Rehabilitation Schedule

codling wind park

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Abbreviations

Abbreviation	Term in full
CPS	Cable protection system
CWP	Codling Wind Park
CWPL	Codling Wind Park Limited
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ESB	Electricity Supply Board
ESBN	ESB Networks
GIS	Gas-insulated switchgear
HWM	High water mark
LiDAR	Light detection and ranging system
MAC	Maritime Area Consent
MAP	Maritime Area Planning
MW	Megawatts
OECC	Offshore export cable corridor
OfTI	Offshore transmission infrastructure
OSS	Offshore substation structure
OWF	Offshore wind farm
TJB	Transition joint bay
TP	Transition piece

Definitions

Glossary	Meaning
the Applicant	The developer, Codling Wind Park Limited (CWPL).
array site	The red line boundary area within which the wind turbine generators (WTGs), inter-array cables (IACs) and the Offshore Substation Structures (OSSs) are proposed.
Codling Wind Park (CWP) Project	The proposed development as a whole is referred to as the Codling Wind Park (CWP) Project, comprising of the offshore infrastructure, the onshore infrastructure and any associated temporary works.
Codling Wind Park Limited (CWPL)	A joint venture between Fred. Olsen Seawind (FOS) and Électricité de France (EDF) Renewables, established to develop the CWP Project.
Environmental Impact Assessment (EIA)	A systematic means of assessing the likely significant effects of a proposed project, undertaken in accordance with the EIA Directive and the relevant Irish legislation.
Environmental Impact Assessment Report (EIAR)	The report prepared by the Applicant to describe the findings of the EIA for the CWP Project.
export cables	The cables, both onshore and offshore, that connect the offshore substations with the onshore substation.
generating station	Comprising the wind turbine generators (WTGs), inter-array cables (IACs) and the interconnector cables.
high water mark (HWM)	The line of high water of ordinary or medium tides of the sea or tidal river or estuary.
inter-array cables (IACs)	The subsea electricity cables between each WTG and between the OSSs.
interconnector cables	The subsea electricity cables between OSSs.
landfall	The point at which the offshore export cables are brought onshore and connected to the onshore export cables via the transition joint bays (TJB). For the CWP Project, the landfall works include the installation of the offshore export cables within Dublin Bay out to approximately 4 km offshore, where water depths that are too shallow for conventional cable lay vessels to operate.
Maritime Area Consent (MAC)	A Maritime Area Consent (MAC) provides State authorisation for a prospective developer to undertake a maritime usage and occupy a specified part of the maritime area. A MAC is required to be in place before planning consent can be sought.
Maritime Area Planning (MAP) Act 2021	The MAP Act 2021 regulates the maritime area, by means of a National Marine Planning Framework, Maritime Area Consents (MACs) for the occupation of the maritime area for the purposes of maritime usages that will be undertaken for undefined or relatively long periods of time (including any such usages which also require development permission under the Planning and Development Act 2000) and licences for the occupation of the maritime area for maritime usages that are minor or that will be undertaken for relatively short periods of time. The MAP Act

	also creates a new regulatory authority, and a regime for designating protected marine areas.
offshore export cables	The cables which transport electricity generated by the wind turbine generators (WTGs) from the offshore substation structures (OSSs) to the TJBs at the landfall.
offshore export cable corridor (OECC)	The area between the array site and the landfall, within which the offshore export cables cable will be installed along with cable protection and other temporary works for construction.
offshore infrastructure	The permanent offshore infrastructure, comprising of the WTGs, IACs, OSSs, interconnector cables, offshore export cables and other associated infrastructure such as cable and scour protection.
offshore substation structure (OSS)	A fixed structure located within the array site, containing electrical equipment to aggregate the power from the wind turbine generators (WTGs) and convert it into a more suitable form for export to shore.
OSS topside	This is the offshore substation topside structure located on the OSS monopile foundation and housing all electrical and ancillary equipment. This includes all systems such as electrical, SCADA, safety and mechanical equipment.
OSS monopile foundation	The bottom fixed structure piled in to the seabed supporting the OSS topside.
offshore transmission infrastructure (OfTI)	The offshore transmission assets comprising the OSSs, and offshore export cables. The EIAR considers both permanent and temporary works associated with the OfTI.
onshore transmission infrastructure (OTI)	The offshore transmission assets comprising the OSSs and offshore export cables. The EIAR considers both permanent and temporary works associated with the OfTI.
onshore substation	Site containing electrical equipment to enable connection to the national grid.
planning application boundary	The area subject to the application for development consent, including all permanent and temporary works for the CWP Project.
revetment	A facing of impact-resistant material applied to a bank or wall in order to absorb the energy of incoming water and protect it from erosion.
transition joint bay (TJB)	This is required as part of the OTI and is located at the landfall. It is an underground bay housing a joint which connects the offshore and onshore export cables.
tunnel	The onshore export cables will be installed within a tunnel that extends from within Compound A, near the landfall, to the onshore substation site.
wind turbine generator	All the components of a wind turbine, including the tower, nacelle, and rotor.

1 INTRODUCTION

1.1 The CWP Project

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish Sea approximately 13–22 km off the east coast of Ireland, at County Wicklow.

2. The CWP Project has an expected generating capacity of 1,300 megawatts (MW) and comprises the following main components:

- The generating station, which comprises the wind turbine generators (WTGs), inter-array cables (IACs) and interconnector cables;
- The offshore transmission infrastructure (OfTI) which comprises the offshore substation structures (OSSs) and offshore export cables;
- The landfall, which describes the point at which the offshore export cables are brought onshore and connected at transition joint bays (TJBs) to the onshore export cables. For the CWP Project, the landfall works include the installation of the offshore export cables within Dublin Bay out to approximately 4 km offshore, where water depths are too shallow for conventional cable lay vessels to operate; and
- The onshore transmission infrastructure (OTI), comprising the onshore export cables, which will partly run under the cooling water channel, and is subject to the CWP Project Maritime Area Consent (MAC), the onshore substation, which will be partly constructed on reclaimed lands subject to the CWP Project MAC, and associated infrastructure.

1.2 Required permissions

1.2.1 Development permission

3. The Applicant is applying for development permission for all components of the CWP Project under Section 291 of the Planning and Development Act (PDA) 2000, as amended. A 10-year planning permission is sought, with an operation lifetime of 25 years. The 25-year operational lifetime shall commence on full commercial operation of the project.

