ABWP Phase I Decommissioning

Proposed Works Description

Volume 2, Chapter 3

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Project name ABWP Phase I Decommissioning

Project no. 1620011606-002

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Contents

List of Tables

List of figures

Appendices

Appendix number	Appendix title
3.1	Outline Onshore Decommissioning Environmental Management Plan
3.2	Outline Traffic Management Plan
3.3	Outline Onshore Waste Management Plan
3.4	Outline Offshore Decommissioning Environmental Management Plan
3.5	Outline Vessel Management Plan
3.6	Fisheries Management and Mitigation Strategy
3.7	Outline Lighting and Marking Plan
3.8	Outline Offshore Waste Management Plan

Statement of Authority

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Kim Bridge	Master of Oceanography (MOcean), University of Southampton (UK)	Over 13 years' experience in permitting, consenting and environmental assessment for a wide range of coastal and marine projects including offshore wind farms, subsea cables, ports and harbours and coastal development in geographies of UK and Ireland.

Glossary

Term	Meaning
Arklow Bank Wind Park (ABWP) Phase I	Arklow Bank Wind Park (ABWP) Phase I comprises: • Offshore infrastructure seaward of High Water Mark (HWM), including: – Seven Wind Turbine Generators (WTG) with a combined capacity of 25.2 MW; – One meteorological (met) mast; – Inter-array cables connecting the WTGs and met mast; and – One offshore export cable connecting WTG T4 with landfall at HWM; • Onshore infrastructure landward of HWM including: – One onshore cable connecting landfall at HWM with the onshore substation; and – One onshore substation compound, where the onshore substation and ancillary infrastructure are located.
Additional mitigation	Actions that will be required to reduce the significance of environmental effects of the Proposed Works, which will be dependent on the significance of effects assessed in the EIAR. Also referred to as secondary mitigation in Institute of Environmental Management and Assessment (IEMA) (2024). IEMA is now the Institute of Sustainability and Environmental Professionals (ISEP).
Alternatives	A description of other options that have been considered during the conception of the Proposed Works (Environmental Protection Agency (EPA), 2022). Article 5(1) and Annex IV of the Environmental Impact Assessment (EIA) Directive) require "a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, including a comparison of the environmental effects" (EIA Directive 2011/92/EU (as amended)).
Arklow Energy	Arklow Energy Limited, the entity seeking planning permission for the Proposed Works, i.e. the applicant.
Backfilling	Placement of excavated material back into the trench or excavation after removal.
Bathymetry	Ocean's depth relative to sea level.
Competent authority	Those authorities that are entitled to give authorisation or consent to a plan or project. In the planning system, this means planning authorities and An Coimisiún Pleanála. There are, however, a wide range of other competent authorities in respect of other consent regimes e.g. EPA (environmental

Term	Meaning
	licencing), Minister for Agriculture, Food and the Marine (forestry, aquaculture and foreshore management), and various state bodies that have authority to undertake development under Part 9 of the Planning and Development Regulations (e.g. An Garda Síochána, defence forces, the courts service). The competent authority for this planning application is An Coimisiún Pleanála (ACP).
Consent	This shall include any licence, permission, permit, approval or other such authorisation granted by a public authority for any activity, or project where the authority is obliged to have regard to the requirements of the Environmental Impact Assessment (EIA) and/or Habitats Directive(s) (MDB, 2017).
Decommissioning	The final closing down and putting into a state of safety of a development, project or process when it has come to the end of its useful life (EPA, 2022).
Detailed Lighting and Marking Plan (LMP)	The contractor-developed version of the Outline LMP (see **Volume 3, Appendix 3.7**), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Offshore Decommissioning Environmental Management Plan (DEMP)	The contractor-developed version of the Outline Offshore DEMP (see **Volume 3, Appendix 3.4**), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Offshore Waste Management Plan (WMP)	The contractor-developed version of the Outline Offshore WMP (see **Volume 3, Appendix 3.8**), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Onshore Decommissioning Management Plan (DEMP)	The contractor-developed version of the Outline Onshore DEMP (see **Volume 3, Appendix 3.1**), to be prepared before Proposed Works Onshore commence and maintained as a live document until completion.
Detailed Onshore Waste Management Plan (WMP)	The contractor-developed version of the Outline Onshore WMP (see **Volume 3, Appendix 3.3**), to be prepared before Proposed Works Onshore commence and maintained as a live document until completion.
Detailed Traffic Management Plan (TMP)	The detailed, contractor-prepared version of the Outline TMP (see **Volume 3, Appendix 3.2**), to be finalised prior to commencement of the Proposed Works Onshore once the Principal Decommissioning Contractor , final methodology, routes, programme and authority requirements are confirmed.
Detailed Vessel Management Plan (VMP)	The contractor-developed version of the Outline VMP (see **Volume 3, Appendix 3.5**), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Draught	Vertical distance between the waterline and the lowest point of a vessel's hull (usually the keel). It measures how deep a vessel sits in the water.
Dredged material	Seabed material arising from localised dredging potentially required to facilitate safe vessel access during Proposed Works Offshore, and / or extraction of seabed material located inside monopile (MP) foundations, as part of MP decommissioning.
Dumping	Any deliberate disposal in the maritime area (including side-cast dredging, plough dredging, water injection dredging and other such dredging techniques of a substance or material from or in conjunction with a vessel or aircraft or offshore installation (Dumping at Sea Act 1996 (as amended)).
Effect	The consequence of an impact on a receptor. For example, in the offshore environment, vessel activity (activity) results in increased levels of underwater noise (impact), with the potential to disturb marine mammals (effect).
Embedded mitigation	Mitigation measures included as part of the Proposed Works. Include modifications arising through the iterative design process; and standard industry practice that would occur even without input from the EIA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. Correspond to primary and tertiary mitigation defined in IEMA (2024) (now Institute of Sustainability and Environmental Professionals (ISEP).
Environmental Impact Assessment (EIA)	Process of assessment of the effects of a project or development proposal on the environment. In the planning area, it is undertaken by a planning authority or An Coimisiún Pleanála during the consideration of applications for planning permission, taking account of an Environmental Impact Assessment Report

Term	Meaning
	(EIAR). The projects which require EIA are listed in Annex I and Annex II of the EIA Directive, as amended (Office of the Planning Regulator, n.d.).
EIA Scoping	The scoping stage provides an opportunity for both developers and the Competent Authority to determine those key environmental impacts and issues of concern that are likely to be of the utmost importance to the Project proposal's decision-making and eliminates those that are less of a concern (European Commission (EC) 2017).
EIA Scoping Presentation	Presentation scoping the likely environmental impacts of the Proposed Works to be further considered in the Environmental Impact Assessment Report (EIAR). The EIA Scoping Presentation is included in **Volume 3, Appendix 1.1** of the EIAR.
Environmental Impact Assessment Report (EIAR)	A report or statement of the potential effects, if any, that Proposed Works, if carried out, would have on the environment. It is prepared by the developer to inform the EIA process (Office of the Planning Regulator, n.d.).
Foreshore	The bed and shore, below the line of high water of ordinary or medium tides, of the sea and of every tidal river and tidal estuary and of every channel, creek, and bay of the sea or of any such river or estuary. Its outer limit is coterminous with the seaward limit of the territorial sea (Foreshore Act 1933 (as amended)), which is at a distance of 12 nm from the nearest point of the baseline or otherwise prescribed (Maritime Jurisdiction Act 2021 (as amended)).
Grapnel Run	A cable recovery technique involving dragging a grapnel along the seabed, causing shallow and temporary seabed disturbance.
High Water Mark (HWM)	Level reached by the sea at high tide, measured as the mean of high tides.
Impact	A change brought about by the Proposed Works.
Inter-array cables	Subsea power lines that link individual wind turbine generators (WTGs) together in an offshore wind farm, forming an electrical network. In ABWP Phase I, inter-array cables connect WTGs and the met mast to each other and have an overall length of 7.4 km.
Landfall	The point where the offshore export cable transitions from the offshore marine environment to the onshore terrestrial environment.
Loading	Act of taking on board or placing a specified quantity of a substance or material onto a vessel or aircraft for subsequent dumping at sea. Loading does not apply in the case of plough dredging, water injection dredging or side-cast dredging (EPA, 2026).
Lowest Astronomical Tide (LAT)	Exact, lowest theoretical sea level that can be predicted to occur under average meteorological conditions.
Maximum design scenario (MDS)	Represents 'realistic worst case' assessment parameters for each potential impact.
Mitigation measures	Measures to avoid, prevent or reduce potential impacts (EPA, 2022), which comprise both embedded and additional mitigation, see separate definitions for these.
Monitoring	The periodic or continuous observation of biodiversity indicators and of other parameters that may affect biodiversity for any changes that may occur over time, so as to confirm predictions made with respect to likely effects and identify adverse changes that may require remedial action (Office of the Planning Regulator, n.d.).
Monopile (MP)	Hollow steel cylinder driven into the seabed typically used to anchor an offshore wind turbine generator (WTG). In ABWP Phase I, MPs support the seven WTGs as well as the meteorological (met) mast.
Offshore export cable	Subsea power cable that transports the total generated power from an offshore wind farm to the onshore power grid. In ABWP Phase I, the offshore export cable connects the wind turbine generator (WTG) T4 to landfall with an approximate overall length of 15.6 km. At landfall, the offshore export cable transitions to the onshore cable connecting to the onshore substation.
Offshore Site	Part of the Site where Proposed Works Offshore are proposed to take place. In this application for planning permission, the Offshore Site comprises the Sub Lease Area, where the ABWP Phase I wind turbine generators (WTGs), met mast and inter-array cables are located, and the offshore export cable 10 m corridor

Term	Meaning
	connecting WTG T4 to the landfall at high water mark (HWM) near Arklow Harbour.
Onshore cable	Land-based portion of the power cable that transports the total generated power from an offshore wind farm to the onshore power grid. In ABWP Phase I, the onshore cable connects the landfall point at HWM to the onshore substation building.
Onshore Site	Part of the site where Proposed Works Onshore are proposed to take place. In this application for planning permission, the Onshore Site comprises the onshore substation compound that hosts the onshore substation building and ancillary facilities; the onshore cable 10 m corridor connecting the landfall point from high water mark (HWM) to the onshore substation, and the area that will temporarily be used for temporary storage of plant, vehicles, machinery, excavated soil and materials.
Onshore substation compound	Fenced compound that hosts the onshore substation building and ancillary facilities, including the 38 kV transformer.
Planning permission	Formal, legal approval required from a local planning authority or An Coimisiún Pleanála (ACP) to carry out development. The Proposed Works require planning permission submitted from ACP under Section 291 of the Planning and Development Act 2000, as amended.
Port marshalling area	The port-based area used for temporary storage, segregation, handling and onward transfer of recovered materials and wastes.
Principal Decommissioning Contractor	In this document, meaning the contractor(s) appointed to undertake the Proposed Works Offshore / Onshore and to prepare, implement and update relevant management plans, keeping them as live documents until completion.
Proposed Works	The Proposed Works include decommissioning of ABWP Phase I offshore infrastructure (Proposed Works Offshore) and decommissioning of ABWP Phase I onshore infrastructure (Proposed Works Onshore).
Reinstatement	The restoration of areas affected by excavation, cable removal, dismantling or other Proposed Works Onshore, including any road, footway, verge or site surface affected by the works.
Scour protection	Engineered barrier typically placed on the seabed around WTG foundations and subsea cables to prevents sediment erosion caused by accelerated water currents and waves, safeguarding the WTG's stability and protecting subsea cables. In ABWP Phase I, scour protection was originally introduced in the form of rock armour, however, this proved ineffective, and was removed in 2005. Since then, scour protection has been introduced through sandbags.
Significance	The importance of the outcome of the impact (or the consequence of change) for the receiving environment (EPA, 2022).
Sub Lease Area	Area where the ABWP Phase I WTGs, met mast and inter-array cables are located, as defined in the Sub Lease granted by Sure Partners Limited (SPL) to Arklow Energy Limited (Arklow Energy) to construct and operate ABWP Phase I.
Territorial sea	Belt of sea adjacent to a coastal State's land territory and internal waters, over which the State has sovereignty. A coastal State may claim up to 12 nautical miles from its baseline (usually the low-water line along the coast) (UNCLOS, 1982).
Transition Piece	The steel connection structure between the tower and the monopile (MP) foundation.
Waste	Any substance or object belonging to a category of waste specified in the First Schedule or for the time being included in the European Waste Catalogue which the holder discards or intends or is required to discard, and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste until the contrary is proved (Waste Management Act 1996 (as amended)).
Waste Hierarchy	The order of preference for managing waste, prioritising prevention, reuse, recycling and recovery ahead of disposal.
Wind Turbine Generator (WTG)	Structure that converts the kinetic energy of ocean winds into electrical energy. ABWP Phase I includes seven GE Energy 3.6s WTGs with a rated capacity of 3.6 megawatts (MW) per WTG.

