Stornoway Deep Water South Scoping Report

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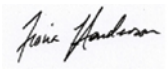
1		For Issue to Client	24/01/24

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Executive Summary

This Scoping Report has been prepared to support a request for a formal Scoping Opinion from Marine Directorate and Transport Scotland in relation to the proposed Deep Water South (DWS) development in Glumaig Harbour, Stornoway. The development forms part of the Stornoway Port Masterplan, the first phase of which, Stornoway Deep Water Terminal, is nearing completion. DWS will provide additional deep-water berthing and laydown facilities to accommodate construction and maintenance needs of the offshore wind sector. With Stornoway being the nearest port to two ScotWind 1 floating offshore wind projects, the proposed development is strategically located to support tow-to-site and maintenance needs of the sector. A full description of the DWS project is provided in Section 3.

The proposed development falls under Schedule 2 of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Harbours Act (Scotland) 1964 (as amended). Schedule 2 projects require an Environmental Impact Assessment (EIA) if the size, nature, or location indicate that the project would likely have a significant effect on the environment. In this instance the proposed development scale in terms of area (port development greater than 1 hectare) and nature (maritime construction works capable of altering coastal processes) are such that without further assessment likely significant effects cannot be ruled out. DWS is also the next phase of development following on from Deep Water Terminal, which was subject to EIA. Therefore, it has been assumed by the project team that an EIA will be required and hence no request for screening has been submitted.

This Scoping Report has been produced to provide appropriate information to Marine Directorate, Transport Scotland and their consultees to allow them to respond to the request for a Scoping Opinion. A description of the project and its location is provided, and a full range of environmental topics has been considered. Where appropriate, reference has been made to previous assessment and mitigation developed as part of the EIA for the Deep Water Terminal.

Ultimately, the aim of this Scoping Report is to facilitate proportionate EIA, with production of the DWS EIA focussed on the key environmental topics relevant to the project. On this basis, and following the assessment detailed within this report, it is recommended that the following topic areas be taken forward for assessment within the DWS EIA: Land and Soil Quality; Coastal Processes; Landscape, Seascape and Visual Effects; Archaeology and Cultural Heritage; Population and Socioeconomics; Aviation; and Access, Traffic and Transport. For each of these scoped-in topics a proposed impact assessment methodology has been outlined for consideration by Marine Directorate, Transport Scotland and their consultees. For topics that are recommended to be scoped-out, mitigation has been proposed to minimise adverse effects where appropriate, in-line with that identified and successfully implemented for the Deep Water Terminal project.

1 Introduction

Stornoway Port Authority (SPA) are proposing further development of facilities in Glumaig Harbour to augment the Deep Water Terminal currently under construction. This will take the form of a land reclamation area and quayside. The new proposal, Deep Water South (DWS), will provide additional laydown space with heavy lift capabilities and deep-water berthing to facilitate requirements of the offshore wind sector. As elements of the proposal are below Mean High Water Springs (MHWS) the works will be subject to licensing under the Marine (Scotland) Act 2010. In addition, works including those onshore will require consent via a Harbour Revision Order under The Harbours Act (Scotland) 1964 (as amended).

Due to the characteristics, location and potential impacts of the proposed DWS development it is assumed that the project will require an Environmental Impact Assessment (EIA) to be undertaken to support the consenting processes. This will be in accordance with the Marine Works (EIA) (Scotland) Regulations 2017 (hereafter known as the 'EIA Regulations') and The Harbours Act (Scotland) 1964 (as amended).

On the basis that an EIA will be required a formal scoping opinion is sought from Marine Directorate and Transport Scotland in alignment with EIA Regulations. This opinion is sought by Affric Limited, acting as the agent for SPA for the proposed development. This scoping report provides information to support these processes. As per Paragraph 14 (2) of the EIA Regulations a description of the proposed location, and the nature and purpose of the development are provided in Sections 3.1 and 3.2 respectively. Information regarding the likely impacts of the development on the environment are presented in Sections 6 to 25.

The purpose of this scoping report is to allow Marine Directorate, Transport Scotland and their consultees to identify whether certain topics and/or aspects of the proposed development are to be included in the scope of the DWS EIA Report (EIAR), according to the principles of proportionate EIA. This allows the authors of the subsequent EIA to understand where to focus their efforts in the EIA process and in preparation of the resulting EIAR.

The approach to scoping is detailed in Section 5.1 of this report and ensures that all environmental topics are discussed in Sections 6 to 25, utilising the descriptors as outlined in Schedule 4 of the EIA Regulations.

2 Background

Situated on the east coast of Lewis, Stornoway is an important hub for maritime activities. Ready access to the Minch from the shelter of Glumaig Harbour and the wider Stornoway Harbour area contributes to its success as the main port for the Outer Hebrides. The majority of freight and people access the islands via Stornoway, and the area has well established maritime facilities including piers, slipways, marinas, associated infrastructure and businesses.

The DWS proposal forms part of SPA's 2017 Port Masterplan, developed in consultation with port users, the local community and public sector partners. The masterplan envisaged that deep water facilities would be built in phases in Glumaig Harbour. The Deep Water Terminal, currently nearing completion, is the first phase. A key aim of the masterplan is to contribute

to the socio-economic status of Stornoway and the Outer Hebrides. The purpose of the DWS project is to provide facilities that will support the development of offshore wind generation in general and in particular, the assembly of floating offshore wind turbines and development of local operations and maintenance activities.

Stornoway is the nearest port to two ScotWind 1 floating offshore wind projects: Magnora Offshore Wind Talisk (approximately 50 nautical miles (nm)) and Northland Power Havbredey (approximately 60nm). These short distances reflect the strategic location of Stornoway Port for enabling tow-to-site and ongoing operations and maintenance bases for these two sites and future floating offshore wind sites. These sites will have capacity of 1,995MW. Stornoway Harbour is ideally located to support the construction and maintenance of these sites.

The Deep Water Terminal development was subject to EIA as the Stornoway Deep Water Port (DWP), as it will be referred to throughout this document. DWP, inclusive of the access and link roads, has been fully consented under relevant Marine Licenses, Planning Consents and Harbour Revision Order, and construction is now nearing completion (Figures 2.1 and 2.2).

Improvement of the Arnish Road, which serves DWP and Arnish Point Industrial Estate, is currently at proposal stage.

Figure 2.1: DWP and Access Road Under Construction (September 2023)

Figure 2.2: DWP Construction Progress (September 2023)

As part of an evolving design process certain adaptations within the scope of the consented DWP project have arisen as the facility undergoes construction. Included with this report Drawing SDWP-WS2139-XX-00-DR-C-9022 (P01) shows the original layout as consented, and Drawing SDWP-WS2139-XX-00-DR-C-9062 (P08) the revised layout being constructed. A dolphin structure to assist with vessel berthing will be installed at the south-eastern corner of the DWP facility in place of a more extensive pier and pontoon originally consented, reducing the footprint of the development. Additionally, a separate bollard island immediately to the south of DWP has been replaced by a simple installation of three floating mooring buoys attached to the shoreline, to be used for mooring of large vessels alongside the main berthing area. The originally consented bollard island consisted of concrete bases, rock slope and rock armour, none of which will be installed under the current DWP construction programme.

The proposed DWS facility extension of the DWP through the addition of laydown area and facilities to support future needs of the offshore wind sector. The consented footprint of bollard island is entirely overlaid by the DWS proposal, and the three mooring buoys being installed in place of bollard island in the interim will be removed in full and replaced by bollard structures on the DWS facility.

Section 3 below sets out details of the DWS proposal, and Section 5 describes the approach taken throughout this scoping report with regards to information already gathered as part of the DWP EIA and construction processes.

3 Deep Water South Proposed Development

3.1 Location

The DWS development is proposed within the southern portion of Stornoway Harbour, on the western shore of Cala Ghlumaig, or Glumaig Harbour. The town of Stornoway lies across the water to the north and Arnish Point Industrial Estate is situated to the east, on the Arnish peninsula which forms the eastern shore of Glumaig Harbour. The proposed DWS facility is located immediately to the south of the current DWP development as illustrated in Figure 3.1 (DWP central grid reference NG 42634 31050). A possible layout for DWS is indicated in Figure 3.1 and Drawing WS2339-XX-XX-DR-C-9007 (P04), located with a central grid reference of NG 42420 31055.

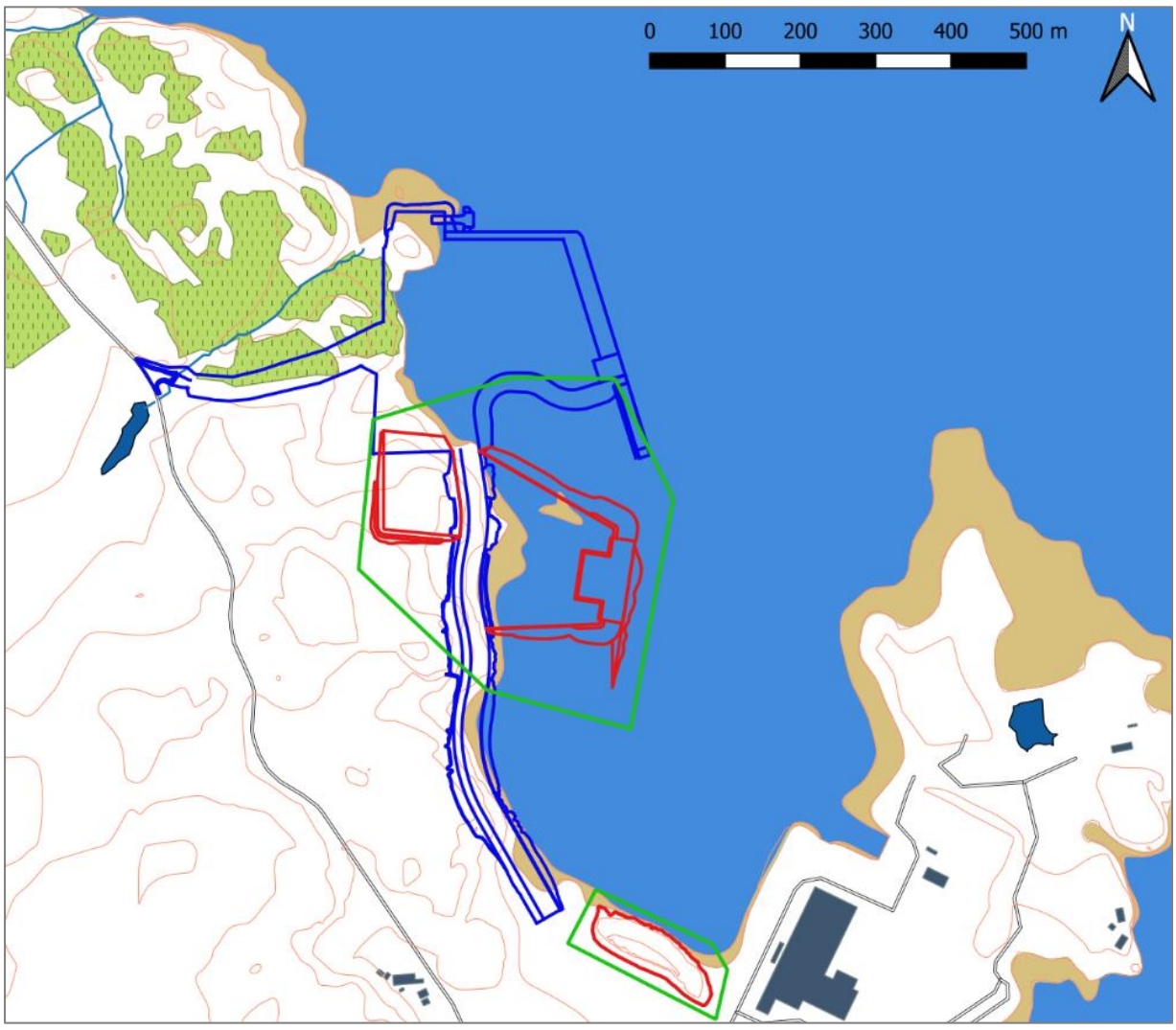

Figure 3.1: Indicative DWS Development Boundary (green) and Indicative Location/Layout (red) Relative to DWP (blue) as shown in Drawing 113_DRG_01_2 Indicative Development Boundary

3.2 Project Description

The proposed DWS development is envisaged to comprise the following main components:

- A deep-water berthing area, with a water depth -13m Chart Datum (CD);
- A reinforced concrete quay capable of housing a heavy-lift crane of up to 3500T capacity;
- Reclamation area bounded by rock armoured slope providing laydown space;
- Mooring bollards, ladders and associated services on the quayside; and
- Onshore laydown space.

Use of the facility is described in Section 3.3.2 below, however during operational use in support of offshore wind projects it is likely that temporary welfare, site office and lighting structures will be in place within the laydown areas.

3.3 Project Phases

3.3.1 Construction Methods

The construction techniques that have been considered throughout this report are as follows:

- Land-levelling activities, namely soil stripping, rock blasting and rock excavation;
- Land reclamation activities, namely rock crushing, rock processing and rock infilling;
- Vibration and impact piling;
- On-site concrete works;
- Dredging; and
- Dredge spoil disposal.

It is envisaged that rock material sourced in the vicinity of the site will be used to complete the majority of the reclamation area and rock armouring. Material won in the creation of the onshore laydown area will be used as infill for the reclamation area and rock armouring. Levelling of an area at the southern end of the link road joining DWP and Arnish Point Industrial Estate may also be used as a source of additional rock material.

To create the reclamation area, an initial rock access bund will be formed, from which construction will progress. On completion of the reclamation area the side slopes will be dressed to a 1 in 1.5 slope, and rock armour placed to prevent erosion of the core material.

At the eastern, seaward-side of the reclamation area, the reinforced concrete deck heavy lifting area and quayside will be constructed. The final design will be informed by ground investigations, but is anticipated to comprise of an open-piled structure with tubular steel piles supporting a suspended concrete deck and faced with fender panels. Piles will be installed by a combination of impact and vibration driving, and toe-pins will be installed where required to provide hold onto bedrock. The piles will be driven from a floating barge and/or from the reclamation area. Piles at the seaward-edge will require support from temporary steel piles and framing during installation. As per other areas of the reclamation perimeter, rock armour will be placed below the open-piled area to protect against erosion of infill.

The design and construction method for the reinforced concrete quay will be developed in light of results from ground investigations. It may be formed on-site using in-situ concrete pours a section at a time, or could comprise pre-cast soffits and beams placed on top of the piles with subsequent in-situ pouring of the top slab. Alternatively, the quay could be of solid construction with an in-situ poured reinforced concrete slab.

To achieve the necessary berthing depth an area of soft dredge will take place at the eastern side of the development. A Best Practical Environmental Option assessment will determine the appropriate route for dredge material be that re-use or disposal.

It is noted that the installation of various electrical, water and drainage services will also be required, however this is a relatively minor construction task and from experience is unlikely to give rise to any significant environmental effects.

3.3.2 Operation

As introduced in Section 1, DWS will provide facilities suitable for the renewable energy sector, enabling a range of activities associated with the development of offshore wind. An operational scenario has therefore been developed for the purpose of understanding what needs to be considered within the EIA for DWS. Although actual operations may vary from the scenarios described below, they are considered to be applicable to the range of offshore wind projects which the DWS development will be able to support.

The following main activities are envisaged at the DWS site:

- Mooring of floating wind turbine bases (whole or components of) at the quayside;
- On-site assembly of floating wind turbines;
- The delivery by sea of the main wind turbine components for on-site assembly and the delivery by road of other equipment, plant and tools;
- Assembly of the floating wind turbines, utilising lifting equipment located on the quayside;
- Wind turbine pre-commissioning and initial testing activities will be carried out at the quayside to ensure that turbines safely and effectively operate;
- Provision of temporary, moveable welfare and office facilities for staff undertaking works on site;
- Maintenance of turbines in need of repair; and
- Use as a base for offshore maintenance.

One fully assembled turbine could be berthed alongside the DWS quayside at any one time, with components for additional turbines within the laydown area.

During the operational phase of the windfarms that DWS will serve, the facility may be used for component replacement or other maintenance activities. However, this scenario is well within the envelope of the assembly and pre-commissioning process described above and hence, is not considered as a separate operational scenario.

The scenario of activities described above will be utilised for the assessment of effects such as noise (Section 9: In-Air Noise and Vibration) and landscape and visual impacts (Section 18: Landscape, Seascape and Visual Effects).

4 Consenting and Policy Context

4.1 Consenting

Consenting of the project will fall under two main legislative acts, the Marine (Scotland) Act 2010 and The Harbours Act (Scotland) 1964 (as amended), which require compliance with underpinning regulations. The main regulatory instruments are discussed here but this review is not exhaustive. In addition, there may be further licences and consents required to facilitate construction and operations.

4.1.1 Marine Licence

A number of activities listed under Part 4, Section 21 of the Marine (Scotland) Act 2010 require a Marine Licence issued by the Marine Directorate Licensing Operations Team (MD-LOT).

Any activity involving the deposit or removal of substances or objects in the sea, either on or under the seabed, or activity to construct, alter or improve any works in or over the sea or on or under the seabed, below MHWS, are all subject to marine licencing according to the Act. The DWS proposal falls within this category and therefore will require Marine Licenscs. Creation of the reclamation area and quayside will require a license to construct in the marine area, and the proposed dredge will require license for dredging and disposal.