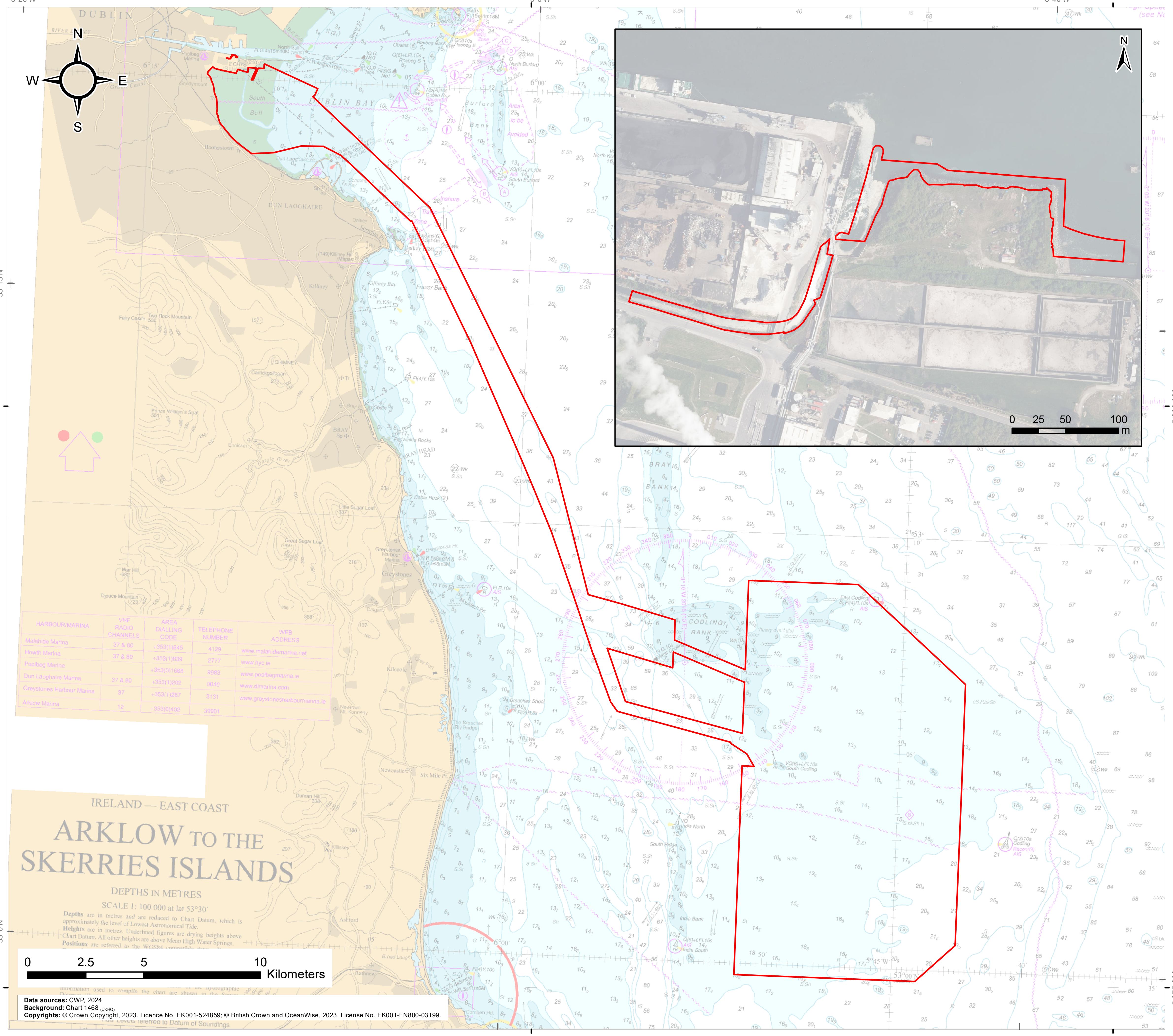
1.2.2 Maritime Area Consent (MAC)

4. The Maritime Area Planning (MAP) Act 2021 established a new Maritime Area Regulatory Authority (MARA). MARA has taken over responsibility from the Minister for the Department of Housing, Local Government and Heritage (DHLGH) for the issuing of licences for maritime usages, including conducting surveys in the marine environment. MARA also has the power to grant MACs.

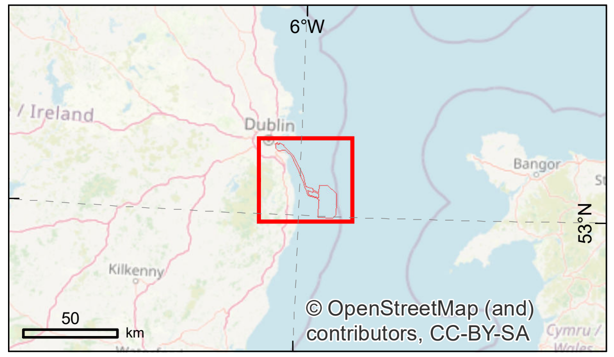
5. A MAC is a right to occupy a specified part of the maritime area, conditional on securing other necessary approvals, and is required before an application for planning permission can be submitted.

6. The Applicant applied for a MAC for the CWP Project in June 2022. In December 2022, a MAC was granted for the CWP Project, conditional on securing planning permission from An Bord Pleanála (MAC number 2022-MAC-006). Subsequent amendments were made to the MAC to extend the planning application date and to include additional areas in the MAC area, to facilitate the construction of the onshore substation and the deployment of temporary demarcation buoys within a maritime

safety demarcation area around the array site during the construction of the offshore wind farm. The CWP MAC boundary is detailed in **Figure 1-1**.



Data sources: CWP, 2024
Background: Chart 1468 (UKHO)



Legend

MAC boundary

Project:	Codling Wind Park	Contractor:
		Website:

Figure 1.1
MAC boundary

CWP doc. number: CWP-CWP-ENG-08-01-MAP-1710

Internal descriptive code:	Size: A3	CRS:
WE - ALL.MAC2 - - (SD.RS.FIG.01)	Scale: 1:160,000	EPSG 25830

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/08/08	MC	NC	ES

1.3 Purpose of this document

1.3.1 Rehabilitation obligation

7. In accordance with Section 96 of the MAP Act 2021, as amended, prior to the expiration of the MAC, the Applicant is required to rehabilitate the MAC consent area, detailed in Error! Reference source not found., and any other part of the maritime area adversely affected by the CWP Project.

8. In order for the relevant part of the maritime area to be considered as rehabilitated, in accordance with section 95 of the MAP Act 2021, as amended, the Applicant is required to either:

(i) restore the part to a satisfactory state, with particular regard to the seabed, water quality, wildlife, natural habitats, landscape and seascape, or

(ii) restore the part to a satisfactory state to enable it to be reused for the purpose for which it was previously used (and whether or not pursuant to a MAC) or for another purpose and, consistent with such purpose, with particular regard to the seabed, water quality, wildlife, natural habitats, landscape and seascape.

9. Section 96(2) of the MAP Act provides a number of examples of rehabilitation: (a) the decommissioning of infrastructure; (b) the removal of infrastructure; (c) the partial removal of infrastructure; (d) the reuse of infrastructure for the same or another purpose; (e) the burying or encasing of infrastructure; and (f) the removal of any deposited or waste material.

10. For the purposes of the current application for development permission, it is assumed that the Applicant will rehabilitate the MAC consent area at the end of the CWP Project's anticipated operation lifetime of 25 years. This Rehabilitation Schedule has been prepared on that basis. This assumption may be reviewed to explore alternative options, such as repowering the CWP within the 45-year period of the MAC. Should repowering be pursued, a new application for development permission would be required, supported by an Environmental Impact Assessment (EIA).

