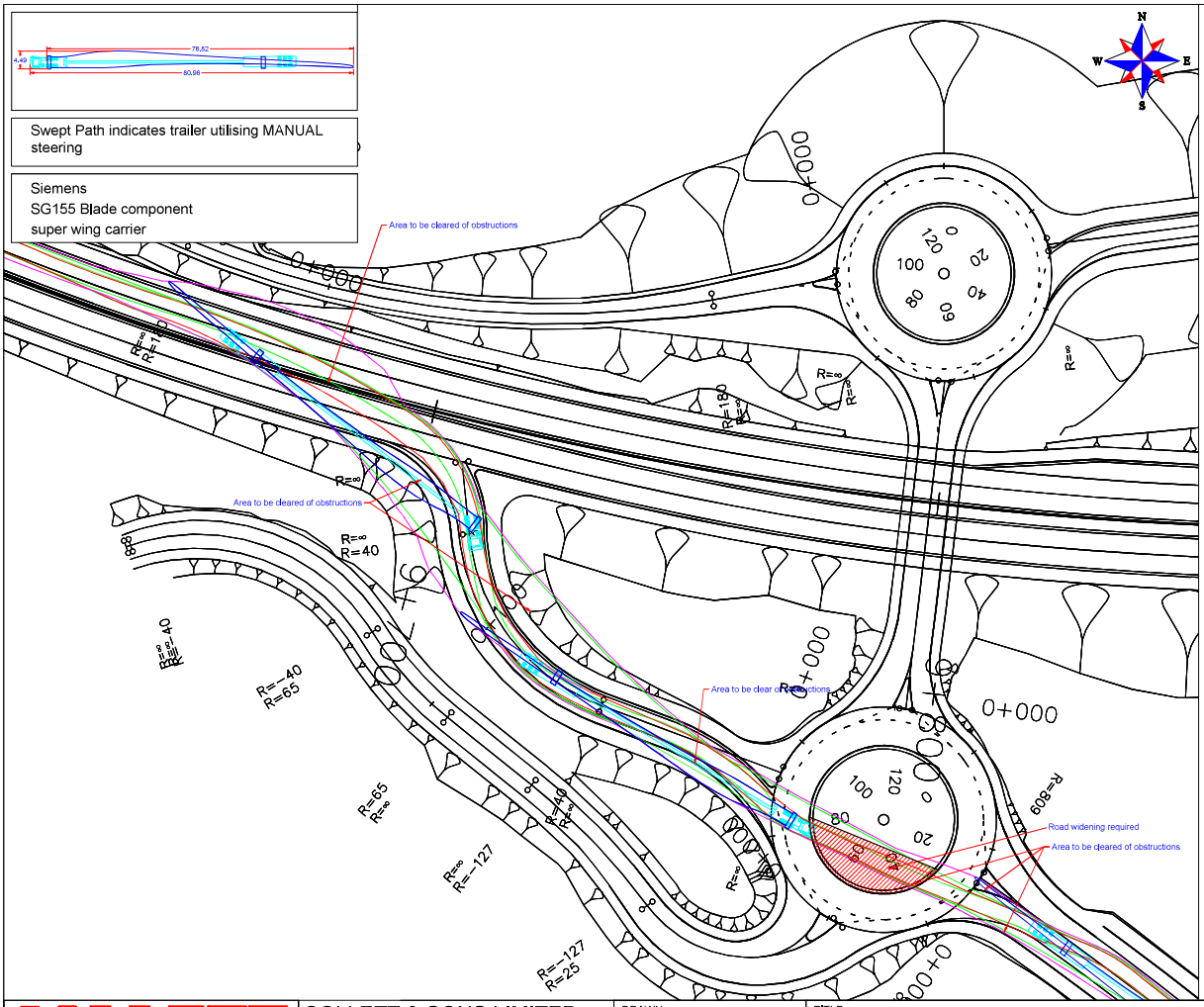
Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

COLLETT
EXPERTS IN MOTION

COLLETT & SONS LIMITED
Victoria Terminal TEL: +44(0)8456 255288
Albert Road FAX: +44(0)8456 255244
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN	G.MOHAMMADI	TITLE	ENTERING BYPASS NEAR TO MACROOM		
DATE	16/06/2022	MAPPING	PROVIDED BY CLIENT	CUSTOMER	FUTURENERGY IRELAND
SCALE 1:750	SIZE A3	PINCH POINT IDENTIFIED BY	CLIENT	SITE	INCHAMORE
				DWG. NO.	343154-50A1.1



Swept Path indicates trailer utilising MANUAL steering

Siemens
SG155 Blade component
super wing carrier

Take exit from bypass onto old N22.
Caution

- Rear projection will oversail to nearside of the road when turning right.
- Trailer body will oversail to edges of the road of the road when navigating new road..
- Widening required to provide a useable road surface as indicated by the RED hatching.
- Any obstructions within the swept area to be removed.
- Ground to be prepared to accept suitable axle loadings.

Irish Grid Reference: W 17902 79117

- The swept path analysis provided is produced from a purely transport orientated view, and does not consider any political issues in terms of land ownership, or any other precincts raised, that may otherwise be restrictive.
- The drawing has been produced from data created from aerial imagery.
- All swept path diagrams and assessments are made and calculated for the road movement of loaded trailer equipment carrying Turbine components. These dimensions are based on the turning circles and specification of Collett & Sons Ltd trailer equipment.
- This SPA is a means of providing evidence of minimum requirements of any one vehicle as a footprint and there is no safety factor or margin included.
- Turbine delivery vehicles can be both left and right hand drive vehicles, therefore due to drivers perception it must be assumed that every vehicle will not follow the exact same line and so a margin of additional space should be allowed for.
- Land take is usually referred to when land is required from Private Land Owners; road widening is usually referred to when land is required within highways boundaries. The boundaries between private land and highways property are assumed by using obvious demarcation such as fence lines/hedges etc. It should be noted that actual boundaries between highways and private land are not substantiated in this report and can only be authenticated by carrying out land searches.
- Garda escorts and permits will be required for the movement of all of the components. Permits will also be required to undertake the movement of the vehicle shown in the swept path analysis. These permits are at the discretion of the Local Authorities (LA). Therefore, approval of these 'permits for movements' by the LA are a major consideration before the physical capability to deliver these components are undertaken.
- In critical areas, where modifications are required, the road construction must be formed to the minimum specification contained in the Turbine Manufactures Transport Guidance Notes.
- The Turbine Manufactures Transport Guidance Notes will state the minimum road width required for the transport of components. Any roads below this stated width will require widening to reflect this regardless of any swept path analysis not indicating modifications.
- The information is privileged and confidential and is for the exclusive use of the nominated client.
- All dimensions in meters

Area within red outline will be swept by tractor and trailer axles

Hatched area within red outline to be levelled and prepared to accept axle loadings

Area within magenta outline will be oversailed by load and projections

Area within green outline will be oversailed by trailer body

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Victoria Terminal TEL: +44(0)8456 255288
Albert Road FAX: +44(0)8456 255244
Halifax, HX2 0DF WEB: www.collett.co.uk

DRAWN	G.MOHAMMADI	TITLE	SLIEVEREAGH CROSS		
DATE	16/06/2022	MAPPING	PROVIDED BY CLIENT	CUSTOMER	FUTURENERGY IRELAND
SCALE 1:750	SIZE A3	PINCH POINT IDENTIFIED BY	CLIENT	SITE	INCHAMORE
				DWG. NO.	343154-60A1.1

Stage 1 Road Safety Audit

Proposed Wind Farm at Inchamore Td, Coolea, Co Cork

On behalf of Coillte CGA \ SSE Renewables Ltd

Prepared By:
CST GROUP
Chartered Consulting Engineers
1, O'Connell Street, Sligo, F91 W7YV
+353 (0)71 919 4500 info@cstgroup.ie www.cstgroup.ie

April 2023

Civil
Structural
Traffic

Table of Contents

DOCUMENT CONTROL

Revision	R0	R1	R1						
Purpose of Issue: P=Preliminary PG=Progress C=Comment I=Information PL=Planning T=Tender CN=Construction	C	C	PL						
Date:	27 01 23	30 01 23	21 04 23						
Originator:	SS	SS	SS						
Checked By:	PJG	PJG	PJG						
Approved By:	SS	SS	SS						

1. INTRODUCTION

1.1. This report describes a Stage 1 Road Safety Audit carried out on behalf of Coillte CGA \ SSE Renewables Ltd on proposals to upgrade an existing priority controlled 'T' junction between the development access and the N22 national grade road.

1.2. The audit was carried out between 24th – 27th January 2023.

1.3. The audit team were as follows:

Team Leader: Stuart Summerfield, HNC (Civil) FCIHT FSoRSA
Certificate of Competency in Road Safety Audits (SoRSA, 2015)
TII Auditor Ref. SS73290

Team Member: PJ Gallagher, BEng M.Inst.A.E.A. MITAI
TII Auditor Ref. PG3425716

1.4. The audit comprised an examination of the drawings relating to the scheme supplied by the design office. A site visit was carried out by both Audit Team members together on 24th January 2023 between the hours of 11:30-12:00. Weather conditions during the inspection were fine and the road surface was dry. Traffic conditions were considered busy with cars, light goods and HGVs. Photographs were taken during the inspection.

1.5. This Stage 1 audit has been carried out in accordance with the relevant sections of the Transport Infrastructure Ireland (TII) Publication (Standard) GE-STY-01024 (Dec 2017) 'Road Safety Audit'. The audit team has examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the design to any other criteria.

1.6. **Appendix A** describes the documents examined by the Audit Team.

Appendix B shows the location of the problems identified by the Audit Team.

Appendix C contains a copy of the TII's approval of the Audit Team.

Appendix D contains the Audit Feed Back Form. The Designer shall consider the Audit Report and prepare a Designer Response to each of the recommendations, using the Feedback Form. The response shall state clearly whether each recommendation is accepted, rejected, or whether an alternative recommendation is proposed. Copies of the Designer Response shall be sent to the Employer and the Audit Team. The Audit Team shall then consider the Designer Response and indicate on the Feedback Form whether the Designer's response to each recommendation is accepted. The completed Report contains the completed Feedback Form with signatures of all three parties involved - Designer, Audit Team Leader and Employer.

1.7. All of the problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise collision occurrence.

2. ITEMS RESULTING FROM PREVIOUS STAGE 1 AUDIT

No previous audit has been offered for reference.

3. ITEMS RESULTING FROM THIS STAGE 1 AUDIT

3.1 Collision Data

Collision data has not been supplied with this scheme.

Road Collision Data is not currently available on the Road Safety Authority Database, therefore no collision trends in the immediate vicinity of the proposed site can be analysed.

3.2 General Problems / Problems at Multiple Locations

3.2.1 National Road Climbing Lane

Problem: The proposals indicate barriers to be provided to close down the national road southbound offside lane, where the climbing lane exists. This area of the national road is up a steep gradient.

Hazard: Faster moving traffic may attempt to overtake slower moving vehicles that are particularly slow due to the road gradient, and cut back in just prior to the temporary barriers. Collisions with the barriers or side swipe collisions with the slow moving vehicle may result.

Recommendation:

- Retain the dual lane set up for the full extent of the climbing lane.
- Adjust the refuge island within the mouth of the development junction such that right turning into the junction is near impossible for long vehicles.
- Ensure all drivers destined for the development are instructed to approach from the south only.

3.2.2 National Road Signage

Problem: Users may attempt to turn right into the development from the national road. These users are likely to wait in the N22 offside lane for gaps in opposing traffic.

Hazard: The stationary vehicle may be subject to rear end shunts from though traffic.

Recommendation: Provide suitable signage prohibiting right turning into the development junction. Additionally, provide signage guiding development traffic to a suitable turning location further to the east.

3.3 Problems at Specific Locations

3.3.1 Development Junction – Gradient

Problem: The development junction is to a steep downhill gradient. Users exiting the development may proceed towards the National Road at excessive speed and fail to stop for the junction.

Hazard: Overshoot incidents may result.

Recommendation: Provide suitable warning signage for drivers exiting the development together with advanced stop signage and also ensure suitable surface friction is provided and maintained on approach to the junction.

3.3.2 Development Junction - Surfacing

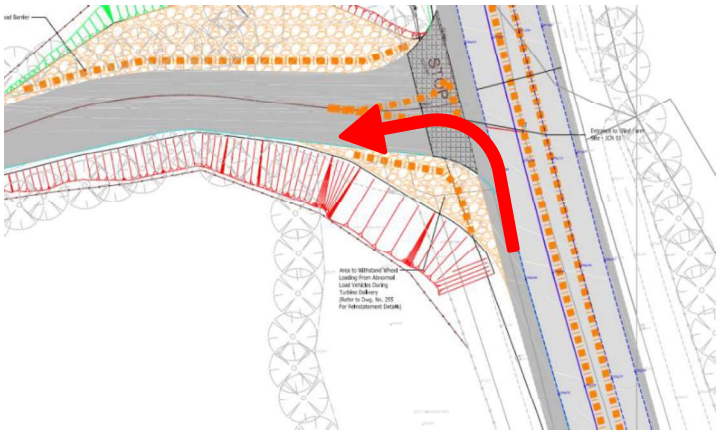
Problem: The development junction is made from unbound granular material. There is risk that stones may be dragged into the National Road.

Hazard: Loose material in the road may be thrown up into the windscreen of other vehicles, or strike cyclists.

Recommendation: Provide a bound surface to the access road.

3.3.3 Vehicle Swept Paths

Problem: It is not clear from the drawings if delivery vehicles have sufficient space to enter the development left from the National Road.



Hazard: Users may slow/stop with the tail of the vehicle protruding into the National Road. Rear end shunts may result.

Recommendation: Undertake swept path analysis and adjust the paved area accordingly.

3.3.4 Turning Area

Problem: The audit team have been advised that vehicles departing the development will turn left from the development junction and undertake a turn at a location further to the north. The formation of the inbound junction for turning may appear as a continuation of the National Road during hours of darkness.

Hazard: Northbound National Road drivers may errantly divert from the mainline to enter this new junction. Impact with southbound National Road traffic may result.

Recommendation: Ensure this junction does not appear as a continuation of the National Road under any lighting conditions.

4. AUDIT TEAM STATEMENT

We certify that we have examined the drawings and other information listed in Appendix A. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems that we have identified have been noted in the report, together with suggestions for improvement which we recommend should be studied for implementation. No one in the Audit Team has been involved with the scheme design as shown in Appendix A.

Signed .....

Stuart Summerfield
Audit Team Leader

Date 27th January 2023

Signed .....

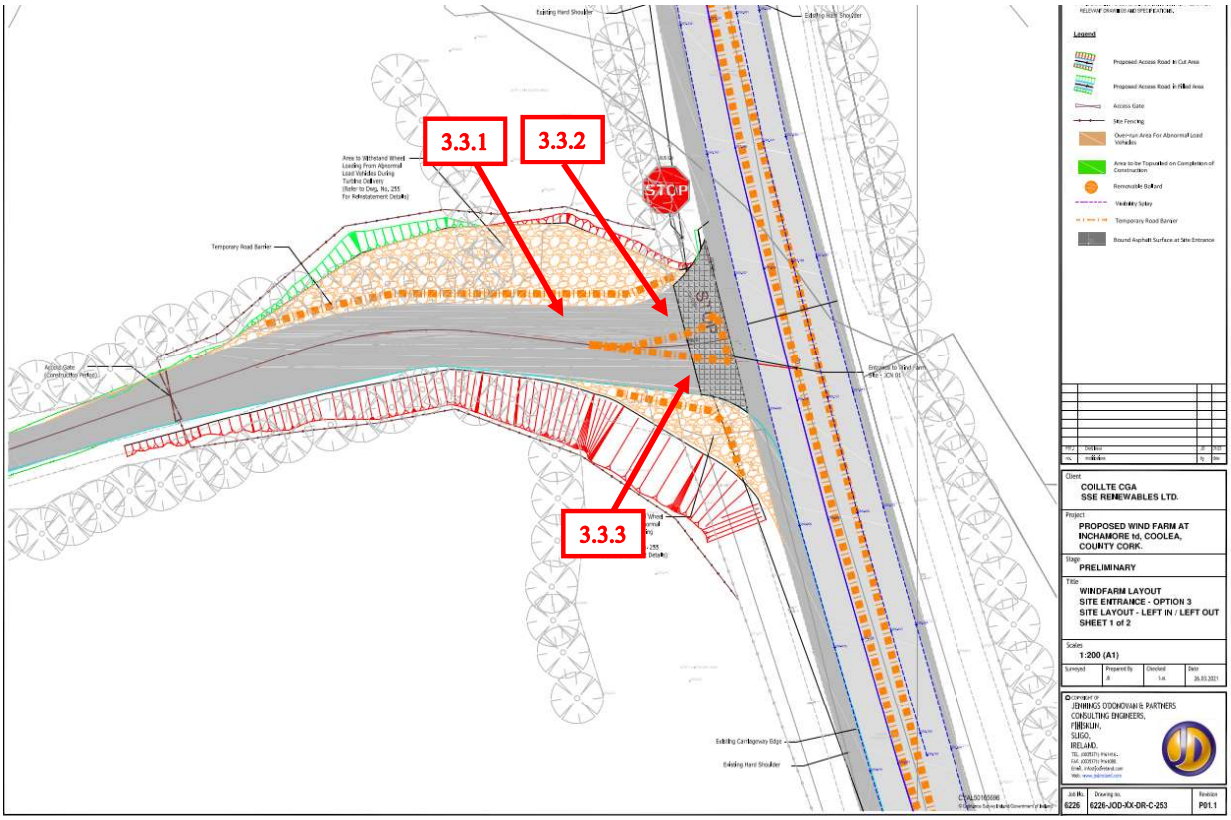
PJ Gallagher
Audit Team Member

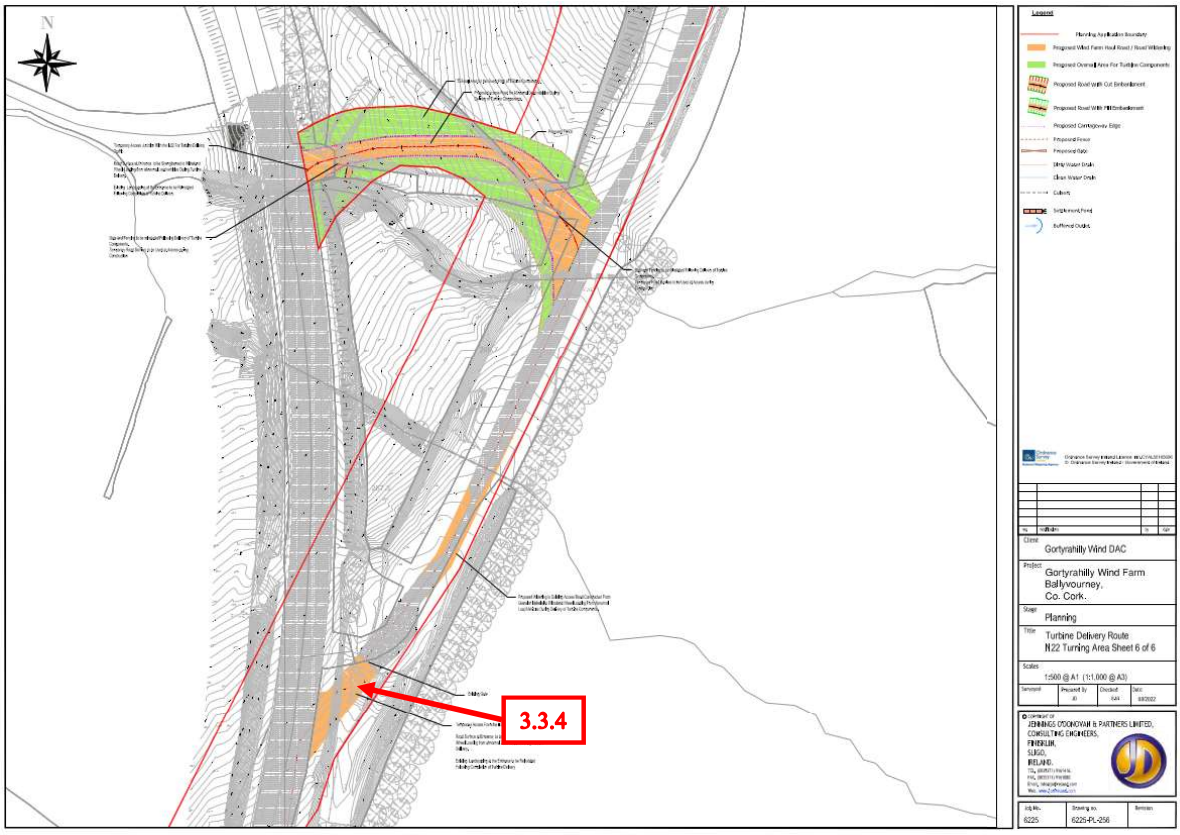
Date 27th January 2023

Appendix A List of Documents Examined

DOCUMENT REF / NAME:	RECEIVED FROM:	DATE:
6226-JOD-XX-DR-C-253 P01.1 Site Entrance Option 3	Jennings O'Donovan	11.01.2023
6225-PL-256 N22 Turning Area Sheet 6 of 6	Jennings O'Donovan	11.01.2023

Appendix B Problem Location Plan


3.3.1
3.3.2
3.3.3
STOP
Existing Hard Shoulder
Existing Hard Shoulder
Temporary Road Barrier
Existing Carriageway Edge
Existing Hard Shoulder
Legend
Proposed Access Road In Cut Area
Access Gate
Site Fencing
Temporary Road Barrier
Client
COILLTE CGA
SSE RENEWABLES LTD.
Project
PROPOSED WIND FARM AT
INCHAMORE ld, COOLEA,
COUNTY CORK.
Stage
PRELIMINARY
Title
WINDFARM LAYOUT
SITE ENTRANCE - OPTION 3
SITE LAYOUT - LEFT IN / LEFT OUT
SHEET 1 of 2
Scales
1:200 (A1)
JENNINGS O'DONOVAN & PARTNERS
CONSULTING ENGINEERS,
FINISKLIN,
SLIGO.
IRELAND.
6226
6226-JOD-XX-DR-C-253
P01.1


N
3.3.4
Legend
Client
Gortyrahilly Wind DAC
Project
Gortyrahilly Wind Farm
Ballyvourney,
Co. Cork.
Stage
Planning
Title
Turbine Delivery Route
N22 Turning Area Sheet 6 of 6
Scales
1:500 @ A1 (1:1,000 @ A3)
JENNINGS O'DONOVAN & PARTNERS LIMITED,
CONSULTING ENGINEERS,
FINISKLIN,
SLIGO,
IRELAND.
6225
6225-PL-256

Appendix C TII Approval of RSA Team

From: TII Systems Notification <noreply@tii.systems>
Sent: Tuesday 17 January 2023 16:11
To: smolloy@jodireland.com
Cc: roadsafetyaudits@nra.ie; Fiona.Bohane@corkrdo.ie; Alastair.DeBeer@TII.ie; Bryan.kennedy@TII.ie; LCurtis@Kerrycoco.ie; Kevin.O'Flynn@tii.ie; Frank.Healy@tii.ie; Stuart Summerfield | CST Group <ssummerfield@cstgroup.ie>; Philip Bayfield | CST Group <pbayfield@cstgroup.ie>; pjgallagher20@hotmail.com
Subject: RSAAS - Road Safety Audit Approvals System - Audit Approval 35562363/36281/Stage 1
Importance: High

Sean Molloy
Finisklin Business Park
Sligo

Date: 17/01/2023

Our Ref: 35562363/36281/Stage 1

re: N22 Inchamore Wind Farm

APPROVAL OF ROAD SAFETY AUDIT TEAM, Stage 1

Dear Sean Molloy,

The following members of the proposed road safety audit team are approved to carry out the Stage 1 road safety audit of N22 Inchamore Wind Farm .