4.1.2 Harbour Revision Order

Harbour developments are controlled under The Harbours Act (Scotland) 1964 (as amended). Stornoway Port Authority Harbour Revision Order (HRO) (Scottish Statutory Instrument no.192 2021) was made on the 21st April 2021 for the DWP developments currently under construction. The current DWS plans are outwith the scope of the current HRO; as such, an application will be made to Transport Scotland for a new HRO.

4.1.3 Marine Pre-Application Consultation

The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013 prescribe the marine licensable activities that are subject to Pre-Application Consultation (PAC) and in combination with the Marine (Scotland) Act 2010, set out the nature of the pre-application process. The DWS development falls within these regulations under regulation 4(b) and 4(d) as a reclamation area exceeding 10,000m^2 and construction activity within the marine area that exceeds 1,000m^2. The project is therefore required to go through the PAC process with consultation, meeting requirements of the Marine Licensing (PAC) (Scotland) Regulations 2013.

4.1.4 Habitats Directive

The European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, also referred to as the 'Habitats Directive', has the primary aim of maintaining biodiversity within Member States. The Habitats Directive is transposed into Scottish law by a combination of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) and the Habitats Regulations 2010 (in relation to reserved matters). These are commonly known as the 'Habitats Regulations'.

The Habitats Regulations identify several habitats or species whose conservation interest requires the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which form a set of protected sites within the United Kingdom (UK) National Network.

In addition, the Regulations make it an offence to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. These listed species are commonly termed European Protected Species (EPS). Actions in relation to EPS can be made lawful through the granting of licenses by the appropriate authorities (see Section 4.1.3.2).

4.1.4.1 Habitats Regulations Appraisal

A Habitats Regulations Appraisal (HRA) will be required for the DWS development due to its proximity to multiple UK National Network sites. These include SACs and SPAs. The legislative context for this requirement is based on Article 6(3) of the Habitats Directive (92/43/EEC) and Article 4(4) of the Birds Directive (2009/147/EC) and is implemented in Scotland through the Habitats Regulations.

In Scotland, Scottish Planning Policy ensures that an additional type of protected site, Ramsar sites, overlap with UK National Network sites and hence, are protected under the same legislation. Therefore, Ramsar sites do not need consideration separately as part of any HRA.

An Appropriate Assessment (AA) is part of the HRA process and is undertaken by the competent authority. AA is required when a plan or project potentially affects a UK National Network site on the basis of 'likely significant effects' (LSEs).

An AA must demonstrate that there will be no adverse effect on site integrity, nor on the conservation objectives of the designated site. Should this requirement not be satisfied, a project would only receive consent if:

(1) Imperative Reasons of Overriding Public Interest are proved; and

(2) There are no satisfactory alternatives.

It is ultimately up to the competent authority to determine whether LSE are present and therefore whether an AA is needed for relevant designated sites. A Pre-screening HRA report will be provided as part of the application process. Based on the DWP development it is assumed that AA will be required for at least the:

- Inner Hebrides & The Minches Special Area of Conservation (SAC) which has a qualifying feature of harbour porpoise (*Phocoena phocoena*); and
- Lewis Peatlands Special Area of Conservation (SAC) in terms of otter (*Lutra lutra*).

Where there is a potential for LSE sufficient information will be provided within the EIA to allow the competent authority to undertake AA where they deem appropriate.

4.1.4.2 European Protected Species Licence

If it is determined that the development or construction activities will likely affect EPS listed under the Habitats Regulations, which includes dolphins, whales, harbour porpoise and

European otter, an EPS Licence will be required. An EPS licence will only be granted if it is proved that:

(1) The project is imperative for Reasons of Overriding Public Interest;

(2) There are no satisfactory alternatives; and

(3) The proposed action must not be detrimental to the maintenance of the species at 'favourable conservation status'.

Depending on the construction techniques there is a potential to disturb dolphins, whales and harbour porpoise. With evidence of European otter known in the area, EPS licence consideration will also be required with regards to otters.

4.1.5 Water Framework Directive

The Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament) is transposed into Scottish law through the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act). The directive aims to achieve a good quality status for all rivers, lochs, transitional waters (estuaries), coastal waters groundwater, and groundwater dependant wetlands. As such, the main aims of the WFD are to:

- Prevent deterioration and enhance status of aquatic ecosystems, including groundwater;
- Promote sustainable water use;
- Reduce pollution; and
- Contribute to the mitigation of floods and droughts.

To assess the impact of any development or activity on a water body, especially those which may pose a risk of reducing the quality status of a water body, a WFD Assessment is required. In a WFD assessment it must be demonstrated whether any activity or development will:

- Cause or contribute to deterioration of status; and/or
- Jeopardise the water body achieving good status.

A WFD Assessment will be required for the DWS development. This is discussed in greater detail in Section 8: Water Quality and Coastal Processes.

Under the WEWS Act, The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) apply regulatory controls over activities which may affect Scotland's water environment. CAR covers activities relating to point-source and diffuse discharges, water abstraction, engineering within inland waterways and groundwater works which could impact upon water courses and water bodies including: rivers, lochs, estuaries, coastal waters, as well as groundwater, and groundwater dependant wetlands. Activities are controlled by the Scottish Environment Protection Agency (SEPA) under General Binding Rule (GBR), Registration and Licence level authorisations. While CAR does not apply to projects authorised by a Marine Licence, construction works above MHWS affecting the water environment and any permanent discharges to water from DWS will fall under CAR. Furthermore, relevant GBRs

should be followed where appropriate to minimise pollution risks in line with construction best practice.

4.2 Policy Context

4.2.1 Scottish Government Net-Zero and Decarbonisation Targets

In 2019, Scotland committed to achieving net-zero greenhouse gas emissions by 2045. This commitment will require the decarbonisation of all sectors, including industry. To address decarbonisation in industry, initial targets up to 2032 were established in the 2018 Climate Change Plan (CCP). The current CCP identifies seven key sectors and a summary of their targets/policies to contribute towards net-zero (Scottish Government, 2020). The sectors outlined in the CCP applicable to the proposed DWS development include:

- **Electricity**: Policies seek the further decarbonisation of energy generation by supporting the development of a wide range of renewable energy technologies, seeking improvements to electricity generation and network asset management. Development is encouraged of a range of technologies that aid system security, flexibility, and resilience, with innovative energy systems which improve efficiencies and deliver secure, clean and affordable electricity. The overall target is to reduce emissions by 28% over the plan period (2018 – 2032).
- **Industry:** Policies seek to reduce industry emissions through a combination of fuel diversification, cost-saving energy efficiency, heat recovery and participation in the EU Emissions Trading System. Additionally, policies seek to consider emerging Carbon Capture and Storage (CCS), Carbon Capture and Utilisation (CCU) and hydrogen opportunities. The overall target is to reduce industry emissions by 21% over the plan period (2018 – 2032).

As part of the commitment to achieve net-zero, the Scottish Government has also set out short, medium and long-term goals and when they are to be achieved by in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. These are as follows:

The Scottish Ministers must ensure that the net Scottish emissions account for the year:

(a) 2020 is at least 56% lower than the baseline;
(b) 2030 is at least 75% lower than the baseline; and
(c) 2040 is at least 90% lower than the baseline.

Each of the sectors outlined in the CCP are required to contribute to achieving the targets as set out by Scottish Ministers in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

4.2.2 Local (UK) Content Targets

Scottish Ministers have identified the need for sufficient local content to be realised by Scottish offshore wind infrastructure projects. This will ensure that there are increased opportunities and benefits to the communities and businesses where an infrastructure project is taking place.

The Offshore Wind Sector Deal builds on the UK's global leadership in offshore wind, maximising the advantages for UK industry from the global shift to clean growth (UK

Government, 2019). Within this deal, the sector is committed to increase local (UK) content to 60 per cent by 2030, including increases in the capital expenditure phase. This includes improving access for Small-Medium Enterprises (SMEs) and the need for increasing the number of highly skilled workers in manufacturing areas throughout the supply chain.

4.2.3 Marine Policy

As the DWS development is in part below MHWS and within 12 nm of the Scottish Coastline, it falls within the remit of the Marine (Scotland) Act 2010 and the 2015 Scottish National Marine Plan (NMP) covering inshore waters as required by the Act (Scottish Government, 2015). The NMP lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs) and sector-specific policies, some of which apply to the construction and operations of DWS. Many GENs are specific to environmental topics and as such, those which are being considered in relation to DWS are identified as follows:

- GEN 2: Economic benefits;
- GEN 3: Social benefits;
- GEN 4: Co-existence;
- GEN 5: Climate change;
- GEN 6: Historic environment
- GEN 7: Landscape/seascape;
- GEN 8: Coastal process and flooding;
- GEN 9: Natural heritage;
- GEN 10: Invasive non-native species;
- GEN 12: Water quality and resource;
- GEN 13: Noise;
- GEN 14: Air quality;
- GEN 15: Planning alignment A;
- GEN 17: Fairness;
- GEN 18: Engagement;
- GEN 19: Sound Evidence;
- GEN 21: Cumulative Impacts; and
- TRANSPORT: Shipping, Ports, Harbours & Ferries

It is noted that work is underway on NMP2. The status of NMP2 will be monitored and if there are any new or different policies relevant to the development then these will be considered within the EIAR.

4.2.4 Planning Policies

Although the DWS development will not be subject to planning consent, rather a Harbour Revision Order, it is deemed appropriate to take account of the planning policy context. The development plan system in Scotland, which provides the framework for considering planning applications, is made up of two main documents:

- The National Planning Framework (NPF); and
- Local Development Plans (LDPs).

The National Planning Framework (NPF) is a requirement of the Planning (Scotland) Act 2006 and sets out the strategy for long-term development within Scotland. The fourth NPF (NPF4), published in February 2023, sets out the strategy for development for the next 20 years (Scottish Government, 2023). The DWS project forms part of the Outer Hebrides Energy Hub, which is one of the 18 national developments set out in NPF4. The DWS will provide a quay and laydown space to service renewable energy developments, which form part of the Energy Hub development.

In November 2018 Comhairle nan Eilean Siar (CnES) adopted the Outer Hebrides Local Development Plan (OHLDP) (CnES, 2018). The plan lays out visions and objectives for the Outer Hebrides and then goes on to detail policies, including those which planning applications would be assessed against. As a result of the Planning (Scotland) Act 2019 the development and lifecycle of LDPs has been revised, and the current OHLDP 2018 – 2023 is expected to undergo renewal is coming years following guidance from the Scottish Government during 2023.

As the updated OHLDP is unlikely to be updated in the Marine Licence and Harbour Revision Order submission timelines, it is proposed that the focus is put on considering policies laid out in NPF4.

The Scottish Government also provides advice and technical planning information in the form of Planning Advice Notes (PANs). Relevant PANs for the DWS development which will be used to support the EIA are identified in Sections 6 to 26.

5 The EIA Process

5.1 Overview and Aim

It is predicted that many of the construction techniques utilised for DWS will not differ notably from those considered for DWP currently under construction. It is therefore envisaged that the potential impacts of DWS on various environmental aspects associated with the development will be largely indistinguishable from those associated with DWP. As such, the potential impacts assessed as part of the DWP EIA have been used to inform this scoping exercise. Where assessments have been previously completed and conclude effects to be non-significantly in EIA terms, without or with mitigation, these topics can be scoped out on the basis that appropriate mitigation is employed. The exception to this is where DWS activities are introducing new potential impacts or could be adding to an effect associated with the DWP facility which additively could give rise to a significant effect (for example landscape and visual).

The aim of this approach is to focus the EIA onto topics which require further consideration to understand their effects, to allow negative effects to be minimised as far as practicable, and beneficial effects to be maximised.

5.2 Methodology

The methodology proposed to inform this scoping exercise is based on the Source-Pathway-Receptor model (Figure 5.1): the construction and operational activities are the sources, and the baseline of each Section topic provides receptor information.

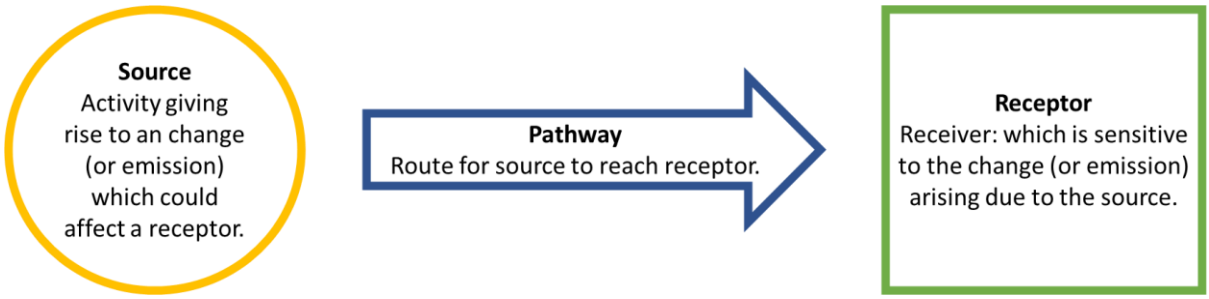

Figure 5.1: Source → Pathway → Receptor Model

Mitigation is utilised to minimise the degree of change or emissions associated with the activity or to break or reduce the pathway to the receptor.

As the DWP development was required to undergo EIA, the significance of potential source effects on the environment and appropriate measures/mitigation to avoid, prevent or reduce environmental harm/damage in relation to the DWS proposal is already well understood. This is particularly in terms of the proposed construction methodologies.

Taking into account knowledge previously gained in relation to DWP, the Source-Pathway-Receptor model has been followed to identify whether the relevant impacts identified as part of the DWP EIA are likely to change when considering activities applicable to DWS. This includes consideration of existing baseline information and knowledge of receptors, assessing sources of impact from DWS in relation to DWP, and the applicability and success of mitigation measures previously employed.

Where there is a change to the source, pathway or receptor, or if in additive effects could occur, consideration is given to whether there is a potential significant effect from DWS taking account of any reasonable mitigation. Where a potential significant effect is identified, and as such a topic is proposed as **scoped in** to the EIA, consideration is given to the appropriate assessment methodology.

Where an environmental topic is proposed to be **scoped out** of the EIA on the basis of mitigation, that mitigation is included in the Initial Schedule of Mitigation (Appendix 1). The mitigation outlined in Appendix 1 shall be included in any Construction Environmental Management Document (CEMD) developed for the DWS development. The CEMD will also include mitigation identified by the EIA process.

6 Air Quality

The focus of this section is potential local impacts on air quality as a result of the proposed DWS development. The primary consideration in this regard is potential dust emissions. While

there are Green House Gas (GHG) considerations associated with the proposal, including emissions and anticipated benefit through facilitation of the offshore wind sector, these are considered in Section 17: Climate Change and Flooding.

Although the location of DWS and construction methods are similar to DWP, changes to baseline identified in 6.2 below mean that direct comparison to previous assessment completed for DWP is not applicable in this section.

6.1 Policy and Guidance

Relevant guidance and information sources used in this section include:

- Air Quality in Scotland (2023) Air Quality Management Areas (AQMA);
- Guidance on the Assessment of Dust from Demolition and Construction by the Institute of Air Quality Management (IAQM) (IAQM, 2016);
- Guidance on Monitoring in the Vicinity of Demolition and Construction Sites (IAQM, 2018); and
- Stornoway Deep Water Port Environmental Impact Assessment Report (Affric, 2020).

Scottish Government policy as part of Scotland's National Marine Plan (NMP) includes:

- **GEN 14 Air quality:** *Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits* (Scottish Government, 2015).

While Paragraph 4.70 of the NMP states that:

'Some development and use may result in increased emissions to air, including particulate matter and gases. Impacts on relevant statutory air quality limits must be taken into account and mitigation measures adopted, if necessary, to allow an activity to proceed within these limits' (Scottish Government, 2015).

6.2 Baseline

The Air Quality in Scotland website provides a centralised source of air quality information for Scotland. Data and maps on Local Air Quality Management parameters and Air Quality Management Areas (AQMA) are provided (Air Quality in Scotland, 2023). Stornoway is not designated as an AQMA, with the nearest designated area being Inverness City Centre AQMA on the Mainland, some 95 miles away. Therefore, no AQMA will be affected by the DWS development.

In terms of human and ecological receptors, screening criteria set out in Step 1 of IAQM Guidance on the Assessment of Dust from Demolition and Construction states that detailed assessment is required if human receptors are present within 350m of the site boundary, and ecological receptors within 50m of the site boundary (IAQM, 2016). The DWP EIA identified no hospitals, schools or other potentially high-sensitivity human receptors or designated ecological receptors within these distances such that they could be significantly impacted by reduced air quality due to construction dust from the development (Affric, 2020).

Since that assessment, construction of DWP itself has begun, and it is anticipated that DWP will be operational prior to the proposed works at DWS commencing. Human receptors at the operational DWP will be within 350m of the DWS construction works, and therefore need to be considered. Following IAQM Guidance, people attending the DWP site for work or travel are identified as a medium-sensitivity receptor (IAQM, 2016).

Additionally, should levelling activities associated with DWS be undertaken in the area at the southern end of the link road joining DWP and Arnish Point Industrial Estate, human receptors at the industrial estate need to be taken into account. Facilities within 350m of the potential rock-take area include fabrication workshops, and as a place of work these are considered a medium-sensitivity human receptor (IAQM, 2016).