1.3.2 Rehabilitation Schedule

11. This Rehabilitation Schedule has been prepared for submission with the CWP Project application for development permission, as required by Section 75(5) of the MAP Act 2021, as amended, and to satisfy Condition 5.1 of 2022-MAC-006. The purpose of this document is to set out how the Applicant will achieve rehabilitation of the maritime area.

12. The Rehabilitation Schedule has been prepared in accordance with the requirements set out in Section 96(4) of the MAP Act 2021, as amended, an overview of which is provided in **Table 1-1** below.

13. It is recognised that, should development permission be granted, this Rehabilitation Schedule will form a binding commitment on the Applicant. It is anticipated that the Rehabilitation Schedule will need to be updated throughout the lifecycle of the CWP Project to reflect changes to regulatory requirements and to incorporate any improvements in knowledge and understanding of the rehabilitation process and impacts on the marine environment. In this instance, the Applicant will apply for the necessary permission to amend the Rehabilitation Schedule.

14. It is further recognised that, under Section 97 of the MAP Act 2021, as amended, MARA may require the Applicant to apply for permission to amend the Rehabilitation Schedule where it considers it is no longer appropriate due to changes in technology, best practice or submissions / recommendations received by MARA from persons or entities concerned with the rehabilitation of marine environments.

Table 1-1 Legislative requirements of this Rehabilitation Schedule

Legislation	Requirement	Rehabilitation Schedule reference
MAP Act, 2021 as amended, section 96(4)	(a) the proposed programme of rehabilitation	Section 4
	(b) the proposed date, or the occurrence of the event, on which the programme will start to be implemented and (if no ongoing maintenance is required by the programme) the proposed date on which the programme will have been fully implemented	Section 7
	(c) the estimated costs of the programme	Section 6
	(d) the expected timelines for applying for and obtaining the other authorisations referred to in subsection 3, required in order to enable the Applicant to discharge that obligation	Section 7

1.3.3 Structure of this Rehabilitation Schedule

15. There is currently no guidance relating to rehabilitation of the maritime area or decommissioning of offshore renewable energy installations in Ireland. Therefore, in addition to the requirements detailed in **Table 1-1** above, in preparation of this Rehabilitation Schedule, the Applicant has taken into consideration the following guidance;

- Department for Business, Energy and Industrial Strategy (BEIS) (2019) Decommissioning of Offshore Renewable Energy Installations Under the Energy Act 2004, Guidance notes for industry (England and Wales);
- Scottish Government (2022) Decommissioning of Offshore Renewable Energy Installations in Scottish waters or in the Scottish part of the Renewable Energy Zone under The Energy Act 2004 Guidance notes for industry (in Scotland);
- International Maritime Organisation (IMO) (1989) Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone; and
- United Nations (1982) United Nations Convention on the Law of the Sea (UNCLOS).

16. The structure of this document has been informed by the recommendations considered to be relevant, as presented in BEIS 2019 Guidance and Scottish Government 2022 Guidance.

17. Any future updates to this Rehabilitation Schedule will take into consideration recommendations included in any guidance which may subsequently be produced in Ireland for the purposes of rehabilitation in the maritime area.

18. A summary of the structure is provided in **Table 1-2** below.

Table 1-2 Structure of this Rehabilitation Schedule

Section number	Section title	Summary of contents
1	Introduction	This section provides an overview of the requirements for the Rehabilitation Schedule, and its proposed content and structure.
2	Background information	An overview of the CWP Project, including an overview of the project infrastructure located in the maritime area, site characteristics and a summary of environmental conditions.
3	Infrastructure subject to the Rehabilitation Schedule	A description of CWP infrastructure within the scope of the proposed programme of rehabilitation.
4	Proposed programme of rehabilitation	A description of the proposed approach to rehabilitation.
5	Environmental Impact Assessment (EIA)	A summary of the conclusions of the EIA undertaken for the CWP Project in relation to rehabilitation.
6	Schedule	A description of the indicative schedule for the programme of rehabilitation, including the expected timelines for applying for and obtaining the authorisations required to undertake the programme.
7	Costs	A description of the estimated costs for the programme of rehabilitation.
8	Seabed clearance and restoration of the site	A description of the plan for confirming restoration of the maritime area.
9	Post-rehabilitation monitoring and maintenance of the maritime area	A description of potential post-rehabilitation monitoring.

2 BACKGROUND INFORMATION

2.1 Site location and characteristics

2.1.1 Offshore site location and characteristics

19. The CWP Project array site is located approximately 13–22 km off the east coast of Ireland between Greystones and Wicklow Town and covers an area of 125 km^2. The offshore export cable corridor (OECC) covers an area of 40.1 km^2 and connects the array site with the landfall location at Poolbeg. The key physical characteristics of the offshore development area are described below.

BathymetryError! Reference source not found.

20. Water depths across the CWP array site range from approximately -28 m to -6 m, relative to the lowest astronomical tide (LAT). The deeper water levels are observed towards the southeast of the array site, with shallower water depths observed towards the northeast. The central part of the array site generally sits at depths between -15 mLAT and -18 mLAT.

21. Water depths along the OECC vary greatly, with depths of up to -120 mLAT near the array site where the OECC intersects a topographic depression on the seabed, known as the Codling Deep. Approximately 6 km offshore, the route passes through a field of large bedforms (sand waves with wave heights up to approximately 4 m with superimposed megaripples). The seabed gradient reduces until it reaches a depth of less than -10 mLAT c. 8 km from the landfall.

Metocean and seabed conditions

22. A full wind measurement campaign at the CWP Project array site has been ongoing since May 2021, including one fixed light detection and ranging system (LiDAR) and two floating LiDARs that have been validated as per industry-recognised guidelines. Long-term wind modelled data has been calibrated with on-site measurements so that the wind speed and direction estimate is representative of the long term.

23. **Plate 2-1** provides a wind rose diagram indicating the wind speed and direction that is typically expected at the array site. Wind direction across the array site is predominantly from the south-southwest (SSW).

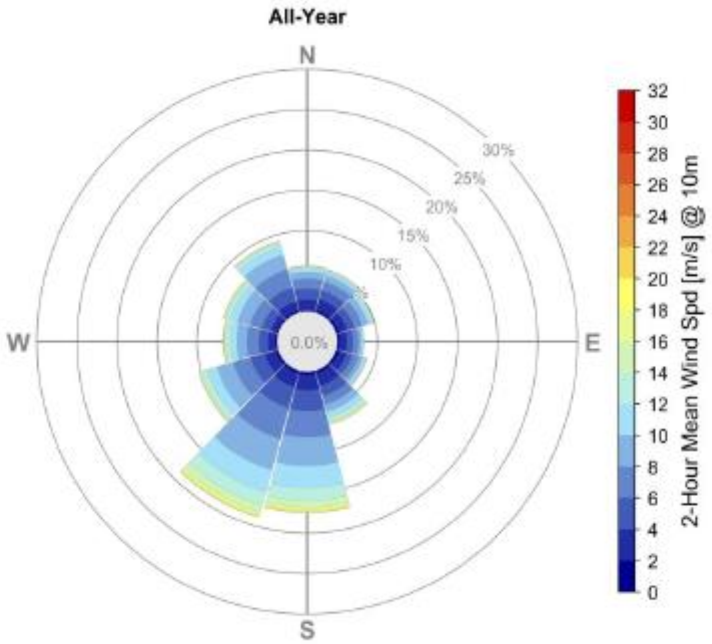


Plate 2-1 All-year rose plot of wind speed and direction at 10 m ASL (centre of array site)

24. Oceanographic surveys within the array site have also been undertaken to record wave, current and water-level data. Long-term metocean modelled data has been calibrated with the survey data collected for the CWP Project.