1. Stuart Summerfield - CST Group Consulting Engineers - Leader
2. Philip Bayfield - CST Group Consulting Engineers - Member
3. PJ Gallagher - CST Consulting Engineers - Member

A copy of all audit reports, design team response and exception reports must be uploaded through RSAAS. Successful upload of these reports and completion of the audit approval process is necessary for any further audit approval on this scheme.

Yours sincerely,

Lucy Curtis

Regional Road Safety Engineer
roadsafetyaudits@tii.ie

Appendix D RSA Feedback Form

ROAD SAFETY AUDIT FEEDBACK FORM

CST Group Chartered Consulting Engineers
1, O'Connell Street, Sligo, F91 W7YV, Ireland

Scheme: Proposed Wind Farm at Inchamore Td, Coolea, Co Cork – Coillte CGA \ SSE Renewables Ltd

Audit Stage: 1 **Date Audit Completed:** 27/01/2023 **Route No.** _____ **Our Ref :** 122359|R1

TO BE COMPLETED BY DESIGNER				TO BE COMPLETED BY AUDIT TEAM LEADER
Paragraph No. in Safety Audit Report	**Problem accepted (Yes/No)**	**Recommended measure accepted (Yes/No)**	**Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.**	**Alternative measures or reasons accepted by Auditors (Yes/No)**
3.2.1	Yes	Yes		
3.2.2	Yes	Yes		
3.3.1	Yes	Yes		
3.3.2	Yes	Yes		
3.3.3	Yes	Yes		
3.3.4	Yes	Yes		

Signed: Sean Molloy Design Team Leader Date: 21/04/2023

Sean Molloy
Jennings O'Donovan

Signed: _____ Audit Team Leader Date: 21/04/2023

Stuart Summerfield
CST Group Chartered Consulting Engineers

Signed: David Heelan Employer Date: 21/04/2023

For FEI \ SSE Renewables Ltd

RE: 122357: Inchamore RSA

DH David Heelan <David.Heelan@futurenergyi

Reply | Reply All | Forward | ...

To Sean Molloy

Cc Shirley Bradley; Stuart Summerfield | CST Group; Caitriona Keaveney | CST Group

Fri 21/04/2023 11:58

122357 Stage 1 RSA Feedback Form R1.docx
35 KB

Hi Sean, Caitriona,

As attached

From: Sean Molloy <smolloy@jodireland.com>
Sent: Friday, April 21, 2023 7:33 AM
To: David Heelan <David.Heelan@futurenergyireland.ie>
Cc: Shirley Bradley <sbradley@jodireland.com>; Stuart Summerfield | CST Group <ssummerfield@cstgroup.ie>; Caitriona Keaveney | CST Group <ckeaveney@cstgroup.ie>
Subject: RE: 122357: Inchamore RSA

Hi David,

Could you please sign the attached Feedback Form and then send it to Caitriona, thanks.

Kind Regards,

Sean Molloy.

B. Eng. M. Sc. CEng MIEI Dip. PM

JENNINGS O'DONOVAN & PARTNERS LIMITED
CONSULTING ENGINEERS

Head Office
Finisklin Business Park, Sligo, Ireland, F91 RHH9. MAP

Tel: +353719161416 Email: smolloy@jodireland.com Web: www.jodireland.com

NSAI ISO 9001, 14001 & BS OHSAS 18001 Certified | ACEI Design Excellence Award Winners 2018 | Engineers Ireland cpd Accredited Employer

APPENDIX 17.1

MITIGATION MEASURES

Introduction

All mitigation and monitoring measures relating to the pre-commencement, construction, operational and decommissioning phases of the Project are set out in the relevant chapters of this EIAR.

All mitigation which will be implemented during the various phases of the Project are presented in **Table 17.1a** below. The mitigation measures have been grouped together according to their environmental field/topic and are presented under the following headings:

- Land Use
- Tourism
- Flora and Fauna
- Peat Management
- Site Drainage
- Telecoms and other service interference
- Health and Safety
- Shadow Flicker
- Noise
- Waste
- Cultural Heritage
- Traffic
- Decommissioning

The mitigation proposals in the below format provides an easy to audit list that can be reviewed and reported on during the future phases of the Project. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as **Appendix 2.1** of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

All monitoring measures which will be implemented during the pre-commencement, construction, operational and decommissioning phases of the Project are outlined in **Table 17.1b**. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring proposals are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for

reporting results where applicable. By presenting the monitoring proposals in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the Project to ensure all required monitoring is completed as required.

It is intended that the CEMP will be updated where required prior to the commencement of construction to include all mitigations and monitoring measures, conditions and or alterations to the EIAR and application documents should they emerge during the course of the planning process and would be submitted to the Planning Authority for written approval.