Acronyms

Acronym	Meaning
ABWP	Arklow Bank Wind Park
ACP	An Coimisiún Pleanála
ATONs	Aids to Navigation
BHD	Backhoe dredger
CSD	Cutter Suction Dredger
DaS	Dumping at Sea
DEMP	Offshore Decommissioning Environmental Management Plan
DOP	Damen Submersible Dredge
DoT	Department of Transport
DP	Dynamic Positioning
DRP	Decommissioning and Reinstatement Plan
EC	European Commission
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
EU	European Union
FMMS	Fisheries Management and Mitigation Strategy
HDD	horizontal directional drilling
IALA	International Organisation for Marine Aids to Navigation and Lighthouse Authority
IEMA	Institute of Environmental Management and Assessment
IROPI	Imperative Reasons of Overriding Public Interest
JUB	Jack-up barge
LAN	Local area network
LAT	Low Astronomical Tide
MMMP	Mammal Mitigation Protocol
MDS	Maximum Design Scenario
MP	Monopile
MBES	Multi-beam Echosounder
O&M	Operations and Maintenance
PLC	programmable logic controller
SAC	Special Area of Conservation
SBP	Sub-Bottom Profilers
SPA	Special Protection Area
SPRT	Soil plug removal tool
SSS	Side Scan Sonar
RMS	Root mean square
T[number]	Turbines 1 to 7
TMP	Traffic Management Plan
TP	Transition Piece
UPS	Uninterruptible power supply

Acronym	Meaning
USBL	Ultra-Short-Baseline
VMP	Ecological Vessel Management Plan
WMP	Waste Management Plan
WTG	Wind Turbine Generators

Units

Unit	Meaning
dB	decibels
h	hours
Hz	hertz
kg	kilogram
kHz	kilohertz
km	Kilometres
kn	knots
kV	kilovolt
m	metre
m^2	square metre
m^3	cubic metre
mm	millimetre
MW	megawatts
nm	nautical mile
s	second
t	tonnes
µPa	micro Pascal
%	percentage

3 PROPOSED WORKS DESCRIPTION

3.1 Introduction

3.1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) describes the components of Arklow Bank Wind Park (ABWP) Phase I offshore wind farm alongside the key activities that will be undertaken during its decommissioning (referred to hereafter as the 'Proposed Works').

3.1.1.2 ABWP Phase I comprises both the offshore and onshore infrastructure that has been generating and transmitting renewable electricity from the offshore wind farm to the Irish electricity grid, constructed between 2003 and 2004 in Arklow, County Wicklow, on the southeast coast of Ireland.

3.1.1.3 This chapter is informed by the following chapters:

- **Volume 2, Chapter 1: Introduction**; and
- **Volume 2, Chapter 2: Description of Alternatives**.

3.1.1.4 This chapter also draws on information contained within the following appendices:

- **Volume 3, Appendices 3.1 – 3.8**: Management Plans, Protocols and Strategies.

3.1.1.5 This chapter describes the following:

- **Section 3.2**: Definition of Assessment Parameters – presents the approach followed in the definition of assessment parameters;
- **Section 3.3**: ABWP Phase I and Proposed Works Overview – provides an overview of the offshore and onshore infrastructure associated with ABWP Phase I and of Proposed Works;
- **Section 3.4**: Proposed Works Offshore – describes ABWP Phase I offshore infrastructure in more detail and describes key activities associated with its decommissioning, i.e. Proposed Works Offshore, and related assessment parameters;
- **Section 3.5**: Proposed Works Onshore – describes ABWP Phase I onshore infrastructure in more detail and describes key activities associated with its decommissioning, i.e. Proposed Works Onshore and related assessment parameters; and
- **Section 3.6**: Programme – outlines the anticipated duration of Proposed Works.

3.2 Definition of Assessment Parameters

3.2.1.1 The EIAR must contain adequate information to enable the competent authority to carry out an assessment of all likely significant effects of a given project on the environment. However, it is acknowledged that certain details may only become available after planning permission is granted, e.g. following a procurement process, and accordingly, a description of a project should be provided to enable the worst-case effects of a project to be described in an EIAR (Environmental Protection Agency (EPA), 2022).

3.2.1.2 In line with the above, this chapter describes not only the key activities associated with the Proposed Works but also specifies the assessment parameters that provide the basis for the assessment of effects presented within the technical chapters of this EIAR (**Volume 2, Chapters 4 – 8**), also referred to as Maximum Design Scenario (MDS).

3.3 ABWP Phase I and Proposed Works Overview

3.3.1 ABWP Phase I Overview

3.3.1.1 As outlined in **Figure 3.1**, the ABWP Phase I offshore wind farm includes:

- Offshore infrastructure located seaward of the High Water Mark (HWM) off the coast of Arklow, County Wicklow, in southeast Ireland, with the Sub Lease Area (see **Section 3.3.2**) located within 10 kilometers (km) of the coast, and comprises:
  - Seven Wind Turbine Generators (WTGs), comprising three rotor blades, nacelle and tower, sitting on transition pieces (TPs) and monopile (MP) foundations, with a combined capacity of 25.2 megawatts (MW);
  - One meteorological (met) mast sitting on a TP and MP, located south of the southernmost WTG turbine (T1);

  - Inter-array cables that connect WTGs and the met mast, located within the Sub Lease Area (see **Section 3.3.2**);
  - One offshore export cable connecting WTG turbine 4 (T4) to the landfall point at HWM; and
  - Scour protection, in the form of sandbags, which have historically been placed around MPs to minimise scour and protect MP integrity in accordance with the original MP structural design.

- Onshore infrastructure located landward of the HWM in Ferrybank, off North Quay road, within Arklow Harbour, and comprises:
  - One onshore cable connecting the landfall point from HWM to the onshore substation (onshore cable section 1), and the onshore substation to the Electricity Supply Board (ESB) Networks 220/110 kV substation located in Killiniskyduff, Arklow (onshore cable section 2); and
  - A fenced onshore substation compound that hosts the onshore substation building and ancillary facilities, including a 38 kilovolt (kV) transformer, and a submerged oil interceptor tank surrounded by a concrete foundation bund. A windscreen located east of the fenced onshore substation compound provides some shelter to sea spray.

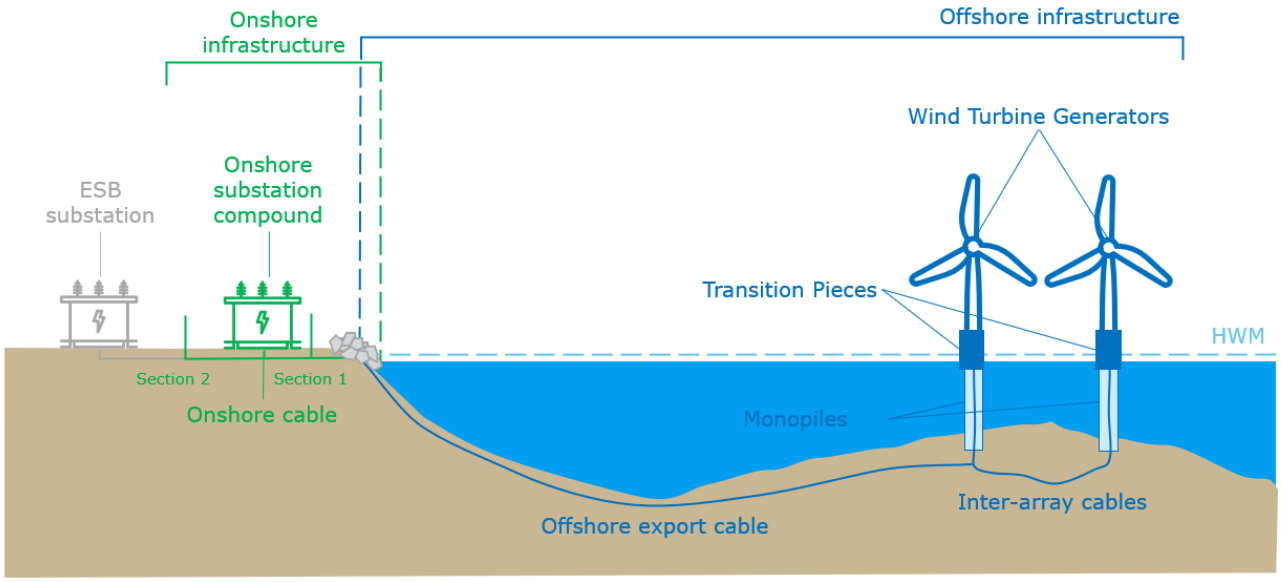

Figure 3.1: Overview of ABWP Phase I offshore and onshore infrastructure

3.3.2 Proposed Works Overview

3.3.2.1 The Proposed Works comprise the decommissioning of offshore infrastructure (Proposed Works Offshore) and onshore infrastructure (Proposed Works Onshore).

3.3.2.2 The Proposed Works Offshore will be undertaken within the 'Offshore Site', which includes:

- The Sub Lease Area, where WTGs, met mast and associated scour protection and inter-array cables are located; and
- A 10 m cable corridor along the offshore export cable route connecting T4 to the landfall point at HWM.

3.3.2.3 As further described in **Volume 2, Chapter 4: Coastal Processes, Water and Sediment Quality**, there is a strong spatial and temporal variability of seabed levels within the Sub Lease Area.

3.3.2.4 The validity of the planning permission (see **Volume 2, Chapter 1**) would allow planning for works when seabed level conditions are favourable for safe vessel access and to minimise the extent of dredging works required or avoid them altogether, which may result in the Proposed Works Offshore being staged in different years, see **Section 3.6**.

3.3.2.5 The Proposed Works Onshore will be undertaken within the 'Onshore Site', which includes:

- A 10 m cable corridor along the onshore cable route between the landfall point at HWM and the onshore substation compound; and
- The fenced onshore substation compound where the onshore substation and ancillary equipment is located.

3.3.2.6 The onshore site also includes the area that will temporarily be used for the temporary storage of plant, vehicles, machinery, excavated soils and materials during Proposed Works Onshore.

3.3.2.7 The Proposed Works Onshore will include the following activities, further described in **Section 3.5**:

- Onshore substation decommissioning and reinstatement of the area within the fenced onshore substation compound; and
- Onshore cable removal and reinstatement of the area affected by removal works.

3.3.2.8 The location of the Offshore and Onshore Sites and infrastructure is illustrated in **Figure 3.2**.

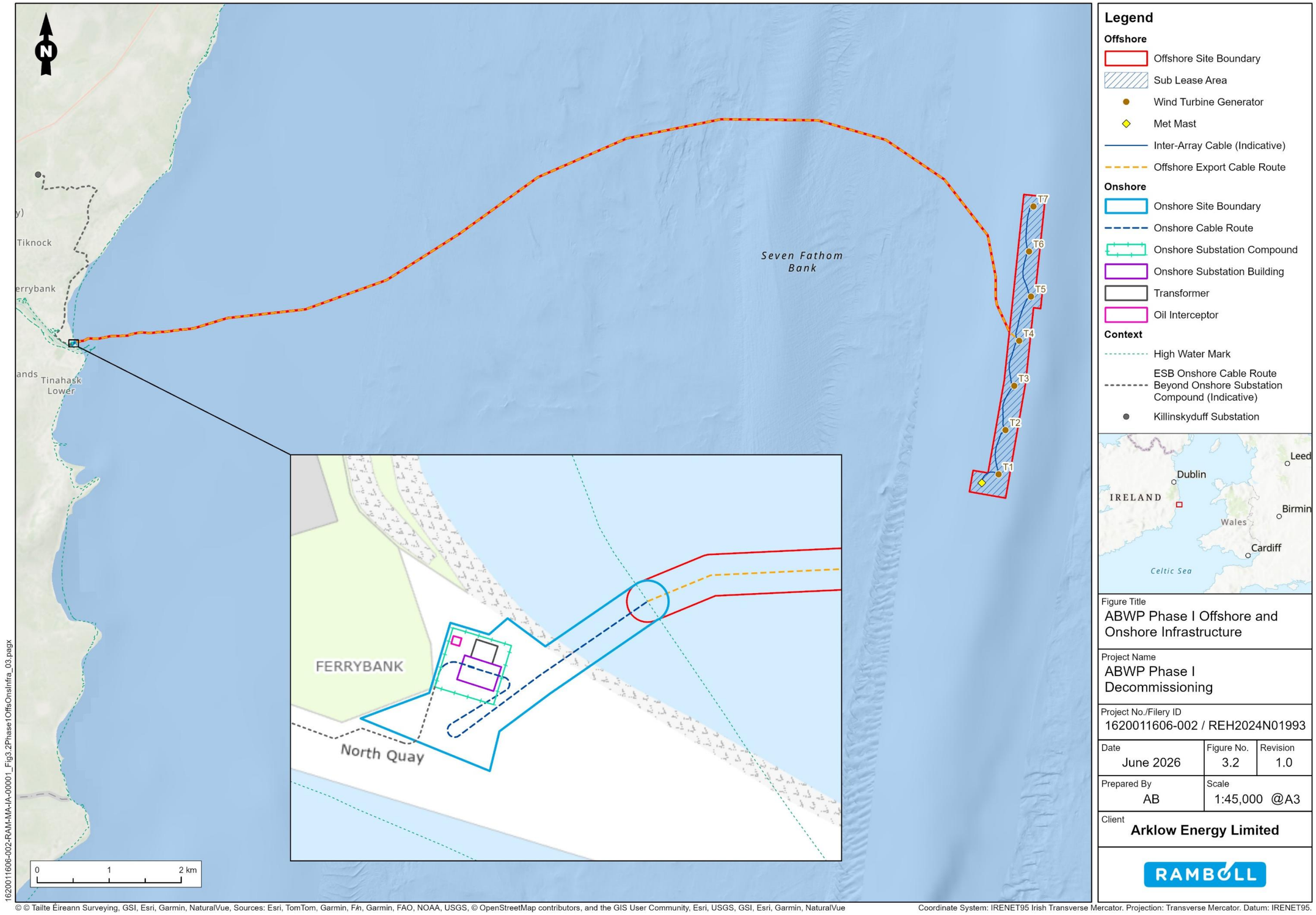

Figure 3.2: ABWP Phase I offshore and onshore infrastructure

3.4 Proposed Works Offshore

3.4.1 Pre-decommissioning Surveys

3.4.1.1 Pre-decommissioning surveys will be undertaken within six weeks in advance of the commencement of each campaign in order to confirm bathymetric conditions, identify any obstructions and hazards, and update the decommissioning methodology (e.g. inform jack-up barge (JUB) penetration depths) and programme to be implemented by the appointed Principal Decommissioning Contractor, as required.