6.3 Potential Construction Impacts

The main impact of construction works on air quality is associated with small solids becoming airborne giving rise to dust. The term dust is taken to incorporate very small particulate matter (particle size of less than 10 microns) as well as larger solids which may become airborne for a short period of time due to the energy they are exposed to (for example blasting). Dust has the potential to impact human health through inhalation of particles or dust particles in eyes, and to affect vegetation by covering the leaves of plants preventing photosynthesis. Dust can also cause a nuisance by coating surfaces such as cars and windows.

To have an environmental impact there is the need for a source, pathway, and receptor. In terms of source and pathway, earthworks comprising of soil stripping, blasting and handling of dry materials during construction of DWS may result in dust emissions; these will travel through the air over a relatively small distance (<350m) before settling. Sourcing of bulk materials from the immediate vicinity of the development (e.g. reclamation infill and rock armour) reduces the need for use of the public road network and thus minimises the risk of vehicle track-out and dust from material transport. Minimal stock-piling of dry materials is envisaged, as use of rock and infill won local to point of use will facilitate delivery on an as-needed basis. Construction of the land-reclamation area will by definition take place in a wet environment, and therefore no significant dust emissions are expected from the early stages of this activity.

Receptors which are present within 350m of the identified dust sources are the medium-sensitivity human receptors detailed in 6.2. The focus of this section is therefore potential impacts on human receptors at the operational DWP and Arnish Point Industrial Estate from soil stripping, blasting and handling of dry materials. For clarity, these two receptors have been considered separately. Note that consideration of receptors at Arnish Point Industrial Estate only applies should levelling works be undertaken at the southern end of the of the DWP-Arnish Point Industrial Estate link road.

The output of assessment following IAQM Guidance is presented in Table 6.3.1.

Table 6.3.1: Assessment of DWS Construction Dust Risk According to IAQM Guidelines (IAQM, 2016)

IAQM Assessment Step	Assessment Outcome by Scenario	
	Levelling activities adjacent to DWP	Levelling activities at southern end of link road
1: Screen for Receptors	Human receptors at DWP within 350m.	Human receptors at Arnish Point Industrial Estate within 350m.
2a: Define the Potential Dust Emission Magnitude	Medium-Large scale of earthworks – area of works >10,000m^2, material coarse in nature (soil & rock).	Medium scale of earthworks – area of works <10,000m^2, material coarse in nature (soil & rock).
2b: Define the Sensitivity of the Area	Low-sensitivity area – Medium sensitivity receptor (place of work) >50m from the potential dust source.	Low-sensitivity area – Medium sensitivity receptor (place of work) >50m from the potential dust source.
2c: Determine Risk Outcome	Low Risk – Medium-Large scale source x Low-sensitivity area.	Low Risk – Medium scale source x Low-sensitivity area.

While both scenarios are concluded to be a low-risk, it is recognised that dust mitigation is desirable with regards to human receptors at both DWP, Arnish Point Industrial Estate and workers within the DWS construction site itself.

6.4 Potential Operational Impacts

Moving into the operational phase, impacts on air-quality will be determined by the nature of activities undertaken at the DWS facility. With expected use centring on the assembly, pre-commissioning and maintenance of floating wind turbine structures, no notable emissions to air are anticipated directly from these activities. Vehicle and plant movements associated with activity at DWS will be taking place on the concrete quayside or dressed surface of the laydown areas, and vehicle access to the site will be via a surfaced road. Any dust arisings from the dressed surfaces, for example during dry weather, are anticipated to remain localised. The risk of dust impact on human receptors at DWP is therefore negligible, with no specific mitigation required.

6.5 Mitigation Measures

A Dust Management Plan (DMP) will be developed for the DWS construction phase, as has been implemented for DWP. Construction works at DWP are well advanced in terms of earthworks, and no dust issues have arisen to date with implementation of the DMP.

Development of a DMP for DWS is in accordance with IAQM Guidance which states that a DMP is desirable even where low risk of dust issues is identified. The DMP will detail steps to minimise dust sources from soil stripping, blasting and handling of dry materials, and will be included within the CEMD for DWS. Further details are presented in the Initial Schedule of Mitigation provided in Appendix 1 of this scoping report.

6.6 Proposed Impact Assessment

It is recommended that construction and operational Air Quality be **scoped out** of the DWS EIA. This is on the premise that impacts are low risk and that the mitigation proposed in Section 6.5 and Appendix 1 is implemented.

7 Land and Soil Quality

The proposed DWS development includes shore-side earthworks to create levelled laydown space. Earthworks will involve the removal of topsoils prior to rock excavation. This activity is proposed to take place within an area well-characterised by investigations undertaken for the neighbouring DWP development and proposed Arnish Road upgrade. Impacts associated with removal of peat soils, known to be present in the area, is the primary focus of this section.

The methodology of the proposed DWS earthworks is analogous to those assessed for the adjacent DWP. With appropriate implementation of mitigation measures including an approved Peat Management Plan (PMP), impacts from construction of DWP were deemed to be non-significant (Affric, 2020). DWS works are anticipated to be no greater in scale than DWP, however construction of DWS does involve the removal of material additional to that affected by DWP. Therefore, while principles such as the PMP may apply, direct comparison to the previous assessment undertaken for DWP is not applicable within this section.

7.1 Policy and Guidance

Peatland has an important capacity to act as a carbon sink. The management of peat soils therefore has implications for carbon emissions and climate change, with a substantial body of associated policies and guidance. Relevant guidance and information sources include:

- Advising on Peatland, Carbon-Rich Soils and Priority Peatland Habitats in Development Management (NatureScot, 2023a);
- Scotland's National Peatland Plan Working for our future (SNH, 2015);
- Peatland Survey. Guidance on Developments on Peatland (Scottish Government, SNH, & SEPA., 2017);
- SEPA Regulatory Position Statement – Developments on Peat (SEPA, 2010);
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables & SEPA, 2012); and
- Towards an assessment of the state of UK Peatlands (JNCC, 2011).

The Scottish National Planning Framework NPF4 (Scottish Government, 2023) outlines three overarching planning objectives up to 2045, supporting the development of sustainable, liveable and productive places. In relation to soils NPF4 sets out under Policy 5 the intent to '*protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development*.' Specifically, '*Development proposals will only be supported if they are designed and constructed in accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and in a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing.*' Furthermore, Policy 5 states that development proposals on peatland will only be supported in certain circumstances, such as essential infrastructure, renewables and supporting fragile communities

in a rural or island area. It also details that development proposed on peatland will require site-specific assessment, including assessment of baseline, likely effects of soil disturbance and climate-related implications (Scottish Government, 2023).

7.2 Baseline

7.2.1 Ground Investigations

Onshore Ground Investigation were undertaken in 2018 by Causeway Geotech as part of the DWP design process, and were reported in the DWP EIAR (Affric, 2020). The investigations comprised boreholes, a trial pit and Russian peat cores. These investigations included the area of the proposed DWS onshore laydown area. Topsoil was found to a depth of 100-200mm, recent deposits (peat) to depths of up to 1.5 meters below ground level (mbgl), and bedrock at depths of 0.3-1.5mbgl. The bedrock included five main rock types: Gneiss, Metadiorite, Metadolerite, Metagabbro, and Metapegmatite (Affric, 2020).

7.2.2 Peat

A further two rounds of peat investigations were undertaken, by Fluid Environmental Consulting and Wallace Stone in 2019 and 2020, similarly reported in the DWP EIAR (Affric, 2020). Combined with the above these survey campaigns totalled 606 depth of penetration peat probes, which were mapped as investigation points and also synthesised into a depth of peat contour map, as shown on Drawing 113_DRG_02_1 Peat Depth Contour Map. Depth of penetration over the area of the proposed DWS onshore laydown is largely 0 - 0.5m and >0.5 – 1.0m; the former is considered to comprise soil cover only, and the latter will contain peat deposits. There are also three small areas of deeper peat cover apparent, with peat depth estimated to be >1.0 – 1.5m.

The potential for peat cover over the area identified for possible levelling at the south end of the DWP-Arnish link road has been assessed by an initial walk-over and probes. This indicates an average cover depth of 0.15m and no penetration greater than 0.5m (Wallace Stone, 2023). Thus, no peat cover is expected to be present in this area.

7.2.3 Contaminated Land

Other than the current works underway for DWP, which has initiated disturbance of some areas for construction access, the site of the proposed DWS onshore laydown area is undeveloped. No signs of contamination (visual or odour) have been observed during the ground investigations or DWP works to date, and as such it is assumed that no contaminated land is present in this area.

The area at the south end of the link road identified for possible levelling is also itself undeveloped. It is however adjacent to land where shot-blast waste stockpiles were previously held, having been generated by former oil-industry activities at the Arnish Point Industrial Estate. These stockpiles have been relocated under appropriate Waste Management License and the area developed into a laydown/yard space. As the site has been subject to remediation and subsequent development, it is not anticipated that further contaminated land is present in the area of the proposed levelling.

7.3 Potential Construction Impacts

A section of hillside within the development site will be levelled utilising blasting techniques. This will create the onshore laydown area west of the link road and provide rock materials for the construction of the DWS reclamation area. As outlined above, an additional area at the southern end of the link road may also be levelled to provide rock materials for the DWS construction.

Prior to blasting, topsoil and peat will need to be cleared from the footprint of the blasting area and around some of the perimeter to ensure stable slopes angles are achieved.

At this stage the exact specification of the area requiring topsoil and peat removal is to be confirmed. However, as an indication the maximum size of the levelled area west of the link road is expected to be in the region of 19,000m^2, inclusive of works to achieve a stable slope around the perimeter. The size of this area may be reduced depending on final design, operational need and availability of rock material from the location at the south end of the link road. Should the material source at the south end of the link road be used, the levelled area west of the link road could be reduced in size. Soil removal over the area at the southern end of the link road would be in the region of 8,550m^2.

Based on the largest anticipated size of the onshore laydown area, it is estimated that in the region of 2,000m^3 of topsoil and 8,000m^3 of peat will be removed. As previously stated, these figures are only indicative, and will be confirmed dependent on final design and findings of further ground investigations.

The intent is that removed peat will be reused/reinstated in the vicinity of the development.

Should levelling take place at the site located at the south end of the link road, appropriate pre-development investigation to confirm that peat or contaminated soils are not present. In the unlikely event peat is present, removed material will be reused/reinstated in the vicinity of the development, in the same manner as peat removed from other areas of soil stripping. Should contaminated soils be identified, management appropriate to the contamination type will be required to prevent release or spread of contaminants.

Note the ecological impacts of topsoil and peat removal are discussed in Section 15: Biodiversity - Terrestrial Ecology.

7.4 Potential Operational Impacts

No operational impacts on land or soil quality are identified as a result of the proposed DWS development. All activity will take place on made surfaces of the onshore laydown area, reclamation area and quayside.

7.5 Proposed Impact Assessment

It is proposed that construction impacts on Land and Soil Quality be **scoped in** to the EIA process for DWS.

A PMP based on the finalised DWS design will be outlined within the EIAR. This will be in-line with the PMP approved for DWP, and will outline details of peat removal, storage and reinstatement. Furthermore, additional pre-development ground investigations undertaken in

relation to the area at the southern end of the link road, if utilised, will be detailed within the EIAR.

8 Water Quality and Coastal Processes

The focus of this section is potential effects on water quality and coastal processes associated with the construction and operation of the proposed DWS development. It includes consideration of the project in terms of the Water Framework Directive (WFD).

As the DWS location and construction methodology are similar to that of the adjacent DWP, reference to the assessment undertaken for DWP has been utilised in this section. The exception to this is in respect of coastal processes and WFD assessment, as the proposed DWS development introduces new structures which will have an effect on the local waterbody additional to that of DWP.

8.1 Legislation, Policy and Guidance

Relevant guidance and information sources used in the section include:

- Guidance for Pollution Prevention (GPP) 5: Works and Maintenance in or Near Water (Natural Resources Wales, Northern Ireland Environment Agency & SEPA, 2018);
- GPP 2: Above Ground Oil Storage Tanks (Natural Resources Wales, Northern Ireland Environment Agency & SEPA, 2021);
- Pollution Prevention Guideline Note (PPG) 6: Work at Construction and Demolition Sites (Environmental Agency, NIEA & SEPA, 2012); and
- Stornoway Deep Water Port Environmental Impact Assessment Report (Affric, 2020).

Relevant legislative frameworks and legislation include:

- European Water Framework Directive (European Parliament, 2000);
- Water Environment and Water Services (Scotland) Act 2003 (Scottish Parliament, 2003);
- Environmental Liability (Scotland) Regulations 2009 (Scottish Parliament, 2009);
- Bathing Water Directive (2006/7/EC);
- The Water Environment (Shellfish Water Protected Areas: Environmental Objectives etc.)(Scotland) Regulations 2013; and
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

Relevant Scottish Government policy as part of Scotland's National Marine Plan (NMP) includes:

- **GEN 8 Coastal Process and Flooding**: Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding**;**
- **GEN 10 Invasive Non-Native Species:** Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made; and

- **GEN 12 Water Quality and Resource:** Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply (Scottish Government, 2015).

The Scottish Government also includes within the NMP a series of good environmental status descriptors as part of the plan's Strategic Objectives. These include:

- **GES 2:** Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems;
- **GES 5:** Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms, and oxygen deficiency in bottom waters;
- **GES 7:** Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems; and
- **GES 8:** Concentrations of contaminants are at a level not giving rise to pollution effects (Scottish Government, 2015).

8.2 Baseline

8.2.1 Sediment Loading

While data on sediment loading levels in the Minch and Western Scotland is limited, studies have identified that suspended particulate concentrations in Western Scotland are highly volatile and dependent on a range of physical forcing factors and seabed characteristics (UKMMAS, 2010). Lighter sediment types like silt are more readily mobilised if disturbed and stay suspended over longer periods, allowing greater geographical dispersal. Heavier sediment types like sand and gravels require greater kinetic energy to be resuspended and quickly fall back to the seabed, limiting geographic spread (Jones et al., 2016) .

Offshore Ground Investigations in Glumaig Harbour were undertaken in 2017, 2018, 2019 and 2020 as part of the DWP development process, the results of which are reported within the DWP EIAR (Affric, 2020). Particle Size Analysis (PSA) of sediment samples collected during the surveys indicates the area to be dominated by gravels. As detailed on the Marine Directorate Pre-Dredge Sampling Results Form submitted in support of the DWP dredge licence approximately 69.2% of the area is made up of gravel substrates of varying sizes. Sands contribute 26.4%, silts and clay 4.4%. Table 8.2.1 presents average sediment composition results across various depths below the seabed, as determined by PSA. Solids composition increases with depth due to compression from overlaying materials, and silt concentrations are highest at the seabed surface.

Table 8.2.1: Average Particle Fraction at Depths Below Seabed

Sample depth (m)	Average Total solids (%)	Average Gravel (>2mm) (%)	Average Sand (>63µm <2mm) (%)	Average Silt (<63µm) (%)
0-0.5	81.94	68.78	23.20	8.02
0.5-1	88.43	75.27	21.82	2.94
1-1.5	89.65	62.64	32.40	4.98
1.5-2	86.61	60.09	37.22	2.72
2-2.5	86.80	72.90	23.20	3.90
3-3.5	92.90	66.89	32.88	0.27
3.5-4	92.73	86.67	12.59	0.76

Currents within Stornoway Harbour are generally weak, and do not tend to exceed 0.1m/s (RPS, 2020). Coupled with the predominantly coarse nature of the seabed, this relatively low energy environment means that any material suspended in the water column would drop out quickly and hence inherent sediment loading within the area of the proposed development is likely to be low.

8.2.2 Sediment Contaminants

Samples obtained during the offshore Ground Investigations outlined in 8.2.1 were also subject to testing for a suite of chemical parameters, in line with MD-LOT Pre-Disposal Sampling Guidance (Marine Scotland, 2017). Tests were conducted for heavy metals, Organohalogens and Polyaromatic Hydrocarbons (PAHs). While heavy metal levels exceeding Marine Directorate's lower-threshold Action Level 1 were identified in some samples, none exceeded Action Level 2. Similarly, PAHs were identified in some samples above Action Level 1 threshold, however there are many naturally occurring PAH especially associated with peat. No exceedances were found for Organohalogens. As such, the sediment is not predicted to be contaminated. This will be confirmed by pre-disposal dredge sampling, undertaken to inform the Best Practicable Environmental Option (BPEO) assessment in support of the dredge license application for the proposed DWS works. Remobilisation of contamination is therefore not considered further.

8.2.3 Waterbody Status

The proposed DWS development lies within the SEPA water quality classification zone of Stornoway Harbour, Waterbody ID: 200191. Stornoway Harbour is an enclosed coastal water body approximately 3.14km^2 in area and includes 13km of shoreline. The condition of the

waterbody is categorised as 'Good' overall, with the most recent classification being for 2020 (SEPA, 2023a). This classification is required to be maintained in the long-term.

Baseline status of the waterbody must take into account the developments already underway for DWP, as assessed during the DWP EIAR process. To do this, the Transitional and Coastal Morphological Impact Assessment System (TraC-MImAS) support tool has been consulted. TraC-MImAS considers the impact of morphological pressures from a development on waterbody status. With inclusion of the consented DWP development, TraC-MImAS classifies Stornoway Harbour as 'High' in terms of Hydrodynamic status, and 'Good' for both Intertidal and Subtidal Zones. The overall classification is based on the lowest status given under the various element considered hence, in this instance the overall classification is 'Good'.