Table 17.1a: Summary of Mitigation Measures

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Pre-Commencement Phase						
MM1	Land Use	Chapter 4: Population and Human Health	4.5.5 Land Use	Existing forestry tracks have been incorporated into the design to minimise the construction of new Site Access Roads and minimise the removal of forested areas. New Site Access Roads have been sensitively designed to minimise impact on forestry. Electricity cables will be installed underground in or alongside Site Access Roads to avoid and minimise negative impact.		
MM2	Tourism	Chapter 4: Population and Human Health	4.5.6 Tourism	In providing for public safety, appropriate signage and safety measures will be put in place during construction and decommissioning activities.		
MM3	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora	A pre-construction survey will take place to map its distribution along tracks in the summer before construction commences.		
MM4	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.3 Badgers 5.9.3 Pre-construction badger survey	As required under the Wildlife Acts, mitigation is required to ensure that active setts are not disturbed. Owing to the difficulty of surveying for badgers within closed canopy conifer forests, the following approach will be followed: Survey for presence of badgers will be carried out at the time of the tree felling operations. This will be by an ecologist with experience of badger survey and working in association with the tree felling contractor. Survey for badger is preferably carried out in the period October to March when vegetation cover is low. Before any felling commences, the ecologist will survey marginal areas around the plantation for signs of badger presence. Also, any accessible areas within the plantation, such as unplanted gaps, will be searched for signs. Once felling commences, the ecologist will monitor the progression of the works as the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				required areas are cleared. Should there be any evidence of a badger sett, all work will cease immediately and a buffer zone will be established where felling works will be restricted. Mitigation will be implemented as considered necessary. This would include application to NPWS for permission to close a sett that could be disturbed by the works. Note that since closure of active setts is prohibited during the badger breeding season (December to June inclusive), scheduling of the tree felling process is important to avoid delays. As it is expected that more than 2 years will have passed since the 2021 baseline survey before construction commences, all work areas will be subject to a pre-construction survey for badger. This survey will give particular focus to the afforested part of site where badger is most likely to occur.		
MM5	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.5 Common Frog	Areas where construction works are due to commence during the period February to August will be checked by the ECoW for the presence of frog spawn, tadpoles and adult frogs. If present, these will be removed under licence from NPWS and transferred to suitable ponds or wetlands in the vicinity.		
MM6	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.5.6.1 Bats Buffer	To minimize risk to bat populations, a buffer zone is recommended around any forestry, treeline, hedgerow, woodland feature, into which no part of the turbine should intrude. Using the formula quoted below, the minimum distances of wind turbines for bat mitigation are calculated for each of the potential turbine models *formula: Buffer distance* = $\sqrt{(50 + b1)^2 - (hh - fh)^2}$ *where bl = blade length, hh = hub height, fh =*		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				feature height (all in meters) The dimensions of the potential wind turbine models proposed to be used are provided in the table below. Feature height is 25m (typical conifer plantation height, the predominant habitat type present within the survey area). Dimensions of Blade length and Hub height were provided and the calculation is as follows: *Buffer distance* = $\sqrt{(50 + 77.5)^2 - (102.5 - 25)^2}$ ***Buffer distance = 101.24m*** Providing alternative foraging areas outside the wind farm zone has been shown to reduce the presence of bats within cleared zones around individual wind turbines (i.e. bats are attracted to the more favourable foraging habitats). Therefore, compensatory habitat is recommended and, where possible, such planting should include deciduous woodland.		
MM7	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.5.6.1.1 Bats Vegetation Removal	An ecologist/ECoW will supervise areas where vegetation, scrub and hedgerow removal will occur prior to construction.		
MM8	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.9.2 Bats Pre-construction Surveys	It is recommended that if three years lapse from between planning-stage surveys in 2019 and installation of the wind turbines, it will be necessary to repeat one full season of surveys during the activity period (EUROBATS, 2014). Future survey work should be completed according to best practice guidelines available. The most current guidance documents for Irish wind farms are from NatureScot (NatureScot, 2021) and Northern Ireland Environment Agency (NIEA, 2021). NIEA guidance suggests increased duration of static monitoring of 50 nights a high suitability sites for bats and provides alternative dates for erection of statics when the proposed site is situated in an upland location.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM9	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.9.2 Pre-construction bat survey	It is recommended that if three years lapse from between planning-stage surveys in 2019 and installation of the wind turbines, it will be necessary to repeat one full season of surveys during the activity period. Future survey work should be completed according to best practice guidelines available. The most current guidance documents for Irish wind farms are from NatureScot (NatureScot, 2021) and Northern Ireland Environment Agency (NIEA, 2021).		
MM10	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.89.3 Pre-construction badger survey	As it is expected that more than 2 years will have passed since the 2021 baseline survey before construction commences, all work areas will be subject to a pre-construction survey for badger. This survey will give particular focus to the afforested part of site where badger is most likely to occur.		
MM11	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.1 Embedded Mitigation	The design principle of maintaining set-backs of 65 m for turbines and associated infrastructure from watercourses and utilising existing forestry access tracks will be implemented except for the clear span bridges, road development and drainage measures as detailed		
MM12	Peat Management	Chapter 8: Soil and Geology	8.6.2.2 Subsoil and Bedrock Removal	The removal of peat and mineral subsoil / bedrock is an unavoidable impact of the Project but every effort will be made to ensure that the amount of earth materials excavated is kept to a minimum in order to limit the impact on the geotechnical and hydrological balance of the Site.		
MM13	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.1.2 Mitigation by Design & Mitigation Objectives	Prior to the commencement of construction, the drainage plan will be implemented. **ATTENUATION FEATURES:** Mitigation measures to address surface water runoff and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				drainage include in line attenuation features such as check dams and stilling ponds and buffered outfalls). Both check dams and stilling ponds provide mitigation against potential impacts to water quality, erosion, and discharge velocity, however they also facilitate buffered and diffuse percolation of surface water runoff into the receiving environment along the permitter of the development footprint. **CHECK DAMS:** Check dams will be constructed along the length of constructed drainage at regular intervals in line with relevant guidance (**Section 9.2.2**) (**Figure 9.12**). **STILLING PONDS:** Stilling ponds with buffered outfalls will be constructed at drainage outfalls associated with the construction runoff drainage network (**Figure 9.1a, Section 5.7 of Management Plan 2 Appendix 2.1**. Buffered outfalls will be established at intervals along the clean runoff drainage network. **PROMOTION OF PEATLAND HABITATS** Excavated peat will be deposited with a view to restore infilled excavation areas associated with the site e.g., adjacent to hardstand areas and borrow pit.		
			9.6.2.14 Emergency Response	Prior to commencement of construction, the Environmental Clerk of Works will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g., specialist hydrocarbon spill response, specialist hydrological and/or water quality response.		
MM14	Site Drainage	Chapter 9:	9.6.1.3 Constraints	The following buffer zones will be marked and implemented prior		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Hydrology and Hydrogeology		to construction: • 65 m Surface Water Buffer Zone (apart from in areas where this is unavailable i.e., in stream works for crossings) - Mapped surface water features i.e., mapped streams, rivers, lakes. Source for mapped surface water features; EPA. • 20 m Drainage Buffer Zone - Non-mapped drainage features i.e., non-mapped streams, natural and artificial drainage features. Recommended groundwater buffer zones range from e.g., 15m (exclusion zone karst swallow holes) to entire catchments (source protection in regionally important karstified aquifer) depending on site specific characteristics. For the purpose of this assessment the following conservative approach has been applied: • 100 m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed access tracks and cable trenches i.e., shallow excavation. Source for mapped abstraction points: GSI. Not applicable, none within 100m of the Site. Applicable to the grid connection and turbine delivery routes. • 250 m Groundwater Buffer Zone – Groundwater abstraction points in relation to proposed borrow pits and foundations. Source for mapped abstraction points: GSI.		
MM15	Land Use	Chapter 13: Material Assets and Other Issues	13.4.3 Agriculture	Mitigation measures to minimise impacts on agricultural land use have been incorporated into the design stage. The construction and operational footprint of the Project has been kept to the minimum necessary to avoid impact on existing land uses and existing tracks have been used where possible.		
MM16	Land Use	Chapter 13: Material Assets and Other	13.5.4 Forestry	Existing forestry tracks have been incorporated into the design to minimise the construction of new Site Access Roads and minimise the removal of forested areas. New Site Access Roads		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Issues		have been sensitively designed to minimise impact on forestry. Electricity cables will be installed underground in or alongside Site Access Roads to avoid and minimise negative impact.		
MM17	Telecoms and other service interference	Chapter 13: Material Assets and Other Issues	13.6.5 Telecommunications	All electrical elements of the Project are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety. Mitigation measures were undertaken in the design phase through mitigation by avoidance i.e., the known routes of the telecommunication links were plotted and a buffer was applied to them, outside of which the proposed turbines were located. Compliance with the EMC Directive 2014/30/EU will mean that the electromagnetic emissions from devices used will not cause interference to other equipment.		
MM18	Telecoms and other service interference	Chapter 13: Material Assets and Other Issues	13.7.5 Electricity Networks	Mitigation by design and avoidance will minimise impacts on existing electricity networks. • Confirmatory drawings for all existing services will be sought upon consultation with ESB Networks. • Immediately prior to construction taking place, the area where excavation is planned will be surveyed by CAT scan (sub-surface survey technique to locate any below-ground utilities) and all existing services will be verified. Temporary warning signs will be erected. • The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to record the exact location of the ducts. The co-ordinates will be plotted on as-built record drawings for the grid connection cable operational phase. • Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				members of the public of the hazards of ongoing construction works.		
MM19	Telecoms and other service interference	Chapter 13: Material Assets and Other Issues	13.8.5 Air Navigation	The IAA will be notified of intention to commence crane operations with at least 30 days prior notification of their erection.		
MM20	Natural Resources	Chapter 13: Material Assets and Other Issues	13.9.4 Quarries	Existing tracks have been used where possible and the layout was designed to minimise the length of new track required in order to reduce the requirement for such stone material.		
Construction Phase						
MM21	Human Health	Appendix 2.1 CEMP	3.1 Human Beings and Community	Turbines will be procured from a reliable manufacturer and will have undergone vigorous safety checks during design, construction, commissioning and operation. Physical and visual warnings such as signs will be erected as appropriate for the protection of site personnel and the public. Facility for remote turbine deactivation will be provided. Access to turbines for site personnel will be restricted in storm events. Where access by site personnel is required safety precautions may include remotely shutting down the turbine, yawing to place the rotor on the opposite side of the tower door and parking vehicles at a distance of at least 100 m from the tower. All personnel will be fitted with appropriate Personal Protective Equipment. Regular maintenance and inspections will take place during the 35-year operational phase. The final turbine model chosen will be in line with International Electrotechnical Commission 61400-1 safety standards. Maintenance visits will take place as needed with the Supervisory Control and Data Acquisition (SCADA) control system monitoring turbine performance remotely. If a fault occurs, then a message is automatically sent to the operations personnel preventing emergency situations. Warning signs and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				security infrastructure will be in place around the onsite switchgear and control building to provide for public safety. Access to the turbines will be via the door at the base of the turbines. The turbine access door will otherwise be securely locked at all times. Measures are set out in **Chapter 15: Transport and Transportation** relating to how delivery of goods and services would be managed during works to minimise impacts.		
MM22	Land Use	Chapter 4: Population and Human Health	4.5.5 Land Use	The construction works will be planned and controlled by a Construction and Environmental Management Plan (CEMP). The public and other stakeholders will be provided with updates on construction activities which will affect access to lands. This will be communicated to members of the public through a community liaison officer employed for the duration of the construction period.		
MM23	Land Use	Chapter 4: Population and Human Health	4.5.6 Tourism	There are no existing walkways or trails located on Site. A section of the grid route (640 m) is located along the Bear to Breifne Way. Pedestrian access will be maintained during the construction and decommissioning phases and works will be completed outside peak tourist season where possible.		
MM24	Health and Safety	Chapter 4: Population and Human Health	4.5.7 Human Health and Safety	All construction staff will be adequately trained in health and safety and will be informed and aware of potential hazards. All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Safe Pass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The Developer is required to ensure a competent contractor is appointed to carry out the construction works. The Contractor will be responsible for the implementation of procedures outlined in the Safety & Health Management Plan. In relation to COVID-19, up to date Health Service Executive guidance will be consulted regularly in line with Health and Safety Authority recommendations and all reasonable on-site precautions will be taken to reduce the spread of COVID-19 on construction sites, should the virus be prevalent at the time of construction. Once mitigation measures and health and safety measures are followed, the potential for impact on human health on the construction site during construction is expected to be not significant and temporary to short-term. Public safety will be addressed by restricting access to the public in the vicinity of the site works during the construction stage. The construction site and associated recreation trails will be temporarily closed in sections to the public for the 18-24 month construction period. This measure aims to avoid potential injury to members of the public as a result of construction activities. Where recreational trail sections are temporarily closed to the public during construction, signage will be provided indicating alternative routes for walkers which avoid the construction site. This aims to avoid potential confusion and disorientation to recreation users as well as maintaining public safety in proximity		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				to the construction site. Appropriate warning signage will be posted at the construction site entrance, directing all visitors to the site manager. Appropriate signage will be provided on public roads approaching site entrances and along haul routes. In relation to the turbine delivery route, extra safety measures will be employed when large loads are being transported, for instance, Garda escort will be requested for turbine delivery and a comprehensive turbine delivery plan will be utilised to avoid potential impact to human safety for road users and pedestrians.		
MM25	Major Accidents and Natural Disasters	Chapter 4: Population and Human Health	4.5.8 Major Accidents and Natural Disasters	The proposed site drainage will mitigate against any potential flooding risk due to run off with the use of Sustainable Drainage Systems (SuDS). Construction drainage will be left in-situ for the lifespan of the project through to decommissioning. The Contractor's fire plans are reviewed and updated on a regular basis. A nominated competent person shall carry out checks and routine maintenance work to ensure the reliability and safe operation of firefighting equipment and installed systems such as fire alarms and emergency lighting. A record of the work carried out on such equipment and systems will be kept on site at all times.		
MM26	Shadow Flicker	Chapter 4: Population and Human Health	4.9 Shadow Flicker	Due to the potential for shadow flicker to affect receptors within the shadow flicker study area, it is proposed that a shadow control system will be installed on each of the wind turbines should it be required. this is only if the 2019 WEDGs come into force during deliberation of the planning application and we need to comply with them. If this occurs we can implement this. The control system will calculate, in real-time: • Whether shadow flicker has the potential to affect nearby		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				properties, based on pre-programmed co-ordinates for the properties and turbines • Wind speed (can effect how fast the turbine will turn and how quickly the flicker will occur) • Wind direction • The intensity of the sunlight • When the control system detects that the sunlight is strong enough to cast a shadow, and the shadow falls on a property or properties, then the turbine will automatically shut down; and will restart when the potential for shadow flicker ceases at the affected properties.		
MM27	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora Habitat Loss	The construction works will cause disturbance to adjoining wet heath and blanket bog habitats around the turbine, hardstand and access road for the T1 turbine, as well as the cutover bog at the T3 turbine. To minimise disturbance to the heath and bog habitats and to ensure good recovery, as well as to minimise areas of bare peat which would be prone to erosion, a programme of ongoing monitoring and rehabilitation will be followed during the construction phase. At the commencement of works at the T1 and T3 locations, the required work footprint on the bog will be identified and the area will be marked by a rope fence (using range poles or similar) and with appropriate signage. No activities of any type will be allowed outside of this agreed work area. The ECoW will inspect the area regularly whilst works are on-going at T1 and T3. Excavated peat and other material will be removed to the approved storage area with no storage of spoil or materials on unplanted bog or heath. The fence will remain in place until the works are fully complete.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				An ecological objective is to minimise the area of exposed peat surface and to encourage revegetation. This will be achieved by the removal from suitable areas of the vegetated heath and bog surface (cut out as sods or 'turves') within the work footprint at T1, the storage of this material, and subsequent reuse around the turbine and hardstand margins. The surface turves of vegetated bog and heath will be dug out to a depth of 30 cm or more using a dumper/digger with a bucket. Care will be taken to keep the turve as intact as possible and the vegetated side upwards (though this is not always possible). The turves will be loaded to a trailer and transported to a pre-identified storage area. The storage area will be located in an area of site (not heath or bog) where disturbance during the storage period will not occur. The turves will be off-loaded from the trailer and placed side by side and vegetation side upwards. They will be placed in single layers, i.e. not piled on top of each other. Should storage be for prolonged periods (months), the turves may need to be watered during dry spells. When ready for placement at the finished turbine/hardstand, they will be lifted with a dumper and bucket and taken to the destination. Here they will be off-loaded, placed side by side on the disturbed peat surface with vegetation side up. The turves will be bedded in with the bucket of a dumper so that they form a continuous layer without gaps between them. This approach will provide almost immediate cover of the bare surfaces. All of the above will be monitored by the ECoW. It is noted that where adequate peat depth is not available to dig out turves, as well as in the cutover bog at T3, the surface peat will be scraped of and stored in piles in a location similar to that		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				for turves. This material will contain root stock, rhizomes and seed of peatland plant species and can be spread on disturbed surfaces when works are complete to assist in revegetation.		
MM28	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora Least cudweed *(Filago minima)*	The areas where the plant occurs will be avoided by the trench excavations as feasible.		
MM29	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora Badgers	Survey for presence of badgers will be carried out at the time of the tree felling operations. This will be by an ecologist with experience of badger survey and working in association with the tree felling contractor. Survey for badger is preferably carried out in the period October to March when vegetation cover is low. Before any felling commences, the ecologist will survey marginal areas around the plantation for signs of badger presence. Also, any accessible areas within the plantation, such as unplanted gaps, will be searched for signs. Once felling commences, the ecologist will monitor the progression of the works as the required areas are cleared. Should there be any evidence of a badger sett, all work will cease immediately and a buffer zone will be established where felling works will be restricted. Mitigation will be implemented as considered necessary. This would include application to NPWS for permission to close a sett that could be disturbed by the works. Note that since closure of active setts is prohibited during the badger breeding season (December to June inclusive), scheduling of the tree felling process is important to avoid delays.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM30	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora Common Frog	Areas where construction works are due to commence during the period February to August will be checked by the ECoW for the presence of frog spawn, tadpoles and adult frogs. If present, these will be removed under licence from NPWS and transferred to suitable ponds, drains or wetlands in the vicinity.		
MM31	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora Bats	Mitigation is best achieved through avoidance especially in relation to bat fauna. It is proposed that the following measures be put in place to avoid or lessen the degree of impacts on local bat populations. **High Level Turbine Locations** *This applies to T2 & T6* • Ensure that wind turbine is 101.2 m away from plantation edge. • A zone of 100 m around the wind turbines (from the tip of the blade) should be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats. A low level of vegetation should be maintained for the entire operational phase. This should be monitored to ensure that scrub vegetation does not develop within the zone around the turbines. • Complete clearance work at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels. **EcoBat Tool Medium Level Turbine Locations** *This applies to T3*		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				This also applies to remaining Internal Road Network • Ensure that wind turbine is 101.2 m away from plantation edge. • A zone of 50 m around the wind turbines (from the tip of the blade) should be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats. • A low level of vegetation should be maintained for the entire operational phase. This should be monitored to ensure that scrub vegetation does not develop within the zone around the turbines. • Complete clearance work at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels. **EcoBat Tool Low Level Turbine Locations** *This applies to T1, T4 & T5* • Ensure that wind turbine is 101.2 m away from plantation edge. • A zone of 50 m around the wind turbines (from the tip of the blade) should be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats. • A low level of vegetation should be maintained for the entire operational phase. This should be monitored to ensure that scrub vegetation does not develop within the zone around the turbines. • Complete clearance work at least 6 months prior to installation of wind turbines. Studies have shown that		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels. Building 2 and mature trees surrounding the building will not be removed during construction of the Project. This area will be protected from any construction works proposed to be undertaken in vicinity of this area. This area will also be protected during the operation of the Project .		
MM32	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.2 Habitats and flora Kerry Slug	• Areas of suitable habitat that occur outside of the footprint of the development will be avoided during the course of construction thereby minimising the loss and disturbance of Kerry Slug habitat. • Immediately prior to undertaking works in areas of suitable habitat (wet heath / blanket bog / rock outcrop), the project ecologist will check for the presence of Kerry Slug. Should slugs be discovered, then they will be transferred to suitable habitat in the surroundings. Similar on-going monitoring of suitable habitat within works areas will continue throughout the construction phase. Such monitoring will be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery. The transfer of Kerry Slugs will be subject to a derogation licence from the Department of Housing, Local Government and Heritage (which has been applied for at time of writing).		
MM33	Flora and Fauna	Chapter 5: Terrestrial	5.5.2 Habitats	An Ecological Clerk of Works (ECoW) will be on site for the duration of the construction phase. As required, this person will		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Ecology	Ecological Clerk of Works (ECoW)	be assisted by a consultant ecologist with expertise in peatland habitats. The consultant ecologist will be employed by the client and will be independent of the Contractor. As ground excavations are opened up, the ECoW will walk the work corridor with a surveyor and within sensitive peatland areas will mark out (with range poles or equivalent) the extremities of the required work area. This will identify the limit of the work area and will prevent unnecessary incursions by the Contractor onto adjoining intact heath or bog.		
MM34	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.2.3 Mitigation by Reduction	During the construction phase the appointed Contractor(s) will ensure that the following mitigation is adhered to in line with IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters: • No works will take place within the 65 m buffer zone of watercourses except for the clear span bridges, road development and drainage measures as detailed. • Site compounds and Soil storage areas will be located at a minimum distance of 65 m from any watercourse. All drainage from these facilities will be directed through a settlement pond with appropriate capacity and measures to provide spill containment. • All site drainage, as described in the surface water management plan and shown on associated drawings, will be directed through either sediment traps, settlement ponds and / or buffered drainage outfalls to ensure that total suspended solid levels in all waters discharging to any watercourse will not exceed 25mg/L (IFI, 2016). All construction site run-off will be channelled through a stilling process to allow suspended solids to settle out and through a spill-		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				containment facility prior to discharge. • Daily monitoring of all sediment traps and settlement ponds will be undertaken by the Environmental Manager or Ecological Clerk of Works to ensure satisfactory operation and/or maintenance requirements. A full specification for the water quality monitoring is presented in the WQMP (provided as part of **Appendix 2.1**). • The storage of oils, hydraulic fluids, etc., will be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005). • All machinery operating on the windfarm site and on the Grid Connection Route will be fully maintained and routinely checked to ensure no leakage of oils or lubricants occurs. All fuelling of machinery will be undertaken at a discrete "fuel station" within the temporary site compound and will be designated for the purpose of safe fuel storage and fuel transfer to vehicles. • Any extensions to existing drainage culverts on the site roads will be undertaken in dry conditions and in low flow conditions on drains that do not run dry. • The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc., will be completed in the dry to avoid pollution of the freshwater environment (see **Chapter 9** for further details). There will be no batching or storage of cement allowed in the vicinity of any watercourse crossing construction area. • Procedures (as detailed in **Chapter 9**) will be put in place to ensure the full control of raw or uncured waste concrete to ensure that watercourses will not be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				impacted. • Should there be any incidents of pollution to watercourses, immediate steps as specified in the Emergency Response Plan (CEMP-Management Plan 1) will be undertaken to resolve the cause of the pollution and where feasible, mitigate against the impact of pollution. • Re-seeding / re-vegetation of all areas of bare ground or the placement of Geo-jute (or similar) matting will take place prior to the start of the operational phase to prevent silt-laden run-off. The seed mix will contain only suitable native species of plant. • Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the project. These stone check dams will only be placed within artificial drainage systems such as roadside drains and not in natural streams or drainage lines. • A full review of construction stage temporary drainage will be undertaken by the Developer (in conjunction with the Project Hydrologist/ Site Engineer and the Project Ecologist) following the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure.		
MM35	Flora and Fauna	Chapter 7: Ornithology	7.5.1.2 Measures to prevent disturbance to breeding Hen Harriers	A section of the grid connection route is located along the route of an existing forestry road which runs north of the Mullaghanish to Musheramore Mountain SPA, with the closest distance between the cable route corridor and the SPA being 170 m. To prevent any potential disturbance to nesting and/or foraging hen harriers, works will be restricted along the identified section to the period outside of the breeding season (March-August). This		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				will ensure that the breeding hen harrier population within the SPA is not disturbed by the Project.		
MM36	Flora and Fauna	Chapter 7: Ornithology	7.5.1.3 Measures to prevent disturbance to sensitive bird species	The study has identified Red Grouse and Snipe (both Red-listed) as the species most sensitive to disturbance that are known to nest within the site. Should any of these species be recorded breeding within 500m of the works area (as established through monitoring during construction), a buffer zone shall be established around the expected location of the nest and works will be restricted until it can be demonstrated by an ecologist that the species has completed breeding in the identified area. Any restricted area that is required to be set up will be marked clearly marked using hazard tape fencing and all site staff will be alerted through toolbox talks.		
MM37	Land Use	Chapter 8: Soil and Geology	8.6.2.1 Land Take	To facilitate the access roads, civil works, site compounds, borrow pits and Turbine Hardstands, 25.68 ha coniferous forestry will need to be clearfelled. The felling area proposed is the minimum necessary to construct the Project and to comply with any environmental mitigation.		
MM38	Peat Management	Chapter 8 Soil and Geology	8.6.2.2.2 Subsoil and Bedrock Removal Mitigation by Good Practices	Excavation of peat in areas where there is >1.0 m in peat depth will follow appropriate engineering controls such as the drainage of the peat along the proposed Site tracks in advance of excavation activity (1 month in advance where possible) so as to reduce pore water content and thus instability of the peat substrate prior to excavation. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains will not be positioned parallel to slope contours, that is, a gradient more than zero. It is noted that some drains will be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				close to parallel with elevation contours. This drainage will be attenuated prior to outfall. It is noted that peat depth at the Site is generally shallow and management of saturated peat will be required at relatively few locations. In those parts of the Site where excavation may intercept areas of peat that are >1.0 m depth, a geotechnical engineer/engineering geologist will be onsite to supervise and manage the excavation works and confirm the necessity for supporting newly excavated peat exposures or redirect initial construction phase drainage to maintain ground stability. For side walls in all excavations a safe angle of repose will be established. This will ensure the potential for side wall collapse will be minimised. For peat, the safe angle of repose is approximately 15°, which equates to a c. 10m horizontal distance if excavating to 2.5 m depth, however given the quality of the peat, and the potential residual water content after pre-excavation drainage works, or increased water content following heavy rainfall events, there remains a risk of localised stability issues arising in areas of deeper peat. Therefore, for excavation in areas of deeper peat (>2.0 m) excavation supports will be used and this will be incorporated into the CEMP for the Development, for example temporary sheet piling, or similar. This will minimise the effect of excavation to the minimum required. Areas of the site where deeper (>2.0 m) peat was detected during site surveys are presented in geo-constraint maps (**Appendix 8.1**). Similarly, the safe angle of repose for subsoils at the Site (GRAVELS), or any other material (e.g., crushed rock) arising at the site must also be considered and similar consideration and mitigation applied respectively.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Adopting good practices, planning ahead and real time monitoring in more sensitive (>1 m peat depth) areas will ensure that any excavations associated with the Development will have minimal impact, that is the risk of the activity of excavation having an increasing or variable impact will be reduced. Similarly, application of the above mitigation measures will reduce the risk of stability issues arising at a localised scale.		
MM39	Peat Management	Chapter 8 Soil and Geology	8.5.2.2.4 Subsoil and Bedrock Removal Mitigation by Reuse	Bedrock material arising at the Site will be reused as fill material, but Site Access Roads and Turbine Hardstands will be surfaced with a harder rock imported to the Site. The imported rock will be locally sourced and similar in nature to the local area in term of geo-chemistry. Similar precautions should be considered when handling and reusing subsoil materials on site due to the risk of enhanced entrainment of solids in runoff. Excess bedrock will be reused as backfill in areas previously excavated, or as backfill in cut and fill operations, for example; Site Access Roads and Turbine Hardstands. Using the local bedrock as fill will ensure that impacts to hydrochemistry are minimised. Geotechnical testing on imported material will be carried out prior to its reuse onsite particularly for reuse as a running or load bearing surface and will only be reused for those purposes if the suitability of same is conforms to relevant standards. Peat material excavated will be reused as backfill in areas previously excavated as much as possible, and/or for reinstatement works elsewhere on the Site. To facilitate this the acrotelm (living layer) and the catotelm (lower layer) will be treated as two separate materials. Catotelm peat will be used to		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				backfill, for example around turbine foundation pads once established. Acrotelm peat will be used as a dressing on top of deposited catotelm peat in order to promote and re-establish flora and ensure the acrotelm layer becomes relatively cohesive in terms of localised peat stability (vegetated). Similarly, all soil and subsoil types or horizons identified during site investigations and during actual construction, **Appendix 8.1**, will be treated as separate materials and arisings separated accordingly. This includes, for example Acrotelm peat, catotelm pet, clays, subsoils (GRAVEL / TILL), weathered rock. Suitable temporary set down areas which will be located within the Development footprint will be identified and will consider and avoid geo-constraints identified in **Chapter 8: Soils and Geology.** Temporary set down / stockpile areas will be considered similarly to active excavation areas in terms of applying precautionary measures and good practices, and mitigation measures, including those relating to control of runoff and entrapment of suspended solids.		
MM40	Peat Management	Chapter 8 Soil and Geology	8.5.2.2.5 Subsoil and Bedrock Removal Mitigation by Remediation	Excess subsoils and bedrock will be used for remediation and reinstatement purposes elsewhere on the Site, including areas already impacted by agricultural activities, eroded or degraded areas, for example, reinstating original ground level in areas of cut peat and/or damming drains in peat areas.		
MM41	Peat Management	Chapter 8 Soil and Geology	8.6.2.3 Storage of Stockpiles Mitigation by Avoidance and Good	No permanent stockpiles will remain on the Site. All excavated materials from the Site or introduced materials for construction will be either used or removed from the Site.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Practice	No temporary stockpiles will be positioned or placed on areas of peat which have not been assessed or are indicated as being geo-hazards, particularly in areas of unacceptable factor of safety / stability (**Appendix B, Appendix I, Appendix 8.1**). All temporary stockpiles will be positioned on established and existing hardstand areas or in designated areas which are appropriate for short term storage. No temporary stockpile placed on established hardstands in areas of deeper peat will be in excess of 1 m in height. This is due to potential localised stability and subsidence issues in relation to the peat under and in vicinity of the hardstand and stockpile. Immediate reuse of material in so far as practical, is recommended. For example, the material arising from the first excavation is deposited in areas identified as having potential for restoration or requiring fill, the material arising from the second excavation is used as fill and reinstatement material in the first excavation location, etc.		
MM42	Peat Management	Chapter 8 Soil and Geology	8.6.2.3.2 Storage of Stockpiles Mitigation by Reduction	Volumes and types of materials arising, temporary stockpiling locations, routes for reuse and remediation, requirements in terms of logistics and considerations in terms of timing and planning of movements of material will be recorded. The material arising from any excavation will have a predetermined plan and route for re-use / remediation, or disposal if all potential for reuse / remediation have been exhausted. The Construction Environmental Management Plan (**Appendix 2.1: CEMP**) will be updated accordingly during the construction phase.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Mitigation measures for stockpiles related to the Grid Connection Route are as follows: Stockpiles will be restricted to less than 2 m in height and will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW). Additionally, any excavated material will be later used to backfill the trench where appropriate, any surplus material will be transported to a licensed facility.		
MM43	Peat Management	Chapter 8 Soil and Geology	8.6.2.4.1 Vehicular Movements Mitigation by Avoidance and Good Practice	Vehicular movements will be restricted to the footprint of the Project and advancing ahead of any constructed hardstand will be minimised in so far as practical. For example, excavation ahead of established hardstands will be in line with expected phases of Turbine Hardstand and Site Access Road construction in terms of both delivery of and installation of material and site activity periods whereby excavations will not be opened ahead of site shut down periods. This will be done with a view to minimising soils / subsoils exposure to rain and runoff. Ancillary machinery will be kept on established Turbine Hardstands, and no vehicles will be permitted outside of the footprint of the Project and will not move onto land that is not proposed for the Project if it can be avoided. Where vehicular movement are necessary outside of the Project, ground conditions will be maintained as well as possible. This includes for example replacing sods, smoothing over with excavator bucket etc. Where ground conditions are poor, or prolonged works, temporary access measures will be deployed, for example floating platforms / floating access track.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				For the Grid Connection Route, before starting construction, the area around the edge of each joint bay which will be used by heavy vehicles will be surfaced with a terram cover (if required) and stone aggregate to minimise ground damage.		