25. The dominant tidal current direction across the array site is north-northeast (NNE) during flood tides and south-southwest (SSW) during ebb sites. **Table 2-1** presents tidal depth averaged current speeds recorded at the array site.

Table 2-1 Tidal depth average current speed descriptors (southwest of array site)

Description	Flood (m/s)	Ebb (m/s)
Minimum astronomical tide	0.59	0.57
Mean neap tide	0.85	0.86
Mean tide	1.15	1.19
Mean Spring tide	1.35	1.43
Maximum astronomical tide	1.54	1.65

26. A series of geotechnical and geophysical surveys were conducted across the array site in 2013, with further surveys conducted in April to August 2021 in the array site and within the OECC, and an offshore geotechnical campaign across the array site between May and August 2023.

27. Seabed sediments within the offshore development area are dominantly sand, with areas comprising a veneer of finer grained sands over a broad expanse of sandy gravels. Several isolated areas of boulders and cobbles have also been observed.

28. Codling Bank, upon which the array site is located, is one of the largest sandbanks in the Irish Sea. It forms part of a series of coast-parallel, north-south trending offshore banks. Uniquely within the context

of these banks, Codling Bank is a stable formation. The lower mobilisation frequency for Codling Bank can be explained by the fact that the seabed substrate in the area is coarser (sandy gravel to gravel) than at other banks, resulting in a higher threshold for sediment mobilisation.

3 INFRASTRUCTURE SUBJECT TO THE REHABILITATION SCHEDULE

3.1 Introduction

29. This section of the Rehabilitation Schedule contains details of all infrastructure within the maritime area of the MAC, which the Applicant has identified will form part of the scope of the future programme of rehabilitation:

- WTGs;
- WTG monopile foundations;
- WTG monopile scour protection;
- Inter-array and interconnector cables;
- Inter-array and interconnector scour protection;
- OSS topside;
- OSS monopile foundations;
- OSS monopile foundation scour protection;
- Offshore export cables;
- Offshore export cable protection;
- Intertidal cable ducts;
- Landfall cable ducts; and
- Relevant onshore transmission infrastructure (OTI).

30. The following section provides an overview of these components as applied for in development permission. This Rehabilitation Schedule will be updated as required throughout the lifecycle of the CWP Project, and will include updated descriptions of the infrastructure within the scope of the programme of rehabilitation once final as-built design information is available.

31. It should be noted that responsibility for the OfTI assets (the OSSs, including monopile foundation scour protection, offshore export cables, including cable protection, and intertidal cable ducts) will transfer to EirGrid, which will be responsible for the rehabilitation programme in relation to those assets.

3.2 Generating station

3.2.1 Wind turbine generators (WTGs)

32. Two WTG layout options are proposed for the CWP Project:

a. **WTG Layout Option A**, consisting of 75 WTGs with a rotor diameter of 250 m; and
b. **WTG Layout Option B**, consisting of 60 WTGs with a rotor diameter of 276 m.

33. For both options, conventional three-bladed, horizontal-axis WTGs will be used, consisting of the following key components:

- Rotor – comprising the blades, hub and spinner;
- Nacelle – housing the electrical generator, transformer, control electronics and drive system; and
- Structural support – including the tower and rotor yaw mechanism which enables the rotor and nacelle to turn to face into the wind.

34. The WTG tower will be a tubular steel column. The dimensions of the tower are presented in **Table 3-1** below. The transition piece connects the tower to the substructure (monopile foundation). WTG electrical and communication equipment will be housed in the WTG foundation and / or the WTG tower.

Table 3-1 Wind turbine generator components and parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of WTGs	75	60
WTG rotor diameter (m)	250	276
Hub height above LAT (m)	163	176
Tip height above LAT (m)	288	314
Blade tip clearance above LAT (m)	37.72	37.72
WTG tower diameter (m)	8	9
Blade chord (width) (m)	7	7.9

3.2.2 WTG monopile foundation

35. Monopile foundations consist of a single tubular section of steel. The required dimensions of the monopile foundation depend on the size of the WTG, hub height above LAT, water depth, metocean conditions and the ground conditions at each location.

36. The WTG tower will be grouted into a transition piece (TP) which is in turn grouted onto the foundation. A grouted transition piece will be installed between the top of the monopile foundation and the underside of the WTG tower and provides a levelling mechanism for the tower.

37. **Table 3-2** presents the monopile parameters associated with WTG Layout Options A and B.

Table 3-2 WTG monopile parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of structures	75	60
Height of monopile above LAT prior to TP installation (m)	6.5	6.5
Height of transition piece above LAT (m)	31.1	31.1
WTG monopile diameter at mudline (m)	9	9.5
WTG monopile length (m)	68.5	69.5
WTG monopile embedment depth (m)	36.0	36.5
WTG monopile seabed area footprint per WTG (m^2)	64	71
Monopile grout volume (m^3)	25	26.5

3.2.3 WTG Monopile scour protection

38. The WTG monopile foundation scour protection design will consist of a standard rock armour solution, consisting of graded stones placed on or around the monopile foundation with a thicker armour layer and a filter layer beneath.

39. The rock used is normally imported from land quarries, although sea aggregates from licensed extraction sites can also be used where suitable, with grain sizes tailored to achieve the necessary protection. Based on existing data, it is currently expected that all WTG locations will require the installation of monopile scour protection.

40. **Table 3-3** presents the parameters for scour protection associated with WTG Layout Options A and B.

Table 3-3 WTG scour protection parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of locations (WTGs) where scour protection is required	75	60
Area of scour protection per location (including monopile footprint) (m^2)	3,640	3,640
Total WTG monopile seabed area take (with scour protection) across the array site (m^2)	273,000	218,400
Height of scour protection above seabed (m)	3.1	3.1
Volume of scour protection per location (m^3)	5,365	5,365

3.2.4 Inter-array cables (IACs) and interconnector cables

41. The IAC network distributes the electrical power generated at the WTGs to the OSSs, where the combined generated power can be converted to a higher voltage for transmission to shore and connection to the onshore grid.

42. In addition to the IAC network, two interconnector cables will connect the northern and southern OSSs to the central OSS.

43. The IACs connect multiple WTGs together into 'strings'. These strings then connect the WTGs to the relevant OSS, with multiple strings connecting back to each OSS. The IACs and interconnector cables are included as part of the generating station whilst the OSSs are included as part of the OfTI.