3.4.1.2 Pre-decommissioning surveys will be undertaken across the Offshore Site, including along the offshore export route.

3.4.1.3 **Table 3.1** outlines the type of surveys anticipated to be required and associated assessment parameters.

Table 3.1: Pre-decommissioning surveys and assessment parameters

Assessment parameter	Value	Notes
Geophysical survey characteristics	• Multi-beam Echosounder (MBES) • Side Scan Sonar (SSS) • Sub-Bottom Profilers (SBP) • Magnetometer • Duration / frequency: – Three days / max twice per year (when covering the Offshore Site only) – 10 days / max twice per year (when also covering the offshore export cable route)	• MBES will be used to update the characterisation of the seabed (e.g. bathymetry, seabed morphology, obstructions / hazards) in high resolution. • SSS will complement the updated characterisation of the seabed undertaken by MBES adding imagery detail. • SBP will update the characterisation of sediments and geological layers beneath the seabed (e.g. sediment thickness, cross-sectional profiles, cable burial depths, obstructions / hazards). • Magnetometer will detect and map magnetic anomalies on or below the seabed. • Geophysical surveys may need to be repeated every six months to confirm seabed level conditions. • Geophysical surveys will only be undertaken during daytime.
Remote Operating Vehicle (ROV) / diver surveys characteristics	• Non-intrusive • Will not generate sound / frequency levels • Duration < one day (as (and if) required)	Used in combination with geophysical surveys for visual confirmation and during underwater inspections.
Supporting Vessel characteristics	Survey vessel with potential use of: • Dynamic Positioning (DP) • Ultra-Short-Baseline (USBL) acoustic positioning systems	It is assumed that the survey vessel to be used will be of small/medium size. One vessel trip represents one way vessel trip between the port (see **Section 3.4.11**) and the Offshore Site or between the Offshore Site and the port, and applies to all vessel types required.
Maximum number of vessel trips	• 2 vessel trips on any given day • 20 vessel trips considering a single campaign (with a maximum duration of 10 days).	One vessel trip equals one way between the designated port and the Offshore Site or vice versa. It is assumed that the survey vessel will return to port each day within a given campaign.

3.4.2 Dredging

Bathymetry aross the Sub Lease Area

3.4.2.1 Bathymetry survey data collated between 2000 and 2025 were reviewed to identify which dataset represented the shallowest water depths (maximum sedbed level) across the Sub Lease Area, and should be used as a basis in the calculation of maximum dredging volumes that could potentially be required to facilitate vessel access during Proposed Works Offshore.

3.4.2.2 Some bathymetry survey datasets were excluded due to low-resolution data, incomplete coverage (e.g., WTG area only), or unavailable formats such as Surfer charts or PDFs:

- 2000 bathymetry data was considered to have a low-resolution, as this was provided on a 50×50 m grid. This spacing produced inflated volumes, as ArcGIS interpolation becomes less accurate with larger gaps between points; and
- Surfer charts were unusable since only contours could be extracted, and interpolating these created broad flat zones with unreliable volume outputs.

3.4.2.3 After review, the bathymetry datasets that were selected for comparison include those corresponding to the following years: 2002, 2006, 2007, 2008, 2009, 2011, 2012, 2023, 2024 and 2025. Analysis included the following steps:

- All selected bathymetry datasets were imported into ArcGIS. Where multiple surveys existed for one given year, they were merged to represent the maximum seabed level elevation. This typically combined a full-area scan with a detailed WTG-area scan;
- Selected datasets were then analysed to define the minimum common area covered in all bathymetry datasets (outlined by the blue dashed line in **Plate 3.1**);
- A water depth of -8.64 m Low Astronomical Tide (LAT) (as per the maximum water depths required for a jack-up barge (JUB) candidate initially identified by Arklow Energy) was used to determine the sediment volumes above that water depth across the minimum common area (with no bulking factors applied), presented in **Table 3.2**.

3.4.2.4 The 2025 bathymetry dataset (shown as contours in **Plate 3.1**) had the highest sediment volumes above the analysed water depth, and selected to be used as a basis in the calculation of maximum dredging volumes that could potentially be required within indicative vessel access channels within the Sub Lease Area, see next subsection.

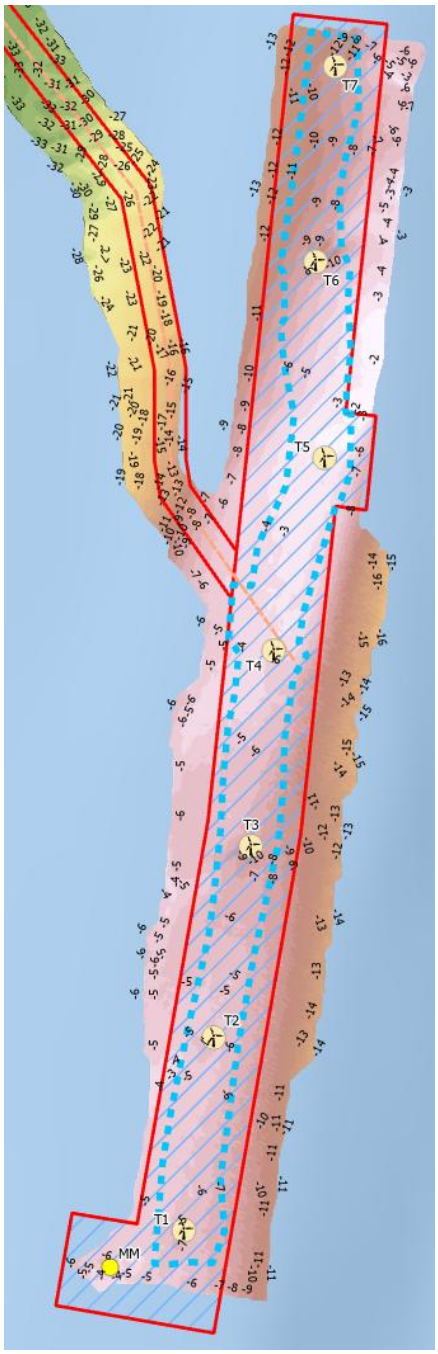

Plate 3.1: Minimum common area covered in bathymetry datasets reviewed represented in blue

Table 3.2: Sediment volume above -8.64 m LAT across the minimum common area within the Sub Lease Area using reviewed bathymetry datasets

Year	Sediment volume above -8.64 m LAT (m^3)
2025	2,447,235
2024	2,378,368
2012	2,361,260
2006	2,282,290
2023	2,266,441

Year	Sediment volume above -8.64 m LAT (m^3)
2002	2,206,382
2011	2,164,105
2009	2,127,953
2007	2,091,024
2008	2,033,155

Potential Dredging Requirements

3.4.2.5 As indicated in **Section 3.4.11**, seabed level depths of -4.5 m and -6 m LAT were eventually defined as the minimum to facilitate safe vessel access to the Sub Lease Area and decommission WTGs and TPs/MPs respectively.

3.4.2.6 Depending on the bathymetric conditions found at the time of decommissioning, some localised dredging may be required. For reference, during construction, some localised dredging was required to facilitate vessel access to WTG T5, which was carried out using a backhoe dredger (BHD) and a suction hopper dredger.

3.4.2.7 Should pre-decommissioning surveys indicate the likely need for localised dredging, additional pre-dredging bathymetric surveys within the Sub Lease Area will be undertaken a minimum of three days before dredging works commence to confirm bathymetry conditions and refine dredging / disposal areas, volume estimates and methodologies, ensuring these are kept within the limits / requirements of the Dumping at Sea (DaS) permit that Proposed Works Offshore will be required to secure from the EPA (see **Volume 2, Chapter 1**).

3.4.2.8 Given the different seabed levels that may be encountered around each MP location, one or a combination of dredging (and associated disposal) methods may be used depending on the seabed levels encountered at the time of decommissioning and final volumes of material to be dredged within each vessel access channel, if any, including:

- **Dredging using a medium-sized Cutter Suction Dredger (CSD).** A CSD is a vessel equipped with a rotating cutter head at the end of a suction line, typically shaped like a basket. It uses blades on the rotating cutter head to dredge its way into the required water depth, and can be equipped with a floating, or partially floating pipeline supported by anchors to transport the dredge material to the designated disposal area within the Sub Lease Area, or use skips for temporary storage of dredge material before this is sidecasted;
- **Dredging using a medium-sized BHD.** BHDs operate in a similar way to a land-based excavator, and are particularly useful in confined or shallow areas. BHDs are equipped with a hydraulic excavator mounted on a pontoon. The dredging pontoon is usually held in place by three spud poles (equipment to position and stabilise the dredger). The BHD would load to a single split hopper barge, which would transit to the designated disposal area within the Sub Lease Area for release before the next load;
- **Plough dredging.** Plough dredging is considered to be an effective method for the removal of areas of higher seabed level, with layers of sediment being removed at each pass until the desired depth is achieved. The contents of the plough would be released once the water depth increases to a depth greater than the plough depth within the local vicinity. Plough dredging may need to be used to maintain pockets of sand within vessel access channels created following dredging with the above methods.

3.4.2.9 It should be noted that, if needed, dredging and associated disposal would only be undertaken within the Sub Lease Area, and in relation to one pre-defined vessel access channel at a time, i.e. no dredging on more than one vessel access channel would be undertaken in parallel, unless some smaller scale maintenance dredging of the already dredged access channel is required immediately before the decommissioning vessels access the channels. Disposal will be undertaken within the Sub lease Area updrift from the dredge location. Vessel access channels will not be maintained to the target dredging depth between Proposed Works Offshore stages. Turbidity monitoring would be undertaken during dredging / dredged material in line with EPA requirements.

3.4.2.10 In order to inform this EIAR, assessment parameters have been defined using the conservative vessel access channels illustrated in **Figure 3.3**. It should be noted that vessel access channels illustrated in **Figure 3.3** are only indicative and the appointed Principal Decommissioning Contractor may choose to use different vessel access channels to minimise dredging requirements whilst ensuring safe vessel access.

3.4.2.11 Maximum dredging volumes have been calculated using conservative vessel access channels and the seabed levels recorded during the latest bathymetry survey undertaken within the Sub Lease Area (in 2025), which recorded the highest sediment volumes across the Sub Lease Area (on average) (see **Table 3.2**), adjusted to capture realistic timeframes that the Proposed Works Offshore can accommodate in its programme (see **Section 3.6**).

3.4.2.12 **Table 3.3** presents the maximum dredging volumes anticipated, which shows the low probability of dredging being required within all vessel access channels during any given campaign, and responds to the sediment dynamics within the Arklow Bank sandbank.

Table 3.3: Dredging volume calculations using the 2025 bathymetry dataset

Vessel access channel location	Target seabed level of -4.5 m LAT			Target seabed level of -6 m LAT		
	Dredging volume (cubic meter (m^3))	Dredging volume including 15% allowance* (m^3)	Duration (days)**	Dredging volume (m^3)	Dredging volume including 15% allowance* (m^3)	Duration (days)**
Met Mast	208	239.2	1	4,133	4,752.95	1
T1	0	0	0	0	0	0
T2	0	0	0	754	867.1	1
T3	0	0	0	0.5	0.58	1
T4	13,711	15,767.65	3	54,254	62,392.1	9
T5	52,411	60,272.65	9	107,665	123,814.75	18***
T6	0	0	0	0	0	0
T7	0	0	0	0	0	0
Total	66,330	76,279.5	13	166,806.5	191,827.48	30

*Additional 15% allowance included to address overdredge tolerance and potential re-sedimentation
**Assuming the use of a BHD which has a lower dredging production rate (7000 m^3/day) in comparison to the use of a CSD (10,000 m^3/day)
***Adjusted to 15 days, considered the absolute maximum number of days of dredging works within any given vessel access channel that Arklow Energy can fit within the Proposed Works Offshore programme. Accordingly, the maximum dredging volume on any given vessel access channel when targeting the seabed level of -6 m LAT, has been adjusted to 105,000 m^3, as indicated in **Table 3.4.**