MM44	Peat Management	Chapter 8 Soil and Geology	8.6.2.5.1 Ground Stability Mitigation by Avoidance and Good Practice	All Site excavations and construction will be supervised by a geotechnical engineer/engineering geologist. The Contractor's * methodology statement and risk assessment will be in line with the Construction Environmental Management Plan and will be reviewed and approved by a suitably qualified geotechnical engineer/engineering geologist prior to Site operations. (* Contractor here refers to the chosen or contracted construction company at the commencement stage of the Project). Any excavations that have the potential to undermine the up-slope component of a peat and / or unstable subsoil slope will be sufficiently supported by buttress, frame or rampart to resist lateral slippage. To this end, all new turbine foundation excavation locations will incorporate a safe angle of repose (**Section 8.5.2.2.2**). In such excavations, the groundwater level (pore water pressure) will be kept low at all times (excavation dewatering) to avoid ground stability risks (subsidence) associated with peat and careful attention will be given to the existing drainage and how structures might affect it. Draining water from the construction area will be done through advanced dewatering techniques. In particular, ponding of water will not be allowed to occur in recent excavations, particularly in any areas encountered where peat is >1 m. All deliberate or incidental		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				sumps will be drained to carry water away from the sump following rainfall. Otherwise, this water will increase hydraulic heads locally (or increased bog water or groundwater levels), increase pore water pressure and can potentially lead to instability. In areas of saturated peatlands, prior to excavation, drains will be established to effectively drain grounds prior to earthworks. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains on areas of the Site with minimal risk of bog failure as identified by Site Investigations will be positioned at a more acute angle to the slope contour in order to reduce the velocity of surface water drainage. It is noted that deeper (>2.0 m) peat at the site is generally confined to isolated pockets and the need for measures such as sheet piling is very low. Due to peat's fluid-like properties, all peat excavated will be immediately removed from sloping areas. Peat will be carefully managed particularly when in temporary storage. Temporary storage areas will be isolated from the receiving environment by means of temporary infrastructure such as boundary berms comprised of subsoils sourced at the site, or similar material. There is potential for large volumes of bog water draining from new stockpiles which will also be managed. Mitigation will include removal of gross solids from runoff prior to bog water intercepting the wind farm drainage network. Temporary measures such as dewatering and pumping through silt bags will be employed to assist this process. Draining of stockpiled peat, in a controlled manner is recommended, (**Management Plan 4 CEMP Appendix 2.1),** with a view to reducing the weight and mobility of the material, therefore reducing risk in terms of		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				localised stability. Similar measures will be applied to the management of subsoil arisings at the site. Peat is required for reinstatement, therefore acrotelm peat (top living layer, c. 0.5 m) will be stripped off the surface of the bog and placed carefully at the margins of the Development along the Site Access Roads and Turbine Hardstand margins that are characterised by near-horizontal slopes (<6°). Relatively high impact construction activities (e.g., excavations, movement of soils / subsoils / rock) are acceptable to be carried out throughout the year, when taking into account the various restrictions of the Project, (for example, breeding bird seasons). However, considering the variability of metrological conditions and the potential for significant events to occur at any stage of the year, the construction phase will be limited to favourable meteorological conditions. In order to mitigate for particular earth works tasks and suitable meteorological conditions, construction activities will not occur during periods of sustained significant rainfall events, or directly after such events (allowing time for work areas to drain excessive surface water loading and discharge rates reduce). From examination of factual evidence to date, the majority of landslides occur after an intense period of rainfall. Stability issues at a localised scale will be similarly impacted by rainfall events, particularly when dealing with exposed soils or open excavations. An emergency response system will be developed for the construction phase of the Project, particularly during the early excavation phase. This, at a minimum, will involve 24-hour advance meteorological forecasting (Met Éireann) linked to a trigger-response system. When a pre-determined rainfall trigger		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				level is exceeded (e.g. one in a 100-year storm event or very heavy rainfall at >25 mm/hr), planned responses will be undertaken. These responses will include; cessation of construction until the storm event including storm runoff has passed over. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions, for example dewatering of standing water in open excavations, etc.		
MM45	Peat Management	Chapter 8 Soil and Geology	8.6.2.5.2 Ground Stability Mitigation by Reduction Appendix 2.1 CEMP	The temporary storage of construction materials, equipment, and earth materials will be kept to an absolute minimum during the construction phase of the Project This will be achieved by means of appropriate planning and logistical considerations, similar to the measures set out in relation to the management of spoil on the Site. For example, the excavation material for the construction of access track will not progress ahead of actual track construction (as discussed under mitigation addressing vehicular movements), therefore minimising the volume of arisings to be managed. Areas for permanent deposit of material e.g., backfill adjacent to constructed infrastructure, will be identified and suitable material deposited as it becomes available.		
MM46	Peat Management	Chapter 8 Soil and Geology	8.5.2.5.3 Ground Stability Mitigation by Remediation	Remediation of soils will include the deposit of suitable material where required. This will include replacement of soils / subsoils in line with baseline conditions. For example, the three principal materials excavated in order of depth will include peat / peat soil (including segregated acrotelm (top living layer) and catotelm peat) or topsoil at the surface, till, and crushed rock. Remediated areas will be managed and monitored in terms of reestablishment of vegetated cover.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				In the unlikely event that a peat or slope stability issue does arise on the Site during the construction or operational phases of the Project given the variable potential extent of associated impacts, remediation will be assessed, prescribed and monitored by a suitably qualified geotechnical engineer/engineering geologist on a case-by-case basis.		
MM47	Peat Management	Chapter 8 Soil and Geology	8.6.2.5.4 Ground Stability Emergency Response and Monitoring Appendix 2.1 CEMP	Emergency responses to potential stability incidents have been established and form part of the CEMP, **Management Plan 1, Emergency Response Plan** before construction works initiate. The following potential emergencies and respective emergency responses are addressed in brief: • Peat stability issues at a localised scale during excavation works – In the event that soil stability issues arise during construction activities, all ongoing construction activities at the particular area of the Site will cease immediately, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. Localised stability issues will likely occur with a broad range in severity including; minor side will collapse with no significant impact, to relatively significant areas of peat being impacted by excavation activities, or in worst case scenarios localised stability at one location triggering a chain of events leading to significant peat or slope stability issue arising. The assigned geotechnical engineer will assess each scenario and will escalate to the following mitigation scope as the need arises. • Provision for a peat stability monitoring programme to identify early signs of potential bog slides (pre-failure indicators, for example cracks forming). This will be done in		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				line with Scottish Government's 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Developments 2017). • Significant peat or slope stability issues during construction activities – In the unlikely event that soil and slope stability issues arise during construction activities, all ongoing activities in the vicinity will cease immediately, all operators will evacuate the area by foot, if safe to do so, until the area is assessed by competent person/s, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. The area impacted will be characterised fully and risk assessments completed prior to any further works commencing at or near the location. This assessment will be phased including initial rapid response Phase 1 Assessment which will include at a minimum the prescription of exclusion zones and preliminary mitigation steps to be taken, for example; the management of runoff in or from the affected area. Considering the highly dynamic nature of peat or soil stability issues at any particular site, it is important to establish an equally dynamic yet robust framework to follow in the event of an incident. Establishment of an emergency framework will follow relevant guidance to initially qualify any incident (by on site competent geotechnical engineer) and risk assess the area, and to then apply initial measures and design a complete emergency / contingency plan in line with an established structured emergency response. Relevant guidance includes as presented in **Section 8.3** of **Chapter 8 Soil and Geology** will be adhered to.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Emergency response will prioritise isolating and containing any materials which is being or will be intercepted by the established drainage network or receiving surface water network. Emergency materials and equipment requirements will be identified, incorporated in the CEMP, and will be managed on site with a view to be being easily accessible and readily available. On-site training and toolbox talks will ensure any response to any potential incident is mobilised quickly and efficiently. The following is a non-exhaustive list of potential emergencies and respective emergency responses: • Peat stability issues at a localised scale during excavation works – In the event that soil stability issues arise during construction activities, all ongoing construction activities at the particular area of the Site will cease immediately, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. • Significant peat or slope stability issues during construction activities – In the unlikely event that soil and slope stability issues arise during construction activities, all ongoing activities in the vicinity will cease immediately, operators will evacuate the area by foot, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. Precautionary measures e.g., silt screen fencing etc. will be in place. Emergency response above existing or in place measures might include crudely building dams with an excavator to attenuate or direct flow until conditions stabilise, depositing subsoil or crushed rock material to dam drainage channels, and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				reactionary dewatering through silt bags to appropriate areas of the site i.e., vegetated area and without impacting on problem area in terms of stability.		
MM48	Peat Management	Chapter 8 Soil and Geology	8.5.2.6.1 Soil Contamination Mitigation by Avoidance	In the event an accidental discharge was to occur without mitigation, contaminates will likely leak or be spilled on soils initially. Protecting soils from such will in turn mitigate against the potential for contaminates reaching the hydrological network associated with the Site		
MM49	Peat Management	Chapter 8 Soil and Geology	8.5.2.6.2 Soil Contamination Mitigation by Reduction	The potential for contaminants will be reduced by managing the importation and mobilisation of equipment and materials associated with the Development, as follows: • Excess packaging and other materials will be discarded appropriately at the Temporary Construction Compound before advancing to the destined construction area. • Any vehicles coming onto the Site will be required to be inspected and cleaned before leaving the Temporary Construction Compound before advancing to the destined construction area. • Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Project where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Development where the use of precast concrete will be used include e.g., structural elements of watercourse crossings (single span / closed culverts) as well as cable joint bay structures. Elements of the Project where the use of precast concrete is not possible includes e.g., turbine foundations.		
MM50	Peat	Chapter 8 Soil	8.6.2.6.3	Mitigation by remediation, for example, housekeeping,		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
	Management	and Geology	Soil Contamination Mitigation by Remediation	maintenance etc, in terms of waste or contaminants will be an ongoing measure throughout the construction phase of the Project, that is any and all contaminants will be removed from the Site in an appropriate manner when ever produced or observed.		
MM51	Peat Management	Chapter 8 Soil and Geology	8.6.2.6.4 Soil Contamination Emergency Response	Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the Project. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand. Significant hydrocarbon spill or leak – In the event of a significant or catastrophic hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as the installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons, excavation and disposal of contaminated material. Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand. Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Wildlife Service will be displayed in a prominent position within the vicinity of works. In the event of a significant contamination or pollution incident e.g., discharge or accidental release of hydrocarbons / fuel to surface water systems, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. The relevant authorities, noted above and stakeholders will also be promptly informed.		
MM52	Peat Management	Chapter 8 Soil and Geology Appendix 2.1 CEMP	8.6.2.7 Material and Waste Management	A site-specific Peat and Spoil Management Plan and a Waste Management Plan has been prepared as part of **Appendix 2.1, Management Plan 4**. All excavated earth materials will either be re-used in an environmentally appropriate and safe manner e.g., landscaping and bog restoration OR removed from the Site at the end of the construction phase. No permeant stockpiles will be left on the site. Any surplus of natural materials (e.g., peat) to be used as backfill or deposited elsewhere in the Site will not be deposited to above existing ground level for the area in question. This ensures that peat used as backfill around newly established turbine foundations will not exceed local ground level, and any peat or natural materials deposited elsewhere, for example peat cutting areas, will not exceed original ground level. In essence, no permanent stockpiles will be established as a product of the construction phase of the Project, or associated restoration activities as all materials will be re-used as much as possible on-site. Excavated materials onsite will be reused and recycled		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				according to the Waste Hierarchy as much as possible. Where it is not possible to do so, any excess materials (road building materials) or artificial (PVC piping, cement materials, electrical wiring etc.) will be taken offsite and disposed of at a licensed facility at the end of the construction phase, refer to **Appendix 2.1**, **Management Plan 5: Waste Management**. Any accidental spillage of introduced materials, such as concrete, will be removed from the Site. The CEMP will include scheduled checks on equipment, materials storage and transfer areas, drainage structures and their attenuation ability (covered in greater detail in the Hydrology chapter of this report) on an ongoing / daily basis during the construction phase of the project. The purpose of this management control is to ensure that the measures in place are operating effectively, prevent accidental leakages, and identify potential breaches in the protective retention and attenuation network during earthworks operations. In addition, all such management plans will be revised as 'live' documents, so that lessons learned and improvements will be made over course of the Project. It is noted that the Project intends to reuse all surplus excavated material at the site, however in the event of waste arising at the site, management of waste arising from the construction phase of the Project will require classification, appropriate transfer, and appropriate disposal. Waste streams will vary and will include the following potential categories: • Inert / Non-Hazardous Soils & Stones (EWC Code: 17 05 04) – greenfield subsoils and bedrock is likely to be Inert. This could include surplus coarse / hardcore		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				aggregate contaminated with soils remaining at the end of the construction phase of the development. • Hazardous Soils & Stones (EWC Code: 17 05 03*) or oily waste (spill kit consumables) – Soils or any materials with significant hydrocarbon contamination will likely be hazardous due to Total Petroleum Hydrocarbon concentrations. Soils impacted by significantly by cementitious material contamination will likely be hazardous due to elevated pH concentrations.		
MM53	Peat Management	Chapter 9: Hydrology and Hydrogeology	9.6.2.1 Earthworks Proposed Mitigation Measures – General / Wind Farm	Mitigation measures to reduce the potential for adverse impacts arising from earth works and management of spoil the following: • Management of excavated material – A Peat and Spoil Management Plan has been prepared and forms **Management Plan 4** of the Construction & Environmental Management Plan (CEMP, **Appendix 2.1**). It incorporates provision on materials management with a view to establishing material balance (reuse of excavation arisings) during the proposed construction phase, thus minimising the potential for or the length of time excavated materials are exposed and vulnerable to entrainment by surface water runoff. • No permanent stockpile will remain on the site during the construction or operational phase of the Project. Excavated materials will be stored temporarily adjacent to the excavation sites (**Management Plan 4, Appendix 2.1**). Geohazards described under **Chapter 8: Soils and Geology, Appendix H,** have also been considered. • Earthworks will be limited to seasonally dry periods and will not occur during sustained or intense rainfall events. Similar to measures outlined in relation to ground stability during excavation works (**Chapter 8: Soils and**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Geology), an emergency response system has been developed for the construction phase of the project (see **Management Plan 1 – Environmental Response Plan** and **Section 5.10 of Management Plan 3, Appendix 2.1**), particularly during the early excavation phase. This involves 24-hour advance meteorological forecasting (downloadable from Met Éireann) linked to a trigger-response system. When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any yellow or greater rainfall warning (>25 mm/hour) issued by Met Éireann), planned responses will be undertaken. These responses will include; cessation of construction until the storm event including storm runoff has passed over, assessment of construction areas and infrastructure by Ecological Clerk of Works, and confirmation no additional escalation of response is required. All construction works will cease during storm events such as yellow warning (Met Éireann) rainfall events. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions, for example, dewatering of standing water in open excavations, repair works to drainage features if necessary. • Exposed soils/peat (exposed temporary stockpiles) will be covered with plastic sheeting during all heavy rainfall / storm events and during periods where works have temporarily ceased before completion at a particular area (e.g., weekends, overnight, etc). • All drainage infrastructure (as per drainage design, **Sections 4 and 5 of Management Plan 3, Appendix**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				2.1) required for the management of surface water runoff or draining peat ahead of excavation works will be established before excavation works commence. Similarly, mitigation measures related to surface water quality will be implemented before excavation works commence. • Conceptual and information graphics presented in **Appendix 9.6 – Tile no. 7, 8 and 9** present indicative layout and specification for both passive treatment trains (clean water interceptor drains), active management treatment trains (management and treatment of construction water) and emergency response and intervention.		
MM54	Site Drainage	Chapter 9: Hydrology and Hydrogeology Appendix 2.1 CEMP	9.5.2.2 Earthworks Proposed Mitigation Measures – Grid Connection Route	The Grid Connection Route will require excavation of cable trenches in existing roadways as well as forestry tracks and private lands. With reference to general excavation practices discussed above, excavation of cable trenches in close proximity to surface water features will require special consideration in terms of managing movements, spoil arising from excavations, and entrainment of solids and contaminants in surface water runoff. Mitigation measures to reduce the potential for adverse impacts arising from earth works and management of spoil include the following: • In sensitive areas, excavation of material will be conducted in a controlled manner whereby any temporary deposit of the material in buffer zones can be minimised. For example, vacuum excavation techniques or similar will be used for excavations within Surface Water Buffer zones and other sensitive areas (constraints) (**Figure 9.13a)**. Excavated soil will be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				removed to temporary storage areas. • Management of excavated material will adhere to the measures related to the management of temporary stockpiles outlined in **Chapter 8: Soils and Geology**, a Peat and Spoil Management Plan has been established and forms part of the Construction & Environmental Management Plan (CEMP, **Appendix 2.1, Management Plan 4**) with a view to establishing material balance during the proposed construction phase, thus minimising the potential for, or the length of time excavated materials are exposed and vulnerable to entrainment by surface water runoff. No permanent, or semi-permanent stockpile will remain on the site during the construction or operational phase of the Development. • All spoil from trenches in public roadways will be removed form Site as it is excavated and transported to a licenced facility for soil and stones. (**Appendix 2.1 CEMP, Management Plan 5: Waste Management Plan**) Road surfacing materials will be stored in a ship for recycling by adding bitumen. • Temporary stockpile locations will be situated outside of Surface Water Buffer Zones (as seen in **Figure 9.13a)**. Temporary Spoil stockpiles shall have side slopes battered back to a safe angle of repose, e.g., 1:1. Silt fencing is to be erected around the base of the temporary mound. Soil will be reinstated on completion of drilling and jointing operations. Temporary storage areas will require bunding and management of runoff likely contaminated with suspended solids (**Appendix 9.6 – Tile 7, 8, 9**). Management of construction waters is discussed in following sections.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Earthworks will be limited to meteorologically dry periods and will not occur during sustained or intense rainfall events. Similar to measures outlined in relation ground stability during excavation works (**Chapter 8: Soils and Geology**), and as discussed in this chapter, an emergency response system has been developed for the construction phase of the project (see **Management Plan 1** appended to the CEMP, **Appendix 2.1**), particularly during the early excavation phase. This, at a minimum, will involve 24 hour advance meteorological forecasting (Met Éireann download) linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g., 1 in 100 year storm event or very heavy rainfall at >25 mm/hr), planned responses will be undertaken. These responses will include cessation of construction until the storm event including storm runoff surge has passed over. Following heavy rainfall events, and before construction works recommence, the site will be inspected and corrective measures implemented to ensure safe working conditions, for example dewatering of standing water in open excavations and transfer to treatment train.		
MM55	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.3 Construction Water Management, Dewatering, Treatment & Discharge of Trade Effluent	Mitigation measures to reduce the potential for adverse impacts arising from earth works / management of spoil and associated entrainment of solids in runoff and construction water will include the following: • . • Management of excavations, that is areas of soil / subsoils to be excavated will be drained ahead of excavation works by sumps, in a stepped / phased approach whenever necessary, with the aim of		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				temporarily lowering groundwater levels to allow excavation to be carried out in dry and stable conditions. For example, saturated areas of peat, thus reducing the volumes of water encountered during excavation works. • Engineered drainage and attenuation features (discussed in following sections) will be established concurrent with excavation works. • Dewatering flow rate or pumping rate will be controlled by an inline gate valve or similar infrastructure (**Appendix 9.6- Tile 8, Tile 11**). This will facilitate reduction of loading on the receiving drainage and attenuation network, thus enhancing the attenuation and settlement of suspended solids. All pumped water will be discharged to constructed drainage and in line treatment train or to a vegetated surface through a silt bag (**Appendix 9.6 – Tile 12**) outside of surface water buffer zones **(Management Plan 3, Appendix 2.1** and **Appendix 9.6 – Tiles 7, 9 and 12).** Dewatering is a dynamic process and will require continuous monitoring and modification depending on conditions encountered (**Appendix 9.6 – Tile 8, refer to Section 9.5.5.5**). • In some areas of the Project constraints related to incline and/or stability, or construction activities within the prescribed buffer zones, will likely limit the potential for installation of engineered attenuation features. In such instances water arising from dewatering activities will be directed or pumped to a settlement tank (**Appendix 9.6 – Tile 8**) before being discharged to the receiving drainage network, OR pumped to an area of the site where the installation of attenuation features is suitable. Areas with such constraints are presented in **Figure 9.13a**. • No extracted or pumped water will be discharged directly		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				to the drainage or surface water network associated with the Site (This is in accordance with the Local Government (Water Pollution) Act, 1977 as amended).		
MM56	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.4.1 Active Construction Water Management	In all instances where construction water, or runoff has the potential to entrain solids during excavation and other construction activities, runoff will be contained by means of temporary berms (lined geotextile of similar), bunds (lined) and sumps. This will be referred to as Dewatering. Construction water (contaminated) will be pumped to the Treatment Train (**Appendix 9.6 Tiles 7,8 and 9)**. Contaminated water arising from construction works, namely; excavations, drilling and temporary stockpiling, will be contained and treated prior to release or discharge. The schematic presented here is a conceptual model of measures implemented to manage arisings and runoff (Letter headings align with **Appendix 9.6 – Tile 8)**: A. Arisings. Arisings from the launch / reception pit, or any other significant excavation (e.g., cable joint bays), will be directed the treatment train. B. Temporary Bund. Arising control area i.e., a temporary bund. Gross solids will be temporarily deposited here. Water arising with the material will be allowed to drain to sump. C. Sump / Pump. Sump will discharge by gravity / pumped to stilling pond. D. Temporary Stilling Pond. This can be constructed using soils for bunding in combination with an impermeable liner. E. Outfall. The outfall from the stilling pond will be buffered (coarse aggregate) to dissipate energy and diffuse discharging water. F. Silt Screen. A silt screen will be in place down gradient of the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Stilling Pond outfall. This is a precautionary measure to mitigate peak loads or surcharges in the system. G. Monitoring Location/s. Discharge quality will be monitored in real time using telemetry systems. Monitoring of discharge quality will be carried out at the outfall of the stilling pond i.e., before being actually discharged to surface vegetation or surface water (licenced). H. Sump / Pump. Discharge By-Pass. If water discharging from the stilling pond exceeds quality reference limits water will be diverted (pumped) from the stilling pond to the settlement / treatment tank. I. Stilling Pond By-Pass. Similar to Discharge By-Pass, if conditions dictate water can be diverted directly to Settlement / Treatment Tank. J. Settlement / Treatment Tank. A settlement tank will in line and ready to use if required i.e., water quality at stilling pond outfall fails to meet quality reference limits. The tank will be equipped with treatment systems which will be activated as the need arises, for example, very fine particles which are very slow to settle can be treated with a flocculant agent to promote settlement of particles. K. GAC Vessel/s. As a precautionary measure, GAC (Granulated Activated Carbon) vessel/s will be in line and ready to use if required. GAC vessels are used to filter out low concentrations of hydrocarbons. Significant hydrocarbon contamination is only envisaged under accidental circumstances. If a hydrocarbon spill does occur, normal operations will pause and the treatment train will be utilised to remediate captured contaminated runoff. L. GAC Vessel By-Pass. If the quality of the water is acceptable in terms of hydrocarbon contamination. M. Treated water will be discharge by gravity / pump to the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				stilling pond for additional clarification, monitoring and buffered discharge to vegetated area. N. Silt Bag. A silt bag can be used as alternative to stilling ponds. However, silt bags must only be used as primary method in lower risk areas i.e., outside of buffer zones, etc. Stilling ponds will be the primary method (D, N) is circumstances where risk is elevated, however a gate vale and silt bag can be included in the treatment train and used as an emergency discharge route in the event that the stilling pond needs remediation or maintenance. In all instances, stilling ponds (D), Silt Bags (N) and outfalls (E) will be situated outside of surface water buffer zones. At many locations, particularly at HDD locations works will be within buffer zones. In these instances, waters can be pumped to the treatment train which can be positioned upgradient along the road (Grid Connection Route) where discharge to vegetated areas / roadside drains can be managed. Discharge of non-contaminated storm runoff to vegetated land within a site red line boundary is not a licenced activity however this methodology is possible only under relatively low flow conditions (e.g., <2 litres per second (L/s) typical of runoff over a relatively small site area. In the event that the expected incoming flow rate or dewatering rate is relatively high (>2 L/s) a discharge licence will be acquired, and trade effluent will be discharge directly to the surface water network. The latter will include all works associated with HDD. The discharge points will be identified during the licence application process. As discussed previously, the main components of the treatment will be positioned outside of the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				prescribed surface water buffer zone where possible. The developer will identify suitable locations for the establishment of temporary infrastructure considering other variable such as traffic and access management. Similarly, the preferred location of discharge points will be outside of buffer zones and into minor or non-mapped surface water / drainage features where possible. The subject drain will be inspected to ensure connection to the mapped network (not blocked). The quality of the water being discharged will be monitored. If discharge water quality is poor (e.g., >25 mg/L) additional measures will be implemented, for example, pausing works as required and treating construction water by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped settlement tank. Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the Site. Silt fences will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced. The discharge area will be outside of designated surface water buffer areas (similar to dewatering of excavations. The quality of water discharged will be in line with licence discharge limits assigned by the Council and will be monitored in real time (telemetry with 15 minutes sampling rate), as well as laboratory samples taken, analysed and reported and the frequency indicated in the licence. Daily sampling is recommended given the short duration and temporary nature of the works. Discharging of construction water (trade effluent) directly to surface waters or groundwater is a licenced activity. (This is in accordance with Local Government (Water Pollution) Act, 1977		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				as amended). Active Construction Water Management will be utilised for all works within surface water buffer zones, and for all over pumping. This is particularly applicable for works at T2, where the mapped streams will be required to be over pumped for the duration of the construction phase.		
MM57	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.4.2 Passive Construction Water and Runoff Management	Passive management systems (**Appendix 9.6 – Tile 7,** refer also to diagrams in **Management Plan 3, Appendix 2.1**) include some of the features described in Active Management treatment trains. These include: • Spoil bunds and/or temporary berms. Spoil bunds and/or berms will be constructed using either crushed rock or clean soils and overlain or lined with an impermeable layer e.g., geotextile or plastic membrane. These features are intended to control the movement of construction water / runoff with a view to; ○ Containing contaminated water (e.g., drilling / excavation spoil and runoff laden with solids). Temporary bunds will be used to manage spoil arising from drilling operations or saturated spoil arising from excavations in sensitive areas e.g., within SW buffer zones. ○ To divert runoff i.e., divert clean/storm runoff during construction works or contaminated construction water away from sensitive receptors such as drains/surface waters directly adjacent to construction areas. • Silt screens. These will be utilised in a similar sense to berms whereby, silt screens will be installed between construction areas and sensitive receptors, including:		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				○ At the outfall of the treatment train where discharging to vegetated ground or within non-mapped drains (within redline boundary). ○ Along the permitter of construction areas which are directly adjacent to watercourses or within surface water buffer zones. This includes all watercourse crossings and sections of Grid Connection Route alongside adjacent watercourses. Passive systems are intended to function with minimal supervision, however in the management of construction water on this site or development, in many cases the diverted water will likely require active management to ensure sensitive receptors are protected. For example, diverted storm water, if clean can discharge to the receiving vegetated areas or existing drains, but any construction waters impacted by contaminants on the site must be managed, and potentially active management / treatment is required.		
MM58	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.5 Release and Transport of Suspended Solids Proposed Mitigation Measures	In order to mitigate the impact posed by release of suspended solids to the surface water environment, the following mitigation measures will be implemented. The drainage, attenuation and other surface water runoff management systems will be installed concurrent with the main construction activities to control increased runoff and associated suspended solids loads in runoff during intensive construction activities e.g., excavation of turbine base. Vehicular movements will be restricted to the footprint of the Project and advancing ahead of any constructed hardstand will be minimised in so far as practical. For example, excavation ahead of established		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				hardstands will be in line with expected phases of Turbine Hardstand and Site Access Road construction in terms of both delivery of and installation of material and site activity periods whereby excavations will not be opened ahead of site shut down periods. This will be done with a view to minimising soils / subsoils exposure to rain and runoff. Drainage infrastructure will be installed during meteorologically dry ground conditions (**Section 9.6.2.2**). Diffuse surface water runoff will be managed as follows: • With reference to **Management Plan 3, Appendix 2.1**, collector drains and/or soil berms will be established to direct/divert surface water runoff from development areas, including temporary stockpiles, and direct same into established treatment trains including stilling ponds, buffered discharge points or other surface water runoff control infrastructure as appropriate. This is particularly important for effective surface water management associated with proposed infrastructure within the varied surface water buffer zones. The drainage system will be permanent (see also **Appendix 9.6** for conceptual graphics). • Silt fences will be established along the perimeter of source areas e.g., stockpiles, within the drainage network, and in existing natural drains and degraded peat areas which are likely to receive surface water runoff (**Appendix 9.6 – Tile 14).** Section 5.5 of the Surface Water Management Plan (**Management Plan 3, Appendix 2.1**) describes this in more detail. This will reduce the potential for surface water runoff loaded with suspended solids to rapidly infiltrate towards and be intercepted by drainage or significant surface water		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				features. Where possible multiple silt fences will be installed at multiple locations in drains / treatment trains discharging to the surface water network. Double silt fences / screens will be deployed at outfalls within surface water buffer areas (**Appendix 9.6 – Tiles 7 – 9**). Silt fences will be temporary features but will remain in place for a period following the completion of the Construction Phase (until such time that site conditions are stable. Waters arising as a product of excavation activities will be managed as follows: • Waters arising from dewatering practices during excavation works will be significantly loaded with suspended solids. As such, constructed stilling ponds followed by buffered outfalls may be insufficient in controlling the release of suspended solids to the surface water network. Routine monitoring will prevent the possibility of clogging from significant volumes of settled or attenuated solids. Therefore, any water pumped from excavations, or any waters clearly heavily laden with suspended solids will be contained and managed and pumped through the preestablished Active Management treatment train (**Appendix 9.6 – Tile no. 8, 9 and 11).** This will include continuous active monitoring of water quality by turbidity measurement on an hourly basis. Waters (likely loaded with suspended solids) intercepted by the established drainage network will be managed as follows: • In line Stilling Ponds will buffer the run-off discharging from the drainage system during construction, by		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				retaining water, thus reducing the hydraulic loading to watercourses. Stilling ponds are designed to reduce flow velocity to 0.3 m/s at which velocity, silt particle settlement occurs. Stilling ponds will be permanent (life of development at minimum). The locations of stilling pond have been chosen as a part of the drainage design, refer to **Series 100 Site Layout Plans 6225-PL-100-107 planning drawings.** Flow control devices such as weirs and baffles will facilitate achieving better attenuation, particularly when considering fluctuating runoff rates (**Appendix 9.6 – Tile 11**). • In line Check Dams will be constructed across drains (**Appendix 9.6 - Tiles 3 – 6, Section 5.6 of Management Plan 3, Appendix 2.1)**. Check dams will reduce the velocity of run-off in turn facilitating the settlement of solids upstream of the dam. Check dams will also reduce the potential for erosion of drains. Rock filter bunds may be used for check dams however, wood or straw/hay bales (**Appendix 9.6 – Tile 13**) can also be used if properly anchored, that is; supported with rock or fitted timber to reduce potential for material to be swept away by incoming water. Multiple check dams will be installed, particularly in areas immediately downgradient of construction areas. Check dams will only be constructed in drainage infrastructure and not in significant surface water features i.e., streams or rivers. Check dams (comprised of rock) established will be permanent. The following will be implemented in the design of check dams and their deployment (CIRA, 2004): o Permanent rock filter bunds (coarse aggregate) will be used for check dams however, temporary		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				wood or straw/hay bales can also be used if properly anchored and if the need arises. Permanent rock filter bunds are preferred as this will ensure that rapid surface water runoff is mitigated against for the life of the Development. o Check dams will be installed at c. 20 m intervals within the length of drainage channels. This is dependent on the slope angle and height of check dams constructed, refer to **Appendix 9.6 – Tile no. 3**. o Check dams will include a small orifice / pipe at the base to allow the flow of water during low flow conditions i.e., maintain hydrological regime during low flow conditions. Note: the use of coarse aggregate will facilitate some infiltration. o Erosion protection will be established on the downstream side of the check dam i.e., cobbles or boulder (100-150 mm diameter) extending at least 1.2 m (**Appendix 9.6 – Tile no. 3 and 4**). o Check dams will be constructed as part of the drain i.e., reduce the potential for bypassing between the drain wall and check dam. o Further details and design considerations are presented in **Appendix 9.6 – Tile no. 3 to 6, refer also to Section 5 of Management Plan 3, Appendix 2.1.** • Surface water runoff will be discharged to land via buffered drainage outfalls (refer to **Appendix 9.6 Tiles 7, 8 and 12**, see also **Figure 4.2** and **Drawing Nos. 6226-PL-301** and **6226-PL-100 to 107** in **Management Plan 3**, **Appendix 2.1**). Buffered drainage outfalls will contain hard core material of similar or identical geology		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				to the bedrock at the site to entrap suspended sediment. In addition, these outfalls promote sediment percolation through vegetation in the buffer zone, removing sediment loading to acceptable levels any adjacent watercourses and avoiding direct discharge to the watercourse. A relatively high number of discharge points / buffered outfalls have been established as part of the design, thus decreasing the loading on any particular outfall. Discharging at regular intervals mimics the natural hydrology by encouraging percolation and by decreasing individual hydraulic loadings from discharge points. • As per the drainage design (**Figure 2.6**), buffered drainage outfalls will be located outside of surface water buffer zones. Similarly, outfalls will not be positioned in areas with extensive existing erosion and exposed soils. Buffered outfalls will be fanned and be comprised of coarse aggregate (cobbles / boulders) (**Appendix 9.6 – Tiles 12 and 13**). These structures will be akin to rip raps (coastal erosion defences/ outfall erosion defences). Silt fences (**Figure 2.6** and **Sections 4 and 5 of Management Plan 3, Appendix 2.1**) will be established downstream of buffered outfalls with a view to ensuring the effectiveness of the attenuation train, particularly during elevated flow events. Buffered outfalls established will be permanent. • Very fine solids, or colloidal particles, are very slow to settle out of waters and the finest of particles require near still water and relatively long periods of time to settle, therefore, such particles are unlikely to settle despite the aforementioned measures. To address this, as required, flocculant will be used to promote the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				settlement of finer solids prior to redistributing to the treatment train and discharging to surface water networks. Flocculant 'gel blocks' are available and can be placed in drainage channels upstream of stilling ponds. Gel blocks are passive systems, self-dosing and self-limiting, however they still require management (by the Contractor's Environmental Manager and supervised by the Developer appointed Environmental Clerk of Works (EnvCoW)) as per the manufacturer's instructions. Flocculants are made from ionic polymers. Cationic polymers (positive charge) are effective flocculants; however, their positive charge make them toxic to aquatic organisms. Anionic polymers (negative charge) are also effective flocculants, and are not toxic i.e., environmentally friendly [1]. Therefore, when flocculants are required, the material used must be made from anionic polymer. Gel blocks will be a temporary measure during the construction phase. • Straw bales (similar to stone check dams) (**Appendix 9.6 - Tile 13**), and silt fences (discussed under diffuse runoff) can also be used within drainage channels for the purposes of attenuating runoff and entrained suspended solids, however these measures should be considered temporary and will be used mainly in managing potential acute contamination incidents (e.g. additional features to control runoff during excavation works) or to facilitate temporary works (e.g. corrective actions, discussed in later sections). Note; the installation of straw bales or silt fences will require checking on a daily basis by the Contractor's Environmental Manager and supervised by the		