44. The IACs and interconnector cables will be AC and of 66 kV voltage. Each cable will comprise three cores with copper or aluminium conductors and insulation / conductor screening. The three cores will be bound together and protected within a layer of steel armour. The cable bundle will also include a fibreoptic communications cable for monitoring of the OWF and control.

45. The total length of IACs and interconnector cables for both WTG Layout Option A and Option B are provided as a range (see **Table 3-4**).

Table 3-4 Inter-array and interconnector cable parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of IAC cable ‘strings’ per OSS	6	6
Length of inter-array cabling on the seabed (km)	120–139	112–130
Length of interconnector cabling on the seabed (km)	7.4–8.6	7.4–8.6

3.2.5 Inter-array and interconnector cable protection

46. The Applicant will, where practicable, bury all cables to a minimum depth of cover. In cases where depth of cover is inadequate, cable protection will be implemented as mitigation to avoid risks to other marine operations.

47. Secondary cable protection within the array site will be achieved by covering the exposed cables with rock placement. This ensures cables remain protected from natural movements of the seabed and from anthropogenic factors that may cause damage to a cable (e.g. trawling or anchors).

48. Rock placement is an established method for protecting cables. The rock used is normally imported from land quarries, although sea aggregates can also be used where suitable, with grain sizes tailored to achieve the necessary protection.

49. Typically, smaller stones are placed over the cable as a covering layer. This provides protection from any impact from larger rocks which are then placed on top of this initial protective layer. The rock grading has a mean rock size of 90–125 mm, up to a maximum of 250 mm.

50. For the purposes of the EIA undertaken in support of the application for development permission, cable protection parameters have been determined using details from a preliminary cable burial risk assessment. These are presented in **Table 3-5.**

Table 3-5 IAC and interconnector cable protection design parameters

Details	WTG Layout Option A	WTG Layout Option B
Length of inter-array and interconnector cabling requiring cable protection (km)	29.8	29.8
Width of cable protection on seabed (m)	7	7
Height of cable protection berm (m)	1.25	1.25
Total area of seabed covered by cable protection (m^2)	208,600	208,600
Number of cable crossings required	None	None

Cable protection system at IAC and interconnector ends

51. In addition to the cable protection measures set out above, a small section at either end of each length of IAC and interconnector cable may also be unburied to allow connection to the WTG or OSS. This is through circular apertures directly on the monopile foundations and / or through external J-tubes attached to the TP and lowered to the seabed. J-tubes support and protect cables between the seabed and the top part of the monopile foundation, for both WTGs and OSSs.

52. The distance of the above cable entries to the seabed or top of scour protection is approximately 3 m, but will depend on the specification provided by the cable protection system (CPS) supplier. CPS tubes made of polymer and / or cast-iron shells will be designed to guard the cable bend radius and protect the cable against over-bending within limited tension forces. The bending stiffness is tuned according to winch pull-in tension, marine cable lay operation and the minimum cable bending radius.

53. Based on existing data, it is expected that all IAC links and interconnector cables will require the installation of a CPS.

3.3 Offshore transmission infrastructure (OfTI)

3.3.1 Offshore substation structure (OSS)

54. Each OSS for the CWP Project houses a range of electrical equipment to receive, transform and transmit the incoming electricity from the WTGs and IACs to shore. The function of the OSS is to collect the incoming electricity from the WTGs and transform this to a higher voltage for transmission to the shore.

55. The CWP Project will incorporate three OSSs and each OSS will be fixed onto a single monopile foundation with a transition piece bolted and / or grouted to the monopile.

3.3.2 OSS topside

Infrastructure design

56. The OSS topside unit is prefabricated in the form of a multilevel structure that is lowered and mounted on a foundation. Each OSS topside will accommodate the following components:

- Medium Voltage (MV) to High Voltage (HV) power transformer;
- MV and HV switchgear;
- HV shunt reactor;
- Low voltage (LV) systems;
- Instrumentation, metering equipment and control systems;
- Standby generator;
- Auxiliary and uninterruptible power supply systems;
- Marking and lighting;
- Emergency shelter or accommodation, including mess facilities;
- Material handling systems;
- Firefighting systems;
- Foam suppression units; and
- Control, LV and battery rooms.

57. The OSS drainage system will collect rainwater below bunded external equipment such as the transformers. The drainage system will incorporate a separation unit which separates any contamination from the collected water. The collected water is recirculated through the separator, with clean water being discharged and any contaminants stored for transportation to shore for controlled processing and / or disposal.

58. **Table 3-6** presents the OSS topside parameters, which are the same for both WTG Layout Option A and B.

Table 3-6 OSS topside parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of OSSs	3	3
Height of topside (m)	31	31
Height of topside above LAT (m)	55	55
Height of underside of topside above LAT (m)	24	24
Length of topside (m)	45	45
Width of topside (m)	35	35

3.3.3 OSS monopile foundation

59. OSS monopile design will be as per the WTG monopile foundation but with some differences:

- The OSS transition piece will accommodate a cable deck and four support points for the OSS topside. The OSS topside will have a welded connection to the transition pieces at each of the support points.
- The OSS foundation will accommodate external J-tubes for support and protection for each of the IACs. In addition, the central OSS foundation will have two interconnector cable J-tubes. The other two OSS foundations will each have a single interconnector cable J-tube.
- For routing export cables, each of the OSS foundations will have an external J-tube. Alternatively, the OSS foundations may have a single entry hole for internally routing export cables.
- A J-tube and anode support cage structure will be installed around each of the OSS foundation monopiles to extend the J-tubes to the seabed.
- OSS foundations will each have two boat landings for access.

60. **Table 3-7** presents the OSS monopile parameters associated with WTG Layout Options A and B.

Table 3-7 OSS monopile foundation parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of structures	3	3
OSS monopile diameter at mudline (m)	9	9.5
OSS monopile length (m)	68.5	69.5
OSS monopile embedment depth (m)	36	36.5
OSS monopile seabed area per OSS (m^2)	64	71
Monopile grout volume (m^3)	25	26.5

3.3.4 OSS scour protection

61. OSS scour protection will be achieved using the same design of scour protection as for the WTGs – rock armour and filter layer.

62. **Table 3-8** presents the parameters for OSS scour protection associated with WTG Layout Options A and B.

Table 3-8 OSS scour protection parameters

Details	WTG Layout Option A	WTG Layout Option B
Number of locations (OSSs) where scour protection is required	3	3
Area of scour protection per location (including monopile footprint) (m^2)	3,640	3,640
Total OSS monopile seabed area take (with scour protection) across the array site (m^2)	10,920	10,920
Height of scour protection above seabed (m)	3.1	3.1
Volume of scour protection per location (m^3)	5,365	5,365

3.3.5 Offshore export cables

63. The OECC connects the array site with the landfall location at Poolbeg. Three 220 kV offshore export cables will be installed within the OECC, which will transmit electricity generated by the WTGs from the OSSs to the onshore export cables, to the onshore substation and ultimately to the Irish electricity grid.