3.4.2.13 Dredging assessment parameters are outlined in **Table 3.4**.

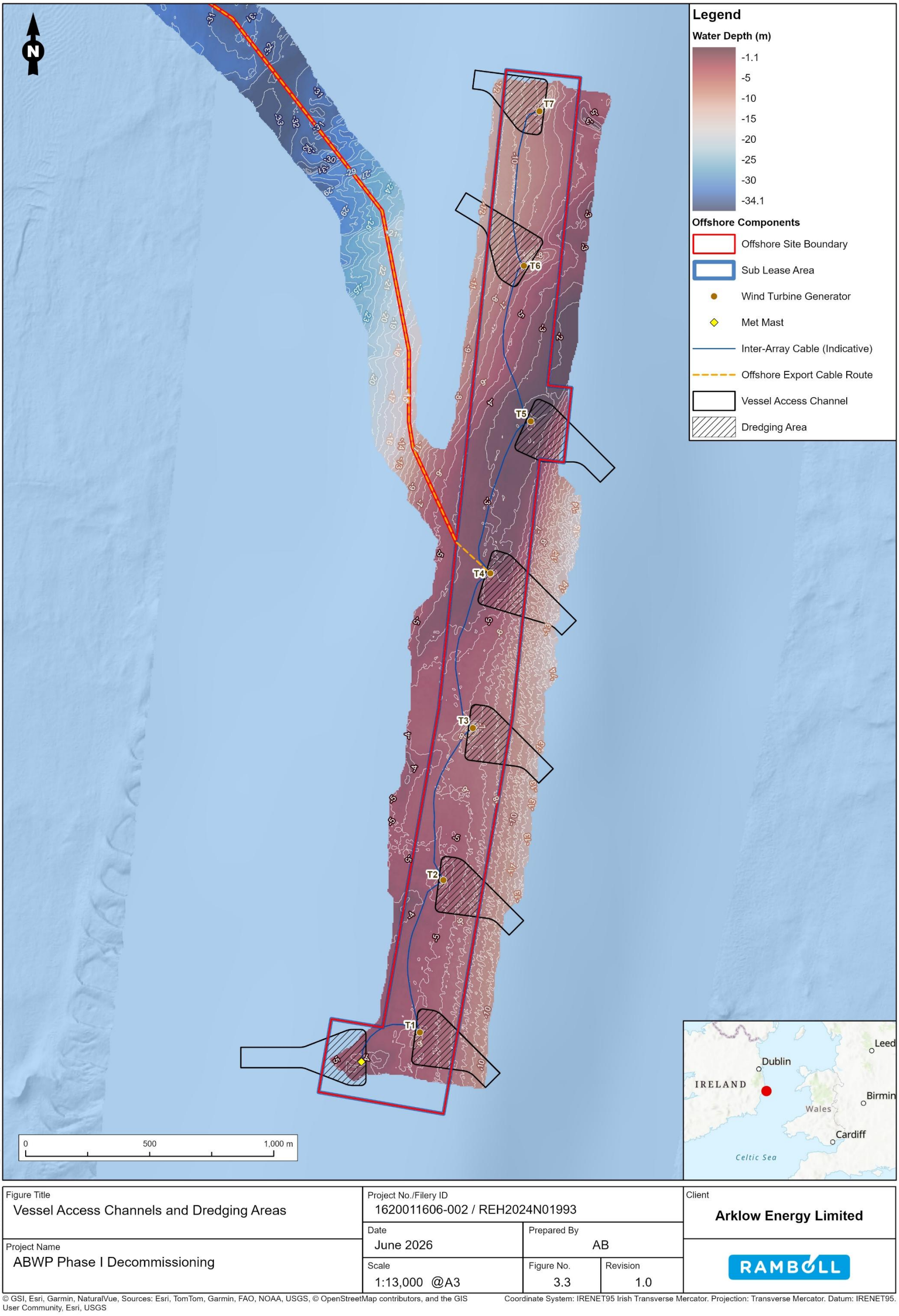

Figure 3.3: Vessel access channels and dredging areas

Table 3.4: Dredging assessment parameters

Assessment parameter	Value	Notes
Pre-dredging bathymetric surveys		
Pre-dredging bathymetric survey characteristics	• MBES • Duration / frequency – Three days / max 16 times per year	These characteristics are based on experience of similar projects. Bathymetric surveys may need to be repeated twice per year along each vessel access channel (i.e. 16 times). Surveys will only be undertaken during daytime.
Pre-dredging bathymetric survey supporting Vessel characteristics	• Survey vessel	These characteristics are based on experience of similar projects. It is assumed that the survey vessel to be used will be of small / medium size and of shallow draught.
Maximum number of vessel trips	• 2 vessel trips on any given day • 48 vessel trips considering a single campaign.	One vessel trip equals one way between the designated port and the Offshore Site or vice versa. Maximum number of trips in any given campaign assumes all vessel access channels (eight) need to be surveyed, and every day within the three-day duration of each survey, the vessel goes back to port.
Dredging		
Target seabed level depth	• For WTG / met mast decommissioning: -4.5 m LAT • For TP/MP decommissioning: -6 m LAT	This is the seabed level depth that will be targeted by any dredging methods required, to be maintained within vessel access channels throughout the duration of relevant Proposed Works Offshore (see **Section 3.4.11**).
Maximum extent of dredging areas	• 287,831 m^2 (which represents 21.3% of the total Sub Lease Area)	The maximum extent of dredging areas equals the conservative extent of vessel access channels inside the Sub Lease Area (see **Figure 3.3**).
Maximum dredging volumes	• For -4.5 m LAT target seabed depth: – Within any given vessel access channel: 60,272.65 m^3 (120,545.3 tonnes (t)) – In total (all vessel access channels): 76,279.5 m^3 (152,559 t) – Total maintenance dredging: 38,139.75 m^3 (76,279.5 t) • For -6 m LAT target seabed depth: – Within any given vessel access channel: 105,000 m^3 (210,000 t) – In total (all vessel access channels): 191,827.475 m^3 (383,654.95 t) – Total maintenance dredging: 86,000 m^3 (172,000 t)	Maximum dredging volumes have been calculated based on the dredging requirements to achieve the target seabed level depth within vessel access channels using the 2025 bathymetry dataset as a basis. The density of wet sand has been assumed as 2 t/m^3. Total maintenance maximum dredging volumes for -4.5 m LAT target seabed have been estimated as 50% of the total maximum dredging volume across all vessel access channels, which may be needed to maintain the target water depth throughout the duration of the Proposed Works Offshore. Total maintenance maximum dredging volumes for -6 m LAT target seabed depth have been calcylated on an access channel by channel basis, accounting for access channel dimensions, infill rates, and maintenance period duration, and include a 15% contingency on estimated sediment volumes, which form the basis for the maintenance dredging scenarios represented in the numerical sediment plume model (see **Volume 3, Appendix 4.2: Coastal Processes Modelling**).

Assessment parameter	Value	Notes
Use of medium-sized CSD		
Dredging characteristics	• Average dredging production rate: 10,000 m^3/day or 232 kilograms (kg)/second (s) • Maximum dredging production rate: 40,000 m^3/day or 926 kg/s • Max sea state (general condition rated between 0 (calm) and 12 (hurricane) (Beaufort scale)) compatibility: 1.25 m considering strong currents	These characteristics are based on experience of similar projects. The average dredging production rate is estimated to allow for weather / sea state stoppages, so dredge rate may increase under favourable weather / sea state conditions.
Disposal characteristics	• Via pipeline: – Average disposal rate: 10,000 m^3/day or 232 kg/s – Maximum disposal rate: 40,000 m^3/day or 926 kg/s – Use of pipeline (circa 1000 – 1200 millimeter (mm) internal diameter) within 1.4 km from dredged areas with release at 1 – 2 m water depth • Via sidecasting – Use of skips with a maximum capacity of 1,000 m^3 – Maximum disposal rate: 6,700 kg/s over 5 minutes	These characteristics are based on experience of similar projects. Floating / partially floating discharge pipeline will be directed towards deepest possible waters within 1.4 km from dredged areas, with release at 1 – 2 m to facilitate dispersion and minimise the formation of mounds.
CSD supporting vessel characteristics	• The CSD may need to be supported by a single small tugboat and a shallow draught small survey vessel (equipped with MBES)	These characteristics are based on experience of similar projects.
Maximum number of vessel trips associated with potential dredging works required	• 3 vessel trips on any given day (for all three vessel types engaged in dredging works, one way) • 48 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign.	One vessel trip equals one way between the designated port and the Offshore Site or vice versa Maximum number of trips on any given day = 3 given that up to 3 vessel types would be engaged, i.e. dredging vessel, small tugboat and survey vessel. The dredging vessel and supporting vessels would only be able to stay within the Sub Lease Area if the weather conditions are safe, otherwise they will head for a safe haven or sheltered area as these vessels are not built for rough conditions. Maximum number of trips considers going to port after dredging within any given channel. Maximum number of trips for all vessel types during one single campaign = 48 (two vessel trips for the three vessels per channel, considering 8 vessel access channels).
Maximum duration	• For -4.5 m LAT target seabed depth: 7 days per vessel access channel • For -6 m LAT target seabed depth: 11 days per vessel access channel	Maximum duration of works is based on maximum dredging volumes and average dredging rates noted above. This excludes transition time between port and Sub Lease Area. Dredging works, if required, will be undertaken 24/7.

Assessment parameter	Value	Notes
Medium-sized BHD		
Dredging characteristics	• Average dredging production rate: 7,000 m^3/day or 163 kg/s • Maximum dredging production rate: 12,000 m^3/day or 278 kg/s	These characteristics are based on experience of similar projects. The average dredging production rate is estimated to allow for weather / sea state stoppages, so dredge rate may increase under favourable weather / sea state conditions.
Disposal characteristics	• Average disposal rate: 7,000 m^3/day or 162 kg/s • Maximum disposal rate: 12,000 m^3/day or 280 kg/s • Use of split hopper barge with a minimum capacity of 1,000 m^3, which would transit to designated disposal area within 1.5 km from dredged areas within the Sub Lease Area for release before the next load. • Disposal will be in discrete plugs from the hopper barge, so discharge will typically be over 1-5 minutes. For a 1,000 m^3 barge this will represent discharge of approx. 6,700 kg/s over 5 minutes.	These characteristics are based on experience of similar projects. Designated disposal sites will always be located within the Sub Lease Area and target deeper areas away from dredged areas to minimise the formation of mounds near vessel access channels.
BHD supporting vessel characteristics	The BHD may need to be supported by a single small tugboat and a single split hopper barge to transfer dredged material from the vessel access channel to the disposal site, and a shallow draught survey vessel.	These characteristics are based on experience of similar projects.
Maximum number of vessel trips associated with potential dredging works required	• 4 vessel trips on any given day (for all four vessel types engaged in dredging works, one way) • 64 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign.	One vessel trip equals one way between the designated port and the Offshore Site or vice versa Maximum number of trips on any given day = 4 given that up to 4 vessel types would be engaged, i.e. dredging vessel, small tugboat, split hopper barge and survey vessel. The dredging vessel and supporting vessels would only be able to stay within the Sub Lease Area if the weather conditions are safe, otherwise they will head for a safe haven or sheltered area as these vessels are not built for rough conditions. Maximum number of trips considers going to port after dredging within any given channel. Maximum number of trips for all vessel types during one single campaign = 64 (two vessel trips for the four vessels per channel, considering 8 vessel access channels).
Maximum duration	• For -4.5 m LAT target seabed depth: 9 days per vessel access channel • For -6 m LAT target seabed depth: 15 days per vessel access channel	Maximum duration of works is based on maximum dredging volumes and average dredging rates noted above. This excludes transition time between port and Sub Lease Area. Dredging works, if required, will be undertaken 24/7.

Assessment parameter	Value	Notes
Plough dredging		
Dredging characteristics	• Maximum plough width: 12 m • Average dredging production rate: 2,400 m^3/day or 56 kg/s • Maximum dredging production rate: 4,000 m^3/day or 93 kg/s	These characteristics are based on experience of similar projects. The average dredging production rate is estimated to allow for weather / sea state stoppages, so dredge rate may increase under favourable weather / sea state conditions.
Disposal characteristics	• Average disposal rate: 2,400 m^3/day or 56 kg/s • Maximum disposal rate: 4,000 m^3/day or 93 kg/s • Disposal within deeper waters within the vicinity of dredged areas, within the Sub Lease Area.	These characteristics are based on experience of similar projects. The ploughed material will be deposited in the deeper water immediately outside the vessel access channel(s).
Plough dredging supporting vessel characteristics	• Plough dredging may need to be supported by a small survey vessel, equipped with MBES to monitor the depth of the seabed at all times and adjust dredging works as required.	These characteristics are based on experience of similar projects.
Maximum number of vessel trips	• 2 per vessel access channel that may need to be dredged (max of 16 within a single campaign)	One vessel trip represents one way vessel trip between the port and the Offshore Site or between the Offshore Site and the port, and applies to all vessel types required. The plough will leave the Offshore Site when sea conditions are unfavourable for ploughing activity, which will be no more than 1 m sea state. Maximum number of trips considers going to port after dredging within any given channel.
Maximum duration	• 9.5 days per vessel access channel	Maximum duration of works is based on maximum estimated duration of individual decommissioning activities per location, i.e. TP / MP removal. This excludes transition time between port and Sub Lease Area.

3.4.3 Decommissioning of Wind Turbine Generators

3.4.3.1 Each of the seven WTGs broadly comprises the components detailed in **Table 3.5**.

Table 3.5: Wind Turbine Generator (WTG) components

Component	Description	Weight
Nacelle	The nacelle sits on top of the tower, housing the yaw system, gearbox, generator, transformer and auxiliary control systems. The hub is made of ductile cast iron and houses the blade pitching mechanisms.	240 t
Blade*	Three blades made of epoxy resin/ glass fibre with a length of 50.5 m and approx. weight of 13 t each per turbine, forming a rotor (104 m diameter).	39 t (three blades)
Tower	There are two tubular steel tower sections connected by a bolted flange, 57 m high. Diameter is 5.4 m at the bottom and 3.4 m at the top.	160 t

* It should be noted that blades were removed in summer 2025 for assessment and maintenance purposes and will not be reinstalled due to their hazardous state. However, the permanent removal of blades is considered to be part of the Proposed Works Offshore so that any potential effects can be assessed appropriately.

3.4.3.2 Before any decommissioning works commence, a work area will be established around the Sub Lease Area to ensure decommissioning vessels can operate safely throughout the duration of Proposed Works Offshore. In line with **Volume 3, Appendix 3.7: Outline Lighting and Marking Plan (LMP)**, the work area will be marked with 12 buoys with a distance of 803 m along its northern and southern boundaries and a distance of 1,204 m along its eastern and western boundaries. The work area will have a total width of 1,605 m and a total length of 4,817 m.