Beyond the immediate marine environment, the River Creed (Abhainn Ghrloda; Waterbody ID: 20753) is the primary watercourse which flows into Stornoway Harbour. This enters the harbour from the west, with the river mouth situated to the north of the proposed DWS development. The River Creed is situated in the Lewis and Harris Coastal Catchment of the Scotland river basin district and the main stem of the river is approximately 18.1km long. This watercourse has a 2020 'High' overall classification for waterbody condition, with 'High' for ecology, biological elements, fish, fish barrier, hydromorphology and hydrology classifications (SEPA, 2023a). No information could be found regarding classification of the River Glen which flows into the northern tip of Stornoway Harbour.

8.2.4 Bathing Waters

No designated bathing waters are located in the vicinity of the proposed DWS development. The nearest SEPA monitored bathing water is located some 65km away at Achmelvich, on the west coast of mainland Scotland (Grid Reference: NC 0556 2494) (SEPA, 2023b).

8.2.5 Shellfish Water Protected Areas & Classified Shellfish Harvesting Areas

Shellfish Water Protected Areas (SWPA) are used for commercial shellfish cultivation. Water quality in these designated areas is regularly monitored by Food Standards Scotland (FSS) and classified by SEPA. The closest designated shellfish waters are Loch Leurbost (SWPA 46) and Loch Erisort (SWPA 36), situated approximately ~12km and ~14.5km respectively by sea from the proposed development.

The most recent 2018 classifications published by SEPA are 'Good' for Loch Leurbost and 'Excellent' for Loch Erisort (SEPA, 2023c). While both locations may be subject to short-term temporary closures associated with seasonally raised levels of shellfish-toxin producing algae, the SEPA classifications represent the longer-term status of the waters. Both SWPAs contain shellfish rearing sites which are listed as currently active (Scotland's Aquaculture, 2023).

Both Loch Leurbost and Loch Erisort are also Classified Shellfish Harvesting Areas (IDs 339 & 607 respectively). A third area, Broad Bay Aiginish (ID 745) is located to the north (Scotland's Aquaculture, 2023), some 21km by sea from the proposed development. These areas are identified as important to commercial harvesting of wild shellfish and are similarly monitored by FSS for parameters relevant to water quality, assessed by microbiological loading in shellfish flesh. Each area is subject to annual classification (A to C/B) by FSS according to species

harvested there. Most recent classification shows lochs Leurbost and Erisort classified as status A for Common mussels, Loch Erisort B for Pacific oysters, and Broad Bay Aiginish B/C for Common cockles and A for Razor clams (Marine Scotland NMPi, 2023).

8.2.6 Non-Native Marine Species (NNMS)

The Western Isles is considered to provide suitable habitat for non-native invasive marine species present in the UK, including Wireweed (*Sargassum muticum*), Green sea-fingers (*Codium fragile* subsp. *Tomentosoides),* Japanese kelp *(Undaria pinnatifida),* Common cord-grass (*Spartina anglica),* Japanese skeleton shrimp *(Caprella mutica),* Leathery sea squirt *(Styela clava)* and Carpet sea squirt *(Didemnum vexillum).* NNMS are currently classified as High, Medium, Low or Unknown impact according to their likely impact on WFD biodiversity classification of a waterbody. High impact species identified as present in Scotland are Common cord-grass, Leathery sea squirt and Carpet sea squirt. Data presented in the Scottish Marine Assessment 2020, collated at the level of Scottish Marine Regions, classifies the Outer Hebrides as having 'Regions of some concern' with a verified record of High impact Common cord-grass (East coast of Harris) and also lower-impact species Japanese skeleton shrimp and Wireweed verified (Marine Scotland, 2020).

In terms of the proposed DWS site, no NNMS were recorded during the benthic survey undertaken as part of the DWP development (Ocean Ecology, 2020), and no NNMS identifications have arisen during the DWP works to date. This has included dive inspection of the '*Alabama*' steamship wreck, where review of photographs by a benthic ecologist identified sea squirts present on the structure to be native species rather than NNMS (Affric, 2020).

8.2.7 Drainage

Drainage at the proposed DWS site currently consists of swales and culverts under construction for the DWP link road which bounds the proposed DWS reclamation area to its western side. In line with the Sustainable Urban Drainage System (SuDS) Manual: CIRIA 753 swales either side of the link road provide conveyance and promote infiltration of surface water run-off. The culverts provide a route for surface water flowing off the surrounding hillside, conveying it under the link road towards the sea.

8.2.8 Coastal Processes

The outer reaches of Stornoway Harbour are open to The Minch and thus tidal and wave regimes are characteristic of open sea. However, modelling of wave regimes within Stornoway Harbour signifies that waves penetrating into the harbour area from the Minch would not affect the development site in Glumaig Harbour (RPS, 2020). The proposed DWS site will most likely be exposed to waves from local fetches, arriving from the north to northeast. It has no exposure from the west, and very short fetches from the east and southeast. Moreover, tidal currents within Stornoway Harbour are generally weak and do not tend to exceed 0.1m/s (RPS, 2020).

The status of Stornoway Harbour in terms of impact on coastal process from morphological changes to shoreline structure through developments can be captured using the TraC-MImAS support tool. As per Section 8.2.3 current status of Stornoway Harbour, taking into account

current consented DWP developments, is 'High' in terms of Hydrodynamic status and 'Good' for both Intertidal and Subtidal Zones, with a 'Good' overall classification.

8.3 Potential Construction Impacts

Water quality may be affected during construction by increased sediment loading from dredging and infilling activities and surface water run-off from stripped land. Impacts may also arise from any sources of contamination, biological or chemical, introduced by construction activities.

Construction methods for DWS are expected to be largely indistinguishable from those of the adjacent DWP development. As such, it is anticipated that sources potentially affecting water quality during construction of DWS will be the same as those previously assessed in the DWP EIAR. Furthermore, the proposed location of DWS, immediately to the south of DWP and within the same waterbody, is considered unlikely to introduce any new receptors or means by which they could be affected by the construction activities.

As per DWP the potential construction impacts identified for DWS are:

- Increased sediment in water column from dredging/dredge disposal;
- Increased sediment in water column from infilling of land reclamation area;
- Increased sediment in water column from surface water run-off;
- Loss of containment: fuel, oil & Control of Substances Hazardous to Health (COSHH) storage, refuelling, fuel, hydraulic fluid & oil leak from vehicles, vessel and plant;
- Loss of containment: concrete and concrete washings; and
- Introduction of NNMS.

Table 8.3.1 details the significance of the construction impacts identified for DWP, as determined in the EIAR (Affric, 2020). It also indicates how the current DWS proposal relates to the DWP development in terms of scale. Where the scale of a source is no greater than that already assessed, given similar receptors and pathways, it can be reasonably concluded that the significance of the effect will not increase. This is on the basis that mitigation previously specified for DWP is similarly applied to the DWS activity, as discussed further in Section 8.6.

Table 8.3.1: Summary of Construction Impacts from DWP and Comparison to DWS

Impact	Significance of Impact – DWP EIAR	Comparison of Scale
Increased sediment loading in water column from dredging	Minor: Non-Significant	The proposed DWS dredge is much smaller in magnitude than DWP, being approximately 2% of the DWP volume.
Increased sediment loading in water column from dredge disposal	Minor: Non-Significant	As above, the proposed DWS dredge is much smaller than DWP. For DWP 90% re-use of dredge material was planned, however the 10% disposal volume is still larger than the total anticipated DWS dredge.

Impact	Significance of Impact – DWP EIAR	Comparison of Scale
Increased sediment loading in water column from infill of land reclamation.	Minor: Non-Significant	The area of land reclamation proposed for DWS is smaller than DWP, being in the order of 60% of the DWP area.
Increased sediment loading in water column from surface water run-off.	Minor: Non-Significant	The area of soil stripping proposed at DWS is smaller than for DWP, with a smaller overall development footprint and no construction of an associated access road.
Loss of containment: fuel & COSHH storage, refuelling, fuel, hydraulic fluid & oil leaks from vehicles, plant and vessels.	Minor: Non-Significant	Similar vehicles, vessels and plant are anticipated to be operating on site during construction of DWS as for DWP. Duration of the DWS operations is anticipated to be less, due to the smaller scale of the DWS project.
Loss of containment: concrete and concrete washings.	Negligible: Non-Significant	The quantity of concrete proposed for DWS construction is anticipated to be no greater than for DWP.
Introduction of NNMS.	Minor: Non- Significant	Similar vehicles, vessels and plant are anticipated to be operating on site during construction of DWS as for DWP.

8.4 Potential Operational Impacts

8.4.1 Coastal Processes

The land reclamation structure and, to a lesser extent, the dredging proposed for the DWS development has the potential to alter the wave and tidal climate, wave directions and geomorphological processes within Stornoway Harbour. It is recognised that the location and shape of the development will influence hydrographics, sediment transport, and thus, potentially coastal processes within the harbour. Modelling is required to identify areas of potential impact and refine the design where necessary.

8.4.2 Operational Activities

The potential impacts on water quality from operational activities at DWS are within the scope of those considered previously for DWP, namely:

- Containment: fuel & COSHH storage, refuelling, hydraulic fluid, oil & fuel leaks from vehicles, plant & vessels;
- Introduction of NNMS due to marine vessel movements;
- Foul drainage outfall from temporary welfare accommodation; and
- Surface water run-off from made surfaces at the quayside.

As per DWP, operations at the proposed DWS facility will be under the governance of SPA. The potential operational impacts identified above represent a 'business as usual' scenario, managed by the Port's environmental management system. This includes procedures and

protocols for minimising risks to water quality, and for dealing with pollution incidents such as SPA's Maritime and Coastguard Agency approved Oil Pollution Response Plan. It is anticipated that operators undertaking activities at the DWS facility will be required to adhere to these measures.

It is of note that activities envisaged for the DWS facility are likely to be of a lesser scale than those assessed for DWP. While activities of vessel berthing and the handling, laydown and storage of renewables components are common between the two facilities, proposed activity at DWS does not include the discharging of gas and oil into onshore storage tanks, storage and/or onward distribution of renewable energy sources (e.g. hydrogen or ammonia) or routine handling of bulk cargo materials. In this respect activities at DWS are therefore of lesser risk to water quality.

An appropriate surface water management system will be designed and employed for the DWS. A packaged treatment plant may be installed to serve temporary welfare facilities. Compliance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended (CAR) will be ensured, that may be by compliance with GBR, registration or simple licence application depending on the final drainage and outfalls design.

Addition of the DWS development to the existing DWP scheme does create interaction with the planned drainage system around the DWP link road, with the DWS reclamation area sited over the exit point of two culverts at the northern-most end of the link road. This will be taken into account in the DWS design process and will be addressed through extension of the culverts and alternative positioning of their outlets.

8.5 Water Framework Directive Assessment

As detailed in Section 8.2.3, the proposed DWS development sits within Stornoway Harbour (Waterbody ID: 200191). The waterbody's current status has been determined from the TraC-MImAS assessment undertaken as part of the DWP EIAR. This includes pre-DWP baseline information provided by Marine Directorate, to which modifications arising from DWP have been added. The current status includes the Newton Marina development, and assumes DWP to be in place in full, as consented, including the bollard island which DWS is proposed to replace. It shows the waterbody to be classified as 'High' status for Hydrodynamics, and 'Good' for both Intertidal and Subtidal zones with an overall classification of 'Good'.

Further modifications proposed to the waterbody as a result of the DWS scheme have been added to the TraC-MImAS tool as an initial assessment of the degree of potential impact on the waterbody's status. The details entered into the TraC-MImAS tool are summarised in Table 8.5.1; these measurements have been derived from an indicative layout of the DWS reclamation area and quayside, as illustrated in Drawing WS2339-XX-XX-DR-C-9007 (P04). Note a worst-case scenario in terms of dredge area has been assumed for the purposes of this initial assessment, and in practice the dredge area may be smaller than described.

Table 8.5.1: Development Detail for Initial TraC-MImAS Assessment

Pressure / unit	Pressure Source	Intertidal Area/length	Subtidal Area/Length
Land Claim - High Impact (km^2)	Land reclamation (laydown area)	0.007	0.027
Dredging – High Impact (km^2)	-13m CD dredge	N/A	0.004
Shoreline reinforcement – Hard engineering (high) (km)	Rock armour surrounding land reclamation	0.016	0.444
Piled Structures (high) (km^2)	Open-piled quay	N/A	0.000133

Table 8.5.2 provides a summary of the outputs of the TraC-MImAS assessment tool, including the percentage of deemed capacity used with respect to Hydrodynamic, Intertidal and Subtidal zones.

Table 8.5.2: Summary of Initial TraC-MImAS Output

Area	Baseline		DWS Development	
	Capactiy Usage (%)	Status	Capacity Usage (%)	Status
Hydrodynamics	2.8	High	3.2	High
Intertidal Zone	8.4	Good	9.4	Good
Subtidal Zone	12.7	Good	14.6	Good
Overall		**Good**		**Good**

The proposed DWS development increases the degree of capacity used across all assessment classes, with the greatest increase seen in the subtidal zone. However, this does not result in a reduction in status classification in any one zone, nor a deterioration of overall waterbody status, which remains Good.

The TraC-MImAS 'HOW TO USE' page states that:

'If the pressure activity is bigger than local unit size (i.e. 0.5km^2) or larger than 1.5% of the water body size, then an expert assessment MUST be undertaken.'

The total anticipated development area of DWS below MHWS is 0.038km^2. Stornoway Harbour waterbody covers an area of 3.14km^2. The development is therefore less than the 0.5km^2 threshold and 1.21% of the whole waterbody, including the maximum expected dredge area. As such, it is not anticipated that assessment beyond use of the TraC-MImAS tool will be required.

It is however noted that this initial assessment has been completed on the basis of an indicative layout of DWS, and the design may well be refined during the EIA process. As such, assessment of the final DWS design using the TraC-MImAS tool will be required.

8.6 Mitigation Measures

The mitigation developed for the DWP project currently under construction will be adopted for the proposed DWS development, alongside the adoption of relevant guidance as detailed in Section 8.1. These measures represent best practice and are summarised in Appendix 1 Initial Schedule of Mitigation. Construction mitigation measures will be incorporated into the CEMD for the DWS development.

Operational mitigation measures will be covered within SPA's environmental management system. This includes appropriate arrangements for fuel and COSHH materials, procedures for dealing with pollution incidents and biosecurity requirements for visiting vessels.

8.7 Proposed Impact Assessment

It is proposed that construction impacts on Water Quality be **scoped out** of the DWS EIA, on the basis that the mitigation outlined in 8.6 and Appendix 1 is implemented.

Similarly, it is recommended that impacts on Water Quality from DWS operations be **scoped out** of the EIA process. This is on the basis that routine operational considerations of containment, surface water drainage, foul drainage arrangements and NNMS management are considered to be covered by SPA's environmental management system and compliance with CAR.

It is recommended that Coastal Processes be **scoped in** to the DWS EIA. The proposed DWS development is an expansion of existing structures in Glumaig Harbour and will further alter the dimensions of Stornoway Harbour waterbody. Modelling is required to understand the potential impacts of the DWS design on wave climate and sediment transport, and the potential knock-on effects on coastal processes. As such, it is proposed that modelling updated to include the DWS development be presented in the EIA.

It is also proposed that the topic be **scoped in** relative to Water Framework Directive Assessment. A TraC-MImAS assessment should be undertaken for the finalised DWS design and included within the EIAR.

9 In-Air Noise and Vibration

This section aims to understand the potential construction and operational in air noise and vibration impacts of the proposed DWS development.

9.1 Policy and Guidance

Relevant guidance and information sources used in this section include:

- Planning Advice Notes (PAN) 1/2011: Planning and Noise (Scottish Government, 2011a);

- Technical Advice Note (TAN) – 'Assessment of Noise' (Scottish Government, 2011b);
- BS 5228-1:2009, Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (+A1:2014) (British Standard Institute, 2014); and
- BS4142+A1:2019: Methods for rating and assessing industrial and commercial sound (British Standards Institute, 2019); and
- Stornoway Deep Water Port Environmental Impact Assessment Report (Affric, 2020).

9.2 Baseline

The proposed DWS development is approximately 2.2km south across the water from the town of Stornoway and is situated within Glumaig Bay. The proposed development is otherwise in a quiet rural location, with residential receptors being more than 1km across the water in Stornoway. Noise in Stornoway is largely related to traffic movements, with particular reference to ferry loading/unloading, and is situated next to a national airport with flight paths above the town centre. Stornoway is also a busy fishing/cargo port, with multiple boats landing per day. As previously mentioned, the DWS development is approximately 2.2km south across the water from Stornoway, and around 200m further away than the DWP.

Due to the proposed DWS development's close proximity to DWP and orientation in relation to the town of Stornoway, residential Noise Sensitive Receptors (NSRs) are considered to be the same as those identified within the DWP EIAR, albeit some 200m further away. The NSRs for DWS can be found in Table 9.2.1.