64. Each offshore export cable will comprise three cores with copper conductors and insulation / conductor screening. The three cores will be bound together and protected within a layer of steel armouring. The cable bundle will also include a fibre optic communications cable for OWF monitoring and control.

65. For the purposes of the application for development permission, the total length of the offshore export cables are provided as a range (see **Table 3-9**).

Table 3-9 Offshore export cable parameters

Details	Value
Number of export cables	3
Total length of offshore export cables (km)	126.0–146.0
Area of the offshore export cable corridor (OECC) (km^2)	40.1

3.3.6 Offshore export cable protection

66. Cable protection will be achieved using rock placement, as described for the IACs and interconnector cables.

67. In addition, concrete mattresses will be used to facilitate cable crossings. Mattresses are generally made of concrete elements formed on a mesh of polypropylene rope, which will conform to changes in seabed morphology. Bevelled elements are used on the edges to create a lower profile to encourage, for example, trawl gear to roll over the mattress.

68. Where appropriate, mattresses fitted with polypropylene 'fronds' can be used to enhance the protection provided. The fronds encourage sediment deposition, creating a protective sand bank.

69. For the purposes of the EIA undertaken to support the application for development permission, cable protection parameters have been determined using details from a preliminary cable burial risk assessment. These are presented in **Table 3-10.**

Table 3-10 Offshore export cable protection parameters

Details	Value
Total length of export cables requiring cable protection (km)	15
Width of cable protection on seabed (m)	7
Total area of seabed covered by export cable protection (m^2)	105,000
Height of cable protection berm (m)	1.5
Number of cable crossings required	24

3.4 Landfall

70. The landfall on the southern Poolbeg peninsula describes the point at which the offshore export cables (part of the OfTI) are brought onshore and connected at three TJBs to the onshore export cables (part of the OTI). Landfall is a complex interaction between land and the marine environment. The Applicant has included the following activities in the scope of 'landfall', extending from approximately 4 km offshore to the TJBs onshore:

- Non-ducted offshore export cable laying in the intertidal area, from the limits of vessel operability (approximately 4 km from the high water mark) to the nearshore approximately 350 m from the high water mark (HWM);
- At approximately 350 m from the HWM, ducted offshore export cable laying, referred to as the 'intertidal cable ducts', from the non-ducted offshore export cables in the intertidal area to the seaward extent of the landfall cable ducts at the onshore / marine interface; and
- Ducted offshore export cable laying, referred to as the 'landfall cable ducts', extending from the intertidal cable ducts to the to the TJBs onshore.

3.4.1 Intertidal cable ducts

71. Offshore export cables will be laid in cable ducts to a distance of approximately 300–350 m from the HWM. Intertidal cable ducts are those located in the intertidal area, from the end of the landfall cable ducts 80–120 m from the HWM to approximately 300–350 m from the HWM, to complete the ducted sections of offshore export cable installation at landfall. Three intertidal cable ducts will be required.

3.4.2 Landfall cable ducts

72. Landfall cable ducts are those between the TJBs (situated onshore) and the intertidal area, between 80 m and 120 m from the HWM.

73. **Table 3-11** presents the key assessment parameters for the landfall cable duct design.

Table 3-11 Landfall cable duct design parameters

Details	Value
No. of landfall cable ducts	3
Length of landfall cable ducts	50

3.5 Onshore transmission infrastructure (OTI)

The relevant components of the OTI included:

- The onshore export cables; and
- The onshore substation.

3.5.1 Onshore export cables

74. Three 220 kV HVAC onshore export cable circuits will connect to the offshore export cables at the TJBs and will transfer the electricity onwards to the onshore substation proposed by the Applicant.

75. Each cable circuit will comprise three cores with copper or aluminium conductors and insulation / conductor screening. As with the offshore export cables, the cable bundle will also include a fibreoptic communications cable for OWF monitoring and control and a cable for earthing. The key design parameters associated with the onshore export cables are described in **Table 3-12**.

76. The onshore export cables between the landfall and the onshore substation will be installed within an underground tunnel that extends under the cooling channel which is subject to the project's MAC.

Table 3-12 Onshore export cable design parameters

Details	Value
Number of onshore export cable circuits	3
Number of cables per circuit	5
Number of ducts required per circuit	5
First tunnel drive distance (m)	330
Second tunnel drive distance (m)	410
Tunnel total length (m)	740
Tunnel inner diameter (m)	3.0
Tunnel outer diameter (OD) (m)	3.6

3.5.2 Onshore substation

77. The onshore substation will be a gas-insulated switchgear (GIS) design, where the HV equipment is designed to be insulated by pressurised gas, which will be partly constructed on reclaimed lands which is subject to the CWP MAC.

78. In summary the onshore substation will include:

- Perimeter structures including upgraded revetements and coastal retaining walls;
- Land reclamation for the Electricity Supply Board (ESB) building;
- Raised site platform;
- One GIS building;
- One ESB GIS building;
- One ESB MV building;
- Three shunt reactors (incorporated within the GIS building);
- One statcom building;
- Three harmonic filters;
- Upgrades to the existing access road from Pigeon House Road to the site entrance;
- New bridge to provide vehicle access across the cooling water discharge channel;
- New internal access road layout within the site boundary;
- Car parking;
- Drainage infrastructure; and
- Security and lighting.

79. The key design parameters for the onshore substation are presented in **Table 3-13** below.

Table 3-13 Design parameters for the onshore substation

Details	Value
General	
Site area (m^2)	16,050
Perimeter structures (combi-wall)	
Total length of combi-wall (m)	230
Length of combi-wall below the HWM (requiring marine piling)	150
Length of combi-wall above the HWM (requiring terrestrial piling)	80
Perimeter structures (revetment)	
Total length of new revetments (m)	150
Width of revetement from toe to crest (m)	10
Height of the revetments and perimeter capping beam (+mOD)	5.24
Land reclamation for ESB building (combi-wall)	
Area of reclaimed land (m^2)	1800
Site platform	
Platform level (+mOD)	5
Buildings and electrical infrastructure	
Number of buildings	4
Main GIS building dimensions (L x W x H) (m)	62.75 x 20.67 x 35.20 (+mOD)
ESB GIS building dimensions (L x W x H) (m)	35.97 x 15.95 x 23.10 (+mOD)

Details	Value
ESB MV building dimensions (L x W x H) (m)	10.14 x 5.64 x 8.07 (+mOD)
Statcom building dimensions (L x W x H) (m)	94.02 x 27.87 x 29.50 (+mOD)
Height of lightning protection masts above buildings (m)	3
Access	
Length of new access bridge (m)	25
Width of new access bridge (m)	9.5

4 PROPOSED PROGRAMME OF REHABILITATION

4.1 Introduction

80. The following sections set out the anticipated measures and general principles that will be adopted for the proposed programme of rehabilitation of the offshore components of the CWP Project. The proposed measures are based on the information that is currently available in terms of component design and proposed installation methods. The final details of the proposed measures will be subject to final component design and post-construction monitoring.