3.4.3.3 The dismantling and removal of WTGs components will be a reversal of the installation process:

- Preparation works, including inspection, removal / securing loose items, etc;
- Position of JUB for pre-load and jack up to working height, ensuring secure attachment to relevant structure points;
- Completion of safety checks and preparation of the WTG for lifting, accessing the inside where required;
- Full de-energising of the WTG, routing power supply from JUB if required for dismantling;
- Permanent removal of rotor and blades;
- Disconnection of power and signal cables between the nacelle and tower before removing nacelle, fastening components to the JUB (and subsequent transport barge if used); and
- Disconnection of power and signal cables between the tower and the TP/ lift system before removing the tower, lifting the tower in sections and fastening components to the JUB (or transport barge) before transferring these to port.

3.4.3.4 **Table 3.6** outlines relevant assessment parameters during WTG decommissioning.

Table 3.6: Wind Turbine Generator (WTG) decommissioning assessment parameters

Assessment parameter	Value	Notes
Cutting characteristics	External cutting	Components may be cut on the JUB to facilitate temporary storage on deck before transfer to port.
Supporting vessel characteristics	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems	These characteristics are based on experience of similar projects.

Assessment parameter	Value	Notes
Maximum number of vessel trips	• 4 vessel trips on any given day (for all four vessel types, one way) • 12 vessel trips considering all WTGs and met mast are decommissioned within the same campaign and transferred to port in three ”loads”	One vessel trip equals one way between the designated port and the Offshore Site or vice versa Maximum number of trips on any given day = 4 given that up to 4 vessel types would be engaged, i.e. transport barge, JUB and 2 tugboats. Maximum number of trips within a single campaign assumes that the JUB or transport barge would need to transfer WTGs / met mast in three loads, see **Section 3.6.1**.
Expected duration	• 6.5 days per WTG	Expected duration is based on experience of similar activities and assumes a conservative window to perform the task. This duration does not include any adverse weather or unexpected delays so should be considered a P0 (lowest possible time) assumption. This excludes dredging that may be required to access the WTG location, separately outlined in **Table 3.3** and **Table 3.4**, and transition between port and Sub Lease Area.

3.4.4 Decommissioning of Met Mast

3.4.4.1 In addition to a TP and MP foundation, the met mast also comprises a number of meteorological sensors located at different heights, a lattice tower with an overall length of 60 m and weight of approximately 10 t, and a triangular platform.

3.4.4.2 The met mast was intended to record wind data pre-construction and stopped working in 2007. The met mast also includes three marine lanterns as Aids to Navigation (ATONs) and a functioning web local area network (LAN) camera mounted on the met mast which is currently operational and used for onshore sea condition monitoring.

3.4.4.3 The met mast will be dismantled in two separate sections, a top section with meteorological sensors still attached, with an approximate weight of 5 t, and the bottom section. The triangular platform will subsequently be dismantled using the similar plant and lifting equipment used during WTG decommissioning (**Section 3.4.3**).

3.4.4.4 **Table 3.7** outlines relevant assessment parameters during decommissioning of meteorological sensors.

Table 3.7: Met mast decommissioning assessment parameters

Assessment parameter	Value	Notes
Cutting characteristics	External cutting	Components may be cut on the JUB to facilitate temporary storage on deck before transfer to port.
Supporting vessel characteristics	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems	These characteristics are based on experience of similar projects.
Maximum number of vessel trips	The vessel trips required to remove the met mast are included in **Table 3.6** above.	
Expected duration	• 2.5 days	Expected duration is based on experience of similar activities and assumes a conservative window to perform the task. This duration does not include any adverse weather or unexpected delays so should be considered a P0 assumption.

3.4.5 Decommissioning of Transition Pieces

3.4.5.1 TPs house electrical equipment and serve as a connection point between WTGs / met mast and the foundations (in this case MPs). The interface between TPs and MPs is a grouted connection. The TPs are made of steel and have the dimensions and weights specified in **Table 3.8**.

Table 3.8: Transition Piece characteristics

TP location	Diameter	Length	Approximate weight
WTGs (T1 – T7)	5.4 m	15.3 m	87.1 t (132 t if attached accessories are considered)
Met mast	2 m	16.5 m	35 t

3.4.5.2 The sequence for removal of each TP is anticipated to comprise:

- Position of JUB for pre-load and jack up to working height, ensuring secure attachment to relevant structure points. Position of transport barge next to JUB and of gangway next to the TP to provide safe access;
- General inspection of the TP before preparation activities for safety purposes;
- Removal / securing of loose items inside and outside of the TP;
- Installation and non-destructive testing of new lifting points, if required;
- Securing of TP to crane for lifting before executing the cuts, which can be done either above or below the grout connection between the TP and MP (see **Figure 3.4**); and
- Lifting of cutting equipment, as well as TP, transferred to the JUB or transport barge.

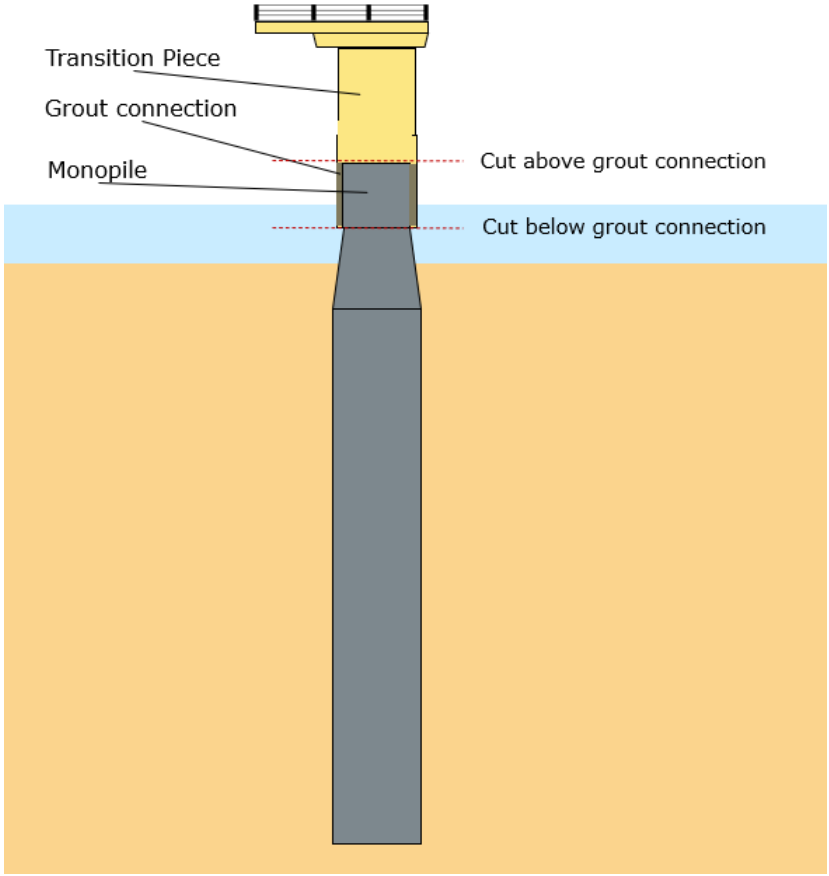

Figure 3.4: Illustration of Transition Piece cutting before decommissioning

3.4.5.3 **Table 3.9** outlines relevant assessment parameters during decommissioning of TPs.

Table 3.9: TP decommissioning assessment parameters

Assessment parameter	Value	Notes
Cutting characteristics	External cutting (grouted connection)	These characteristics are based on experience of similar projects. If the cut is undertaken below the grout connection there is potential for the cut to be undertaken underwater, depending on the water level at the time of decommissioning.
Supporting vessel characteristics	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems	These characteristics are based on experience of similar projects. Decommissioning and transfer of TPs and MPs will be undertaken together at each MP location.
Maximum number of vessel trips	• 4 vessel trips on any given day (for all four vessel types, one way) • 10 vessel trips considering all TPs and MPs are decommissioned within the same campaign and transferred to port in two "loads"	One vessel trip equals one way between the designated port and the Offshore Site or vice versa. Maximum number of trips on any given day = 4 given that up to 4 vessel types would be engaged, i.e. transport barge, JUB and 2 tugboats. Maximum number of trips within a single campaign assumes that the JUB or transport barge would need to transfer TPs / MPs in two loads, see **Section 3.6.1**.
Expected duration	• 9.5 days per TP/MP	Expected duration includes the decommissioning of both TP and MP in any given location. Expected duration is based on experience of similar activities and assumes a conservative window to perform the task. This duration does not include any adverse weather or unexpected delays so should be considered a P0 assumption. This excludes dredging that may be required to access the TP/MP location, separately outlined in **Table 3.3** and **Table 3.4**, and transition between port and Sub Lease Area.

3.4.6 Decommissioning of Foundations

3.4.6.1 All seven WTGs, as well as the met mast, sit on MPs, with dimensions described in **Table 3.10**.

Table 3.10: Monopile characteristics

Location	Diameter	Length	Embedment depth (level of toe) (LAT)	Approximate weight
T1	5.1 m	44 m	-36.65 m	274 t
T2		45 m	-37.65 m	281 t
T3		45 m	-37.65 m	281 t
T4		45 m	-37.65 m	281 t
T5		42 m	-34.60 m	252 t
T6		45 m	-37.65 m	281 t
T7		44 m	-36.65 m	274 t
Met mast	1.8 m	31.4 m	-29.10 m	47.5 t

3.4.6.2 The sequence for removal of a MP is anticipated to comprise:

- Following removal of the TP, then the seabed material inside MPs is extracted (also referred to as 'soil plug') using a soil plug removal tool (SPRT), such as an internal Damen Submersible Dredge (DOP) pump, fitted with water jets, or a cutter head, to disturb the material that may have become compacted over time inside the MP. The target dredging

depth will be 3 m below the target cutting depth to ensure cutting equipment can be safely operated (see **Figure 3.5**). Internal dredging volumes are outlined in **Table 3.11**;

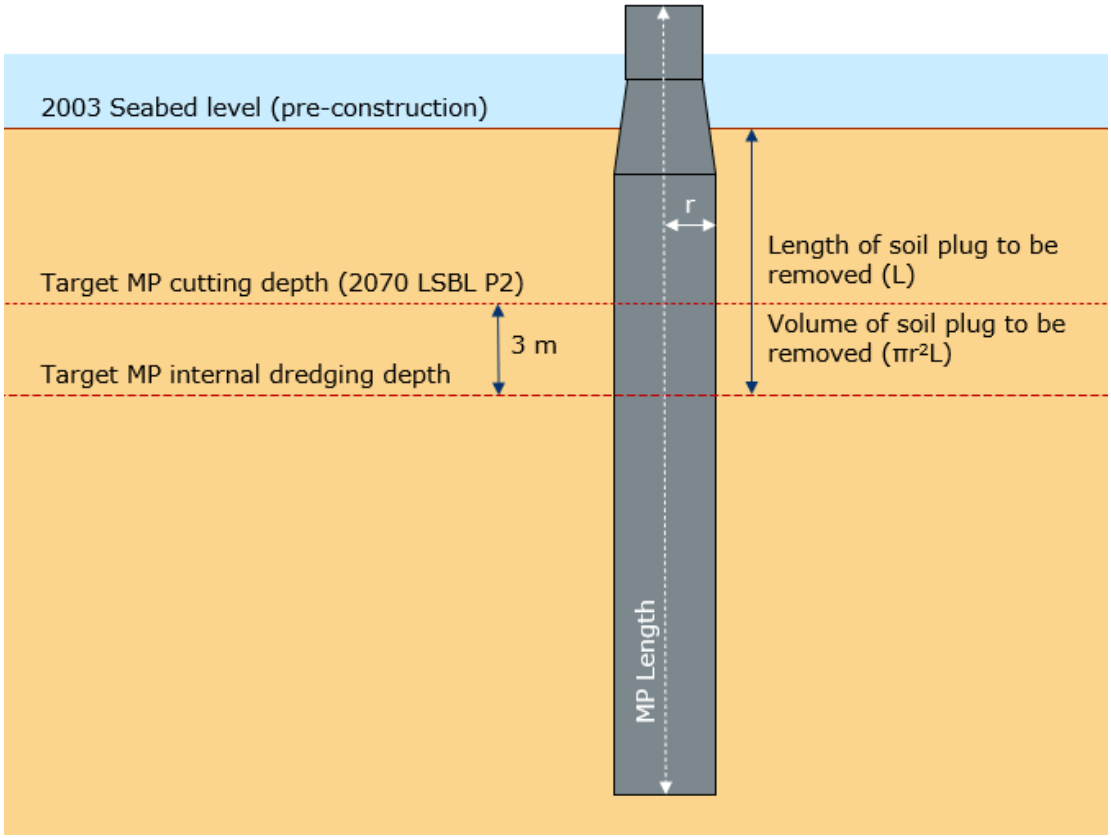

Figure 3.5: Indicative illustration of MP internal dredging volume calculations. Please note ABWP phase I monopiles have no taper.

Table 3.11: Internal dredging volume calculations

Location	2003 Seabed level (pre-construction) (mLAT)	Target MP cutting depth (2070 LSBL P2) (mLAT)	Target MP internal dredging depth (mLAT)	Length of soil plug to be dredged (2003 seabed level - Target MP internal dredging depth) (m)	Volume of soil plug to be dredged (m^3)
T1	-4.70	-8.34	-11.34	6.64	136
T2	-5.20	-6.59	-9.59	4.39	90
T3	-5.20	-8.55	-11.55	6.35	130
T4	-4.80	-8.09	-11.09	6.29	129
T5	-2.70	-6.67	-9.67	6.97	143
T6	-5.00	-8.89	-11.89	6.89	141
T7	-4.40	-9.75	-12.75	8.35	171
Met mast	-2.70	-10.55	-13.55	10.85	28
				Total	968

- Dredged material will be released via pipeline within 100 m from MP locations at the same time as being dredged;
- Use of jetting, vibratory or any other friction removal equipment around the MP, if required;
- Installation of the internal cutting equipment inside the MP at the required cutting elevation;

- Securing of the MP to crane for lifting before cutting the MP at the target cutting depth (see Figure 3.6 and paragraphs 3.4.6.4 - 3.4.6.6);
- Perform the internal cut;
- Holding and then lifting the MP whilst activating the equipment intended to remove potential shaft friction; and
- Transfer of cutting equipment and MP onto the JUB and transport barge respectively.