Table 9.2.1: Residential NSR's for Construction & Operation of DWS

NRS ID	NSR Descriptor	Grid Reference	Distance & Direction from Nearest Point of DWS
01	South Beach	NB42170 32730	1.9km NNW
02	Newton Street	NB42638 32548	1.6km N
03		NB42805 32437	1.5km N
04		NB42948 32393	1.6km N
05	Seaview Terrace	NB43096 32312	1.5km N
06	Builnacraig Street	NB43275 32138	1.4km NNE

In the immediate vicinity of the proposed development, there is the Arnish Point Industrial Estate (containing a quay, fish harvesting station and a seaweed processing factory) and the DWP. The DWP is currently under construction during the writing of this report, but it must be noted that it is expected to be fully operational prior to the construction of the DWS development. These developments are not considered sensitive due to their context and industrial nature.

There are also some Traffic Noise Sensitive Receptors (TNSRs) associated with the proposed DWS development. As the access of DWS is identical in road traffic terms to DWP and routing for deliveries by road and personnel traffic anticipated to be the same, the scope of the assessment undertaken for DWP is considered to be applicable to DWS. This is particularly with regards to Heavy Goods Vehicle (HGV) deliveries of materials from the nearby Marybank Quarry via the A859 and Arnish Road. It must be noted that deliveries by sea will be delivered to the DWP, as opposed to the town of Stornoway, once the DWP is operational. TNSRs

identified within the DWP EIA, and thus applicable to the proposed DWS development can be seen in Table 9.2.2.

Table 9.2.2: TNSR for Construction and Operation of DWS

NSR ID	NSR Descriptor	Grid Reference
01	House by Macaulay Farm	NB40148 32192
02	House at Marybank	NB40144 32604
03	Perceval Road South; West of A857	NB42455 33965
04	A857/Macaulay Road; North of Perceval Road South	NB42512 34095
05	Perceval Road South; East of A857	NB42616 33970
06	A857/Macaulay Road; South of Perceval Road South	NB42519 33935

With regard to vibration, the NSRs identified in Table 9.2.1 can be considered potentially sensitive to vibration and are 1.3km from the area where blasting will take place. Vibration at the receptors will likely arise from traffic movements. In addition, industrial receptors at Arnish Point require consideration with regard to vibration.

9.3 Potential Construction Impacts

9.3.1 In-air Noise

The scale of noise impacts will be determined by noise source, duration, and location of construction activities in relation to the closest NSRs and the time at which they are undertaken. Noise generating activities relevant to the proposed DWS development include the following:

- Pile installation;
- Rock blasting;
- Rock crushing;
- HGV and construction plant movements;
- Dredging (likely to be backhoe or trailed suction); and
- General construction activities.

Using a worst-case approach, multiple scenarios were assessed in the Noise Assessment Report (NAR) to inform the DWP EIA process (Affric, 2020a). The scenarios were assessed in line with the 'A B C Category' method in BS5228-1:2009+A1:2-014, using a 3D modelling approach to calculate construction noise at the NSRs identified in Table 9.2.1. The magnitude and significance were then determined using guidance provided in TAN 1/2011.

All scenarios were determined as having neutral significance at each NSR, with exception to NSR06 during two scenarios whereby dredging (backhoe and cutter suction) took place during the evening and night at the dredge pocket closest to the NSRs.

The NAR conducted for the DWP EIA utilised the 'A B C Category' method from BS5228-1:2009+A1:2014. Thus, using the 'A B C Category' thresholds for a worst-case Category A dwelling and simple noise attenuation calculations, the sound pressure levels (SPLs) 10m from a noise source that are required to exceed the thresholds can be seen in Table 9.3.1.

It must be noted that the threshold levels are $L_{Aeq,t}$ (logarithmic average over time) values over night-time, evenings and daytime periods. This means that the noise levels would need to be continuous over 1 hour during the day, or 5 minutes at night to breach the threshold values.

Table 9.3.1: Noise Source from DWS Required to Exceed BS5228-1:2009+A1:2-014 Thresholds

Period	Threshold Value for Category A (dB)	SPL at 10m from Noise Source at DWS Required to Exceed Threshold (dB)
Night-time	45	91.85
Evenings	55	101.85
Daytime	65	111.85

SPLs at 10m from the noise source for some typical items of plant likely to be utilised during the proposed DWS development, as detailed within BS5228-1:2009+A1:2-014 can be found in Table 9.3.2.

Table 9.3.2: SPL at 10m from Plant Items as per BS5228-1:2009+A1:2-014

Plant Item	Continuous SPL at 10m from Plant Item (dB)
50t Dump truck	82
Wheeled excavator/loader	82
Pneumatic breaker	86
Tipper lorry`	85
Compacter rammer	92
50 x Compacter rammer	109

As can be seen in the tables above, the majority of the plant items do not exceed an SPL at 10m of 91.85dB. As a worst case, it is also demonstrated than even in the non-feasible scenario whereby 50 compactor rammers were operating at the same time, it would not breach the daytime threshold levels. There may be instances whereby these noise levels are instantaneously exceeded, but the plant items will not be operating and generating these noise levels continuously throughout the daytime, evening and night-time periods. Hence taking account plant operating times, $L_{Aeq,t}$ are highly unlikely to be exceeded. Thus, the significance of noise impacts during the daytime, evening, and night-time will be neutral at all NSRs.

The NAR determined that noise due to construction traffic at TNSRs has slight significance. However, as the scale of the proposed works at DWS are no greater than DWP (for example concrete quantity for DWS an estimated 65% of that used for DWP), the assessment parameters used for DWP can be considered to represent a worst-case indication of increased HGV movements on the road network associated with the DWS construction. Additionally, there is more opportunity for materials for DWS to be delivered by sea, as the DWP will be operational during the construction phase of DWS. This has the potential to reduce HGV movement associated with the delivery of materials to the proposed development. Thus, there will be no significant effects in relation to TNSRs during the construction phase of DWS.

9.3.2 Vibration

The blasting for DWS will take place in close proximity to the blasting carried out for DWP. Blasting is instantaneous and will not give rise to a continuous source of vibration. Furthermore, it is not expected to cause significant vibration effects at receptors due to the

1.3km distance between the rock blasting and the nearest receptor. There is potential for blasting to have effects on the industrial receptors at Arnish Point without appropriate mitigation, as they are within relatively close proximity to the blasting site.

9.4 Potential Operational Impacts

9.4.1 In-air Noise

Operational noise from the proposed DWS will be variable dependent on the activities being carried out at any one time. During the NAR for DWP, operational noise significance was mostly neutral, with the exception of being neutral/slight as NSR01 & NSR06. As the distance from DWS is an additional 200m away from identified NSRs than the DWP, operational activities are highly unlikely to cause noise levels to be significant at the NSRs. Reference can be made to Table 9.3.1, which also shows that extremely high noise sources would be required to exceed threshold levels during operations.

Any increase in noise due to operational traffic movements will primarily be associated with a small commuting workforce. Unlike DWP, there will be no passenger coaches and few HGV movements arising from vessels at port, as DWS is being constructed to primarily facilitate the offshore wind industry. The majority of deliveries to and dispatches from DWS during operations are anticipated to be by sea.

The assessment parameters used for DWP can therefore be considered to represent a worst-case indication of operational traffic movements on the road network associated with the operations of DWS. Thus, there will be no significant impacts.

9.4.2 Vibration

There are no known notable sources of vibration expected during operations of the DWS development.

9.5 Mitigation Measures

9.5.1 In-air Noise

Due to the distance between the proposed DWS and NSRs, no significant effects with regards to construction noise are expected. This is line with conclusions of the DWP EIAR which assessed similar construction methodologies in closer proximity to the NSRs. However, it is proposed that the timing restrictions for rock blasting applied during DWP works be similarly adopted for DWS (9am – 7pm Monday to Saturday, with blasting normally taking place prior to 5pm). Additionally, relevant best practice guidance as identified in PAN1/2011 and in Section 8 of BS5228 will be implemented as detailed in the Initial Schedule of Mitigation provided in Appendix 1.

Similar to the DWP, no significant noise effects are predicted for the operational phase of DWS, however, general good practice to minimise noise levels from an employee health perspective will aid in ensuring any effects are minimised.

Mitigation identified during the proposed Transport Assessment (refer to Section 24: Access, Traffic and Transport) will also ensure any traffic related noise impacts are minimised during the construction and operational phases.

It is worth mentioning that thus far during the construction of DWP, there has only been one complaint with respect to noise. The complaint was received on 5th January 2023 and originated from a local resident at NSR06 Builnacraig Street. It was in relation to night-time trailer-suction dredging works within the DWP dredge area and a lack of notification. The works were also during a particularly cold, still night, which would have contributed to enhanced noise levels at NSR06. After discussions with the local resident and pre-emptive letter drops prior to further dredging at night, dredging continued at night without further complaints, indicating the mitigation was successful. For DWS, dredging will only take place in the immediate vicinity of the proposed quay, with greater distance between NSRs and the dredge area.

9.5.2 Vibration

Mitigation outlined within Part 2 of BS5228-1:2009+A1:2014, and as detailed in Appendix 1, will be implemented in order to minimize any vibration impacts.

9.6 Proposed Impact Assessment

It is proposed that construction and operational In Air Noise and Vibration is **scoped out** of the DWS EIA, on the basis that mitigation measures outlined in the Initial Schedule of Mitigation (Appendix 1) are implemented and that noise impacts will have neutral significance.

10 Underwater Noise

The focus of this section is to provide an understanding of underwater noise and vibration associated with the construction and operation of the proposed DWS development. Effects of underwater noise on marine mammals and fish are considered in Sections 12 and 13 respectively, taking account of the noise levels discussed in this section.

The construction noise sources from DWS are similar to those considered for the DWP. DWS is located further south in Glumaig Harbour than DWP and hence more enclosed from the open sea by Arnish Point than DWP. As such, reference to the assessment undertaken for DWP has been utilised in this section as it is likely to present the worst-case scenario.

10.1 Policy and Guidance

Scottish Government policy as part of Scotland's National Marine Plan includes:

- ***GEN 13 Noise:*** *Development and use of the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects* (Scottish Government, 2015).

The Scottish government has released a series of good environmental status (GES) descriptors within Scotland's National Marine Plan. These include:

- ***GES 11:*** *Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment* (Scottish Government, 2015a).

10.2 Baseline

No baseline data has been collected and no published data is available for the existing underwater noise levels within Glumaig Harbour. Underwater noise levels were predicted for the piling and dredging activities associated with the DWP construction. These activities are now complete and hence are not considered to be part of the baseline.

The main source of underwater noise within the Stornoway Harbour area is associated with vessel movements, including the ferries, commercial and recreational vessels. Facilities in Glumaig Harbour that vessels will regularly utilise include the newly constructed DWP, the Arnish facility and fish harvesting station. The pontoon serving the fish harvesting station is utilised six days per week, by live fish carrier vessels attending the facility from fish farms. The DWP has been built to accommodate larger vessels such as cruise ships and includes a freight ferry quay. The freight ferry quay will be utilised almost daily all year round while cruise vessels visits will peak in the summer months with potentially multiple visits a week.

Ships give rise to sound frequencies from around 10Hz up to and above 1kHz which is within the hearing ranges of both cetaceans and pinnipeds (as discussed in Section 12). Sound produced by ships is typically over 160dB re 1µPa at 1m, but varies depending on the vessel type, size and how it is operating. Larger ships (>100m) generate lower frequency noise at louder levels (180-190dB re 1µPa) (International Maritime Organisation, 2023).

10.3 Potential Construction Impacts

The main sources of noise during construction are associated with dredging and pile driving. Both of these activities were considered for the DWP, as such the previously completed assessment has informed this section. General marine construction techniques such as infilling and rock armour placement also give rise to underwater noise. However, experience from previous projects has shown that these activities do not result in underwater noise emissions of a magnitude that has the potential to cause significant negative impacts on marine receptors and are therefore not considered further.

10.3.1 Dredging

There are three main dredging techniques available, backhoe, cutter suction and plough dredging, with cutter suction being the noisiest of the three. The DWP EIAR considered both backhoe and cutter suction dredgers, both of which were ultimately utilised. Cutter suction was utilised for the bulk of the dredge, with backhoe employed to remove material in the later stages from discrete locations.

For the DWS project, it would be appropriate to allow for all three dredge techniques. The bulk of dredging is likely to utilise cutter suction or backhoe, and any remedial dredge to remove high spots could use either backhoe or plough techniques.

Cutter suction gives rise to the highest underwater noise levels and hence is considered as worst-case scenario. Broadband source noise levels for the cutter suction dredger were identified to be in the region of 175dB$_{RMS}$ re 1µPa by Irwin Carr Consulting who undertook the

underwater noise assessment for DWP included as appendix K.1 of Volume 3 of the DWP EIAR (Affric, 2020). Their modelling of dredge activities showed that noise levels higher than the Impulse Temporary Threshold Shift (TTS) for Low Frequency (LF) hearing cetaceans such as minke whales (168dB$_{SEL-24}$) was limited to an area within 200m of the dredge vessel, and within 100m for other species. It could, however, be argued that dredging is a non-impulsive noise in which case the TTS for LF cetaceans of 179dB$_{SEL-24}$ is not breached at all.

The location of DWS on the western shores of Glumaig Harbour is well away from the mouth of both Glumaig Harbour and the mouth of Stornoway Harbour which opens up into the Minch. The land around Glumaig Harbour, including Arnish Point to the east of the dredge area, acts as a noise barrier and hence prevents dredge noise reaching the Minch.

It is appropriate to assume that dredging associated with the DWS has the potential to give rise to noise levels that can cause TTS to stationary cetaceans in the immediate vicinity of a dredge vessel and could cause disturbance to marine mammals especially LF cetaceans within Glumaig Harbour. It is less likely to be at a level that will cause disturbance in the wider Stornoway Harbour area and will not cause be loud enough to cause disturbance in the Minch.

10.3.2 Piling

Underwater sound arising from piling activities is determined by the pile diameter and the piling technique utilised. The larger the diameter of the pile, the more surface area there is in contact with the water and hence, the higher the sound levels produced during pile driving. The piling technique employed determines the nature and level of noise produced. Vibro piling, carried out using a vibrating hammer, results in a continuous broadband noise, which in general has a reduced sound pressure level compared to impact piling (Nedwell et al., 2003; Affric, 2015; Graham et al., 2017). In contrast, impact piling is a loud impulsive noise source. Table 10.3.1 taken from Chapter 11 of the DWP EIAR provides an understanding of source noise levels associated with piling for both piling techniques and a variety of pile diameters.

Table 10.3.1: Derived Pile Source Levels for Various Diameters (Affric, 2020)

Pile Diameter (cm)	Impact Piling		Vibratory Piling	
	Single Strike dB$_{z-p}$	Single Stirke dB$_{SEL}$	dB$_{z-p}$ re 1 µPa	dB$_{RMS}$
220	231.6	203.2	217.7	204.8
123	227.5	198.6	213.1	200.2
80	225.0	196.6	211.1	198.2
30	218.0	189.6	204.1	191.2

The initial design of the DWS utilises tubular steel piles with an expected diameter in the region of 100cm. However, to allow for potential changes in design it is assumed that 123cm diameter piles like those utilised for DWP could be employed. It is assumed that piles will be installed using a combination of vibro and impact piling.

As discussed in Sections 12 and 13, underwater noise can cause harm and disturbance to marine mammals and fish. This may be in the form of permanent or temporary hearing effects (Permanent Threshold Shift (PTS) and TTS respectively), masking of animals' communications or disturbance of normal behaviour. Hence there is a need to understand over what area piling noise will dissipate to levels below which harm or disturbance could occur.

Underwater noise modelling was undertaken by Irvin Carr Consulting for early designs of the DWP, the output of which is included as Appendix K.1 of Volume 3 of the DWP EIAR (Affric, 2020). It considered 220cm diameter piles for impact (single and multiple strike) and vibro piling. The modelling took into account marine mammal and fish hearing group sensitivities.

Figure 10.3.1 is extracted from Appendix K.1 of the DWP EIAR, it shows impact areas of PTS, TTS and Masking for marine mammal and fish species during impact piling. It is noted that since the publication of Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendation for Residual Hearing Effects was published in 2019, hearing groups have been changed. Cetaceans previously classed as Mid Frequency (MF) and High Frequency (HF) are now being noted as HF and Very High Frequency (VHF) respectively to better reflect their regions of best hearing sensitivities (Southall et al, 2019). Figure 10.3.1 utilises the old convention, hence, MF should be read as HF and HF as VHF.

Figure 10.3.1 shows the risk zones for a stationary mammal; if a mammal is moving away from the noise source the risk zones would be smaller. The figure does illustrate that for impact driving of a 220cm pile a VHF mammal such as a harbour porpoise would have to have swum out of the harbour by the 100th strike to avoid auditory injury.