81. The Rehabilitation Schedule will be revisited and updated at various points during the lifetime of the project and rehabilitation proposals will be finalised towards the end of the CWP Project lifetime. All rehabilitation approaches remain open to consideration during this period, noting the requirement for permission to amend this Rehabilitation Schedule.

4.2 Guiding principles

82. In accordance with Section 96 of the MAP Act 2021, as amended, the obligation on the holder of a MAC to rehabilitate part of the maritime area may include one, or more than one, of the following:

    (a) The decommissioning of infrastructure;
    (b) The removal of infrastructure;
    (c) The partial removal of infrastructure;
    (d) The reuse of infrastructure for the same or another purpose;
    (e) The burying or encasing of infrastructure; and
    (f) The removal of any deposited or waste material.

83. As described below, it is proposed that rehabilitation activities for the CWP Project will include a combination of decommissioning of infrastructure and removal and partial removal of infrastructure, and may include the burying and encasing of infrastructure and the reuse of infrastructure for the same or another purpose. Any components to be left in situ will be in accordance with the standards set out by the International Maritime Organisation (IMO), which consider the following matters:

- Any potential effect on the safety of surface or subsurface navigation, or of other uses of the sea;
- The rate of deterioration of the material and its present and possible future effect on the marine environment;
- The potential effect on the marine environment, including living resources;
- The risk that the material will shift from its position at some future time;
- The costs, technical feasibility and risks of injury to personnel associated with removal of the installation or structure; and
- The determination of a new use or other reasonable justification for allowing the installation or structure or parts thereof to remain on the seabed.

84. Rehabilitation activities will be undertaken in accordance with the IMO and UNCLOS guidance listed in **paragraph 15** above.

85. The relevant guiding policies, plans and legislation will be reviewed and updated as necessary at the time of rehabilitation, and the information contained within them will be used to determine the best options for the programme of rehabilitation.

4.3 Pre-rehabilitation

86. Prior to commencing rehabilitation works, reviews of the regulations and a review all relevant legal requirements will be undertaken, consultations carried out with relevant prescribed bodies and relevant consents obtained.

4.3.1 Subsea survey

87. Prior to rehabilitation works commencing, and to inform the final scope of rehabilitation, a full baseline seabed survey along all cable routes and around each monopile will be undertaken to identify:

- Cable route and any potential cable extraction obstacles;
- Status and condition of cable crossings / protection;
- Seabed level changes around WTG monopiles and OSS monopiles;
- Status and condition of scour protection at WTG positions;
- Extent of marine growth;
- Extent of corrosion;
- Removal of debris and / or obstructions.

4.4 Approach to rehabilitation

88. CWP will be built in a way that enables the maritime area to be rehabilitated as efficiently and safely as possible at the end of its operational lifetime. **Table 4-1** provides a summary of the Applicant's proposed approach to rehabilitation. The methodology for each component is described in the sections below.

Table 4-1 Rehabilitation approach for infrastructure subject to the Rehabilitation Schedule

Component	Proposed rehabilitation approach
WTGs	Complete removal from site.
WTG monopile foundations	Monopile foundations will be cut below the seabed level to a depth that will ensure the remaining foundation is unlikely to become exposed. This is likely to be approximately 1 m below seabed, although the exact depth will depend upon the seabed conditions and site characteristics at the time of rehabilitation. Cut section removed from site.
WTG monopile scour protection	Complete removal from site.
IACs and interconnector cables	Complete removal from site.
IACs and interconnector cable protection	Complete removal from site.
OSS topsides	Complete removal from site.
OSS monopile foundation	Monopile foundations will be cut below the seabed level, to a depth that will ensure the remaining foundation is unlikely to become exposed. This is likely to be approximately 1 m below seabed,

Component	Proposed rehabilitation approach
	although the exact depth will depend upon the seabed conditions and site characteristics at the time of rehabilitation. Cut section removed from site.
OSS monopile foundation scour protection	Complete removal from site.
Offshore export cables	Complete removal from site.
Offshore export cable protection	Complete removal from site.
Intertidal cable ducts	Complete removal from site.
Landfall cable ducts	Complete removal from site.
Onshore export cables	Complete removal from site.
The underground tunnel, within which the onshore export cables will be installed	Remain in situ and may be reused for the same or another purpose.
Onshore substation buildings and electrical infrastructure	Complete removal from site.
The reclaimed land, substation platform, perimeter structures and the new access bridge at the onshore substation site	Remain in situ and may be reused for the same or another purpose.

89. It may be preferable to leave infrastructure that is currently proposed to be fully removed, in situ, for example to preserve marine and terrestrial habitats that have been established over the life of the CWP Project. This will be subject to discussions with regulators at the point of rehabilitation.

4.4.1 Rehabilitation approach for WTGs

90. The decommissioning and removal of the WTG superstructure is expected to be the reverse of the installation procedure, as follows:

- Conduct assessment of potential hazards during the decommissioning and removal works, and pollutants to the environment that may result from the works;
- Mobilise suitable vessels to the array site;
- Remove any potentially polluting or hazardous fluids / materials from the WTGs (if identified in the risk assessment);
- Remove rotor blades;
- Remove nacelle;
- Remove tower sections; and
- Transport all components to an onshore site where they will be processed for reuse, recycling or disposal.

4.4.2 Rehabilitation approach for OSS topsides

91. The methodology for decommissioning and removal of the OSS topsides is likely to be as follows:

- Conduct assessments on the potential hazards during the decommissioning and removal work, and pollutants to the environment that may result from the works;

- Isolate / disconnect from the grid and SCADA;
- Remove any potentially polluting or hazardous fluids / materials (if identified in the risk assessment);
- Mobilise suitable heavy lift vessels to the OWF site;
- Detach the OSS topsides from the OSS foundations by cutting at the support points;
- Remove main topside structure; and
- Transport to an onshore site, where components will be processed for reuse, recycling or disposal.

4.4.3 Rehabilitation approach for substructures and foundations and scour protection

92. It is anticipated that, following WTG and OSS topside decommissioning and removal, the monopile foundations will be cut below the seabed level to a depth that will ensure the remaining foundation is unlikely to become exposed. This is likely to be approximately 1 m below seabed, although the exact depth will depend upon the seabed conditions and site characteristics at the time of rehabilitation activities being undertaken.

93. The sequence for removal of the foundations consisting of monopiles and transition pieces is anticipated to be:

- Mobilise suitable vessel (likely to be a floating or jack-up heavy-lift vessel);
- Remove cable connections and make safe operating conditions for the crew;
- Cut the TP just above the grouted connection or unbolt the flange with the monopile and remove by crane using safe lifting/hoisting points;
- Deploy remotely operated vehicles (ROVs) to inspect the foundation and reinstate lifting attachment if required;
- Excavate outside and inside monopile to approximately 0.5 m below anticipated level of cutting (this will include removing any scour protection or debris around the base of the foundation);
- Cut the monopile using either a waterjet cutter or a mechanical cutter flush with the seabed;
- Lift foundation onto the transport vessel or the decommissioning vessel and transport to shore;
- Process components with respect for maximum reuse or recycle and minimum disposal.