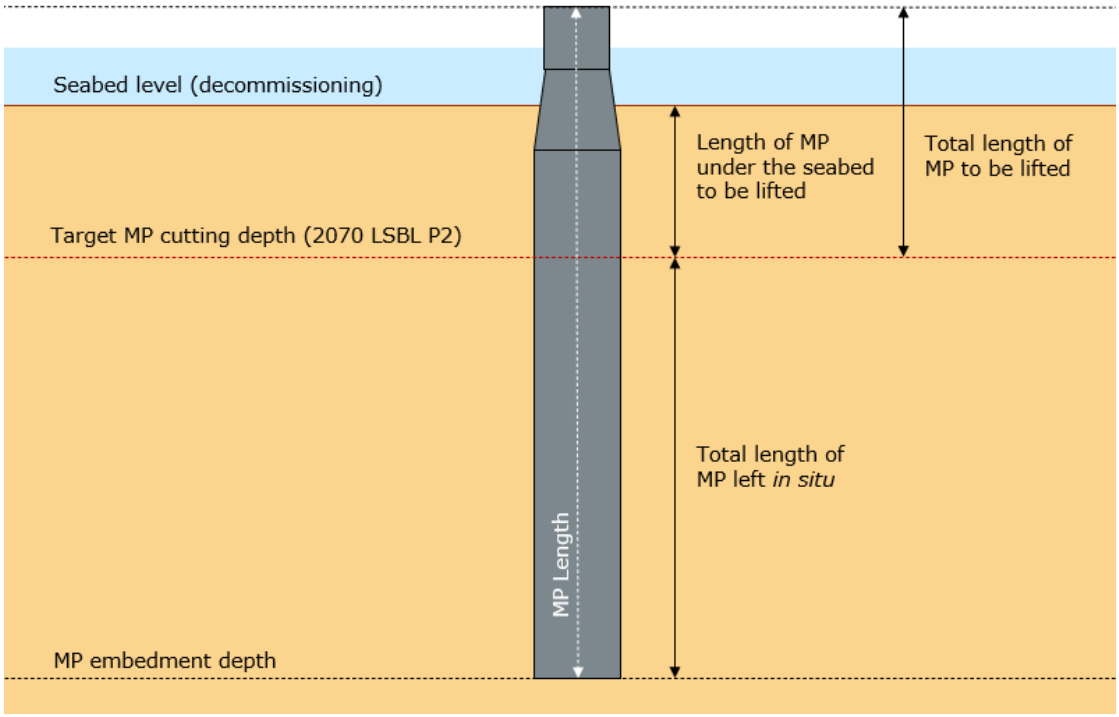

Figure 3.6: Indicative illustration of MP partial cutting calculations. Please note ABWP phase I monopiles have no taper.

3.4.6.3 **Table 3.12** outlines relevant assessment parameters during MP decommissioning. Supporting vessel characteristics and expected duration would be as presented for TP decommissioning, as decommissioning of these two offshore infrastructure components will be undertaken at the same time.

Table 3.12: MP decommissioning assessment parameters

Assessment parameter	Value	Notes
Internal dredging		
Maximum dredging volumes	• Within any given MP: 171 m^3 (342 t) • In total (all MPs): 968 m^3 (1,936 t)	The volume of soil plug to be dredged at each MP location has been calculated based on the target MP dredging depth and seabed levels recorded before installation (2003), see **Table 3.11.** The density of wet sand has been assumed as 2 t/m^3.
Dredging characteristics	• Average dredging production rate: 20 m^3/h or 10 kg/s • Maximum dredging production rate: 40 m^3/h or 20 kg/s	These characteristics are based on experience of similar projects. Assumes the use of a 3 bar DOP pump with a flow capacity of 800 m^3/h and 5-10% average production density achieved in the hands of an experienced operator. This allows for power/flow losses.
Disposal characteristics	• Average disposal rate: 20 m^3/h or 12 kg/s • Maximum disposal rate: 40 m^3/h or 23 kg/s • Use of pipeline (circa 200 - 350 mm internal diameter) within 100 m	These characteristics are based on experience of similar projects. The pipeline will be directed towards deepest possible waters within 100 m from MPs, with release at 1 – 2 m to facilitate dispersion and minimise the formation of mounds.

Assessment parameter	Value	Notes
	from MPs with release at 1 – 2 m water depth	
Internal cutting		
Cutting characteristics	Internal cutting (from inside MP)	These characteristics are based on experience of similar projects.
Lifting		
Friction removal equipment characteristics	• Vibratory tool (i.e. vibratory hammer/extractor) attached to the top of the MP that uses counter-rotating eccentric weights driven by hydraulic or electric motors creating a vertical oscillating force that is transmitted into the MP, temporarily fluidising the soil around the MP. • Jet lancing, a hydraulic method that injects high-pressure water via steel pipes (i.e. jet lances) placed along the MP or integrated into the lifting frame, eroding and weakening the seabed to facilitate lifting operations.	These characteristics are based on experience of similar projects.
Maximum length / weight of MP to be lifted	• Per MP: 17.10 m / 98.39 t (MP at T7) • In total:121.23 m / 692.34 t	Maximum length of MP to be lifted has been calculated based on the total length of the MP and length of the MP left *in situ*. Maximum weight of MP to be lifted has been calculated based on the total length of the MP to be lifted and a weight/length ratio specified for each MP (see **Table 3.13**).
Maximum length / weight of MP to be left *in situ*	• Per MP: 31.06 m / 193.95 t (MP at T2) • In total: 222.17 m / 1,279.46 t	Maximum length of MP to be left *in situ* has been calculated based on the original embedment depth of the MP and the target cutting depth. Maximum weight of MP to be left *in situ* has been calculated based on the total length of the MP to be left *in situ* and a weight/length ratio specified for each MP (see **Table 3.13**).
Supporting vessel characteristics	JUB supported by two tugboats and transport barge, with potential use of: • DP • USBL acoustic positioning systems	These characteristics are based on experience of similar projects. Decommissioning and transfer of TPs and MPs will be undertaken together at each MP location.
Maximum number of vessel trips	The vessel trips associated with the TP / MP removal are set out above in **Table 3.9**.	
Expected duration	The expected duration of TP / MP decommissioning is set out above in **Table 3.9**.	

Monopile Target Cutting Depth

3.4.6.4 The MP target cutting depth has been defined using the numerical model developed to inform **Volume 3, Appendix 4.1: Seabed Mobility Assessment**, which predicts the Lowest Seabed Level (LSBL) that will be reached at each MP location within the model timescales (up to 2070).

3.4.6.5 The second probability percentile (P2) LSBL has been selected as the target cutting depth, considered to represent a very low and rare seabed level value that will minimise post-decommissioning residual MP exposure risks.

3.4.6.6 **Table 3.13** outlines the target cutting depth at each MP location and approximate length / weight of MPs to be lifted and be left *in situ*:

- Total length of MP to be lifted is estimated based on the difference between the total MP length and the length of the MP proposed to be retained *in situ* under the seabed;

- Total length of residual MP to be left *in situ* is estimated based on the difference between the MP embedment depth (see **Table 3.10**) and target cutting depth; and
- Weight of MPs to be lifted / left *in situ* is based on the length of MP and weight per length of MP ratio based on weights presented in **Table 3.10**.

Table 3.13: Monopile target cutting depth (P2 LSBL) in relation to 2025 bathymetry.

Location	Target cutting depth (m LAT)	Length of MP to be lifted (m)	Weight of MP to be lifted (t)	Length of MP to be retained *in situ* (m)	Weight of MP to be retained *in situ* (t)
T1	-8.34	15.69	97.71	28.31	176.29
T2	-6.59	13.94	87.05	31.06	193.95
T3	-8.55	15.90	99.29	29.10	181.71
T4	-8.09	15.44	96.41	29.56	184.59
T5	-6.67	14.07	84.42	27.93	167.58
T6	-8.89	16.24	101.41	28.76	179.59
T7	-9.75	17.10	106.49	26.90	167.51
Met mast	-10.55	12.85	19.56	18.55	28.24
Total		121.23	692.34	220.17	1,279.46

3.4.6.7 **Table 3.14** outlines the target cutting depth at each MP location in relation to seabed levels recorded in 2025. However, it should be noted that the depth below seabed level that target cutting depths represents will depend on the seabed levels encountered at the time of decommissioning.

Table 3.14: Monopile target cutting depth (P2 LSBL) in relation to 2025 bathymetry.

Location	Target cutting depth (m LAT)	Seabed levels 2025 (m LAT)	Depth of the cut below seabed level (based on 2025 bathymetry)
T1	-8.34	-5.2	3.14 m
T2	-6.59	-6.32	0.27 m
T3	-8.55	-6.26	2.29 m
T4	-8.09	-4	4.09 m
T5	-6.67	-3.21	3.46 m
T6	-8.89	-4.9	3.99 m
T7	-9.75	-6.7	3.05 m
Met mast	-10.55	-6.49	4.06 m

3.4.7 Scour Protection Removal

3.4.7.1 Originally, rock armour scour protection was placed around some MPs. However, due to the dynamic conditions on the bank, this proved ineffective against scour and in 2005 divers were deployed to remove the rock armour.

3.4.7.2 In order to address and prevent scour issues and protect the MPs, underwater remedial works have regularly been performed as part of the ABWP Phase I maintenance program. This has mainly involved placing sandbags around MPs, filled with sediment from around MPs using divers in accordance with the original MP structural design. In total, approximately 821.2 m^3 (1,642.4 t) of sand contained in sandbags have been placed around MPs within the Sub Lease Area between 2005 and 2023. It should be noted that the latest bathymetry survey, conducted in 2025, did not record the presence of any sandbags within the Sub Lease Area, which are assumed to have degraded, moved or be buried.

3.4.7.3 Subject to confirmation of the presence of any residual scour protection sandbags during pre-decommissioning surveys (see **Section 3.4.1**), the sequence for removal of scour protection is anticipated to comprise:

- Position of support vessel equipped with MBES and grab dredger next to the MP;
- Guiding of the grab dredger to grab the individual sandbags identified and mapped during MBES, and to lift them from the seabed to a skip located in a supporting barge; and
- Recovering of sandbags and release of material back into the seabed via side casting.

3.4.7.4 If there are residual scour protection sandbags within vessel access channels, and dredging works are required to facilitate safe vessel access (see **Section 3.4.2**), sandbags will likely be collated by the CSD and/or BHD, and be recovered during dredging works.

3.4.7.5 Should any residual scour protection sandbags be detected during post-decommissioning surveys (see **Section 3.4.10**), sandbags will be recovered using the approach described in **paragraph 3.4.7.3**.

3.4.7.6 **Table 3.15** outlines relevant assessment parameters during scour protection removal.

Table 3.15: Scour protection decommissioning assessment parameters

Assessment parameter	Value	Notes
Dredging characteristics	• Maximum grab dredger penetration depth: 2 m below seabed level • Dredging area: 30 m within individual MPs	These characteristics are based on experience of similar projects.
Disposal characteristics	• Sand contained within the recovered sandbags will be temporarily stored in the grab dredger internal hopper, with an assumed capacity of 500 m^3 until full, at which point, sand will be sidecasted • Disposal rate: 500 m^3/min (16,666.67 kg/s)	These characteristics are based on experience of similar projects. It is assumed that a maximum of one skip would be collated and sidecasted.
Supporting vessel characteristics	• Grab dredger • Small barge equipped with MBES and a skip to temporarily store the content of sandbags	These characteristics are based on experience of similar projects. Max number of vessel trips subject to final methodology.
Maximum number of vessel trips	• Maximum number of vessel trips on any given day: 4 (2 for each vessel type, return trips) • Maximum number of vessel trips per campaign: 80	One vessel trip equals one way between the designated port and the Offshore Site or vice versa Maximum number of trips on any given day = 4 given that up to 2 vessel types would be engaged and return to port after each day of work. Maximum number of trips during a single campaign = 80 (assuming 20 working days required)

Assessment parameter	Value	Notes
Expected duration	• 20 days	Expected duration is based on experience of similar activities and assumes a conservative window to perform the task. This duration does not include any adverse weather or unexpected delays so should be considered a P0 assumption.

3.4.8 Inter-array Cable Removal

3.4.8.1 The inter-array cables have the following characteristics:

- Approximate overall length: 7.4 km;
- Outside diameter: 100 mm;
- Cross section: 75 mm;
- Number of cable cores: 3; and
- Conductor type: copper.

3.4.8.2 Inter-array cables were originally buried to a target burial depth of 2 m by mechanical trenching. At each MP, cables are routed through a flexi-hose duct (part of the cable protection system) that extends 10.7 m in length.

3.4.8.3 A cable position and burial depth survey was completed in 2007, noting that inter-array cables were mostly buried in sandwaves of approximately 0.5 m to 1 m depths below seabed level. Annual SSS surveys of the inter-array cables undertaken between 2010 and 2025 have not detected any exposure, with the exception of small sections of cable protection near MPs (see **Volume 3, Appendix 5.1: Benthic/Live Habitat Cable Survey and Observations Log**). Accordingly, although seabed levels can vary across the Sub Lease Area, it is considered reasonable to assume that inter-array cables are / will be located within 3 m below the seabed level at the time of decommissioning.