[1] USEPA (2013) Stormwater Best Management Practice – Polymer Flocculation (Available at: http://www.siltstop.com/pictures/US_EPA_Polymer_Flocculant_Handout__3-14.pdf)

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Environmental Clerk of Works (EnvCoW) to ensure the bypassing does not occur. Coarse stone / boulders could be used in conjunction with these measures to address such issues. The above measures, buffer zones, constructed drainage, check dams, two-stage stilling ponds design for attenuation, buffered outfalls are referred to as The Treatment Train, whereby the runoff will continuously be treated from source (construction area) to receptor (site exit, outfall of attenuation lagoon). Where necessary (>25 mg/l suspended solids) the treatment train will be augmented through the use of anionic polymer gel blocks. These measures reduce the suspended sediment and associated nutrient loading to surface water courses and mitigates potential impacts to water quality and on plant and animal ecologies downstream of the site. The precautionary and mitigation measures listed here will avoid, reduce or remedy all potential impacts on water quality and will ensure that the sensitive receptors in the catchment of the development do not suffer any deterioration in water quality, either during construction, operation, or decommissioning. With reference to **EIAR Chapter 6: Aquatic Biology**, the populations of Freshwater Pearl Mussel in the lower catchments of the windfarm (Sullane) and along the grid connection route will not be negatively affected by the Project Therefore, the risk to sensitive receptors is be low. Particularly sensitive areas are identified and presented in **Figure 9.13a** to inform the drainage design. The drainage design is presented on **JOD Drawings 6226-PL-100 to 6226-**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				PL-107 and calculations are included in **Management Plan 3 – Surface Water Management Plan** appended to the CEMP, **Appendix 2.1**. The design indicates in detail the locations of treatment train features, and the specification required at each location.		
MM59	Site Drainage	Chapter 9: Hydrology and Hydrogeology Appendix 2.1 CEMP	9.6.2.6 Release of Hydrocarbons Proposed Mitigation Measures	To control and contain any potential hydrocarbon and other harmful substances spillage by vehicles during construction, the refuelling of plant equipment will be carried out at a location separate from the Project Site where possible, thus mitigating this potential impact by avoidance. However, given the remote nature of the Site, this is not likely to be a practical measure for large machinery such as cranes used during the Development. Where fuelling offsite is impractical (e.g., bulldozers, cranes, etc.), and refuelling must occur on site, then a discrete "fuel station" (**Figure 2.16**) will be designated with the Contractor's compound for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station will be bunded to 110% volume capacity of fuels stored at the site. The bunded area will be drained by an oil interceptor and drainage of same will be controlled by a pent stock valve that will be opened to discharge storm water from the bund outside buffer zones. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning following construction. For site cranes, refuelling will take place outside of buffer zones and a drip tray will be used. Spill kits will be available within the refuelling vehicle for any such refuelling activity. Despite the management of refuelling and fuel storage, there		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				remains the risk of leakage from vehicles and plant equipment during construction activity. The plant equipment used on site will require regular mechanical checks and audits to prevent spillage of hydrocarbons on the exposed ground (during construction). As a precautionary measure, oil (hydrocarbon) absorbent booms will be installed in all surface water features associated with the Project, downstream of each of the proposed construction areas, and at principal surface water features draining the Site. Two oil booms will be installed at each required location, this will facilitate changing out of booms if needed, without facilitating direct flow of floating product during such activities if present. Oil booms deployed will have sufficient absorbency relative to the hazard, for example the volume of fuel in a particular construction vehicle. In the event of an accidental spill during the construction or operational phase of the Project, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. In this regard, spill kits will be kept in each vehicle associated with the Project i.e., spill kits will be readily available to all operators. Spill kits will contain a minimum of; oil absorbent granules, oil absorbent pads, oil absorbent booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter). No materials contaminated or otherwise will be left on the Site. Spill kits will also be established at proposed construction areas, for example a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Once the above measures are implemented the risk of hydrocarbon contamination intercepting the surface water network will be significantly reduced, however there remains a level of risk, and therefore both precautionary measures and emergency response protocols have been established and specified in Management Plans 1 and 3 of the CEMP, **Appendix 2.1**.		
MM60	Site Drainage	Chapter 9: Hydrology and Hydrogeology Appendix 2.1 CEMP	9.6.2.7 Construction and Cementitious Materials Proposed Mitigation Measures	In order to mitigate the potential impact posed by the use of concrete and the associated effects on surface water in the receiving environment, the following precautions and mitigation measures are recommended: • Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Project where precast concrete will be used have been identified and are indicated in the CEMP, Appendix 2.1. Elements of the Project where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Elements of the Project where the use of precast concrete is not possible includes turbine foundations and joint bay pit excavations. Where the use of precast concrete is not possible the following mitigation measures will apply. • Lean mix concrete, often used to provide protection to main foundations of infrastructure from soil biome, can alter the pH of water if introduced, which would then require the treatment of acid before being discharged to the surrounding environment. The use of lean mix concrete will be minimized, limited to the requirement of turbine foundations. The risk of runoff will be minimal, as concrete will be contained in an enclosed, excavated		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				area. • The acquisition, transport and use of any cement or concrete on site will be planned fully in advance of commencing works by the Contractor's Environmental Manager and supervised at all times by the Developer appointed Environmental Clerk of Works (EnvCoW). This entails minimising quantities on site, planning delivery routes and washout stations. • Vehicles transporting such material will be relatively clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on the vehicle which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the Contractor's yard. Vehicles will also be in good working order. • Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints. • Concrete will be poured during metrological dry periods/seasons in so far as practical and reasonably foreseeable. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e., avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any foreseen intense rainfall event (>3 mm/hour, yellow on Met Éireann rain		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Éireann. This also will avoid such conditions while concrete is curing, in so far as practical. • Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately. • Pouring of concrete into standing water within excavations will not be undertaken. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the treatment train and buffered surface water discharge systems in place. • Temporary storage of cement bound sand (if required for construction of the substation building) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g. using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off. • No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately. Concrete washing will be contained and managed similarly. • A designated skip(s) will be provided for washing out of concrete chutes. The contents will be allowed to settle and the supernatant will be removed off site by licenced generator to a licenced waste water treatment plant.		
MM61	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.8 Watercourse Crossings Proposed Mitigation Measures	All crossings will have clear span structures. This is in line with good practice as defined by relevant guidance (SEPA, 2010) whereby; the course of action serves a demonstrated need, minimises the potential for ecological harm.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Considering the width of all waterbodies associated with crossings discussed here (<2 m width) in stream supports will not be required for the construction of single span structures. • The design facilitates adequate hydraulic capacity (**Management Plan 3 of Appendix 2.1**). This ensures that the design will maintain the existing channel and will facilitate peak discharge events (storm events) without flow being constrained and contributing to flooding or other issues. Values presented **Appendix 9.1: SFRA** indicate the potential discharge rate associated with each watercourse crossing during a 1 in 100-year storm event. For existing crossings, the channel width will be maintained. • In line with the above design consideration, allowance will be made for the transport of sediment through the crossing, not just hydraulic capacity. • The design facilitates adequate freeboard to OPW requirements. The design facilitates passage of woody debris. Freeboard to facilitate navigation and recreation is not applicable in relation to the development and associated surface water features. • For single span structures, abutments will be set back from the river channel (**Appendix 9.6 – Tile 15**) and banks to allow the continuation of the riparian corridor underneath the structure. This helps to minimise or prevent the need for bed and bank reinforcement, reduces the risk of creating a barrier to fish passage and allows mammal passage under the structure. The distance between the bridge abutments will be as wide as possible and will maintain the bank habitat, maximising the riparian corridor and allowing the river		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				some space to move. Foundations (of abutments) will be deep enough to minimise or prevent the need for bed or bank reinforcement or bridge weirs or aprons. This will maintain the natural bed material and bed levels, protecting habitat and allowing fish passage. Foundations will be buried deep enough to allow for scour during high flows. Construction will be supervised by a suitably qualified engineer who will confirm that the depth is as per the design. • The design minimises the potential for localised bank and bed erosion, refer to Planning **Drawing No. 6226-PL-WC-01, 6226-PL-WC-02, 6226-PL-WC-03**.		
MM62	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.8.1 Instream Works	Infrastructure such as culverts over natural or artificial drainage channels and non-mapped rivers will require instream works. Where culverts are required and the subsequent in-stream works are necessary, the following will be implemented: • Contracted operators will draft method statements and risk assessments in line with mitigation outlined in this report and in consultation with relevant guidance prior to commencing works (as part of the watercourse crossing consent application). Relevant guidance referenced is presented in **Section 9.3**. Method statements will be included in the CEMP, **Appendix 2.1.** • The construction area will be isolated, this means; the water feature (streams / drains) will be temporarily dammed upstream of the watercourse crossing and flow will be diverted by means of a flume / pipe by gravity or pumped (this is referred to as over pumping, **Appendix 9.6 – Tile 1**) downstream of the watercourse crossing and construction area. Following the successful upstream damming, a downstream dam or barrier will also be established. The downstream barrier will ensure		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				contaminated runoff in the isolated work area can be contained and managed and will block surface water back flow in lower lying or flatter areas. **Appendix 9.6 – Tile 1** presents a conceptual plan view of an isolated construction area within a surface water feature. Over pumping of a surface water feature is considered diversion of water runoff only and therefore considered similar to discharge of storm water runoff only to sewer (exempt from licensing), however it is imperative that controls are in place to ensure environmental impacts are minimised, particularly in relation to ecological sensitivities. • In order to ensure isolation and over pumping is carried out effectively, the methodology must ensure that dams are secure / sufficiently supported, and that pumping of water can continue uninterrupted and that pumps are capable of keeping up with the discharge rate of the surface water feature. Pumping systems will require backup and fail-safe protocols e.g., backup pumps and generator. At significant surface water features e.g., non-mapped streams, isolation and diversion of drainage will be implemented. • Provided the construction water within the isolation area is managed effectively, over pumping of the surface water feature does not pose a significant risk to surface water quality downstream of the watercourse crossing. With reference to **Section 6.4.2 of Chapter 6: Aquatic Biology**, clear span design of the bridges/crossings will not affect instream aquatic habitat or interfere with the passage of fish or aquatic fauna. • Water ingress into the construction area will be managed and collected by established sumps		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				immediately downstream of the works (upstream of the downstream barrier) (**Appendix 9.6 – Tile no. 1**). Runoff within the construction area will likely be heavily laden with suspended solids. Where required, dewatering (pumping out or extracting) of such waters will be discharged to an inline settlement tank, or preestablished stilling pond to remove suspended solids before being discharged (**Appendix 9.6 Tiles 8 and 9**). The quality of the water being discharged will be monitored. If discharge water quality is poor (e.g., >25 mg/L) additional measures will be implemented, for example treating construction water by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped settlement tank. Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the Site (an example is provided in **Appendix 9.6 – Tile 12**). Silt fences (**Appendix 9.6 – Tile 14**), will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced. The discharge area will be outside of the surface water buffer areas (similar to dewatering of excavations). For further details refer to **Appendix 9.6 – Tiles 6 to 9**. o Discharging of construction water (trade effluent) directly to surface waters is a licenced activity. No extracted or pumped or treated construction water from the isolated construction area will be discharged directly to the surface water network associated with the Site (This is in accordance with Local Government (Water Pollution) Act, 1977 as amended). It is noted that all		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				runoff on the site will eventually discharge to the receiving surface water network, however with appropriate management the quality of runoff discharging to the surface water network will be acceptable e.g., <25 mg/L Suspended Solids. • Operation of machinery in-stream will be kept to an absolute minimum and avoided where possible. Where in stream works are required, the area will be isolated by means of over pumping or drainage diversion (**Appendix 9.6 Tile 1**), discussed further below. • Works in relation to watercourse crossings will be carried out during periods of sustained dry meteorological conditions and will not commence if sustained wet conditions or if wet conditions are forecast (**Section 9.6.2.1**). • Works in relation to watercourse crossings will be planned and carried out as efficiently as possible. This means work plans are agreed fully and all equipment and materials are prepared fully before in stream works commence. Works will be completed as quickly as possible and will not pause for the duration of the in stream works e.g., Installation of culverts (24 hour as necessary), with the exception of circumstances related to meteorological and/or health and safety conditions. • Only precast concrete will be used for in stream works. • Precautions will be made to mitigate the potential risk of a hydrocarbon spill. Further to measures outlined in **Section 9.5.3.2**, settlement tanks (will be adequately equipped with hydrocarbon removal functionality on standby, for example hydrocarbon absorbent booms, oil skimmers, and GAC (granulated activated carbon) filters, should they become necessary (**Appendix 9.6 –**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Tile 8).		
MM63	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.8.2 Diversion of Drainage	Diversion of artificial drainage channels will be required at locations where the development layout intercepts existing artificial drainage networks (**Figure 9.7**), for example T2 associated hardstand area is overlain on an existing mapped surface water feature / river. Diversion of drainage will be done under similar conditions to that described above for instream works. Many of the existing constructed drainage channels are observed to be dry during sustained dry meteorological conditions which implies that over pumping or diverting of water flow may not be necessary, nonetheless the methodology described for instream works will be implemented to mitigate the risk of any flow through the construction area or for unforeseen wet meteorological events. Any newly installed drain will be fully formed prior to the diversion of existing drainage. Erosion control will be incorporated into the design (**Appendix 9.6– Tile 2**), this requires minimising the area of exposed soil in existing and newly established channels. This will include a combination of the use of coarse aggregate / crushed rock (non-friable / non-weak), engineered solutions and/or revegetation. A series of temporary silt fences (**Appendix 9.6– Tile 14)** will be installed to mitigate against the entrainment and mobilisation of solids during key events during the construction process, for example, the initial use of the new diverted channel, or the infilling of the original channel made redundant (**Management Plan 3, Appendix 2.1).** The use of silt screens as a form of mitigation during watercourse crossing works is considered a		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				precautionary measure. Refer to **Appendix 9.6 – Tile 2** for further information on the recommended ordering of control measures.		
MM64	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.9 Grid Connection Route – Excavation of Cable Trenches, Watercourse Crossings and Horizontal Directional Drilling	Excavation and installation of cable ducts within existing bridges (alteration) will require consent from the OPW and various mitigation measures. Mitigation measures have been developed to minimise the environmental impacts of the grid connection route on the receptors of conservation importance that have been recorded in the area. Mitigation measures mentioned in this Report are included in the CEMP, **Management Plan 2- Water Quality Management Plan, Appendix 2.1**. Detailed site investigations, method statements and risk assessments will be carried out with a view to identifying and qualifying risk associated with all watercourse crossings associated and in close proximity to the grid route connection corridor. In relation to directional drilling, and the general risk to groundwater during grid connection route construction, risk assessment and prescription of mitigation measures will be designed in accordance with relevant guidance and reference documents, **Section 9.3**. Risk assessments involved identifying pathways and receptors for each potential source of contamination. This included each directional drilling location and is particularly important in relation to groundwater source protection zones and surface water bodies protected for the purposes of drinking water. Prescription mitigation measures are driven by the identification and qualified risk associated with each particular location and are as follow: **General Overview of Works Mitigation Measures**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• The timing of grid connection cable laying will be carried out during metrologically dry seasons/periods. • An Environmental Clerk of Works (EnvCoW) should be onsite in order to lessen environmental disruption and ensure site integrity is maintained. The Environmental Clerk of Works (EnvCoW) will also be responsible for routine environmental monitoring and report writing. • Methodology Statements of works, prepared by the Contractor, will be submitted to the local and relevant authorities associated with the Project. • Any temporary access structures, put in place to allow machinery access to the area will be arranged in discussion with the Environmental Clerk of Works (EnvCoW) and the site will be fully restored post grid route connection (GRC) works. • All chemical fluids used in the boring process are to be inert to the environment (environmentally safe) and follow the relevant legislation. The Contractor is to retain a chemical register and have Safety Data Sheet (SDS) documents available onsite during the operation. The Contractor will also be responsible for a Fluid Management procedure which should include: o Drilling Fluid program and MSDS o Management of spoil including volume on site, specialised site storage		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				○ Management of drilling fluid displacement (expected volumes and proposed storage) • Considering the high volumes, high flow rates and high contaminant content (drilling spoil) of water arising for drilling activities, water will be managed and treated by means of a settlement tank and/or associated infrastructure (**Appendix 9.6 – Tile 8**). If a separation (recycling) system is to be used it must be adequately sized and bunded to handle the through-put of the drilling fluid so continuous drilling and reaming operation can be maintained. A separation system must be complete with screens and hydro - cyclones to separate the solids from liquid. Drilling fluids and drill spoils will be disposed off-site at an approved licensed location or discharged to the local surround area with approved licencing permits. **Good Practice of Plant Machinery** • All equipment used during HDD will be in good working order, checked regularly and maintained when necessary. Fluid return lines used in HDD process should be tested for leaks prior to use to check their reliability. Plant machinery not in use is required to have drip trays below engines as well as at refuelling points, if necessary. • All practices involving bentonite will be monitored closely, that is: pumping pressure, drilling mud formulation i.e., drilling fluid		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				volume and the volume of mud returns. • Fuels, lubricants and hydraulic fluids for equipment use on Site will be carefully handled to avoid spillage, properly secured and provided with spill containment kits in case of incident to ensure best practice. • Spill kits, hydrocarbon mats, oil booms etc., will be maintained at areas of works for emergency use and replaced when necessary. **Contingency Plan** • In the event that a drilling fluid spill or 'breakout' occurs, the Contractor shall cease drilling immediately, notify the Environmental Clerk of Works (EnvCoW) and Emergency Service Management Personnel. • Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident. • The Contractor is to draft and apply a Contingency Plan highlighting with the principal HDD risks. At minimum, the Contractor will have equipment and materials on standby to mitigate against the following risks associated with HDD[2]: ○ Hydro-lock (loss of fluid flow)		

[2] MDM (2018) "Rockabill System Specifications for Cable Installation", McMahon Design & Management Ltd. Consulting Engineers and Project Managers, Job no. 1319