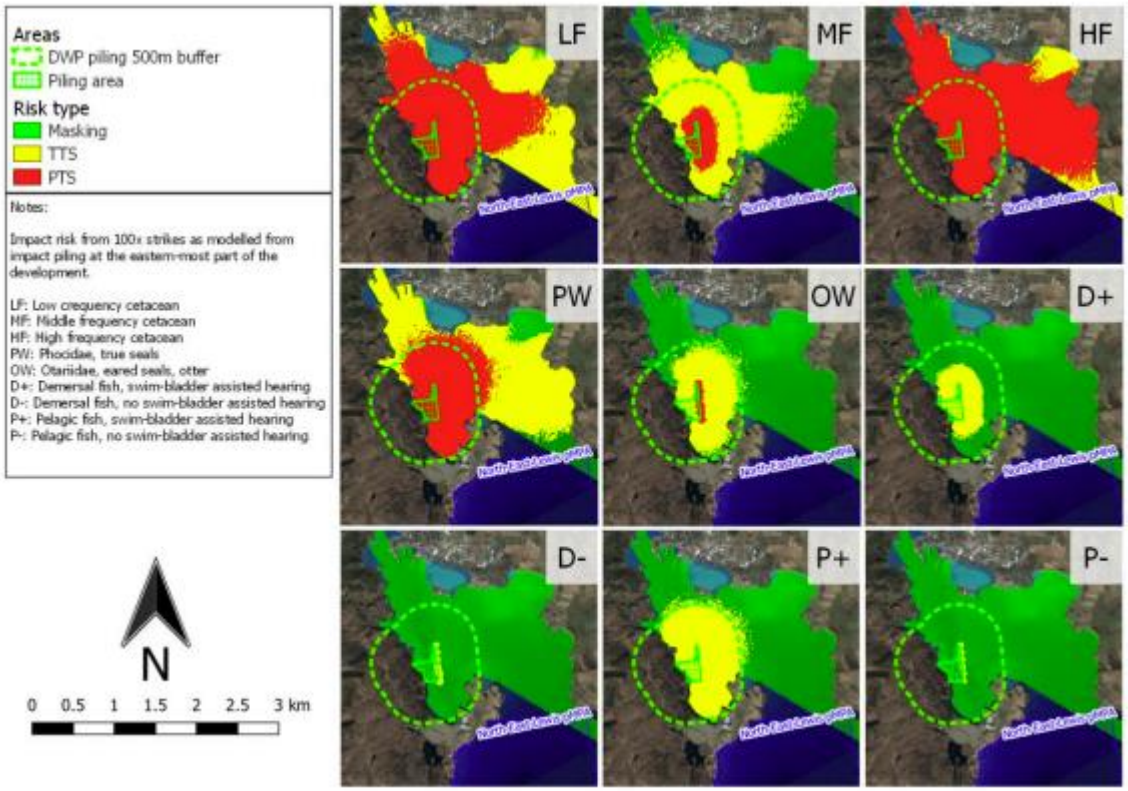

Figure 10.3.1: Impact Pilling Stationary Risk Zones for 220cm Pile Struck 100 Times

The modelling was utilised in the DWP EIAR to understand the impacts associated with piling 123cm piles noting that the source noise levels would be 4.6dB lower than a 220cm pile as detailed in Table 10.3.1. Irwin Carr Consulting note that a reduction in noise by 3dB reduced the impact range by up to 50%. As the likely noise reduction between a 220cm and 123cm

pile is more than 3dB it was safely assumed that the impact ranges modelled and illustrated in Figure 10.3.1 would be halved.

As discussed in Section 10.3.1 Arnish Point acts as a noise barrier stopping noise from reaching the Minch, as is clearly shown in Figure 10.3.1 in relation to DWP. The location of DWS further south in Glumaig Bay will mean that increased noise levels from piling will only occur within the Stornoway Harbour Area and not extend to the Minch.

Impacts on marine mammals and fish associated with increased noise levels within Stornoway Harbour associated with piling are discussed further in Sections 12 and 13 respectively.

10.4 Potential Operational Impacts

Underwater noise sources associated with operations are limited to vessel movements. It is not anticipated that routine maintenance dredges will be necessary at DWS however, if they were the impacts would be less than to those associated with construction dredge.

10.4.1 Vessel Movements

The creation of an additional berth at DWS will facilitate additional vessel use of Stornoway Harbour which will in theory add to the overall soundscape. However, as discussed in Section 10.3 and demonstrated in Figure 10.3.1, noise arising within Glumaig Harbour is screened by Arnish Point and does not impact upon the wider Minch.

It could be argued that vessel movements to and from DWS pass through the Minch, potentially the Little Minch and the North Atlantic increasing the soundscape in these waters. However, as discussed in Section 3.3.2, the aim of the development is to support the construction and operational phases of offshore wind developments in the area. As such, the availability of a suitable port facility close to the developments will reduce overall distances of vessel travel associated with construction and operation of offshore wind sites. Hence overall, the proposed DWS development will help minimise increases in the marine soundscape associated with the move towards net-zero.

10.5 Mitigation Measures

No construction mitigation to reduce noise impacts has been identified. It is recognised that the design of elements such as pile size has an impact on source noise levels and hence smaller pile diameters are preferred. This will be taken account of during the development of the design however, design requirements such as deck loading will take precedence to ensure the appropriate functionality of DWS.

10.6 Proposed Impact Assessment

Due to the existing understanding of underwater noise sources and the dissipation of noise within Glumaig Harbour and noise barrier effects of Arnish Point, there is no need to undertake any new underwater noise modelling to inform the consideration of underwater noise impacts upon ecological receptors. As such, it is proposed that Underwater Noise be **scoped out** from the DWS EIAR.

11 Biodiversity

11.1 Introduction

This section lays out the guidance and regulations relevant to ecological receptors and the impact assessment methodology that the following topic-specific chapters then utilise:

- Section 12: Marine Mammals;
- Section 13: Fish Ecology;
- Section 14: Benthic Ecology; and
- Section 15: Terrestrial Ecology and Ornithology.

11.2 Legislation, Policy, and Guidance

11.2.1 Marine (Scotland) Act 2010

The Act sets out duties on Scottish Ministers to ensure Scotland's seas are sustainably managed and contains provisions for new Marine Protected Areas (MPAs) in Scottish territorial waters. In order to help meet this requirement, the Joint Nature Conservation Committee (JNCC) and NatureScot have produced a list of habitats and species occurring in Scottish waters which are noted for their conservation importance; these are referred to as Priority Marine Features (PMFs) (Tyler-Walters et al. 2016). These encompass benthic and intertidal habitats, marine mammal, fish and invertebrate species. Inclusion in the PMF list itself does not provide legal protection, however due consideration must be provided in Impact Assessments, and as such, all PMFs are considered sensitive for the purpose of this assessment. A subset of the PMFs, called MPA search features, will be used to help identify possible areas for MPAs and develop the network in Scottish waters. MPAs are discussed further in Section 11.3.2.2.

The 2015 Scottish National Marine Plan (NMP), a requirement of the Marine (Scotland) Act 2010, lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs), most of which apply to the construction and operations of the proposed DWS development. GENs specifically relevant to biodiversity include:

- **GEN 9 Natural heritage:** *Development and use of the marine environment must comply with legal requirements for protected areas and protected species; Not result in significant impact on the national status of Priority Marine Features; and protect, and where appropriate, enhance the health of the marine area;* and
- **GEN 10 Invasive non-native species:** *Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practise of existing activity should be taken when decisions are being made* (Scottish Government, 2015).

The NMP also contains a series of good environmental status descriptors. Those relevant to biodiversity include:

- **GES 1:** *Biological diversity is maintained and recovered where appropriate. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions;*

- **GES 2:** *Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems;*
- **GES 4:** *All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity;* and
- **GES 6:** *Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected* (Scottish Government, 2015).

11.2.2 Habitats Directive

The European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, also referred to as the 'Habitats Directive' (Official Journal of the European Communities, 1992) has the primary aim of maintaining biodiversity within the European Union (EU) Member States. The Habitats Directive is transposed into Scottish law by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland). These are commonly known as the 'Habitats Regulations'.

The Habitats Regulations identify several habitats or species whose conservation interest requires the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which form a set of protected sites within the United Kingdom (UK) National Network (see Section 11.3.1.1).

In addition, the Regulations make it an offence to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licenses by the appropriate authorities.

Species protected by the Regulations are commonly termed European Protected Species (EPS). EPS potentially relevant to the proposed DWS development include bats, otter, cetaceans and basking shark.

11.2.3 Wildlife and Countryside Act 1981 & Nature Conservation (Scotland) Act 2004

The Wildlife and Countryside Act 1981 (WCA) (as amended in Scotland) was originally conceived to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and the European Birds Directive in Great Britain. It has been extensively amended since it first came into force.

The WCA applies to the Scottish terrestrial environment and inshore waters and provides protection to a wide range of species including birds, mammals, fish, invertebrates, and plants. Specific species protected by the WCA are listed in Schedules 1 to 8.

Section 9 (4) of the WCA provides special protection to selected animal species, as listed in Schedule 5, against damage to "*any structure or place which [any wild animal included in the schedule] uses for shelter and protection*", and against causing disturbance whilst in such places.

The WCA also contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants

listed in Schedule 9. It also provides a mechanism making the above offences legal through the granting of licenses by the appropriate authorities.

Important amendments to the WCA have been introduced in Scotland including the Nature Conservation (Scotland) Act 2004 (in Scotland) (NCSA). Part 3 and Schedule 6 of this Act make amendments to the WCA, strengthening the legal protection for threatened species. The NCSA is also the instrument under which Sites of Special Scientific Interest (SSSI) are protected in Scotland.

Section 2 of the NCSA also sets out the requirement for Scottish Ministers to designate a Scottish Biodiversity Strategy. As part of this the Scottish Biodiversity List has been produced. This lists a wide range of terrestrial and marine habitats and species which are considered to be of principal importance for biodiversity conservation in Scotland.

The Wildlife and Natural Environment (Scotland) Act 2011 provided a new licensing element to the WCA within Scotland, specifically for certain non-avian protected species '*for any other social, economic or environmental purpose*'. This licensing purpose is qualified by two constraints; '*that undertaking the conduct authorised by the licence will give rise to, or contribute towards the achievement of, a significant social, economic, or environmental benefit;* and *'that there is no other satisfactory solution*'.

11.2.4 Planning Policy and Guidance

National Planning Framework 4 (NPF4) sets out as part of the National Planning Policy for Sustainable Places, Policy 3: Biodiversity. The policy intent is to '*protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks*' (Scottish Government, 2023). Specifically in relation to EIA developments NPF4 states that demonstration must be made of how the proposal meets the following criteria:

- *'The proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats;*
- *Wherever feasible, nature-based solutions have been integrated and made best use of;*
- *An assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements;*
- *Significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate*; and
- *Local community benefits of the biodiversity and/or nature networks have been considered'* (Scottish Government, 2023).

At a local level the Outer Hebrides Local Development Plan provides relevant policy under NBH2: Natural Heritage. Policy NBH2 sets out the Council's process with regards to designated sites and protected species, including EPS (CnES, 2018).

Planning Advice Note (PAN) 60: Planning for Natural Heritage (Scottish Government, 2008) sets out guidance and case studies in relation to planning and the natural environment,

11.3 Designated Sites

Designated sites represent the very best of Europe's landscapes, plants and animals, rocks, fossils, and landforms. Their protection and management will help to ensure that they remain in good health for all to enjoy, both now and for future generations. They may be designated to meet the needs of international directives and treaties, national legislation and policies, or more local needs and interests.

11.3.1 International

11.3.1.1 European Sites

European Sites include those which make up the UK National Network as part of the Habitats Directive and Birds Directive. Sites included in the UK National Network are Special Protected Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites, although the latter are included as part of SPAs or SACs in Scotland.

SACs are internationally important for threatened habitats and species. They are also selected for a number of habitats and species, both terrestrial and marine, which are listed in the Habitats Directive.

SPAs are internationally important for threatened habitats and species. They are also selected for a number of rare, threatened, or vulnerable bird species listed in Annex I of the Birds Directive, and also for regularly occurring migratory species.

If there is potential for ecological connectivity between any plan or project and any qualifying features of a European Protected Site, a Habitat Regulation Assessment (HRA) must be carried out to determine whether there is a Likely Significant Effect (LSE) on any qualifying feature. Any plan or project, which is likely to have a significant effect on a European Protected Site (either alone or in combination with other plans or projects) and is not directly connected with or necessary to the management of the site, shall be subject to an Appropriate Assessment (AA) of its implications for the European Protected Site in view of the site's conservation objectives. The AA must be completed by the Competent Authority and is included within the HRA. Ramsar Sites

Ramsar sites are wetlands of international importance, designated under the Ramsar Convention (Ramsar, 1971). Wetlands are defined as areas of marsh, fen, peatland, or water, whether natural or artificial, permanent, or temporary, with water that is static or flowing, fresh, brackish, or salt, including areas of marine water the depth of which at low tide does not exceed six metres. There are currently fifty one Ramsar sites designated as internationally important wetlands in Scotland, covering a total area of about 313,000 hectares (Scottish Natural Heritage, 2017). All Ramsar sites in Scotland are also either SPAs or SACs (UK National Network sites), and many are also Sites of Special Scientific Interest (SSSIs), although the boundaries of the different designations are not always exactly the same (Scottish Natural Heritage, 2017). It is not surprising that internationally important wetlands are also of European interest for a wide variety of water birds, bogs, lochs, coastal wetlands and other water-dependent habitats and species. Although there is no specific legal framework that safeguards Scottish Ramsar sites, they benefit from the measures required to protect and enhance the Natura Sites and SSSIs which overlap them. NatureScot also includes Ramsar sites in its site condition monitoring programme.

11.3.1.2 OSPAR

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) is the mechanism by which fifteen governments of Western Europe work together to protect the marine environment of the north-east Atlantic. OSPAR incorporates a wide range of marine issues, from work on pollution and dumping at sea, to the conservation of marine biodiversity.

In 2003, the government committed to establishing a well-managed, ecologically coherent network of Marine Protected Areas (known as the OSPAR MPA commitment). Marine Special Areas of Conservation (mSACs) designated under the Habitats Directive, have been submitted as the UKs initial contribution to the OSPAR network. Whilst OSPAR covers many different issues, the focus of NatureScot's current work is on delivering the OSPAR MPA commitment. A list of marine habitats and species considered to be under threat or in decline within the north-east Atlantic has been produced by OSPAR (known as the OSPAR Threatened and Declining List). The known distribution of these habitats and species in waters around the UK has been mapped on the National Biodiversity Network website. The habitats and species on the OSPAR Threatened and Declining List have been considered through NatureScot's Priority Marine Features (PMFs) work, as discussed in Section 11.2.1. Together with mSACs and marine Special Protection Areas (mSPAs) (also designated under the Habitats Directive) Scotland will achieve the OSPAR commitment of establishing a well-managed, ecologically coherent network of MPAs.

11.3.2 National

National designations cover a range of different types of protected area and are made by a variety of local and national authorities. Some of these designations focus on nature conservation, while others are concerned with special landscapes. The management of multi-functional protected areas (such as our National Parks) seeks to balance the needs of people, landscape, and nature.

11.3.2.1 Sites of Special Scientific Interest

Sites of Special Scientific Interest (SSSI) are those areas of land and water (to the seaward limits of local authority areas), that NatureScot considers to best represent our natural heritage, its diversity of plants, animals and habitats, rocks and landforms, or a combination of such natural features. They are the essential building blocks of Scotland's protected areas for nature conservation. Many are also designated as Natura Sites (SPAs and SACs). The national network of SSSIs in Scotland forms part of the wider Great Britain series. NatureScot designates SSSIs under the Nature Conservation (Scotland) Act 2004. SSSIs are protected by law. It is an offence for any person to intentionally or recklessly damage the protected natural features of an SSSI.

11.3.2.2 Marine Protected Areas

Scotland (along with the rest of the UK) has designated a number of Marine Protected Areas (MPAs) which include SACs and SSSIs. The term "MPA" can be used for several different types of protected areas within the marine environment. The Marine (Scotland) Act 2010 has established a new power for MPAs in the seas around Scotland, to recognise features of national importance and meet international commitments for developing a network of MPAs.

11.3.3 Local

Local natural heritage designations identify areas that are important to people, generally in a Council area. Local nature conservation sites and special landscape areas may be known locally by other names, but all are used to direct local planning policies and highlight local sites of interest. Local nature reserves are areas of at least locally important natural heritage value, which local authorities own or manage, to provide opportunities for people to find out about their environment. Local designations are generally made by local authorities, though many are proposed by special interest and conservation groups, such as local Regionally Important Geological Sites (RIGS) Groups or the Scottish Wildlife Trust.

11.3.4 Designated Sites Relevant to Deep Water South

Where designated sites are situated within reasonable distance of the development site, the potential for qualifying features to be ecological receptors of the proposed development must be considered. A search for designated sites within 20km of the proposed DWS was carried out with these sites listed in Table 11.3.4. These sites comprise of MPA, SAC, SPA, Ramsar and SSSI designations. No locally designated sites are identified within 20km of the proposed DWS site.