3.4.8.4 Inter-array cables will be fully removed in accordance with the following sequence:

- Position of the multicat vessel at the designated location near the WTG where the cable needs to be recovered;
- Unburial of cable using a running method comprising a grapnel run or similar that 'under runs' the cable while being towed from a line from a host vessel, pulled out using clamps and a cable puller, towed slowly (approximately 1 knot) across the seafloor; and
- Cutting of cables underwater or on vessel deck with shears into manageable sections (generally between 7 m and 9 m), deposited in containers.

3.4.8.5 **Table 3.16** outlines relevant assessment parameters during inter-array cable removal.

Table 3.16: Inter-array cable decommissioning assessment parameters

Assessment parameter	Value	Notes
Running method characteristics	• Maximum footprint: 3 m in width • Sound levels / frequency:	These characteristics are based on experience of similar projects. Maximum footprint estimated based on Department for Business Enterprise and Regulatory Reform (BERR) (2008).
Cable recovery details	• Total cable length: 7.4 km • Total cable weight: 102.49 t • Total conductor weight: 14.89 t	Assumes the approximate weight of the cable in air is 13.85 kg/m, and that de conductor density is 8.94 t/m^3
Supporting vessel characteristics	• Multicat vessel of shallow draught equipped with a running method	These characteristics are based on experience of similar projects.
Maximum number of vessel trips	• 2 vessel trips on any given day (one vessel engaged only, two ways)	One vessel trip equals one way between the designated port and the Offshore Site or vice versa The maximum number of vessel trips within a single campaign is based on the assumption that in addition to the return trips required to mobilise / demobilise the multicat vessel, 14 vessel trips will be needed to

Assessment parameter	Value	Notes
	• 16 vessel trips within the same campaign (for one single vessel, two ways)	/ from the port to off-load the inter-array cable sections recovered.
Expected duration	• 20 days	Expected duration is based on experience of similar activities and assumes a conservative window to perform the task. This duration does not include any adverse weather or unexpected delays so should be considered a P0 assumption.

3.4.9 Offshore Export Cable Removal

3.4.9.1 The offshore export cable has the following characteristics:

- Approximate overall length: 15.6 km;
- Outside diameter: 127 mm;
- Cross section: 300 mm;
- Number of cable cores: 3; and
- Conductor type: copper.

3.4.9.2 The offshore export cable was originally buried to a target burial depth of 2 m by mechanical trenching. A 5.5 m section of the offshore export cable was laid over wreck remains (see **Volume 3, Appendix 8.1: Marine Archaeology Technical Report**).

3.4.9.3 A cable position and burial depth survey was completed in 2010, noting that the offshore export cable was located between 0 m and 0.5 m depths below seabed level. Annual SSS surveys of the offshore export cable undertaken between 2012 and 2019 detected evidence of trenching and spoil heaps, observed to gradually reduce on an annual basis, indicating that areas of the trench had been naturally backfilled to its original level pre-trenching. The latest survey conducted in 2025, which combined SSS with ROV deployment, suggests that the offshore export cable is largely covered except for three short sections, including the section of the offshore export cable that overlays the aforementioned wreck remains (see **Volume 3, Appendix 5.1: Benthic/Live Habitat Cable Survey and Observations Log**). Accordingly, it is considered reasonable to assume that the offshore export cable is / will be located within 3 m below the seabed level at the time of decommissioning, with some sections potentially exposed.

3.4.9.4 At landfall, the offshore export cable was originally routed onshore using horizontal directional drilling (HDD) and terminated directly in the onshore substation building (see **Section 3.5.1**).

3.4.9.5 The offshore export cable will be fully removed in accordance with the following sequence:

- Position of the multicat vessel at the designated location near the WTG where the cable needs to be recovered;
- Unburial of cable with a running method using a grapnel run or similar, pulled out using clamps and a cable puller;
- The offshore export cable will be severed by grapple and shears in the vicinity of the landfall , left exposed on the seabed until this is pulled from land (see **Section 3.5.2**); and
- Cables will be cut underwater or on vessel deck with shears into manageable sections (generally between 7 m and 9 m) and deposited in containers for subsequent transfer to port.

3.4.9.6 **Table 3.17** outlines relevant assessment parameters during offshore export cable removal.

Table 3.17: Offshore Export cable decommissioning assessment parameters

Assessment parameter	Value	Notes
Running method characteristics	• Maximum footprint: 3 m in width	These characteristics are based on experience of similar projects. Maximum footprint estimated based on BERR (2008).
Cable recovery details	• Total cable length: 15.6 km • Total cable weight: 380.64 t • Total conductor weight: 125.52 t	Assumes the approximate weight of the cable in air is 24.4 kg/m, and that the conductor density is 8.94 t/m^3.

Assessment parameter	Value	Notes
Supporting vessel characteristics	• Multicat vessel of shallow draught equipped with a running method	These characteristics are based on experience of similar projects. The maximum number of vessel trips is based on the assumption that in addition to the return trips required to mobilise / demobilise the multicat vessel, 17 vessel trips will be needed to / from the port to off-load the offshore export cable sections recovered.
Maximum number of vessel trips	• 2 vessel trips on any given day (one vessel engaged only, two ways) • 19 vessel trips within the same campaign (for one single vessel, two ways)	One vessel trip equals one way between the designated port and the Offshore Site or vice versa The maximum number of vessel trips within a single campaign is based on the assumption that in addition to the return trips required to mobilise / demobilise the multicat vessel, 17 vessel trips will be needed to / from the port to off-load the offshore export cable sections recovered.
Expected duration	• 35 days	Expected duration is based on experience of similar activities and assumes a conservative window to perform the task. This duration does not include any adverse weather or unexpected delays so should be considered a P0 assumption.

3.4.10 Post-decommissioning Surveys

3.4.10.1 As part of the proposed post-decommissioning monitoring of Proposed Works Offshore, the following post-decommissioning surveys will be conducted:

- A post-decommissioning survey within three months of completion of all decommissioning works to verify resulting seabed condition and inform the Close Out Report that will be prepared following the completion of Proposed Works Offshore to provide a final, "as-left" account of the Proposed Works Offshore, demonstrating compliance with the planning application and approved Decommissioning and Reinstatement Plan (DRP), see **Volume 2, Chapter 1**.;
- Annual bathymetric surveys within the Sub Lease Area during years 1 – 4; and
- Final bathymetric survey within the Sub Lease Area at year 5.

3.4.10.2 If monitoring confirms any observed residual MP exposure, then the relevant authorities will be informed.

3.4.10.3 **Table 3.18** outlines the type of surveys anticipated to be required and associated assessment parameters.

Table 3.18: Post-decommissioning surveys and assessment parameters

Assessment parameter	Value	Notes
Geophysical survey characteristics	• MBES • SSS • SBP • Magnetometer • Duration / frequency: 10 days per survey	These characteristics are based on experience of similar projects. Geophysical surveys will only be undertaken during daytime.
ROV characteristics	• Non-intrusive • Will not generate sound / frequency levels • Duration < one day (as (and if) required) per survey	These characteristics are based on experience of similar projects. Used in combination with geophysical surveys for visual confirmation if needed.
Supporting Vessel characteristics	One survey vessel per survey, with potential use of: • DP • USBL acoustic positioning systems	These characteristics are based on experience of similar projects. It is assumed that the survey vessel to be used will be of small / medium size.

Assessment parameter	Value	Notes
		One vessel trip represents one way vessel trip between the port and the Offshore Site or between the Offshore Site and the port, and applies to all vessel types required.
Maximum number of vessel trips	• 2 vessel trips on any given day • 20 vessel trips considering a single survey (with a maximum duration of 10 days).	One vessel trip equals one way between the designated port and the Offshore Site or vice versa. It is assumed that the survey vessel will return to port each day. Effort assumed per survey.

3.4.11 Ports and Vessel Spread

3.4.11.1 At this stage, it is anticipated that the main decommissioning vessels will be mobilised from a European port, assuming a transit duration of up to 15 days.

3.4.11.2 ABWP Phase I decommissioned components will be taken to an available Irish port (Rosslare, Waterford, Dublin and Greenore are potential ports being considered, see **Figure 3.7**), which shall be confirmed once the Principal Decommissioning Contractor is appointed. Considering the closest (Rosslare) and most distant port (Waterford), transit times between the designated Irish port and the Offshore Site would vary from 9 hours to 22 hours (travelling at 4 – 6 knots). The local ports of Arklow and/or Wicklow may be used to mobilise survey vessels.

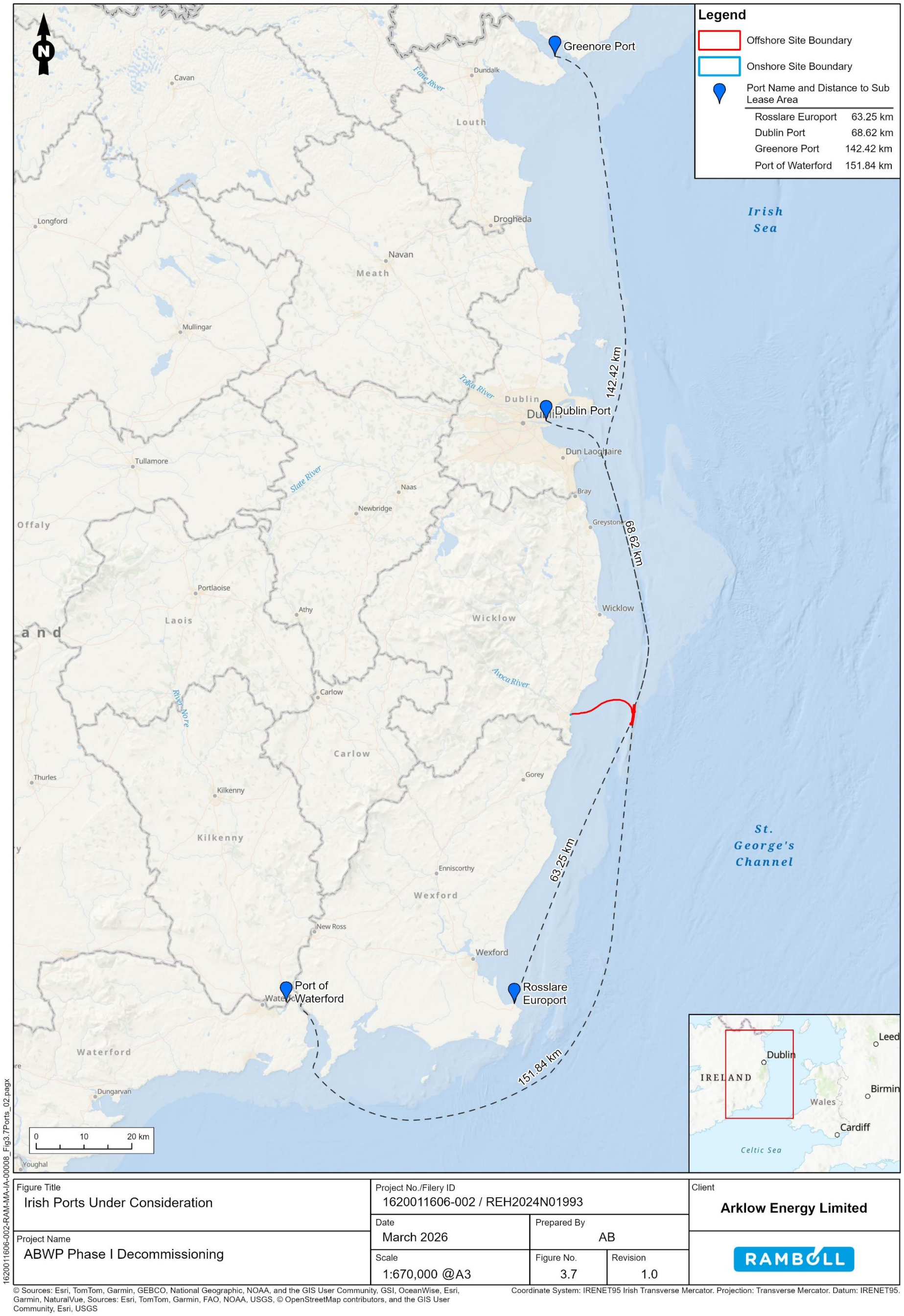

Figure 3.7: Irish ports under consideration

3.4.11.3 The number of transits between the Offshore Site and the designated Irish port will depend on the actual vessels selected, and their deck space and layout design. However, the vessel spread and anticipated maximum number of vessel trips (as per assessment parameter tables above) are outlined in **Table 3.19**.

Table 3.19: Anticipated Vessel Spread during Proposed Works Offshore

Proposed Works Offshore	Vessel type	Maximum number of vessel trips
Pre-decommissioning Surveys	Survey vessel	• 2 vessel trips on any given day • 20 vessel trips considering a single campaign (with a maximum duration of 10 days)
Dredging (if required)	Survey vessel (pre-dredging surveys)	• 2 vessel trips on any given day • 48 vessel trips considering a single campaign
	• Medium-sized CSD • Small tugboat • Small survey vessel	• 3 vessel trips on any given day (for all three vessel types engaged in dredging works, one way) • 48 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign
	• Medium-sized BHD • Small tugboat • Small split hopper barge • Small survey vessel	• 4 vessel trips on any given day (for all four vessel types engaged in dredging works, one way) • 64 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign.
	• Barge equipped with a plough • Small survey vessel	• 2 vessel trips on any given day (for both vessel types engaged in dredging works, one way) • 16 vessel trips considering all eight vessel access channels require some level of dredging during a single campaign
Decommissioning of WTGs / met mast	• JUB supported • Two tugboats • Transport barge	• 4 vessel trips on any given day (for all four vessel types, one way) • 12 vessel trips considering all WTGs and met mast are decommissioned within the same campaign
Decommissioning of TPs & MP Foundations	• JUB supported • Two tugboats • Transport barge	• 4 vessel trips on any given day (for all four vessel types, one way) • 10 vessel trips considering all TP/MPs are decommissioned within the same campaign
Scour Protection Removal	• Grab dredger • Small barge	• Maximum number of vessel trips on any given day: 4 (2 for each vessel type, return trips) • Maximum number of vessel trips per campaign: 80
Decommissioning of inter-array cables	• Multicat vessel equipped with a running method	• 2 vessel trips on any given day (one vessel engaged only, two ways) • 16 vessel trips within the same campaign
Decommissioning of the offshore export cable	• Multicat vessel equipped with a running method	• 2 vessel trips on any given day (one vessel engaged only, two ways) • 19 vessel trips within the same campaign
Post-decommissioning Surveys	• Survey vessel	• 2 vessel trips on any given day • 20 vessel trips considering a single survey (with a maximum duration of 10 days).