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				○ A hydro-fracture incident (loss of fluid pressure) ○ Fluid spill over ○ Hydrocarbon/fuel spill ○ Drill pipe rupture ○ Borehole path failure ○ Major workplace safety events in remote areas • The HDD operators will need to be equipped with straw bales, stakes to secure bails, oil booms, silt fences, sandbags, shovels, pumps, and any other materials or equipment necessary to contain and clean up and properly dispose of unintentional releases.		
MM65	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.10 Groundwater Contamination Proposed Mitigation Measures	In order to mitigate groundwater contamination by hydrocarbons in particular, the following will be implemented: • Minimum fuel storage will occur on site and re-fuelling of vehicles will occur off-site at a controlled fuelling station whenever possible. • Where fuelling must occur on site due to logistical reasons, then a discrete "fuel station" will be used. • For large machinery such as cranes, drip tray will be used and spill kits will be on hand. The following mitigation measures will be implemented in relation to non-hydrocarbon potential contamination: • Wastewater from the sanitation facility will be mitigated by use of temporary, self-contained compound. This facility will not interact with the existing hydrological environment in any way and wastewater will be removed off-site weekly, by a licensed wastewater disposal company and disposed at an appropriate		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				licenced facility. • Inorganic nutrients such as nitrogen and phosphorus compounds (if present in excavated sediment and as discussed in discussed in **Section 9.5.3.2** with commercial forestry) will be controlled by the attenuation of the suspended solids to which they adsorb to and by retention of discharge waters within stilling ponds to allow peak runoff to recede prior to discharge (refer to the next section, **9.6.2.12** for monitoring details). It is noted that the baseline surface water chemistry indicates elevated Ammoniacal Nitrogen and Phosphate. • Bacteriological contamination arising from availability of nutrients (e.g. livestock etc.) will be mitigated by appropriate self-contained sanitation facilities (above) and livestock grazing control on the site overall, but particularly on areas zoned for excavation and development. • There is low risk of mobilising trace metals that may naturally be present, refer to **EIAR Chapter 8: Soils and Geology, Appendix C** for recoded locations of iron pan. The potential impact may arise from introduced water percolation with excavated bedrock substrate[3]. Concentrations of trace metals are usually low in the natural environment; however, water quality will be checked for metals concentration before, during and after the construction phase as part of monitoring at river monitoring locations.		
MM66	Site Drainage	Chapter 9: Hydrology and	9.6.2.13 Clear Fell of Forestry	• Phased felling approach. • Minimising erosion by use existing tracks and use of brash		

[3] Teagasc (n.d.) "Research Soils Special: Irish Soil Information System" *Agriculture and Food Development Authority*

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Hydrogeology Appendix 2.1 CEMP		for off track areas. • Follow all relevant forestry guidance and policies, including; - Forest Protection Guidelines - Forestry and Water Quality Guidelines - Forest Harvesting and Environmental Guidelines - Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures - Forest Biodiversity Guidelines - Forestry and The Landscape Guidelines - Forestry and Archaeology Guidelines • All drains, either mound drains, culverts, water crossings crossed during extraction, if necessary, will be cleared of any debris to ensure no drainage issues will occur for the remining trees, which can be a major attributor to windblow. • Felling and extraction of timber will, are to be undertaken in dry weather conditions. • Harvesting operations are scheduled according to the nature of the soil with sites being categorised into winter and summer sites depending on ground conditions. Also, best practice is to suspend mechanised harvesting operations during and immediately after periods of particularly heavy rainfall.		
MM67	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.2.14 Emergency Response	Potential issue; Elevated concentrations of suspended solids in runoff during excavation activities during an unforeseen or low probability storm event, for example a 1 in 100-year event. Proposed measure; Cover exposed stockpiles in plastic sheeting and placement of straw bales and silt fences in associated drainage channels. Potential issue; Failure or degradation of stone check dam during a storm event with associated elevated runoff volumes. Proposed measure; Introduction of straw bales and silt fences		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				in order to regain attenuation capacity of the drainage channel until the maintenance can be completed. Potential issue; Localised peat stability issue leading to deposit of peat within an active drainage channel. Proposed measure; Introduction of straw bales and silt fences directly downstream, of the area in order to attenuate gross solids isolate the area and over pump until remedial works and maintenance can be completed, divert all runoff from the area to Active Management area of the treatment train (**Appendix 9.6 – Tile no. 7 to 9**). Potential issue; Management of unexpected runoff patterns leading to excessive drying or wetting in a particular area, potentially leading to enhanced erosion and / or adversely impacting on the ecological health of blanket peat ecosystems. Proposed measure; This type of issue will require assessment on a case by case basis. Solutions might include; decommission, modification, introduction or relocation of buffered outfall, or diversion of runoff volumes to or away from the area. In regard to the potential for erosion and similar physical processes, any such issues will become apparent through monitoring relatively rapidly, whereas impacts to ecological sensitivities will become apparent relatively slowly in comparison. It is noted that much of the Site is impacted as part of baseline, in this regard e.g., extensive existing artificial drainage networks. Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the proposed development. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the turbine erection materials and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand. Significant hydrocarbon spill or leak – In the event of a significant hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons and contaminated runoff will be contained, managed and pumped to a controlled area in line with Active Management including treatment through a suitably equipped treatment tank and Granular Activate Carbon (GAC) vessels. This process will be managed by the Environmental Clerk of Works (EnvCoW) in conjunction with a preidentified consultant (Environmental Clerk of Works (EnvCoW) specialist register) in regard to effective remediation, treatment and removal of hydrocarbon contaminated water and soils Excavation and appropriate disposal of contaminated soils will be required in this instance. If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer will have an approved and certified clean-up consultancy available on 24-hour notice to contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up. Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand.		
MM68	Site Drainage	Chapter 9:	9.6.2.15	Environmental incidents including accidental spillages on soils (e.g., fuel), breeches of licence limits if applicable (discharge of		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Hydrology and Hydrogeology	Managing & Reporting Environmental Incidents	trade effluent), and significant environmental incidents (e.g., landslide) will be reported to the Local Authority as part of emergency responses to such incidents. Incident notification will be escalated to relevant third parties where relevant e.g., Inland Fisheries Ireland (IFI) if surface water receptors are intercepted.		
MM69	Air and Climate	Chapter 10: Air and Climate	10.2.8.1 Construction Phase Mitigation	The main potential impact during the construction phase of the Project will be from dust nuisance at sensitive receptors close to the Site. Good practice site procedures will be followed by the appointed contractor to prevent dirt and dust being transported onto the local road network. Good practice site control measures will comprise the following: • Site Access Roads will be upgraded and built in the initial construction phases. These roads will be finished with graded aggregate which compacts, preventing dust. • Approach roads and construction areas will be cleaned on a regular basis to prevent build-up of mud and prevent it from migrating around the Site and onto the public road network. • Wheel wash facilities will be provided near the Site entrance to prevent mud/dirt being transferred from the site to the public road network. • Public roads along the construction haul route will be inspected and cleaned daily. In the unlikely event that dirt/mud is identified on public roads, the roads will be cleaned. The wheel wash facility will be investigated, and the problem fixed to prevent this from happening again. • During periods of dry and windy weather, there is potential for dust to become friable and cause nuisance to nearby residences and users of the local road network. This requires wetting material and ensuring water is supplied at the correct levels for the duration of the work activity. The weather will be monitored so that		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				the need for damping down activities can be predicted. Water bowsers will be available to spray work areas (wind turbine area and grid connection route) and haul roads to suppress dust migration from the Site. • Vehicles delivering materials to the site will be covered appropriately when transporting materials that could result in dust, e.g., crushed rock or sand. • Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the Contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery. • All machinery when not in use will be turned off. • Ready-mix concrete will be delivered to the Site and no batching of concrete will take place on the Site. Only washing out of chutes will take place on site and this will be undertaken at a designated concrete washout facility at the contractor's compound. The concrete wash water will be disposed of at a licensed facility as outlined in the Construction Environment Management Plan (CEMP) – Management Plan 5 Waste Management Plan (**Appendix 2.1**) • Speed restrictions of 15km/h on access roads will be implemented to reduce the likelihood of dust becoming airborne. Consideration will be given to how on-site speed limits are policed by the Contractor and referred to in the toolbox talks. • Stockpiling of materials will be carried out in such a way as to minimise their exposure to wind. Stockpiles will be covered with geotextiles layering and damping down will be carried out when weather conditions require it. • Earthworks and exposed areas/soil stockpiles will be re-		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				vegetated to stabilise surfaces as soon as practicable. • An independent, qualified Geotechnical Engineer will be contracted for the detailed design stage of the project and geotechnical services and will be retained throughout the construction phase, including monitoring and supervision of construction activities on a regular basis. The methodology statement will be signed off by a suitably qualified Geotechnical Engineer. • A complaints procedure will be implemented on site where complaints will be reported, logged and appropriate action taken.		
MM70	Noise	Chapter 11: Noise and Vibration	11.5.1 Construction Noise Mitigation	General guidance for controlling construction noise through the use of good practice given in BS 5228 will be followed. During construction of the project, activity shall be limited to working times incorporated in any planning permission.		
MM71	Waste	Chapter 13: Material Assets and Other Issues	13.10.7 Waste	***Concrete*** During the construction phase: Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Development where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Elements of the development where the use of precast concrete is not possible include turbine foundations and joint bay pit excavations. Where the use of precast concrete is not possible the following mitigation measures will apply. The acquisition, transport and use of any cement or concrete on site will be planned fully in advance and supervised at all times .		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Vehicles transporting such material will be relatively clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on vehicles which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. Vehicles will also be in good working order. Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints. Concrete will be poured during metrological dry periods/seasons. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e. avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any foreseen intense rainfall event (>3mm/hour, yellow on Met Eireann rain forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Eireann. This also will avoid such conditions while concrete is curing, in so far as practical. Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately. Pouring of concrete into standing water within excavations will be avoided. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Temporary storage of cement bound sand (if required) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g., using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off. No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately. A concrete washings area can be seen on Drawing No. 6226-PL-803. Upon implementation of the above mitigation measures, the effects of the construction of the Development are considered to be not significant. ***Chemicals, Fuels and Oils*** All storage containers of over 200 litres will have a secondary containment of 110% capacity to ensure that any leaking oil is contained and does not enter the aquatic environment. A **Chemical and Waste Inventory will be kept**. This inventory will include: List of all substances stored on-site (volume and description) Procedures and location details for storage of all materials listed. Waste disposal records, including copies of all Waste Transfer Notes detailing disposal routes and waste carriers used. Any tap or valve permanently fixed to the mobile unit through which oil can be discharged to the open or when delivered through a flexible pipe which is fitted permanently to the mobile unit, will be fitted with a lock and locked shut when not in use. Sight gauges will be fitted with a valve or tap, which will be shut		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				when not in use Sight gauge tubes, if used will be well supported and fitted with a valve. Mobile units must have secondary containment when in use/out on site. Under the EU Directive 95/55/EC all such dangerous substances will be conveyed in a container that compiles with the ADR. As such the manufacturer of each bowser will provide certification to contractors that the following: A leak-proof test certificate. A copy of the IBC approval certificate. An identification plate attached to the container. Where mobile bowsers are used on site, guidelines will be followed so that: Any flexible pipe, tap or valve will be fitted with a lock where it leaves the container and be locked shut when not in use. Flexible delivery pipes will be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Where possible, a nozzle designed to dispense oil is used; The pump or valve will have a lock and be locked shut when not in use. For loads in excess of 1000 litres (220 gallons), the bowser vehicle driver will have undergone training and hold a special license. ***Refuelling*** During construction/decommissioning, where possible all refuelling on site will be within the temporary compound within the re-fuelling area (see Drawing No. 6226-PL-803). Only essential refuelling (e.g., cranes) will be carried out, outside of		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				this area, but not within 65m of any watercourse. In such cases a non-permeable High-density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during filling and disconnection. This membrane will be inspected and if there is any sign of oil contamination, it will be removed from site by a specialist licensed waste contractor. All vehicles will be well maintained and free from oil or hydraulic fuel leaks. ***Packaging*** In accordance with the waste hierarchy, packaging will be returned to the originator ahead of re-use or recycling. Where this is not possible, waste will be separated as appropriate and safely stored on site appropriately in anticipation of recycling. ***Metals*** Waste metals from concrete reinforcing during construction and removal of metals during decommissioning etc. will have commercial value and will be re-used or recycled with the appropriate licensed waste contractor.		
MM72	Cultural Heritage	Chapter 14: Cultural Heritage	14.5.1 Construction Phase	The wind farm layout was informed by the archaeological desktop studies and fieldwork undertaken during the design and assessment phases and was designed to avoid the known locations of known and potential archaeological monuments as well as an undesignated late 19th century farm building within the east end of the Site. The mitigation measures presented in this section comprise construction phase archaeological monitoring of ground works as well as protection measures for known and potential cultural heritage assets within the Site. These mitigation measures are in accordance with guidelines for planning conditions for wind		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				energy developments within close proximity to recorded archaeological monuments as published in Section 7.4 of the *2006 Wind Energy Development Guidelines*[4] and Section 7.6 of the *2019 Draft Revised Wind Energy Development Guidelines*[5]. Ground works during the construction phase will be subject to archaeological monitoring by a suitably qualified archaeologist under licence by the National Monuments Service. A systematic advance programme of archaeological field-walking surveys will also be carried out within Development areas in forestry plantations following tree felling to confirm the conditions predicted in this assessment, i.e., that they contain no visible surface traces of potential unrecorded archaeological or architectural heritage sites. In the event that any sub-surface archaeological features are identified during archaeological monitoring they will be securely cordoned off, cleaned and recorded *in situ*. The National Monuments Service will then be notified and consulted to determine further appropriate mitigation measures, which may include preservation *in situ* (by avoidance) or preservation by record (archaeological excavation). The archaeologist appointed to monitor the construction phase will also supervise the establishment of minimum 30m radius concentric buffer zones around the external-most elements of Field Boundary (CO057-006----) and Enclosure (CO057-007----). These buffer zones will be securely fenced off and their locations will be clearly signed as 'No Entry' for the duration of the construction phase. No ground works of any kind (including but not limited to advance geotechnical site investigation) and no		