Table 11.3.4: Designated Sites Relevant to the Proposed DWS Development

Designated Site	Distance and Direction from DWS	Qualifying Feature(s)	Considered further? Yes/No	Evaluation Rationale
North-East Lewis MPA	850m SE	Risso's dolphin (*Grampus griseus*), sandeels (*Ammodytes marinus/Ammodytes tobianus*)	Yes	Risso's dolphin are a mobile feature with extensive home ranges. Sandeels can also range locally, and the features are therefore **considered further in Section 12: Biodiversity - Marine Mammals and Section 13: Biodiversity – Fish.**
		Marine geomorphology of the Scottish shelf seabed, Quaternary of Scotland	No	The proposed DWS development will not interact with any of the immobile features.
Inner Hebrides and the Minches SAC	1.9km ESE	Harbour porpoise (*Phocoena phocoena*)	Yes	Harbour porpoise are a mobile feature with extensive home ranges and are therefore **considered further in Section 12: Biodiversity - Marine Mammals.**

Designated Site	Distance and Direction from DWS	Qualifying Feature(s)	Considered further? Yes/No	Evaluation Rationale
Tong Saltings SSSI	3.1km NNE	Breeding bird assemblage.	Yes	Ornithological features have extensive home ranges, in particular migratory species. Therefore, breeding birds have been **considered further in Section 15: Biodiversity – Terrestrial Ecology and Ornithology.**
		Mudflats; Saltmarsh; and Sand dune.	No	The proposed DWS development will not interact with any of the immobile features.
Lewis Peatlands SPA	5.6km NNW	Breeding red-throated diver (*Gavia stellata*); breeding black-throated diver (*Gavia arctica*); breeding golden eagle (*Aquila chrysaetos*); breeding merlin (*Falco columbarius*); breeding golden plover (*Pluvialis apricaria*); breeding dunlin (*Calidris alpina schinzii*), breeding greenshank (*Tringa nebularia*)	Yes	Ornithological features have extensive home ranges, in particular migratory species. Therefore, breeding birds have been **considered further in Section 15: Biodiversity – Terrestrial Ecology and Ornithology.**

Designated Site	Distance and Direction from DWS	Qualifying Feature(s)	Considered further? Yes/No	Evaluation Rationale
Lewis Peatlands Ramsar	5.6km NNW	Breeding red-throated diver (*Gavia stellata*); breeding black-throated diver (*Gavia arctica*); breeding golden eagle (*Aquila chrysaetos*); breeding merlin (*Falco columbarius*); breeding golden plover (*Pluvialis apricaria*); breeding dunlin (*Calidris alpina schinzii*), breeding greenshank (*Tringa nebularia*)	Yes	**Considered further as part of Lewis Peatlands SAC** due to same designated features and site boundary.
		Blanket bog; depressions on peat substrates and; subalpine wet heath.	No	The proposed DWS development will not interact with any of the immobile features.
Lewis Peatlands SAC	8.8km WNW	Otter (*Lutra lutra*).	Yes	Otter are a mobile species with extensive home ranges and are therefore **considered further in Section 15: Biodiversity – Terrestrial Ecology and Ornithology.**
		Blanket bog; Depressions on peat substrates; Acid peat-stained lakes and ponds; Wet heathland with cross-leaved heath; and Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels.	No	The proposed DWS development will not interact with any of the immobile features.

Designated Site	Distance and Direction from DWS	Qualifying Feature(s)	Considered further? Yes/No	Evaluation Rationale
Achmore Bog SSSI	10.5km WSW	Blanket bog	No	The proposed DWS development will not interact with this immobile feature.
Gress Saltings SSSI	11.6km NE	Saltmarsh	No	The proposed DWS development will not interact with this immobile feature.
Loch Laxavat Ard and Loch Laxavat Iorach SSSI	18.3km WNW	Breeding bird assemblage.	Yes	Ornithological features have extensive home ranges, in particular migratory species. Therefore, breeding birds have been **considered further in Section 15: Biodiversity – Terrestrial Ecology and Ornithology.**
		Oligotrophic lochs; and Scrub.	No	The proposed DWS development will not interact with any of the immobile features.
Loch Scarrasdale Valley Bog SSSI	19.75km	Blanket bog	No	The proposed DWS development will not interact with this immobile feature.
Loch nan Eilean Valley Bog SSSI	19.8km	Blanket bog; valley fen	No	The proposed DWS development will not interact with any of the immobile features.

12 Biodiversity - Marine Mammals

This section considers the potential impacts on marine mammals from construction and operation of the proposed DWS development.

Construction and operational impacts on marine mammals from the adjacent DWP were previously assessed within the DWP EIAR. With appropriate implementation of mitigation, impacts were deemed to be non-significant (Affric, 2020). The proposed DWS location is very similar to that of DWP, particularly when considering the highly mobile nature of marine mammals. Construction methodologies for the two developments are also expected to be largely indistinguishable. As such, reference to the assessment undertaken for DWP has been utilised in this section.

12.1 Legislation, Policy, and Guidance

The nature conservation legislation and policy relevant to marine mammals is detailed in Section 4: Consenting and Policy Context and Section 11: Biodiversity.

12.2 Baseline

12.2.1 Data Review

A desk study has been undertaken to inform characterisation of the marine mammal baseline. This includes an assessment of the marine mammals which may be utilising the proposed development area and surrounding waters, information on populations sizes, seasonal trends, and foraging characteristics. The following data sources have been consulted:

- NatureScot SiteLink Portal (NatureScot, 2023d);
- The UK PMF list (Tyler-Walters et al., 2016.);
- National Marine Plan Interactive (Marine Scotland, 2023);
- Management Units (MUs) for cetaceans in UK waters (IAMMWG, 2015; 2023);
- Scientific Advice on Matters Related to the Management of Seal Populations: 2017 & 2018 (SCOS, 2017, 2018);
- Atlas of Cetacean Distribution in North-West European Waters (Reid et al., 2003); and
- Various scientific reports and journal articles regarding marine mammal distribution and movements in the northeast Atlantic region.

12.2.2 Designated Sites

There are no designated sites for marine mammals within the proposed development area, however, sites are present within the vicinity, as detailed in Table 11.3.4 and below:

12.2.2.1 North East Lewis MPA

The North-East Lewis MPA lies approximately 0.6km southeast of Stornoway Harbour and is designated for features including Risso's dolphin (*Grampus griseus*).

The North-East Lewis MPA is one of only two places in the UK where high numbers of Risso's dolphin are recorded and thought to be resident. The species normally favours deeper offshore waters where the continental shelf slopes off quickly but around the Isle of Lewis they gather close to shore in water depths ranging from 20-200m. Sightings of Risso's dolphins have been most prominent on the eastern and northern coasts of the Isle of Lewis, with the Eye Peninsula and Butt of Lewis being noted 'hotspots' (Scottish Government, SNH, & Conservation, 2014; Weir et al., 2019). It has been suggested that the area is important for feeding due to the year-round presence of the species and the continued sightings of particular individuals (Weir et al., 2019).

Dedicated research efforts by Whale and Dolphin Conservation between 2010 and 2017 focussing on the North-east Lewis MPA area produced relative abundance values of 0.554 to 6.647 individuals per km^2 (Weir et al., 2019) and the greatest relative abundance was found on the southern coastline of the Eye Peninsula. As of 2017, a total of 113 individual Risso's dolphins have been identified in the North-east Lewis MPA (Weir et al., 2019).

As the North-East Lewis MPA is located less than 1km from the proposed DWS site, and the Stornoway dredge spoil disposal ground is situated within the MPA, there is potential for connectivity between the proposed development and the protected Risso's dolphin feature of the MPA and therefore the designated site is considered further.

12.2.2.2 Inner Hebrides & the Minches SAC

The Inner Hebrides & the Minches SAC is designated for the conservation of harbour porpoise (*Phocoena phocoena*), under the European Habitats Directive. The area is of key importance to the UK as part of the harbour porpoise Management Unit (MU). The Inner Hebrides & the Minches SAC is estimated to support approximately 5,438 individuals for at least part of the year, equating to approximately 32% of the MU (SNH, 2016a). It is suggested that these areas, relative to the rest of the continental shelf, include the best habitat for harbour porpoises, and have been used consistently by the species over the last two decades (SNH, 2016a).

The Inner Hebrides & the Minches SAC is taken forward for further consideration because it is situated within ~ 1.9km of the proposed DWS development, and 850m of the Stornoway dredge spoil ground, hence, there is potential connectivity between the development and qualifying interests of the SAC.

12.2.3 Species Accounts

Eight species of cetacean are regularly recorded in the Minch (Reid et al., 2003), the waterbody which Stornoway Harbour adjoins.. Five of these species are considered to occur commonly or be resident in the area including harbour porpoise, white beaked dolphins, Risso's dolphins, killer whales, and minke whales. The remaining 3 species are regular visitors, but less common and not thought to be resident, these include; bottlenose dolphins, short beaked common dolphins, and Atlantic white sided dolphins (Reid et al., 2003). Humpback whale are also known to be present in Scottish waters, including the Minch. Two species of pinniped are resident in the Minch and the surrounding waters: the common and grey seal. Both species use coastal sites for breeding/pupping and hauling out, and feed in inshore and offshore waters. Each of these marine mammal species are introduced in more detail in the following sections.

12.2.3.1 Regularly Occurring Cetaceans

12.2.3.1.1 Harbour Porpoise (Phocoena phocoena)

The harbour porpoise is distributed throughout temperate and subarctic waters of the North Pacific and North Atlantic oceans and is the most abundant cetacean to occur in north west European shelf waters. They are the UK's smallest, and most abundant cetacean, with the highest densities occurring along the North Sea coast, around the Northern Isles and the Outer Hebrides (Hammond et al., 2003; Reid et al., 2003). The harbour porpoises occurring within the vicinity of the development are included as part of the West Scotland MU, which is estimated to be composed of 21,462 individuals (IAMMWG, 2015). MMO data from watches carried out during DWP construction included one sighting of a harbour porpoise on the 14th February 2023 (OSC, 2023). Harbour porpoise are expected to be one of the most frequently encountered cetaceans in the area of the proposed development and will therefore be considered further.

12.2.3.1.2 White-Beaked Dolphin (Lagenorhynchus albirostris)

The UK is in the southern extent of the range of white-beaked dolphins, and as such the UK distribution is centred in the north. Scottish shelf waters are considered to be the main stronghold of this species in Europe, particularly in the Minch, to the north of the Outer Hebrides, the outer Moray Firth, and off the coast of Aberdeenshire (Northridge et al. 1995; Reid et al., 2003). The species typically inhabits deeper coastal waters with a depth of around 200m (Reid et al., 2003).

White-beaked dolphins from British and Irish waters are considered a single population of 15,895 individuals and as such are included as one MU (IAMMWG, 2015; 2023). The high densities of this species reported in the Minches make it likely that this species will be present within the vicinity of the development. Sightings of white-beaked dolphin in the UK peak between June and October, although they are present year-round (Reid et al., 2003). As such, further consideration will be given to this species with regards to the proposed development.

12.2.3.1.3 Risso's Dolphin (Grampus griseus)

Risso's dolphins have been identified in many parts of the UK including parts of the North Sea, the western shores of Scotland, the Outer Hebrides, the Irish and Celtic seas and around Bardsey Island, Wales. Risso's dolphins however, despite their widespread distribution throughout UK waters, are considered as a single population as a result of the lack of population estimates (IAMMWG, 2015). Although the species is comparatively uncommon when taking into account sightings of other species, there is some evidence of changes in the seasonal distribution of this species. Risso's dolphin sightings occur most frequently in the Minch between May and September and in offshore waters near the continental shelf break during the winter months of October to May (Reid et al. 2003). MMO data from watches carried out during DWP construction included a single sighting of a group of five Risso's dolphins on the 8th June 2023 (OSC, 2023). These were sighted outwith the mitigation zone at approximately 800m. Due to their presence in the area, Risso's dolphins will be considered further.

12.2.3.1.4 Minke Whale (Balaenoptera acutorostrata)

The minke whale is the most common baleen species recorded in British shelf waters, including in the north-eastern Atlantic, where high densities are present off the west coast of Scotland, particularly in the Minch (Hammond et al. 2003; Reid et al., 2003) They feed mainly in deep coastal waters (<200m deep) over the continental shelf, rather than out in the open ocean. They regularly appear around sandbanks or where upwellings bring nutrients and prey near the surface, or in the strong currents around headlands and small islands (Reid et al., 2003). Minke whales are considered to be a coastal species, occurring in areas within approximately 7km of the coast (Macleod et al., 2004; Reid et al., 2003).

Minke whales throughout British and Irish waters designated as a single population of 23,528 individuals, although this is likely an underestimate (IAMMWG, 2015). Densities of minke whale are found to be greatest in Scottish seas during the summer months, between May to September, although there is evidence to suggest that some individuals remain in Scottish waters all year round (Macleod et al., 2004). Minke whales will therefore be given further consideration.

12.2.3.1.5 Killer Whale (Orcinus orca)

Killer whales occur frequently in the deep North Atlantic, and in coastal waters of north-west Europe. In UK waters, the highest densities of killer whales are recorded off the coasts of north-east Scotland and the Shetland, although regular sightings are also recorded off north-west Scotland (Reid et al., 2003). Killer whales are present year-round throughout Scottish waters, although they are primarily recorded in coastal waters during the summer months (Evans et al., 2010).

The majority of killer whale sightings in Scottish waters are transient visitors from pods based in Iceland, the Faroe Islands, and Norway (Evans et al., 2010) however, there is a small resident pod of killer whales based on the west coast of Scotland, known as the 'West Coast Community.' This is the only resident population of killer whales in the UK, and of the eight documented members, only two mature bulls have been sighted since 2016 (Scullion et al., 2021). These two bulls are frequently sighted in the Sea of the Hebrides, to the south of the development area, and are known to forage in the Minch (Hebridean Whale and Dolphin Trust (HWDT), 2018). Though there are few confirmed numbers in this population, consideration will still be given with regards to the proposed development.

12.2.3.2 Other Cetaceans

12.2.3.2.1 Bottlenose Dolphin (Tursiops truncatus)

Bottlenose dolphins are distributed throughout UK shelf waters, primarily close to shore with one of the largest semi-resident populations of bottlenose dolphins found in the Moray Firth, in northeast Scotland. In total, there are six MUs for bottlenose dolphins in UK waters, and as bottlenose dolphins are most commonly recorded within the 20m depth contours, they have a predominantly coastal distribution (IAMMWG, 2015).

Individuals occurring within the vicinity of the development, due to its position on the Isle of Lewis, are most likely to belong to the Coastal West Scotland and Hebrides (CWSH) MU (IAMMWG, 2023). The animals within this MU are less well understood however two disparate communities have been identified within the MU - the 'Inner Hebrides' and 'Sound of Barra' communities. The Inner Hebrides community is made up of approximately 30 individuals which move widely across the west coast (van Geel, 2016). The population ranges throughout the year across the whole of the west coast of Scotland, and as such there is considered to be only a small possibility that they will be present within the Stornoway Harbour area. The Sound of Barra group is made up of less than 15 individuals, and this resident community are mainly found within the Sound of Barra and in immediately adjacent waters (Cheney et al., 2013; van Geel, 2016) approximately 140 km from Stornoway Harbour. It is considered unlikely that these individuals would be found within the vicinity of the proposed development. This species will therefore not be considered further.

12.2.3.2.2 Short-Beaked Common Dolphin (Delphinus delphis)

Short-beaked common dolphins (common dolphins) are one of the most abundant cetacean species and is the most numerous offshore species in the north-east Atlantic (Reid et al., 2003). Common dolphins from British and Irish waters are considered a single population of 56,556 individuals (IAMMWG, 2015) however, the Outer Hebrides is towards the northern extent of the species' range, which, combined with the coastal nature of the Minch means that this

offshore species is not present in the region in high numbers (Reid et al., 2003). The majority of sightings on the west coast of Scotland are to the north or south of the proposed DWS development; at the continental shelf break, or in the Sea of the Hebrides (Marine Scotland, 2018). Sightings do however exist for groups of common dolphin within Stornoway Harbour (HWDT, 2023). MMO data from watches carried out during DWP construction included two sightings of a short beaked common dolphin including a group of five on the 2nd June 2023 and a single individual on the 14th June 2023 (OSC, 2023). Short-beaked common dolphin will therefore be given further consideration.

12.2.3.2.3 Atlantic White-Sided Dolphin (Lagenorhynchus acutus)

Atlantic white-sided dolphins are predominantly an offshore, deep-water species, and are most frequently encountered at the continental shelf break, in areas of steep seabed relief, to the north-west of the Outer Hebrides (Reid et al., 2003). Atlantic white-sided dolphins from British and Irish waters are considered a single population of 46,249 individuals (IAMMWG, 2015). Little is known about the temporal movements of this species, although they are occasionally recorded in shallower continental shelf waters, including the Minch (Reid et al, 2003). No records exist within Stornoway Harbour and as the species are predominantly an offshore species, they will not be considered further with regards to the proposed development.

12.2.3.2.4 Humpback Whales (Megaptera novaeangliae)

Humpback whales are a large baleen whale, inhabiting both shallow and deep waters and capable of diving to depths of over 600m (Derville et al., 2020). They are a migratory species, moving from feeding grounds in the Northeast Atlantic and Barents Sea to breeding grounds in the Caribbean, Cape Verde, and the Azores. From data collected over recent years, the Minch has been noted as a hot spot with a number of sightings concentrated in this area during late autumn and winter, and in early to mid-summer, coinciding with migration. Sightings of humpback whales in Scotland have increased along with population numbers of humpback whales globally (WDC, 2018). It has been estimated that there are at least 35,000 humpback whales in the North Atlantic MU and that humpback whales are likely to be resident year-round in Scottish waters but in extremely low numbers (Marine Scotland Science, 2020). Humpback whales will be given further consideration due to the increase in sightings in the area.

12.2.3.3 Pinnipeds

12.2.3.3.1 Common Seal (Phoca vitulina)

Common seals are widespread around the west coast of Scotland particularly throughout the Hebrides and Northern Isles with haul-outs generally situated in sheltered waters, on tidal sandbanks and rocky skerries.