94. It may be preferable to leave any scour protection around the monopile bases or covering cables in situ, in order to preserve the marine habitat that has been established over the life of the CWP Project. This will be subject to discussions with regulators and advisors at the point of rehabilitation. For the purposes of the EIA undertaken to support the application for development consent; however, it has been assumed that scour protection will be removed.

4.4.4 Rehabilitation approach for IAC, interconnector and offshore export cables and cable protection

95. It is currently assumed that, at the time of rehabilitation, all cables in the maritime area, including landfall and intertidal cable ducts, will be wholly removed.

96. It is likely that equipment similar to that which is used to install the cables may be used to reverse the burial process and expose them. Therefore, the area of seabed impacted during the removal of the cables is anticipated to be the same as the area impacted during the installation of the cables. Divers and / or ROVs may be used to support the cable removal vessels.

97. A offshore cable removal programme will include the following:

- Identify the location that cable removal is required;

- Remove cables. Feasible methods include pulling the cable out of the seabed using a grapnel, pulling an under-runner using a steel cable to push the electrical cable from the seabed or jetting the seabed material; and
- Transport cables to an onshore site where they will be processed for reuse, recycling or disposal.

98. It is assumed that cable protection will also be wholly removed. If cable protection is to be removed using currently available technology, it will most likely be removed by a vessel using a dredger or grab.

99. Further discussions at the time of rehabilitation and discussions will be held with stakeholders and regulators to determine the exact methodology for the removal of cables. It may be preferable to leave the cables in situ or for them to be partially removed.

4.4.5 Rehabilitation approach for OTI

100. It is recognised that legislation and industry best practice change over time. However, at the end of the operational lifetime of the CWP Project, it is assumed that all OTI will be removed where practical to do so. In this regard, the following assumptions have been made:

- The TJBs and onshore export cables (including the cable ducting) shall be completely removed.
- The landfall cable ducts and associated cables shall be completely removed.
- The underground tunnel, within which the onshore export cables will be installed, shall be left in situ and may be reused for the same or another purpose.
- The onshore substation buildings and electrical infrastructure shall be completely removed.
- The reclaimed land, substation platform, perimeter structures and the new access bridge at the onshore substation site will remain in situ and may be reused for the same or another purpose.
- The ESBN network cables (including the cable ducting) shall be completely removed.

101. The general sequence for rehabilitation is likely to include:

- Dismantling and removal of electrical equipment;
- Removal of ducting and cabling, where practical to do so;
- Removal and demolition of buildings, fences, and services equipment; and
- Reinstatement and landscaping works.

102. Closer to the time of rehabilitation, it may be decided that removal of certain infrastructure, such as the TJBs, landfall cable ducts and associated cables, onshore export cables, and ESBN networks cables, would lead to a greater environmental impact than leaving the components in situ. In this case, it may be preferable not to remove these components at the end of their operational life. In any case, the final requirements for decommissioning of the OTI, including landfall infrastructure, will be agreed at the time with the relevant statutory consultees.

4.4.6 Waste management

103. Waste management will be carried out in accordance with the relevant legislation at the time of rehabilitation and will have regard to the waste hierarchy, which suggests that reuse should be considered first, followed by recycling, then incineration with energy recovery and, lastly, disposal.

104. A waste management plan will be prepared prior to commencement of rehabilitation works. Particular attention will be given to potentially hazardous or environmentally sensitive substances contained within certain pieces of electrical equipment on the OSS and in the WTGs.

5 ENVIRONMENTAL IMPACT ASSESSMENT

105. In support of the application for development consent, the Applicant has identified, described and assessed the impacts of the decommissioning and rehabilitation works and presented them in the EIAR which accompanies the application.

106. Throughout the EIAR, the assessments refer to the decommissioning of the project and the decommissioning phase. For the purposes of the EIAR, this is synonymous with rehabilitation.

107. The potential significant residual impacts, which may result from the decommissioning phase of the CWP Project, are presented in the EIAR, **Volume 5**, **Chapter 34 Summary of Residual Effects**.

108. Residual impacts are the final or intended impacts which occur after the proposed mitigation measures have been implemented. They refer to the degree of change that will occur after the proposed mitigation measures have taken effect.

6 COSTS

109. The anticipated costs for a programme of rehabilitation for a project of the scale of CWP are estimated to be in the range of €155–255 million if undertaken today. Further detailed financial information will be provided on a confidential basis as required.

7 SCHEDULE

110. An indicative schedule of rehabilitation is provided below, with anticipated timelines for rehabilitation of the components located within the MAC area. A full schedule will be provided closer to the point of rehabilitation, setting out the detailed programme for consultation with the relevant authorities.

111. It is anticipated that the full programme of rehabilitation will take approximately 24 months to complete.

Indicative schedule of rehabilitation	Year 1		Year 2		Year 3	
WTG removal		■				
WTG foundation (above seabed) removal			■			
Inter-array cable removal			■			
Offshore substation topside removal x 3				■		
Offshore substation foundation (above seabed) removal				■		
Offshore export cable removal						
Repurposing of onshore export cable tunnel or sealing off				■		
Repurposing of onshore substation compound				■	■	

8 SEABED CLEARANCE AND RESTORATION OF THE SITE

112. Following the completion of rehabilitation works, evidence will be provided to confirm that the relevant part of the maritime area has been restored, as far as possible and desirable and in line with the final Rehabilitation Schedule. The adequacy of this restoration will be agreed in consultation with the appropriate regulatory authorities towards the end of the operational lifetime of the CWP Project.

9 POST-REHABILITATION MONITORING AND MAINTENANCE THE MARITIME AREA

113. It is recognised that rehabilitation may require ongoing maintenance, depending on the final measures agreed for rehabilitation of the of the CWP Project.

114. Post-rehabilitation monitoring surveys of the site will be carried out by an independent contractor at appropriate intervals after the rehabilitation works are complete. The scope will be described in the final Rehabilitation Schedule, agreed in advance with the relevant authorities.

10 REFERENCES

115. Department of Business, Energy and Industrial Strategy (UK Government) (2019) Decommissioning of Offshore Renewable Energy Installations Under the Energy Act 2004, Guidance notes for industry (England and Wales). [Online]. Available at: decommisioning-offshore-renewable-energy-installations-energy-act-2004-guidance-industry__1_.pdf (publishing.service.gov.uk) [accessed 29 May 2024];

116. Scottish Government (2022), Decommissioning of Offshore Renewable Energy Installations in Scottish waters or in the Scottish part of the Renewable Energy Zone under The Energy Act 2004 Guidance notes for industry (in Scotland). [Online]. Available at: decommissioning-offshore-renewable-energy-installations-scottish-waters-scottish-part-renewable-energy-zone-under-energy-act-2004-guidance-notes-industry-scotland.pdf (www.gov.scot) [accessed 29 May 2024];

117. International Maritime Organisation (IMO) (1989) Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone; and

118. United Nations Convention on the Law of the Sea (UNCLOS), 1982.