[4] https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/
[5] https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				machinery, storage of materials or any other activity related to construction will occur within these buffer zones. The location of a derelict farm building, which shown on the second edition 6-inch OS map (published 1900), is c.110m outside the nearest construction area within the Site. This will be clearly signed as "No Entry" during the construction phase. The locations of these onsite archaeological monuments and farm building will also be identified as 'no-entry' areas during the construction phase site inductions. The location of two features located c.40m to the north of T2, which are tentatively identified as being of archaeological potential (hut site and upright stone), are located in private lands outside the Redline Boundary. The erection of fencing around their locations will therefore not be feasible but, "No Entry" signs will be erected at the north, south and east edges of the Redline Boundary within their environs. The Project is located within the Múscraí Gaeltacht area and any signage erected within the public realm during the construction phase will include Irish and English text.		
MM73	Traffic	Chapter 15: Traffic and Transport	15.6.1 Construction Phase	The potential effects of the construction of the Project have been identified as being negligible to minor (see **Table 15.19**), but temporary in nature. The following mitigation measures are proposed: • A Traffic Management Plan (TMP) has been developed (see Management Plan 7 attached to the CEMP). Prior to construction and once the Contractor's have confirmed their suppliers, the TMP will be updated in consultation with Cork County Council, Kerry County Council and An Garda Síochána as necessary to take account of any conditions attached to a grant of permission. All drivers will be made aware of the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				location and presence of sensitive receptors at an induction session prior to construction activities taking place and will be made aware of the speed limits of the various roads on the route which are contained in the TMP and on the traffic arrangements for entering and exiting the site. This is to ensure compliance with speed limits, and traffic management arrangements. • At the forest junction at the N22 (wind farm access) bitumen macadam surface will be provided some 30 m into the junction with room to park HGV's clear of the N22. • The forest access track will be regraded so as to reduce the gradient towards the N22. An "Aco" type drain shall be provided to intercept rainfall run-off. • All the traffic to the wind farm site will approach from the east such that they turn left at the forest access. All traffic leaving the wind farm site will turn left only and, if required, can turn around at Cummeenavrick turning area. Signage and road markings will be provided to facilitate/promote these manoeuvres. • The new N22 Macroom By-Pass will be used to transport turbine components, materials for upgrading the turbine haul route, materials for construction of the civil and electrical works to and from the wind farm site, as well as materials for the grid connection so as to minimise traffic through built-up areas such as Macroom, Ballymakeery and Ballyvourney. • All significant traffic likely to be generated by Inchamore Wind Farm will be during the construction of the Project and will be temporary in nature. It is envisaged that the construction period for the wind farm will span a 21-month period with the underground cable being installed		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				over a concurrent 12-month period. The construction-phase Traffic Management Plan will mitigate these impacts. A number of mitigation measures are embedded within the design: - The design is such as to minimise the extent of the new build requirement by using existing forestry tracks where possible, thereby minimising materials requirements. - The design is such as to maximise the use of onsite resources (particularly stone material for track construction) to minimise the requirement for material import. Some 49,842 of stone is proposed to be won from the borrow pit which equates to a 4,154 HGV trips to the site avoided (see **Chapter 2: Table 2.4a**). - Retaining surplus excavated material on the Site so as to reinstate the borrow pits, thereby eliminating traffic associated with the disposal of same. Some50,276 m^3 of spoil are proposed to be stored in the on-site borrow pit or in roadside berms, resulting in a saving of 4,190 HGV trips off the site (see **Chapter 2: Table 2.4b**). - Designing the cable for installation in pre-laid ducts, rather than directly installing the cable in the ground. The latter would require the entire trench from joint bay to joint bay to be fully open for cable laying. • There will be special transporter vehicles with rear wheel steering used in delivery of wind turbine components to ensure safe transportation and manoeuvrability on the roads. Extendable transporter vehicles will be retracted on return journeys. • Prior to the delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána and Cork and Kerry County Council Roads Departments to discuss the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				requirement for a Garda escort. • The Developer will confirm the intended timescale for abnormal deliveries and every effort will be made to avoid peak times such as school drop off times, church services, sporting events, peak traffic times where it is considered this may lead to unnecessary disruption. • Abnormal loads are likely to travel at night and outside the normal construction times as may be required by An Garda Síochána. Due to the relatively modest distance between Ringaskiddy Port and the Site of c.92.8 km, the journey is achievable within a 2-3 hour timeframe. Accordingly, locations for resting will not be required. Local residents along the affected route will be notified of the timescale for abnormal load deliveries. • A condition survey of the existing N22 between Cummeenavrick and the Ballyvourney Junction of the Macroom Bypass will be carried out prior to commencement of construction and another will be undertaken post-construction. The Developer will lodge a bond with Kerry County Council and or Cork County Council prior to commencement of construction in the amount to be agreed with the respective Council for the possible repair/upkeep of the road. During the construction period, the road will be inspected weekly by the Developer's Resident Engineer and the Contractor will be instructed to repair any defects within the following week. At the end of the construction period, any further defects will be remedied to the satisfaction of Kerry Council Council, Cork County Council and Transport Infrastructure Ireland. • Wheel cleaning equipment will be used at the exit from the wind farm Site at Derryreagh and also at the exit		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				from the Grid Connection Works at Cummeenavrick to prevent any mud and/or stones being transferred from Site to the public road network. All drivers will be required to see that their vehicle is free from dirt and stones prior to departure from the construction Site. • The Site entry point will also be appropriately signed. Access to the wind farm construction Site will be controlled by on Site personnel and all visitors will be asked to sign in and out of the Site by security / Site personnel on entering and exiting the Site. All Site visitors will undergo a Site induction covering Health and Safety issues at the Contractor's temporary compound and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite. • Any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas will be employed. • To reduce dust emissions, vehicle containers/loads of crushed stone will be covered during both entrance and egress to the Site. • A survey of the turbine component haul route will be undertaken prior to commencement to identify if any new overhead lines or broadband lines will need to be raised along the route to allow abnormal loads such as tower sections and nacelles to be delivered. • During the construction phase, clear construction warning signs will be placed on the N22 as necessary, which will advise road users of the presence of a construction Site and of the likelihood of vehicles		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				entering and exiting the Site or road construction areas. This will help improve road safety. • Works on public roads on the turbine delivery haul road and grid connection will be strictly in accordance with "Guidance for the Control and Management of Traffic at Road Works – 2nd Edition 2010" as well as "Traffic Signs Manual 2010-Chapter 8- Temporary Traffic Measures and Signs at Roadworks". • Where required, . Road Opening Licence will be obtained for the directional drill of the grid connection under the N22. • All vehicles using or while in operation at the wind farm site shall either have roof mounted flashing beacons or will use their hazard lights. • A speed limit of 25 km/h shall apply to all vehicles within the wind farm site.		
MM74	Health and Safety	Appendix 2.1 CEMP Management Plan 1 Emergency Response Plan	3. Incident & Hazard Reporting	A reporting system has been developed (see sections **6.3** to **6.9** of **Management Plan 1**) for reporting environmental incidents or hazards for the site. These reports will be logged so that they can be regularly revised and form part of the response plan procedural review. **Sections 6.3** to **6.9** of the CEMP have attached a blank environmental incident reports/audit forms that should be completed in the event of an accident/incident. This includes details of all non-compliance and corrective actions carried out as a result of any incidents.		
MM75	Health and Safety	Appendix 2.1 CEMP Management	4. Waste Disposal After Environmental	If spill kits etc. are used in the event of a pollution incident, operatives need to carefully dispose of used equipment by carefully placing them in a sealed bag or container. They should		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Plan 1 Emergency Response Plan	Incidences	then be removed from site by a licensed waste contractor as per the **Waste Management Plan.** Contaminated soil also needs to be disposed of as hazardous waste by a permit holder. This is also further detailed in the **Waste Management Plan** of this CEMP.		
MM76	Health and Safety	Appendix 2.1 CEMP Management Plan 1 Emergency Response Plan	5. Site Induction and Toolbox Talks	It is imperative that all contractors, sub-contractors and staff on site are fully familiar with this emergency response plan and it will be detailed regularly in Toolbox Talks. During these talks, they will also receive regular reminders of the importance of the local environment and of the necessary environmental controls that are in place on site.		
MM77	Health and Safety	Appendix 2.1 CEMP Management Plan 1 Emergency Response Plan	6.1 Procedure to be followed in the event of an incident	The following procedures are intended as a guide in dealing with incidents. Health & Safety guidance should be followed at all times applying common sense and ensuring the health & safety of yourself and others: 1. Identify the source of the spillage and cut off source if possible, e.g. by closing valve, righting container etc. 2. Work on site will cease and all operatives will assist in placing spill mats on the affected area. Site Manager/ Main Contact should be notified. 3. Identify where spillage may go. If spillage is near a watercourse (drainage/ditch/ river) divert spillage away from the watercourse through the use of absorbent materials from the spill kit. 4. SUSPENDED SOLIDS CONTAMINATION OF WATERCOURSE: If watercourse is at risk of contamination		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				from suspended solids from a slope failure, do as follows: a) Place straw bales wrapped in geotextile or sand/gravel bags with geotextile curtains immediately in the watercourse(s) at regular intervals downstream from the incident. These sand/straw bags and bales will be removed and replaced with stone filters once water quality is stabilised. b) Stone check dams faced with a layer of geotextile will be constructed at critical points along the watercourse. c) Small sumps will be formed intermittently between the check dams to reduce the amount of suspended solids contained in the water. 5. OIL SPILL IN WATERCOURSE: If spill has reached the watercourse, do as follows: a) Place flexible absorbent booms across watercourse, ahead of the contamination within a quiet stretch of water. b) Place absorbent cushions in the water immediately upstream of these booms as well as downstream of the booms. c) Remove and replace saturated absorbent material as required. Please ensure removed cushions are placed in sealed polythene bags/containers and disposed of by the principal waste contractor. 6. PEAT SLIDE: Where the onset or actual detachment of peat (e.g., cracking, surface rippling) occurs: a) All activities in the area will cease and all available resources will be diverted to assist in the required mitigation procedures. b) All relevant authorities should be notified if a peat slide		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				event occurs on site and this Emergency Response Plan (ERP) followed. c) Where peat slides do not represent a risk to a watercourse and have stopped moving, they will be stabilised using rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and a stabilisation procedure implemented. The area will be monitored, as appropriate, until movements have stopped. d) Where possible, check barrages (comprises the placement of rock fill across a watercourse which allows the passage of water but will prevent peat debris from passing through) will be constructed on land using rock fill to prevent a peat slide reaching any watercourse. e) If peat reaches a watercourse a check barrage will need to be constructed across the watercourse preventing the peat from moving downstream. The check barrage will allow water to flow through it, but the peat will be trapped. f) The size of the check barrage will depend on the scale of the peat slide to be contained and the geometry of the watercourse at the location of the barrage. g) All measures to contain the peat slide must be approved by the Cork County Council or Inland Fisheries Ireland (IFI). 7. In the unlikely event of a fire at a turbine or at the substation, all personnel on site will meet at a designated fire point and emergency services will be contacted. 8. Icing conditions bring a variety of risks, including power loss, ice fall and shedding (throw), and rotor imbalance. In the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				unlikely event of ice throw from blades or rotor imbalance occurs, all activities in the area will cease and site personnel will stand clear of turbines where possible until they have been shut down completely. 9. Notify all parties in the order listed overleaf. Notification should be made by one member of staff whilst remainder of staff present deal with the spill/incident. 10. Dig up any and all contaminated ground as soon as possible/immediately. All contaminated materials should be placed in sealed polythene bags/containers and disposed of appropriately by an appropriate licensed waste contractor. 11. Complete required record of incident and response into reporting system		
MM78	Health and Safety	Appendix 2.1 CEMP Management Plan 1 Emergency Response Plan	6.2 Communication Plan	A Communication Plan (to be followed in the event of an incident) will be provided by the Contactor, in liaison with relevant stakeholders and will be included in the updated ERP prior to commencement of site development works.		
Operational Phase						
MM79	Health and Safety	Chapter 4: Population and Human Health	4.5.7.2 Human Health and Safety Operation	For operation and maintenance staff working at the proposed wind farm, appropriate site safety measures will be utilised during the operational phase by all permitted employees. All personnel undertaking works in or around the turbines will be fully trained and will use appropriate Personal Protective Equipment (PPE) to prevent injury. Equipment within high voltage substations presents a potential hazard to health and safety. The proposed substation will be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESB and EirGrid standards. All electrical elements of the Project are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety. All on-site electrical connections are carried by underground cable and will be marked out above ground where they extend beyond the track or hardstanding surface. Details of cables installed in the public road will be available from ESBN. Lightning conductors will be installed on each turbine as all structures standing tall in the sky require this protection. Turbines specifically require this to prevent power surges to electrical components. Turbines will be fitted with ice detection systems which will stop the turbine from rotating if ice is forming on a turbine blade. This aims to prevent ice throw. Rigorous statutory and engineering safety checks imposed on the turbines during design, construction, commissioning and operation will ensure the risk posed to humans is negligible. 24-hour remote monitoring and fault notifications are included as standard in the Turbine Operations and Maintenance Contracts. A Supervisory Control and Data Acquisition ("SCADA") system will monitor the Development's performance. If a fault occurs, then a message is automatically sent to the operations personnel preventing emergency situations. In addition to scheduled maintenance, the maintenance contracts will allow for call out of local engineers to resolve any issues as soon as they are picked up on the remote monitoring system.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Access to the turbines inner structure will be locked at all times and only accessed by licenced employees for maintenance. In line with the Health Service Executive's Emergency Planning recommendations, any incident which may occur at the site which requires emergency services, incident information will be provided in the 'ETHANE' format: • Exact location; • Type of incident; • Hazards Access and egress; • Number of casualties (if any) and condition, and • Emergency services present and required		
MM80	Shadow Flicker	Chapter 4: Population and Human Health	4.9.1.7 Shadow Flicker Mitigation Measures & Residual Effects	Due to the potential for shadow flicker to affect receptors within the shadow flicker study area, it is proposed that a shadow control system will be installed on each of the wind turbines. The control system will calculate, in real-time, if required: • Whether shadow flicker has the potential to affect nearby properties, based on pre-programmed co-ordinates for the properties and turbines; • Wind speed (can effect how fast the turbine will turn and how quickly the flicker will occur); • Wind direction; • The intensity of the sunlight, and • When the control system detects that the sunlight is strong enough to cast a shadow, and the shadow falls on a property or properties, then the turbine will automatically shut down safely; and will restart when the potential for shadow flicker ceases at the affected properties.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				It is intended that the measures outlined above, subject to safe shut down time of approximately 60 seconds, will eliminate the potential for shadow flicker to affect any of the properties within the study area, this will be the case regardless of which turbine is selected within the turbine range. Therefore, the Development which currently complies with the WEDG (2006) shadow flicker guidelines will comply with the 2019 Draft WEDG if they come into effect.		
MM81	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.6.2.1 Bats Feathering of Blades	The operation of the turbines should be in a manner that will restrict the rotation of turbine blades as much as possible below the manufacturer's cut-in speed (e.g. by feathering the blades during low wind levels - changes in blade feathering by altering the angle of the blade and therefore preventing the blades from rotating during low wind situations). This would prevent freewheeling or idling of the blades. Therefore, ensure that blades of turbines are prevented from freewheeling (idling/spinning). Feathering of the blades during low wind conditions are recommended for all turbines. All turbines will enact a feathering protocol when wind speeds are below the cut-in speed of the turbine. Feathering entails pitching turbine blades at 90 degrees or parallel to the wind to reduce their rotation speed while idling to below two revolutions per minute.		
MM82	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.6.2.2 Bats Turbine cut-in speeds	There are bat mitigation measures available in relation to wind farms to reduce fatalities. One successful measure applied to wind farms in Europe is to increase the cut-in speeds of the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				individual turbines. This is important in order to protect High Risk species (Leisler's bat, soprano and common pipistrelle) foraging/commuting in vicinity of turbine locations. Increasing the cut-in speed to 5.5 m/s from 30 minutes prior to sunset and to 30 minutes after sunrise to reduce bat collisions with turbines will be employed where required, *i.e.* at turbine locations where surveillance recorded high bat activity levels for High Risk and Medium Risk bat species and/or bat carcasses were recorded. The duration required depends on the level of bat mitigation required for individual turbine sites (i.e. full bat activity season or confined to spring & autumn months – this will be determine by first year surveillance – see below). A risk assessment will be undertaken using the surveillance data and analysed using best practice e.g. assessment of static data should be completed using the online tool *EcoBat* (http://www.mammal.org.uk/science-research/ecostat/) as recommended by SNH, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring. Where cut-in speeds are required, they will be operated according to specific weather conditions. In a previous bat survey undertaken by the author, static units were erected on an anemometer at 4 m and 50 m level. The number of bat passes recorded on the static units was analysed according to temperature and wind speed recorded at similar height levels. During this survey, it was determined that: 1. The vast majority of bat passes were recorded at the temperatures of 8°C and greater. Therefore, when the air temperature was less than 7°C there was no bat activity recorded below this temperature		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				during the surveys completed. 2. In general, bat activity was highest at low wind speeds (<5.5 m/s). It has been shown that curtailing the operations of wind turbines at low wind speeds can reduce bat mortality dramatically, especially during the late summer and early autumn months. 3. SNH (2021) recommend that curtailment is implement for 10°C and above. Reducing fatalities can be reduced by changing the speed trigger or cut-in speeds of the turbines (i.e. meaning that the turbine is not operational during low wind speeds) or by changing the turbine blades angles which will mean that higher wind speeds are needed to start the wind turbine blades moving. Modern remotely operated wind turbines allow such cut-in speeds to be controlled centrally and automatically. Due to the high levels of bat activity, cut-in speed is required at T2. a. Surveillance will be undertaken at the High and Medium Risk turbine (T3) over a period of three years (first three years of operation, but an annual review is required to determine the cut-in speeds after 1 year of operation). If the *Common pipistrelle* activity remains moderate to high at the T3 Medium Risk turbine after the first year of surveillance then the cut-in speeds (coupled with carcass search results) will be put in place immediately. High and Medium Risk turbines surveillance will continue to review the situation at each individual turbine location for the remaining two years. This will allow refinement of the curtailment regime.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				For all other turbines, operation without cut-in speeds coupled with 3 years of surveillance (according to SNH, 2021 guidelines) to determine if cut-in speeds are required at these turbine locations. As recommended by SNH, 2019 if curtailment is put into operation, *"then the effectiveness of curtailment needs to be monitored in order to determine (a) whether it is working effectively* (i.e. *the level of bat mortality is considered to be incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties".* *"Where the need for curtailment has been identified, a curtailment regime should be developed and presented as a part of the supporting Environmental Statement for the project. The proposed operating regime should specify, and be designed around the values for the key weather parameters and other factors that are known to influence collision risk which may include any or all of the following:* • *Wind speed in m/s (measured at nacelle height)* • *Time after sunset* • *Month of the year* • *Temperature (°C)* • *Precipitation (mm/hr)* Post construction acoustic surveys provide additional information which, when used in conjunction with appropriate carcass search data, can support any proposed changes to pre-application predictions concerning the need for curtailment or adjustments to an agreed curtailment regime.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				This surveillance and annual review should be carried out by an independent experienced bat ecologist and all reports should be issued to the Local Authority and NPWS for review.		
MM83	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.6.6.2.2 Bats Turbine cut-in speeds	**EcoBat Tool High Level Turbine Locations** *This applies to T2* • Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades). • Operate the wind turbine from 30 minutes prior sunset to 30 minutes after sunrise at a cut-in speed of 5.5 m/s during specified weather conditions and during the active bat season (April to October) when air temperatures are 10 ºC or more at the nacelle height. • Undertake monitoring the first three years of operation to determine bat activity levels post construction. Review the results of monitoring at individual High-Risk turbines after Year 1. • Operate wind farm with specific cut-in speeds from Day 1 of Year 2, if required, and review after surveillance/monitoring is completed. • Undertake a carcass search for 3 years post operation of the wind farm to determine whether a higher cut-in speed of the blades is required. • Review after Year 1 along with bat activity monitoring. • Annual inspection of each buffer zone around each turbine will be undertaken and any regenerating trees or tall shrubs will be cut back. **EcoBat Tool Medium Level Turbine Locations**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				This applies to T3 *This also applies to remaining Internal Road Network* • Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades). • Put in a monitoring programme for the first year of operation to ensure that bat activity is at a low level in vicinity of these turbines. • Review monitoring results to determine if further bat mitigation measures are required (e.g. cut-in speeds). • Undertake a carcass search for 3 years post operation of the wind farm. • Annual inspection of each buffer zone around each turbine will be annually inspected and any regenerating trees or tall shrubs will be cut back. **EcoBat Tool Low Level Turbine Locations** *This applies to T1, T4 & T5* • Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades). • Undertake a carcass search for 3 years post operation of the wind farm. • Annual inspection of each buffer zone around each turbine will be annually inspected and any regenerating trees or tall shrubs will be cut back. Bat mitigation measures during the Operational Phase will be reviewed by implementing a strict surveillance programme for the first three years of operation of the wind farm in order to identify if there exists a substantial risk at a particular turbine location or during a particular time-period (3 years - as per		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				recommendation of SNH, 2021 guidelines). This surveillance required is as follows (following SNH 2021 guidelines): a) Bat activity surveillance The level of bat activity will be monitoring for a minimum of 10 nights at each turbine location (ground level) during three of the eight month activity period (March/April to October/November). The surveillance periods will be divided into three survey periods to represent the three main periods where bat collisions have been documented: Spring (April/May); Summer (June/July) and Autumn (August/September). b) Carcass search During the surveillance periods of specific wind turbines, carcass search is proposed for a minimum of 1 morning per turbine (i.e. 3/4 mornings in total over the 1 year surveillance i.e. one per surveillance period). For each turbine, the search area will be 100 m radius after ideal bat foraging weather conditions (mild, calm and dry weather and greater than 10^{o}C). A scavenger trial is required to facilitate analysis (as per SNH, 2021 guidelines). c) Assessment of static data will be completed using the online tool *EcoBat Tool* (http://www.mammal.org.uk/science-research/ecostat/) as recommended by SNH, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring.		
MM84	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.3 Operational Phase Mitigation	The Site compound / office will house all potential pollutants within a secure bunded COSSH store for the operational phase of the project. All onsite wastewater treatment facilities at the proposed sub-station will function in full compliance with current water quality		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				requirements (Building Regulations 2010 as amended S.R. 66:2015) to prevent nutrient loading entering aquatic environments.		
MM85	Flora and Fauna	Chapter 7: Ornithology	7.5.2.1 Measures for White-tailed Eagle	Once operational, a programme will be put in place to remove carcasses (mainly of sheep) from the site. This will involve search of the wind farm infrastructure area by site management for the presence of dead and/or injured animals (mostly lame sheep or animals caught in wire fencing). It is noted that such animals are usually identified by a concentration of corvids (ravens and hooded crows). Search would be on a weekly basis. Should a carcass be located, this will be removed at the earliest opportunity by an appointed representative following standard practice for the disposal of carcasses (subject to Health and Safety issues). Injured or trapped animals will be reported to local landowners.		
MM86	Flora and Fauna	Chapter 7: Ornithology	7.5.2.2 Measures for Kestrel	Should monitoring identify more than one Kestrel casualty at a specific turbine(s), proactive measures will be taken to discourage the birds from hunting in the area of the turbine(s). This will involve clearing rank vegetation from around the relevant turbine(s) to make it less suitable for supporting prey items such as small mammals (mice, shrews, voles) and birds (meadow pipit, skylark etc).		
MM87	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.6.3.1 Increase in Hydraulic Loading Proposed Mitigation Measures	The principles of the mitigation measures described under **Section 9.6.1.2** (check dams, stilling ponds, attenuation lagoons etc.) are based on the control and management of runoff discharge rates, which ensure the regulating the speed of runoff		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				within the drainage network, buffering the discharge from the drainage network where possible, and maintaining the natural hydrological regime. As such, the measures described with a view to controlling the release of suspended solids also mitigate against the potential for rapid runoff and rapid hydrological responses to rainfall potentially leading to flooding and erosion of the drainage network or downstream of the Wind Farm Development. The same measures will be implemented with a view to mitigating against net increase surface water runoff arising from the development. For example, the following conceptual model will be applied at a proposed turbine hardstand location: • Collector drains; allowing for 0.5 m depth, 1.0 m width, presume semi-circular, sectional area; c. 0.4 m^2. Presume 100 m length of collector drain; up to 40 m^3 capacity per 100 m, by 50% allowing for gradient equates to 20 m^3. Collector drains are not intended to store runoff, however the in line attenuation features, such as check dams and flow regulators will serve to reduce discharge rates dramatically, effectively backing up water and regulating the rate of discharge. The actual attenuation capacity of the drainage network and treatment trains will be calculated during the detailed design phase of the development. • Check dams at regular intervals throughout the drainage network (existing, new clean collector and new dirty collector drains) will attenuate runoff intercepted by respective drainage channels.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Dirty water collector drains (associated with construction areas) will direct runoff to established stilling ponds. Stilling ponds will reduce the velocity of runoff, further reducing the hydrological response to rainfall. • Buffered outfalls to vegetated areas will utilise the infiltration capacity of the ground prior to the rejected rainfall eventually being intercepted by the receiving surface water system. • Clean water collector drains will intercept clean runoff (upgradient of construction areas) and will direct runoff around construction areas. The runoff will be attenuated by means of check dams and intermittent buffered outfalls (**Appendix 9.6 – Tile 7**). The potential combined attenuation capacity of the proposed drainage infrastructure has been designed to attenuate net increase in water runoff during extreme storm events i.e., 1 in 100-year storm event plus a 20% allowance for global warming, as set out in **Appendix 9.1 – SFRA**.		
MM88	Waste	Chapter 13: Material Assets and Other Issues	13.8.5 Air Navigation Mitigation Measures	An agreed (with IAA) aeronautical lighting scheme will be utilised.		
MM89	Waste	Chapter 13: Material Assets and Other Issues	13.10.7 Waste	**Staff Facilities** Provision for separation of waste streams will be provided so that e.g., paper, and cardboard waste and bottles may be recycled.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Sewage It is proposed to install a rainwater harvesting system as the source of water for toilet facilities for the operational phase. Wastewater from the staff welfare facilities in the control building will be collected in a sealed storage tank, fitted with a high-level alarm. This is a device installed in a fuel storage tank that is capable of sounding an alarm, during a filling operation, when the liquid level nears the top of the tank.		
MM90	Traffic	Chapter 15: Traffic and Transport	15.6.2 Operational Phase	Effects during operation have been assessed as being imperceptible. However, it is still important that any effect is minimised as for as is possible. Therefore, the following measures are recommended: • All vehicles using the wind farm site shall either have roof mounted flashing beacons or will use their hazard lights. • A speed limit of 25km/h shall apply to all vehicles within the wind farm site. • Locational signage shall be maintained throughout the operational period. • Road surfaces shall be inspected on a quarterly basis and will be repaired within one month of the inspection. • Safety arrangements at the forest road entrance/exit at Derryreag shall be reviewed every two years to confirm that traffic management arrangements are adequate.		
Decommissioning Phase						
MM91	Decommissioning	Chapter 4: Population and Human Health	4.5.5 Land Use	The decommissioning works will be planned and controlled by a Decommissioning Plan, Management Plan 7 of the Construction and Environmental Management Plan (CEMP). This provides		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				details on day to day works and methodologies. As part of these works, the public and other stakeholders will be provided with updates on decommissioning activities which will affect access to lands. This will be communicated to members of the public through a community liaison officer employed for the duration of the decommissioning period.		
MM92	Decommissioning	Chapter 4: Population and Human Health	4.5.7 Human Health and Safety	Public safety will be addressed by restricting access to the public in the vicinity of the site works during the decommissioning stage. The Site will be temporarily closed in sections to the public for the 18-24 month decommissioning period. This measure aims to avoid potential injury to members of the public as a result of activities. Appropriate warning signage will be posted at the decommissioning site entrance, directing all visitors to the site manager. Appropriate signage will be provided on public roads approaching site entrances and along haul routes. Public consultation will be conducted along the grid cable route to inform local residents ahead of decommissioning works.		
MM93	Decommissioning	Chapter 6: Aquatic Ecology	6.5.4 Decommissioning Phase Mitigation	Decommissioning of the Project will be scheduled to take place after the proposed 35-year lifespan of the project. Decommissioning phase impacts are likely to be broadly similar to construction phase impacts, in terms of potential surface water quality impacts from ground disturbance, refuelling and the storage of potentially hazardous materials onsite. The implementation of all mitigation measures detailed for the construction phase will be adopted in full during the decommissioning phase to ensure all such impacts are avoided. A Decommissioning Plan has been included in **Appendix 2.1**.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				When the final Decommissioning Plan is prepared prior to decommissioning, all drainage management measures, which will include maintenance of the operational drainage measures, will be included in that document, as required. However, it should be noted that by the time decommissioning is undertaken after the planned 35-year lifespan of the Project, the areas within the Site will have revegetated resulting in a resumption of the natural drainage management that will have existed prior to any construction. It is not anticipated that the decommissioning phase will interrupt this restored drainage regime in any way with the works proposed. As a minimum measure, areas where freshly placed soil material as part of turbine foundation reinstatement work will be surrounded by silt fencing if deemed necessary until the area has naturally revegetated. Restoration of the Site following decommissioning of infrastructure will require the prior establishment of the new baseline conditions at the Site which will have developed over the intervening 35 years life of the project. These studies will inform any modification or additional sensitivities that may need to be factored in restoration and site-specific measures.		
MM94	Decommissioning	Chapter 8: Soil and Geology	8.6.4 Decommissioning Phase	Ultimately, any such restoration activities will need to be assessed under the scope of multiple environmental disciplines, similar to this EIAR, and the potential synergistic effects. Given that the condition of the environment will likely change over the course of the operational phase of the Project, particularly in terms of the condition and degree of establishment of blanket bog and associated ecology, and ornithology, it is recommended that the potential for restoration following the decommissioning phase of the Project is evaluated closer to the time (c. 25-30		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				years). It should be noted that restoration activities do not currently conform to baseline conditions.		
MM95	Decommissioning	Chapter 12: Landscape and Visual Amenity	12.7.1 Decommissioning Phase	The decommissioning phase will see a similar nature of effects to the construction stage due to the movement of heavy machinery within the Site and to and from the Site removing turbine components. However, such effects will be temporary in duration and decreasing in scale as turbines are removed from view and the landscape is substantially reinstated to former uses (with the likely exception of the Substation infrastructure). Structures and cabling will be removed and hardstands and turbine foundations will be allowed to regenerate naturally. Roads and associated drainage will remain in place. As with construction stage landscape and visual impacts, decommissioning stage effects are not considered to be significant.		
MM96	Decommissioning	Chapter 15: Traffic and Transportation	15.6.3 Decommissioning Phase	As the turbine blades can be cut into manageable lengths on decommissioning, there is no requirements to adjust street furniture on the turbine supply haul route for decommissioning. The wind turbines proposed as part of the Project are expected to have a lifespan of up to 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the site may be decommissioned fully, with the exception of the electricity substation. Upon decommissioning of the proposed wind farm, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated, cut and removed off-site for recycling. Turbine foundations will		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				remain in place underground and will be covered with earth and allowed to revegetate or reseeded as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in potentially significant environment nuisances such as noise, dust and/or vibration. The site roadways will be in use for additional purposes to the operation of the wind farm (e.g., for forestry and recreational use) by the time the decommissioning of the project arises and therefore the site roads will remain in situ for future use. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed. The grid connection, when completed, will be handed over to ESB Networks as the Distribution System Operator and thus it will not be removed. The traffic management of the decommissioning phase will be informed by the road conditions at the time of decommissioning. It is not possible to predict the changes to the public road infrastructure and policies in the next 30-40 years. It is envisaged that a Traffic Management Plan will be developed for the decommissioning phase. Nevertheless, the following traffic management measures are likely to be required: • Signage will be erected at the site entrance and on the N22 approaching the site. • Construction traffic associated with decommissioning will be scheduled so as to avoid school drop off and collection times. • All vehicles using or while in operation at the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				wind farm site shall either have roof mounted flashing beacons or will use their hazard lights. • A speed limit of 25 km/h shall apply to all vehicles within the wind farm site.		