3.4.11.4 Upon arrival to the designated Irish port, components will be unloaded using the vessel's main crane, auxiliary cranes/ and land cranes to optimise the programme.

3.4.11.5 Within the designated Irish port, appointed contractors will use available storage / working areas to break down / reduce component sizes to compliant road transport dimensions, who will then transfer these to appropriate waste management facilities for reuse, recycle or disposal operations in accordance with relevant waste regulations.

3.4.12 Embedded Mitigation

3.4.12.1 As further described in **Volume 2, Chapter 1**, embedded mitigation includes measures integrated in the definition of Proposed Works, including:

- Modifications arising through the iterative design / methodology development process; and
- Standard industry practice that would occur even without input from the EIA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects.

3.4.12.2 **Table 3.20** outlines embedded mitigation that is considered as part of the Proposed Works Offshore and will be assumed to be effectively implemented when considering potential for significant effects.

Table 3.20: Embedded mitigation relevant to Proposed Works Offshore

Embedded Mitigation	Notes
Development and adherence to the Detailed Offshore Decommissioning Environmental Management Plan (DEMP)	**Volume 3, Appendix 3.4: Outline Offshore DEMP** presents standard industry practice and legal requirements for environmental management and mitigation that will be implemented as part of the Proposed Works Offshore. The outline Offshore DEMP also summarises any required additional mitigation identified in relevant EIAR chapters, serving as a framework for the future decommissioning contractor(s) to develop in detail before decommissioning works commence.
Development and adherence to the Detailed Vessel Management Plan (VMP)	**Volume 3, Appendix 3.5: Outline VMP** defines best-practice vessel management measures, including transit routes, speed restrictions, timing of activities, pollution prevention, and crew environmental awareness, to minimise disturbance, collision risk, and ecological harm.
Development and adherence to the Fisheries Management and Mitigation Strategy (FMMS)	**Volume 3, Appendix 3.6**: **FMMS** sets out standard industry practice measures for fisheries liaison and coexistence with the fishing industry throughout the Proposed Works Offshore programme. The FMMS has been prepared in line with relevant policy and good practice guidance and includes measures to avoid or reduce disruption to commercial fisheries, regardless of impact significance. Where significant effects are identified within the EIAR, the FMMS also provides the framework for implementation of any additional mitigation measures identified through the assessment.
Development and adherence to the Detailed Lighting and Marking Plan (LMP)	**Volume 3, Appendix 3.7: Outline LMP** identifies required lighting and marking throughout the Proposed Works Offshore in line with relevant standards and legal requirements.
Development and adherence to the Detailed Offshore Waste Management Plan (WMP)	**Volume 3, Appendix 3.8: Outline Offshore WMP** establishes a clear framework for the identification, handling, and management of wastes arising from Proposed Works Offshore, ensuring compliance with standard industry practice and relevant waste legislation, and the principles of the waste hierarchy.
Post-decommissioning monitoring	Post-decommissioning monitoring will comprise (noting sub lease ends 19 June 2033): • A post-decommissioning survey within three months of completion of all decommissioning works to verify resulting seabed condition and inform the Close Out Report; • Annual bathymetric surveys within the Sub Lease Area during years 1 – 4; and • Final bathymetric survey within the Sub Lease Area at year 5. If monitoring confirms any observed residual MP exposure, then the relevant authorities will be informed.

3.5 Proposed Works Onshore

3.5.1 Onshore Substation Decommissioning

3.5.1.1 The Onshore Site includes a small fenced compound (overall footprint: 220 m^2) that hosts the onshore substation, a small one-floor building (footprint: 34.8 m^2; height: 4.650 m) of concrete construction with a pitched, tiled roof surrounded by hardstanding.

3.5.1.2 Within the fenced compound, a 38 kV transformer (footprint: 35.6 m^2; height: 4.6 m) and a submerged oil interceptor tank (10.24 m^2), the latter surrounded by a concrete foundation bund (covering an area of 34.5 m^2), are located. A windscreen located east of the fenced compound provides some shelter to seaspray, as illustrated in **Plate 3.2.**

Plate 3.2: Fenced onshore substation compound within the Onshore Site observed from the west (left) and transformer (right)

3.5.1.3 The onshore substation has been responsible for protecting the grid from ABWP Phase I generation circuit fails, receiving / exporting at the same voltage, i.e. 38 kV.

3.5.1.4 The sequence for decommissioning the onshore substation and ancillary facilities within the fenced compound of the Onshore Site will comprise:

- In collaboration with ESB, termination and isolation of 38 kV and 400 V electricity supplies;
- Removal of cooling oil (6,700 L) from transformer via oil tanker and transport to a licensed waste facility for decontamination;
- Transportation of transformer to a licensed waste facility for further decontamination of residue oils and contaminants prior to metallic recycling / processing;
- Removal of grey water from submerged oil interceptor tank, to be subsequently excavated and removed;
- Excavation and removal of concrete bund;
- Dismantling and removal of all equipment within the onshore substation building, including switchgear, servers, programmable logic controller (PLC), uninterruptible power supply (UPS), communication infrastructure, etc) for the onward recycling/transportation to a licensed waste facility for further processing and disposal. All cables are anticipated to be processed through a copper granulation plant for optimal environmental outcomes; and
- Dismantling of onshore substation building structure, followed by clearance and levelling, anticipated to include reinstatement in line with Wicklow County Council requirements.

3.5.2 Onshore Cable Removal

3.5.2.1 As indicated in **Section 3.3**, the Onshore Cable includes two main sections, further illustrated in **Figure 3.1**:

- Onshore cable section 1, connecting the landfall point from HWM to the onshore substation, proposed to be permanently removed; and
- Onshore cable section 2, connecting the onshore substation to the ESB Networks 220/110 kV substation located in Killiniskyduff, Arklow, of which:
  - The portion located within the Onshore Site will be permanently removed as part of the Proposed Works Onshore;
  - The portion located outside the Onshore Site will be separately managed by ESB Networks and therefore considered outside the Proposed Works Onshore. ESB Networks anticipated to bottle-end the onshore cable outside the fenced compound, and disconnect this at the ESB Networks 220/110 kV substation. This portion of the onshore cable is anticipated to remain in the ground and be re-used at some time in the future (when there are load increases or generation connections in the area).

3.5.2.2 Onshore cable removal works will commence once the fenced compound area is vacant and reinstated so that it can be used to temporarily store machinery, vehicles and excavated soil during onshore cable removal works, which will comprise:

- Set up of exclusion zones and signage along the onshore cable route covered by the Proposed Works Onshore (approximately 30 m long);
- Verify the location and depth of the cable using a cable detector;
- Begin excavation at one end of the cable route, maximum excavation width of 3 m and cut sections of the cable as necessary, extracting the cable from the trench using mechanical aids, and placing removed cable sections in appropriate containers for transport and disposal; and
- Backfill and compact excavated trench with excavated soil previously stored within the fence compound area for reinstatement.

3.5.2.3 Reasonable endeavours will be undertaken to fully remove the onshore cable, however, some sections may be left *in situ* if cable pulling becomes unfeasible, which may be particularly relevant for the section of the onshore cable located below the rock revetment (approximately 5 m in length). It is considered reasonable to determine this detailed requirement at decommissioning stage as specific cable conditions can only be known once excavation works commence.

3.5.3 Embedded Mitigation

3.5.3.1 **Table 3.21** outlines embedded mitigation that is considered as part of the Proposed Works Onshore. As indicated in **Volume 2, Chapter 1** and **Volume 3, Appendix 1.1: EIA Scoping Presentation**, given the small scale, nature and temporary nature of Proposed Works Onshore, and considering the effective implementation of embedded mitigation measures, potential for significant effects to arise from the Proposed Works Onshore has been ruled out and has been scoped out from this EIAR.

Table 3.21: Embedded mitigation relevant to Proposed Works Onshore

Embedded Mitigation	Notes
Development and adherence to the Detailed Onshore DEMP	**Volume 3, Appendix 3.1: Outline Onshore DEMP** presents standard industry practice and legal requirements for environmental management and mitigation during Proposed Works Onshore, serving as a framework for the future decommissioning contractor(s) to develop in detail before decommissioning works commence.
Development and adherence to the Detailed Traffic Management Plan (TMP)	**Volume 3, Appendix 3.2: Outline TMP** provides a framework to ensure that traffic associated with the Proposed Works Onshore are managed safely and efficiently, while minimising disruption to the local road network and surrounding communities.
Development and adherence to the Detailed Onshore Waste Management Plan (WMP)	**Volume 3, Appendix 3.3: Outline Onshore WMP** provides a framework for managing waste generated during the Proposed Works Onshore, in accordance with standard industry practice and relevant waste legislation, and the principles of the waste hierarchy.

3.6 Programme

3.6.1 Programme for Proposed Works Offshore

3.6.1.1 As indicated in **Section 3.3.2**, the validity of the planning permission (see **Volume 2, Chapter 1**) would allow planning for works when seabed level conditions are favourable for safe vessel access and to minimise the extent of dredging works required or avoid them all together, which may result in the Proposed Works Offshore being staged in different years.

3.6.1.2 All Proposed Works Offshore will be programmed during favourable weather / sea state conditions to reduce the risk of downtime and risks to personnel (i.e. between May and October) and be undertaken 24 hours (except where otherwise specified), seven days a week to maximise favourable weather / sea state windows of time.

3.6.1.3 **Table 3.22** sets out an indicative programme for the Proposed Works Offshore to be undertaken in one season i.e. without staging, distinguishing between two main campaigns:

- First campaign, focused on the decommissioning of WTGs and met mast; and
- Second campaign, focused on the decommissioning of TPs/MPs, scour protection removal and inter-array and offshore export cable removal; as well as post-decommissioning surveys.

3.6.1.4 The indicative programme illustrated in **Table 3.22** assumes that any dredging for vessel access required, if any, and associated pre-dredging surveys would be completed within the timeframes presented.

3.6.1.5 It should be noted that if there are programme gap(s) between campaigns lasting more than one year, then the buoyed work area will be removed during these programme gap(s) when no Proposed Works Offshore take place. During these potential programme gap(s), existing marine marking will be reinstated, with marine lantern marking placed on the TPs (see **Volume 3, Appendix 3.7**).

3.6.1.6 The indicative programme excludes post-decommissioning surveys beyond those proposed within three months from completion of Proposed Works Offshore, which will not require the designated buoyed work area.

Table 3.22: Indicative programme of Proposed Works Offshore

Activities	Expected duration	Weeks																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Pre-decommissioning Surveys	10 days																																
Finalisation of Offshore Decommissioning Method Statement and associated management plan	30 days																																
Mobilisation (between off-hire place (European port) to designated Irish port and to Offshore Site)	16 days																																
First Campaign																																	
Decommissioning of WTGs at three locations	19.5 days (6.5 days per WTG)																																
Transfer from Offshore Site to designated Irish port, unloading and remobilisation	5 days																																
Decommissioning of WTGs at three locations	19.5 days (6.5 days per WTG)																																
Transfer from Offshore Site to designated Irish port, unloading and remobilisation	5 days																																
Decommissioning of final WTG and met mast	9 days (6.5 days for the WTG and 2.5 days for the met mast)																																
Transfer from Offshore Site to designated Irish port, unloading and remobilisation	5 days																																
Second Campaign																																	
Decommissioning of TP/MP at four locations	38 days (9.5 days per TP/MP)																																
Transfer from Offshore Site to designated Irish port, unloading and remobilisation	5 days																																
Decommissioning of TP/MP at four locations	38 days (9.5 days per TP/MP)																																

Activities	Expected duration	Weeks																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Transfer from Offshore Site to designated Irish port, unloading and transit to off-hire place (European port)	27 days																																
Scour protection removal	20 days																																
Inter-array cable removal	20 days																																
Offshore export cable removal	35 days																																
Post-decommissioning surveys	10 days																																

Legend

- Surveys
- Decommissioning / removal works
- Vessel transit / works at port
- Office-based work

3.6.2 Programme for Proposed Works Onshore

3.6.2.1 The Proposed Works Onshore will be programmed independently from the Proposed Works Offshore, but there is potential for these to be executed in parallel.

3.6.2.2 Given the proximity of the Onshore Site to the sea, Proposed Works Onshore will be programmed during favourable weather and sea state conditions to minimise potential downtime and risks to personnel and be undertaken during day time, anticipated as working from Monday to Saturday.

3.6.2.3 **Table 3.23** outlines the indicative duration of Proposed Works Onshore.

Table 3.23: Indicative programme of Proposed Works Onshore

Activities	Anticipated Duration	Indicative Programme (weeks)				
		W1	W2	W3	W4	W5
Proposed Works Onshore	30 days					

3.7 References

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