Table 17.1b: Monitoring Schedule

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	Appendix 2.1 CEMP Management Plan 3 Surface Water Management Plan	An inspection and maintenance plan for the drainage system on site will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the site ECoW or the Project Hydrologist.	On going	Monthly	Project Hydrologist
MX2	Clear Felling of Coniferous Plantation	EIAR Chapter 9: Hydrology and Hydrogeology Appendix 2.1 CEMP Management Plan 3 Surface Water Management Plan	Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling should be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e., where an impact has been shown). Baseline laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will also be undertaken as per water monitoring programme for the overall Development and each primary watercourse along the route.	As Required	Monthly	ECoW
MX3	Drainage Inspection	EIAR Chapter 9: Hydrology and Hydrogeology Appendix 2.1 CEMP Management	Prior to commencement of works in sub-catchments across the site main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage.	As Required	Monthly	Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
		Plan 3 Surface Water Management Plan				
MX4	Birds	EIAR Chapter 7: Ornithology	Pre-commencement bird surveys will be undertaken prior to the initiation of works at the Site. The survey will include a thorough walkover survey to a 500m radius of the Project footprint and/or all works areas, where access allows. If winter roost sites or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located, and earmarked for monitoring at the beginning of the first winter season or breeding season (respectively) of the construction phase. If it is found to be active during the construction phase no works shall be undertaken within a 500m buffer in line with best practise. No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied.	Once	As required	Project Ornithologist
Construction Phase						
			An Ecological Clerk of Works (ECoW) and Environmental Manager will be on site as required during the construction phase. As required, a consultant ecologist with expertise in peatland habitats will assist the ECoW and Environmental Manager. The consultant ecologist will be employed by the developer and will be independent of the Contractor. The ECoW will ensure that all mitigation relating to ecological impacts is being implemented throughout the construction phase of the project. Mitigation for Kerry Slug, as described in **Section 5.6.7**, will involve monitoring of potential Kerry Slug habitat prior to any			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			works commencing. This will be carried out by an ecologist with proven expertise in the ecology of Kerry Slug and will be under licence. .			
MX6	Chapter 6: Aquatic Ecology	6.7 Monitoring Construction	In order to verify the efficacy of pollution prevention and mitigation works during construction, Water Quality Monitoring will be undertaken prior to, during and post completion of construction works in accordance with the parameters and schedules as set out in the Water Quality Management Plan. Monitoring will be undertaken in all watercourses within the catchment of the construction area. Monitoring will be overseen by a qualified and experienced Environmental Manager or Ecological Clerk of Works. The specific monitoring requirements including frequency and parameters, are detailed in the **Chapter 9: Hydrogeology and Hydrology** and in the Water Quality Management Plan. Baseline monitoring undertaken at the Site as part of this study will be repeated periodically i.e., before, during and after construction phase, to measure any deviations from baseline hydrochemistry that occur at the Site, including discharge rates. The construction and post construction monitoring programme for the Gortyrahilly site will include the following: • During the construction phase daily inspection of silt traps, settlement ponds, buffered outfalls and drainage channels will be undertaken. Routine measurement of total suspended solids, electrical conductivity, pH and water temperature at selected water monitoring locations at the			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			Site will be carried out. Monitoring of locations where excavations are being dewatered (likely high in solids) will be done in real time. • During the construction phase of the project, the development areas will be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process.			
MX7	Chapter 7: Ornithology	7.5.2.3 Construction Monitoring	During the breeding season (March-August) bird monitoring surveys will take place to a distance of 500 m from the development area. The purpose of the monitoring will be to identify the presence of sensitive breeding species of conservation importance so that mitigation can be taken to avoid impacts on the breeding activities from the works. The key species of concern at this site are Red Grouse, Snipe and Merlin. The monitoring surveys will be undertaken by a suitably qualified ornithologist. Should the presence of any of these species be confirmed, the location of the nest will be identified (as far as is possible without causing disturbance to the birds) and a buffer zone of 500 m will be observed where works are restricted until after breeding is complete.			
MX8	Chapter 9: Hydrology and Hydrogeology	9.5.2.12.1 Monitoring (Wind Farm Site)	To ensure effective implementation of mitigation measures, environmental auditing, and monitoring of environmental obligations of the Developer, an Environmental Clerk of Works (Ecological Clerk of Works (ECoW)) will be assigned by the Developer to carry out monitoring at the Site during the			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			construction and operational phases of the Project. The role of the Ecological Clerk of Works (ECoW) will be to actively and continuously monitor site conditions and advise on environmental issues and monitoring compliance, and will not be responsible for implementing measures, the due duty of implementing measures will be held by the Developer / contracted construction operator. The Ecological Clerk of Works (ECoW) will have the authority to temporarily stop works in a particular area of the site to ensure corrective measures are implemented and adverse environmental impacts are minimised if not avoided. Monitoring of pollution prevention and mitigation undertaken by the Ecological Clerk of Works (ECoW) assigned by the Developer will include: • Monitoring site pollution prevention plan. • Water quality monitoring. • Advising on required pollution prevention measures (as described in this EIAR) and monitoring their effectiveness. • Liaison with local authorities in relation to pollution instances if applicable. • Considering the Ecological Clerk of Works (ECoW) will be responsible for monitoring a broad range of environmental factors at the Site, technical monitoring and advice will be sought such as from specialist consultants as the need arises e.g., installation and website for telemetry. The following measures will be implemented for Site monitoring in relation to the hydrological and hydrogeological impacts: • The baseline monitoring undertaken at the Site as part of this study will be repeated periodically before, during and after the construction phase of the Project to monitor any			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			deviations from baseline water quality that occur at the Site. This monitoring along with the detailed monitoring outlined below will ensure that the mitigation measures that are in place to protect water quality are working. Specifically, a construction period and post construction monitoring programme for the Site will include the following: - During the construction phase, daily inspection of silt traps, buffered outfalls and drainage channels and daily measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations on the Site (locations close to active working zones). Monitoring of same during times when excavations are being dewatered (likely high in solids) will be done in real time. In this regard, physiochemical properties will be monitored in real time by means of alarmed telemetry e.g., telemetric monitoring at baseline sampling locations and alarm thresholds established in line with water quality reference concentrations/limits which will be set using relevant instruments for example, Surface Water Quality Regulations, <25mg/l Total Suspended Solids (TSS). - Continuous Monitoring will be carried out as part of Active Management of construction water management and treatment (**Figure 9.12**). These monitoring systems will travel with the active construction areas / remain with the Active Management infrastructure. The purpose of this is to recycle water if quality is unfavourable and adjust the dewatering and treatment train accordingly until discharge quality is observed to be acceptable. A small degree of tolerance above reference concentrations is acceptable at this location			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			but only if the discharge from the Active Management train discharges to another Passive Management system or to a non-sensitive vegetated area. If discharging within sensitive areas or buffer zones, the quality of discharge from the Active Management train will be in line with prescribed reference limits (e.g., 25mg/l TSS). - Continuous Monitoring at downstream Baseline SW Monitoring Locations (**Figure 9.6**) will be carried out using telemetry during the construction phase. Triggering of the threshold at these locations will trigger emergency response and escalation of measures including immediate full site inspection to ascertain to the potential unknown source (bearing in mind that the quality of managed runoff at the site will be known by means of live telemetry and handheld meters). Continuous monitoring at Baseline SW Monitoring Locations will continue into the operational phase until stable conditions are observed e.g., stable conditions in line with baseline conditions for 6 months. - Post construction: inspection of silt traps, buffered outfalls and drainage channels, measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations at the Site will be carried out at a reasonable frequency (weekly initially gradually reduced based on observed stability of conditions), and will also be scheduled following extreme metrological events (Section 9.5.2.1). During the operational phase of the Project the stilling ponds and buffered outfalls will be periodically inspected e.g., weekly during maintenance visits to the Site initially and gradually reduced based on observed stability of			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			conditions. - During the construction phase of the project, the Development areas will be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process. This monitoring will continue at a reasonable frequency (weekly initially gradually reduced based on observed stability of conditions) during the operational phase of the Project, however it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase. - During the construction phase of the project, the Development areas and adjacent receiving drainage systems will be monitored daily for evidence of erosion and other adverse impacts to natural drainage channels and existing degraded areas whereby soils/peat are exposed and prone to enhanced degradation. This monitoring will continue at a reasonable frequency during the operational phase of the Project, however it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase. - During both the construction and operational phases of the project watercourse crossings will be monitored frequently (daily during construction and intermittently during operational phase i.e., weekly / monthly inspections initially and reduced gradually in line with observed stability and confidence in longer term data obtained. The water course crossings will be monitored			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			in terms of structural integrity and in terms of their impact on respective watercourses. • A detailed inspection and monitoring regime, including frequency is specified in the Construction Environmental Management Plan (CEMP), Management Plan 2, **Appendix 2.1**. This includes an environmental risk register e.g. constraints linked to the development construction schedule, routine reporting on the performance and effectiveness of drainage and attenuation infrastructure, and any actions taken to rectify or enhance the system. • Site water runoff quality at all surface water monitoring locations will be monitored on a continuous basis during the construction phase of the Project. Monitoring will continue into the operational phase until such time that the Site and water quality have stabilised (stable conditions in line with baseline conditions for e.g. 8 consecutive quarterly monitoring events). This monitoring will be carried out at the downstream surface water baseline sampling location (**Figure 9.6**) • Continuous monitoring systems will be in place, particularly in principal surface water features draining the site. For example, remote sensing, or telemetric monitoring sensors (turbidity) will be employed in this regard. • At construction areas requiring drilling (HDD) and/or significant excavations (launch pits, cable joint bays), and in the management of general excavations, arisings will be managed carefully with a view to containing and treating all drained water and runoff which will likely be laden with suspended solids. Active continuous monitoring will be			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			required at these locations in line with the conceptual model presented in **Appendix D – Tile 2**. The monitoring location will be at the outfall or discharge point of the treatment train at any respective location. Continuous monitoring will include telemetry. • Continuous Monitoring Locations or Telemetric Monitoring Stations (TMS) will use probes to monitor the following parameters: - Electrical Conductivity - Turbidity (Data obtained can be equated to estimated Total Suspended Solids (TSS) through calibration) - pH - Temperature - Capacity for additional probes. • TMSs will be self-powered and will be comprised of the following components at a minimum: - Remote Telemetry Unit (RTU) – Modem / data hub and transmission. - Solar panel - Sensor – pH - Sensor – Turbidity - Sensor – Electrical Conductivity - Sensor Cleaning Device (SCD)(Turbidity probe) - Power Management Unit (PMU) - Power Bank (PB) - Website – presenting data trends over time. - Metal stand / frame and protective fencing. - The TMS will have capacity for additional parameters. • Telemetric continuous monitoring sampling frequency is			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			generally set at one data point per 15 minutes, however considering the intensive nature of the proposed works, particularly drilling activities, if possible it is recommended that sampling frequency is set at 5 minutes or less with a view to escalating responses to potential discharge quality issues in good time. Data is transmitted to a project website which will display data trends over time. Access to the website can be gained and shared via a website link. • Telemetric Monitoring Systems will be used a key part of Active Management of runoff and construction water at the site, as presented in **Figure 9.12 – Tiles no. 7 to 9**. • A handheld turbidity meter will be available and used to accurately measure the quality of water discharging from the site at any particular location. The meter will be maintained and calibrated frequently (per the particular unit's calibration requirements / user manual), and will also be used to check and calibrate remote sensors if they are employed. Quality thresholds will be established for the purposes of escalating water quality issues as they arise. • Rainfall will be monitored (1 no. rainfall gauge required). This unit will be connected with and displayed with other site water quality telemetry data via the telemetry website. • Surface water runoff control infrastructure will be checked and maintained on an ongoing basis, and stilling ponds and check dams will be maintained (de-sludge / settle solids removed) on an ongoing basis, particularly during the construction phase of the Project. It is important to minimise the agitation of solids during these works,			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			otherwise it will likely lead to an acute significant loading of suspended solids in the drainage network. This can be achieved by temporarily reducing or blocking inkling flow and vacuum extracting settled solids or sludge. Where the drainage feature posses relatively significant flow rates, isolating and over pumping is the best course of action. • As part of the **Construction Environmental Management Plan (CEMP), Management Plan 2**, regular checking and maintenance of pollution control measures are required (in line with frequencies outlined above), with an immediate plan for repair or backup if any breaches of design occur. In the event that established infrastructure and measures are failing to reduce suspended solids to an acceptable level, construction works will cease until remediation or upgrading works are completed. • All details in relation to monitoring will be included in the **Surface Water Management Plan (SWMP) (Appendix 2.1)**. Consultation with relevant stakeholders will be sought prior to the SWMP being reviewed and approved by the planning authority. Monitoring of potential hydrological impact of the Project, particularly during the operational phase will be inherently linked to the ecological health of the blanket peat (as a functioning ecosystem) and therefore both hydrology and ecology will be considered, and monitored in tandem. For example, impacts to the hydrological regime at the Site can potentially impact on the ecological health or characterisation of the Site, and vice versa. Ecological indicators can potentially provide useful data in relation to the long-term impact of changes to the hydrological regime at the Site. However, ,			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			changes to the management of runoff and in turn the hydrological regime at the site will lead to a positive impact overall when compared to the baseline conditions associated with the site e.g. introduction of intermittent buffered outfalls along the length of the drainage network is in contrast to baseline, this will promote a more even distribution runoff, attenuate runoff and reduce the hydrological response to rainfall, enhanced potential for recharge to ground, and in turn raising bog water levels resulting in wetting of blanket peat at the Site.			
MX9	Chapter 9: Hydrology and Hydrogeology	9.5.2.12.2 Monitoring (Grid Connection Route and Turbine Delivery Route)	Monitoring will be carried out at each significant construction location (HDD, any excavation >2.0m, temporary bridge construction) and at significant environmental receptors including the following Environmental Monitoring Locations: • Upstream and downstream of surface water crossings on mapped rivers. • Operational wells within groundwater buffer zones associated with significant construction locations (namely SW Crossings). • Groundwater abstraction points within buffer zones (mapped wells, source protection areas, and/or associated Regionally Important Karst Aquifer). Monitoring proposed will be specified relative to the particular activity and associated risk at respective locations. **Routine Surface Water Monitoring** Similar to Wind Farm Site baseline monitoring, baseline surface water samples will be obtained at upstream and			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			downstream sampling locations at each significant construction location over mapped rivers. Baseline surface water samples will be obtained at accessible locations such as existing bridges on public roads. Where upstream access is poor, the upstream baseline sampling location will be directly/immediately upstream of the construction location (e.g., existing bridge / culvert). **Routine Groundwater Monitoring** At Horizontal Directional Drilling (HDD) locations, any mapped wells identified in HDD groundwater buffer zones (250m) will be monitored to establish baseline, and routinely monitored during the construction and for a period into the operational phase of the Project. All abstraction points associated with groundwater source protection areas and within Regionally Important Karst aquifers associated with the development will be monitored with the same frequency. **Continuous Monitoring of Active Construction Water Management and Discharge** At construction areas requiring drilling (HDD) and/or significant excavations (launch pits, cable joint bays), and in the management of general excavations, arisings will be managed carefully with a view to containing and treating all drained water and runoff which will likely be laden with suspended solids. Active continuous monitoring will be required at these locations in line with the conceptual model presented in (**Chapter 9**). The monitoring location will be at the outfall or discharge point of the treatment train at any respective location. Continuous monitoring will include telemetry. Continuous Monitoring Locations or Telemetric Monitoring			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			Stations (TMS) will use probes to monitor the following parameters: • Electrical Conductivity • Turbidity (Data obtained can be equated to estimated Total Suspended Solids (TSS) through calibration) • pH • Temperature • Capacity for additional probes. TMSs will be self-powered and will be comprised of the following components at a minimum: • Remote Telemetry Unit (RTU) – Modem / data hub and transmission. • Solar panel • Sensor – pH • Sensor – Turbidity • Sensor – Electrical Conductivity • Sensor Cleaning Device (SCD)(Turbidity probe) • Power Management Unit (PMU) • Power Bank (PB) • Website – presenting data trends over time. • Metal stand / frame and protective fencing. • The TMS will have capacity for additional parameters. Telemetric continuous monitoring sampling frequency is generally set at one data point per 15 minutes, however considering the intensive nature of the proposed works, particularly drilling activities, if possible it is recommended that sampling frequency is set at 5 minutes or less with a view to escalating responses to potential discharge quality issues in good time. Data is transmitted to a project website which will display data trends over time. Access to the website can be gained and shared via a website link.			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			In line with monitoring objectives in relation to surface water quality, parameter value thresholds or limits will be established on the telemetry website, text and email alerts will be established which will notify relevant assigned persons of trend anomalies which require investigation, escalation, and corrective mitigation, for example: • A threshold of 25mg/l Total Suspended Solids (TSS) will be applied at treatment train outfalls/discharge points, in line with legislative reference limits for surface water quality. Exceedance of such threshold will trigger further investigation and escalation of responses on site with a view to identifying potential uncontrolled sources of contaminants. Parameter trend analysis will also inform investigations and response, for example, intermittent spikes in concentrations in line with baseline conditions versus continuously elevated concentrations caused by an ongoing environmental incident. • The website will be periodically checked and maintained on a weekly basis at a minimum. The client will also receive maintenance alerts in relation to the monitoring stations, for example; in the event data is not being received from a particular probe the client / assigned person/s will be notified by the system and maintenance call outs will be conducted.			
MX10	Chapter 9: Hydrology and Hydrogeology	9.5.2.12.3 Active Monitoring on Site	Handheld meters (Turbidity / Total Suspended Solids (TSS)) will used by the ECoW / competent operators during construction works. This will be done with a view to managing water treatment and anticipating potential surcharges in water or TSS loading within the treatment train. Handheld meters will also be used to monitor outfall/discharge quality in the event			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			telemetry systems fail or during system maintenance. Handheld probes will be checked and calibrated regularly.			
MX11	Chapter 9: Hydrology and Hydrogeology	9.5.2.12.4 Monitoring Under Licence	Where a discharge licence is required, the conditions of the licence will stipulate monitoring requirements in line with licence parameters with associated emission limit values. The frequency of sampling will likely be daily or weekly. Sampling will include obtaining physical samples at an agreed discharge sampling point and will be sent an accredited laboratory for analysis. Where discharge licence is required, monitoring in line with the licence will be done in addition to the other monitoring regimes undertaken as described in sections above. Monitoring under licence conditions will not negate the requirement for the other regimes described.			
MX12	Chapter 9: Hydrology and Hydrogeology	9.5.2.12.5 Tailoring of Monitoring Requirements	Monitoring will be tailored at each location in terms of requirements set out in trade effluent discharge licence/s where relevant. • The baseline monitoring undertaken at the proposed site as part of this study will be repeated periodically before, during and after the construction phase of the Project to monitor any deviations from baseline hydrochemistry that occur at the site. This monitoring along with the detailed monitoring outlined below will help to ensure that the mitigation measures that are in place to protect water quality are working. Specifically, a construction period and post construction monitoring programme for the Project site should include the following. - During the construction phase; daily inspection of silt traps, buffered outfalls and drainage channels and daily measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			locations on the site. Monitoring of same during times when excavations are being dewatered (likely high in solids) should be done in real time. - Post construction: at a reasonable frequency inspection of silt traps, buffered outfalls and drainage channels, measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations at the site. During the operational phase of the Project the stilling ponds and buffered outfalls will be periodically inspected during maintenance visits to the site. - During the construction phase of the project, the development areas should be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process. - During both the construction and operational phases of the project, watercourse crossings should be monitored frequently (daily during construction and intermittently during operational phase). The water course crossings should be monitored in terms of structural integrity and in terms of their impact on respective watercourses. - A detailed inspection and monitoring regime, including frequency has been specified in the Construction and Environmental Management Plan (CEMP, **Appendix 2.1 Management Plan 2**).			
MX13	Chapter 15: Traffic and Transport	15.9 Monitoring	The local road network near the Site used to transport construction materials will be monitored during construction so that any damage caused by construction traffic associated with			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			the Project can be identified and maintenance works carried out as soon as practicable to avoid issues for other road users and the local population of the area. Any extensive repairs, such as full road width resurfacing, required to the local road network arising from damage caused by traffic associated with the Project will be carried out once construction activities have ceased onsite. The monitoring will be undertaken by the Owner's Engineer to be appointed by the Developer for the construction stage in conjunction with the Local Authority Roads Area Engineer. The appointed Contractor will be responsible for seeing that HGV drivers travelling to and from the Site obey the designated speed limits, rules of the road and that they only use the designated civils construction haul route. This will be undertaken through regular toolbox talks for drivers during the construction of the Project.			
Operational Phase						
MX14	Chapter 5: Terrestrial Ecology	5.9.2 Bat monitoring	The following monitoring programme will take place to establish bat activity within the operational wind farm and the number of bat collision fatalities at each turbine. • The static survey should be completed during the spring, summer and autumn of each year for a minimum of three years commencing from year 1 of the operational phase of the wind farm. This will comprise collection of bat activity, fatality and site-specific weather data in each of the three seasons. Each of the turbines will be monitored using specially trained search dogs. • The collision monitoring program will require site-specific data on seasonal scavenger removal rates and on the			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			efficiency of detection of animal carcasses by the dogs used for bat searching. • Modelling / calculation of the level of bat fatality likely to occur over the active season based on the results of the work. • The production of an annual report detailing the approach to, results and conclusions of the work. Statistical analysis of the relationship between weather and fatality levels will be included. The report will be issued to Cork County Council.			
MX15	Chapter 6: Aquatic Ecology	6.7.1 Post-construction phase monitoring	On completion of the construction phase one round of post construction monitoring will be undertaken using the suite of parameters as detailed in the Water Quality Management Plan. During the operational phase of the project the stilling ponds and buffered outfalls will be periodically inspected during maintenance visits to the Site.			
MX16	Chapter 7: Ornithology	7.5.2.3 Post-construction monitoring	**Flight activity surveys** Flight activity surveys will be undertaken using the Vantage Point method (Scottish Natural Heritage 2017). This will use the same VPs as used for the baseline EIAR surveys in 2020-2021. The surveys will be undertaken monthly in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the project (in accordance with Scottish Natural Heritage Guidance 2009). **Distribution and abundance surveys** Distribution and abundance surveys will be undertaken to monitor short-term and long-term effects on bird populations within the site. Survey methodology will be similar to methods			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			employed for baseline EIAR surveys which will allow a comparison of data to be made for each monitoring year. Surveys will be undertaken in the same monitoring years as the vantage point surveys. **Red Grouse survey** Repeat of the pre-construction Red Grouse survey (under licence) in Years 1, 2, 3 and 5 of operation. This will establish whether Red Grouse maintain a presence on site in the area of the wind farm infrastructure. Surveys will follow the standard methodology as used in the baseline EIAR survey. **Collision searches** The objective of collision monitoring and corpse search is to establish whether bird fatalities are occurring as a result of collision with turbine blades. A standard plot size will be selected at each turbine location where search will occur. At the start of each survey, data recorded will include meteorological and ground cover information. The locations of any carcasses found will be recorded by GPS and will be photographed in-situ. The state of each carcass will be recorded on a corpse record card, using the following categories (after Johnson 2003): • Intact - a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger. • Scavenged - an entire carcass which shows signs of being fed upon by a predator or scavenger, or a portion(s) of a			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			carcass in one location such as wings, legs, skeletal remains or pieces of skin. • Feather Spot - ten or more feathers at one location indicating predation or scavenging. If only feathers are found, 10 or more total feathers or two or more primaries must be discovered to consider the observation a casualty. Searcher efficiency and predation tests will be carried out at the commencement of the programme in order to calibrate the results to account for the search dog's ability to find bird corpses and to also account for scavenging of corpses by animals. The collision searches will be carried out on a monthly basis in Years 1, 2, 3, & 5 of the operational phase of the wind farm.			
MX17	Chapter 8: Soila and Geology	8.5.3 Operational Phase	Regular monitoring, similar to the construction phase but on a less frequent basis will be required. For example, the Development will be inspected on a routine quarterly basis and following storm events. Any potential issues arising will be noted and remedial action taken in line with construction phase mitigation.			
Decommissioning Phase						
MX18	Appendix 2.1 CEMP	Management Plan 6 Decommissioning Plan	The Site Manager in consultation with the ECoW will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works.	As required	As required	Site Manager