Common seals in the UK are divided into MUs; the proposed DWS development is situated within the 'Western Isles' MU region, where the population is currently estimated to be at least 3,532 individuals, as of 2019 (SCOS, 2022). Common seals present in the vicinity of the development may also be members of the large 'West Scotland' MU, which has an estimated population of 15,600 (SCOS, 2022).

The species are present in UK waters year-round with pups being born during June and July. During this period, females spend a high proportion of time ashore with their pups (Hammond et al., 2003; SCOS, 2017). Common seals moult in August (SCOS, 2017) and numbers at haul-out sites are highest during this period. There is a single designated common seal haul-out site within 25km (by sea) from the DWS development, known as Broad Bay, on Northeast Lewis.

Common seal habitat utilisation in the north-west of Scotland is concentrated to the south-east of the Outer Hebrides, with the highest usage observed in the Sea of Hebrides. Predicted common seal usage of the western Minch is comparatively low, with densities of 5-10 seals per 5km x 5km cell anticipated in the immediate vicinity of the proposed development (Russel et al., 2017). MMO data from watches carried out during DWP construction included nine sightings of common seals between January 2023 and June 2023. Each record involved one individual at a time (OSC, 2023). This species will therefore be considered further.

12.2.3.3.2 Grey Seal (Halichoerus grypus)

Grey seals occur only in the north Atlantic, Barents and Baltic Seas, with their main concentrations located along the Canadian and US eastern seaboards and in northeast Europe (SCOS, 2017). The UK contains around 38% of the total world breeding population of grey seals, and 88% of those breed in Scotland, with major concentrations in the Outer Hebrides and Orkney (SCOS, 2017). In 2022, the total UK population of grey seals was estimated to be 162,000 individuals (SCOS, 2022), with pup production estimated to be around 54,050 in Scotland (SCOS, 2022). The proposed DWS development is situated within the 'Western Isles' grey seal MU where the population has been estimated to be 21,512 individuals (SCOS, 2022).

Grey seal haul-outs are generally located on remote uninhabited stretches of coast, and often in more exposed areas compared to common seals. Breeding occurs in the autumn, with peak pupping between August and December (SCOS, 2017) although in northern Scotland pupping typically occurs between October and late November (Hammond et al., 2003). Moulting occurs between December and April (Hammond et al., 2003; SCOS, 2017). Designated breeding grey seal haul-out sites are concentrated in the Northern Isles, Orkney, and Shetland, and in the Outer Hebrides. Non-breeding haul-out sites are also concentrated at these locations, in addition to various sites along the west coast of Scotland. No designated grey seal haul-outs are located within 25km by sea of the proposed development.

At-sea grey seal usage maps show that grey seal activity in the north-west of Scotland was concentrated to the west of the Outer Hebrides, particularly around the Monach Islands (Russel et al., 2017). Grey seal densities in the Minch and Sea of the Hebrides were comparatively low in comparison to common seal densities (Russel et al., 2017). The density of grey seals was found to be 0-5 individuals per 5km x 5km cell which would suggest that it is unlikely that grey seals will be present in the immediate vicinity of the proposed development however, sightings data shows records of grey seals in the harbour area. MMO data from watches carried out during DWP construction included 159 sightings of grey seal between October 2022 and June 2023. The most seen at once included ten individuals made up of both adults and juveniles on the 20th February 2023 (OSC, 2023). This species will therefore be given further consideration.

12.3 Potential Construction Impacts

12.3.1 Underwater Noise

As discussed in Section 10, there will be underwater noise generated by construction activities associated with the proposed DWS development. Marine mammals use acoustics for communication, navigation, and foraging, and as such are particularly sensitive to underwater noise. Underwater noise emissions can result in disruption of foraging behaviour, displacement, masking of communications, disturbance, and injury.

Southall et al (2019) groups marine mammals into functional hearing groups and applies filters to the unweighted noise to approximate the hearing response of the receptor. The hearing groups of marine mammals identified within the vicinity of the proposed DWS development are summarised in Table 12.3.1 below.

Table 12.3.1: Functional Hearing Groups, and Relevant Marine Mammals Species (Southall et al, 2019)

Hearing Group	Marine Mammal Species	Generalised Hearing Range
Low Frequency (LF) Cetaceans	Minke Whales, Humpback Whales	7Hz to 35kHz
High Frequency (HF) Cetaceans	Dolphin species as identified in Section 12.2.3, Killer Whales	150Hz to 160kHz
Very High Frequency (VHF) Cetaceans	Harbour Porpoise	275Hz to 160kHz
Phocid Carnivores in Water (PCW) (Underwater)	Grey Seals, Common Seals	50Hz to 86kHz

The Southall publication determines impact from assessment of an area wherein noise will induce either 'Temporary Threshold Shift' (TTS) or 'Permanent Threshold Shift' (PTS) as judged by the weighted Sound Exposure Level over a typical 24-hour period (dBSEL-24). The sound level at which impacts occur is also dependent on the type of noise: impulsive or non-impulsive noise.

For impulsive noises, the guidance presents unweighted frequency maximal zero to peak pressure ($dB_{z\text{-}p}$) and frequency weighted sound exposure level (dB_{SEL}) criteria. For non-impulsive noises, only cumulative, frequency weighted dB_{SEL} are provided. The injury criteria for impulsive noises and non-impulsive noises (Southall et al, 2019) are summarised in Tables 12.3.2 and 12.3.3 respectively.

Table 12.3.2: Acoustic Injury Criteria for Marine Mammals in Relation to Impulsive Noise (Southall et al, 2019)

Impulsive Noise	TTS Criteria		PTS Criteria	
Functional Group	dB_{SEL-24} (weighted) dB re 1 µPa	dB_{z-p} (unweighted) dB re 1 µPa	dB_{SEL-24} (weighted) dB re 1 µPa	dB_{z-p} (unweighted) dB re 1 µPa
LF Cetaceans	168	213	183	219
HF Cetaceans	170	224	185	230
VHF Cetaceans	140	196	155	202
PCW Pinnipeds	170	212	185	218

Table 12.3.3: Acoustic Injury Criteria for Marine Mammals in Relation to Non-Impulsive Noise (Southall et al, 2019)

Non-Impulsive Noise	TTS Criteria	PTS Criteria
Hearing Group	dB_{SEL-24} (weighted) dB re 1 µPa	dB_{SEL-24} (weighted) dB re 1 µPa
LF Cetaceans	179	199
HF Cetaceans	178	198
VHF Cetaceans	153	173
PCW Pinnipeds	181	201

12.3.1.1 Piling

The initial design of the DWS utilises tubular steel piles with an expected diameter in the region of 100cm. As discussed in Section 10.3.2, to allow for potential changes in design it is assumed that 123cm diameter piles like those utilised for DWP could be employed.

As discussed in Section 10.3.2, increased noise levels from piling will only occur within the Stornoway Harbour Area and will not extend to the Minch. Noise levels within Stornoway Harbour associated with impact piling will however be high enough to potentially cause PTS and TTS to marine mammals if present in the area.

The greatest impact ranges of TTS and PTS are predicted for stationary VHF cetaceans as a result of impact piling. Harbour porpoise are the only VHF cetacean species relevant to the development location. The possibility for harbour porpoise being present within Stornoway Harbour is low despite being close to the Inner Hebrides and The Minches SAC. This is due to the unsuitability of the habitat. Glumaig Harbour is generally much shallower (0-15m water depth) than the preferred foraging depths of ~20–50m for harbour porpoise. A review of sightings data shows that densities of harbour porpoise are low in the Stornoway and Glumaig Harbour areas (Marine Scotland NMPi, 2023; HWDT, 2023).

The DWP EIAR identified that underwater noise would have a low, short term and reversible but significant effect on harbour porpoise, however with mitigation measures in place this was reduced to non-significant (Affric, 2020). The effects on harbour porpoise from piling noise emissions at DWS are predicted to be well within the scope of those assessed for DWP. This is due to the location of the works further south within Glumaig Harbour. The potential noise propagation as noise emissions will be interrupted by Arnish Point and the DWP development, limiting the propagation of noise such that it is unlikely to reach the Inner Hebrides and The Minches SAC.

The impacts from piling on LF cetaceans (minke and humpback whales) was also considered within the DWP EIAR. For LF cetaceans, impact piling will have a range of PTS beyond 500m and up to 1.5km for TTS, encompassing the entire harbour area. As the waters within 500m of the works are very confined and less than 15m deep, it is very unlikely that minke or humpback whales would be present in the area and subject to effects of TTS or PTS. It is not anticipated that these species would be adversely affected by piling works for the construction of the proposed DWS development.

Considering HF cetaceans, impact piling is likely to have a PTS range of no more than 500m, with zones of TTS encompassing potentially up to 1.5km. Potentially affected species include Risso's dolphin, short-beaked common dolphin, and killer whale. It is, however, expected that these species would be found in low densities within these distances from the works suggesting that the number of animals possibly subjected to disturbance will be low. As such, it is not anticipated that in EIA terms, as was concluded in the DWP EIAR (Affric, 2020), that a significant effect will occur. It is not expected that noise will travel into the North-east Lewis MPA where Risso's dolphin are a designated feature.

With regards to pinnipeds (PCW), the zone of PTS extended to approximately 500-1000m, with zones of TTS potentially encompassing the majority of the harbour area. Low density distributions of grey seals have been recorded within Stornoway Harbour and as such, are extremely unlikely to be present during piling. With respect to common seals, the nearest known designated common seal haul-out site lies approximately 25km away (by sea) from the development, known as Broad Bay, on North-east Lewis. As such, common seals are much more likely to be present in the TTS zone than grey seals due to having foraging ranges which extend some 50km from the closest haul-out site. Zones of TTS also extend into areas which provide more suitable foraging grounds with water depths of up to 30m. Common seals, however, are extremely unlikely to remain in the PTS zone for long periods of time as it provides unsuitable habitat for foraging due to the shallow depth.

It is recognised that beyond potential hearing impacts, it is possible for underwater noise to create a disturbance effect known as masking. Masking occurs when sound interferes with a marine mammals' ability to perceive and distinguish different sounds. Although it is still relatively unclear on how masking affects each marine mammal species, it is understood that masking could inhibit vocalisations relating to foraging and breeding success (National Research Council (U.S.), 2003). Some researchers have however shown that marine mammals may have the ability to increase the amplitude of their vocalisations as a short-term response to increased noise levels (Clark et al., 2009; Parks et al., 2011) and prevent inhibition from occurring.

12.3.1.2 Dredging

As described in Section 3.3.1, a dredge is required to provide adequate depth at the proposed DWS quayside. Noise generated by dredging was assessed as part of the EIA for the adjacent DWP (Affric, 2020). This modelled the use of cutter-suction dredging, in order to represent and assess a worst-case scenario.

As discussed in Section 10.3.1., noise monitoring for cutter-suction dredging conducted at other projects and applied to DWP indicated that unweighted source levels of noise would be

in the region of 175 dB re 1 µPa. Comparison with the weighted Southall et al guidance for impacts on marine mammals indicated that in the case of the DWP, it was likely that LF cetaceans would be susceptible to the greatest level of noise impacts from dredging activities, with zones of TTS anticipated to extend some 200m from the source. TTS zones were limited to 100m for other species. It should be noted that the probability of a marine mammal being within such close proximity to dredging activities is very low. It is therefore not anticipated that underwater noise from dredging during DWS works will have a significant effect on marine mammals, as was concluded in the DWP EIAR.

12.3.2 Water Quality

As outlined in Section 8: Water Quality and Coastal Processes, construction of DWS could have the following effects on water quality, which in turn are relevant to marine mammals:

- Increased sediment loading in the water column, resulting from dredging, spoil disposal, infilling, and site surface water runoff; and
- Spillage of hazardous materials from machinery, equipment, and processes involved in the construction.

12.3.2.1 Increased Sediment Loading

Increased sediment loading in the water column will result in increased turbidity which could inhibit the foraging success of marine mammals. This is more apparent in largely visual predators such as seals, which do not utilise sonar for detection of prey (Todd et al., 2015). As well as the inhibition of foraging, increased turbidity may also cause seals to avoid affected areas, resulting in the displacement or interruption of transiting individuals. This is most apparent in common seals (*Phoca vitulina*), where visual acuity has been known to deteriorate as turbidity increased (Todd et al., 2015).

Many other marine mammal species, such as toothed cetaceans, inhabit turbid environments and are able to utilise these waters through the use of sophisticated sonar which helps them understand the physical environment around them (Au et al., 2000). For these species, foraging abilities are not inhibited and there is evidence of some level of tolerance to turbidity (Au et al., 2000; Pirotta et al., 2013; Todd et al., 2015).

As such, negative effects may occur for species which do not primarily use acoustics or sonar for biological functions, and which regularly utilise the waters in the vicinity of the development site and spoil ground for foraging, socialising, or migration (Pirotta et al., 2013; Todd et al., 2015).

Section 8: Water Quality and Coastal Processes notes that no significant effects on sediment loading in the water column were identified as part of the DWP EIAR (Affric, 2020) and with appropriate mitigation there are not expected to be impacts upon marine mammals in the area.

Dredged spoil disposal, if determined appropriate by BPEO assessment, will likely take place at the licensed Stornoway disposal ground, located south of Arnish Point. The spoil ground is approximately 850m from the Inner Hebrides and the Minches SAC and within the North-east Lewis MPA, hence spoil disposals have the potential to negatively impact the harbour porpoise

and Risso's dolphin features of these sites. In addition, common seals are known to regularly frequent the waters around north-east Lewis. This notwithstanding, marine mammal densities in the vicinity of the spoil ground are not expected to be high. This is the because the spoil ground is located within 200m off the coast in water less than 20m deep; such areas are not considered to be valuable habitat for cetaceans, and there are no designated seal haul-outs within 25km by sea of the spoil ground. As discussed in Section 8 however, with the implementation of mitigation successfully used during construction of the DWP, it is not expected that there will any significant effects due to increases in sediment loading in the water column on the designated sites and their protected features.

12.3.2.2 Release of Hazardous Substances

A release of oils or other pollutants has the potential to result in both short and long-term impacts on marine mammals. Short term effects include reduction in the thermal properties of seals' fur, resulting in hypothermia and potentially death, as well as poisoning of both seals and cetaceans through inhalation or ingestion of the contaminant resulting in sickness or death. Both seals and cetaceans may also avoid a contaminated area, which could impact foraging behaviour. In the longer term, both seals and cetaceans may accumulate toxic pollutants through the ingestion of contaminated food, or through a prolonged exposure to low levels of pollution. Such toxic build-up may lead to reductions in reproductive success, illness, and increased mortality rates (Gubbay & Earll, 2000).

For all marine mammal receptors, the magnitude of potential impacts arising from a release of contaminants would depend on the nature and quantity of material released into the environment. There is the potential for a spill of hazardous material to have long term major impacts, through changes to the health and behaviour of the receptors on a regional scale however, the adoption of the mitigation measures and standard industry best practice techniques for pollution prevention identified in Section 8 significantly reduces or removes the risk of such an event occurring during DWS construction works. As such, it is considered extremely unlikely that a release of hazardous material of a scale with the potential to negatively impact marine mammals or their designated sites will occur, as was similarly concluded within the DWP EIAR.

12.3.3 Physical Injury

During dredged spoil disposal operations, there is the potential for a marine mammal to be directly under the disposal vessel when the spoil is released. In this event, the animal could be injured or killed by falling debris. Spoil disposal from the proposed DWS dredge may take place at the licensed Stornoway disposal ground (HE035). The spoil ground is approximately 850m from the Inner Hebrides and the Minches SAC and within the North-East Lewis MPA, and hence spoil disposals have the potential to negatively impact the harbour porpoise and Risso's dolphin features of these sites. In addition, Risso's dolphins and common seals are known to regularly frequent the waters around North-East Lewis. It should however, be noted that marine mammal densities in the vicinity of the spoil ground are not expected to be high. The probability of a marine mammal therefore being in the spoil ground and directly under the spoil vessel at the time of release is extremely low, and it is unlikely that an animal would be injured in this way. It is therefore not anticipated that dredge disposal will have a significant effect on marine mammals, as was concluded within the DWP EIAR.

12.4 Potential Operational Impacts

12.4.1 Underwater Noise

The creation of an additional berth at DWS will facilitate additional vessel use of Stornoway Harbour which will in theory add to the overall soundscape however, as discussed in Section 10.3 and demonstrated in Figure 10.3.1, noise arising within Glumaig Harbour is screened by Arnish Point and does not impact upon the wider Minch which offers more suitable habitat for marine mammals.

As discussed in Section 10.4.1, the proposed DWS development will support further growth in the offshore renewables sector. This has the potential to increase vessel movements giving rise to underwater noise emissions within the Stornoway Harbour area, the Minch and potentially out into the Atlantic Ocean. However, it should be noted that the developments within Stornoway Harbour will prevent the need to provide support to offshore wind projects in the area from further afield. Therefore, underwater noise from ship movements effect on underwater noisescapes will ultimately be less, and potential impacts on marine mammals will be less than if DWS wasn't developed.

12.4.2 Water Quality

During operation there could be effects on water quality relevant to marine mammal species due to spillage of hazardous materials from machinery, equipment and vessels operating at the new DWS facility.

The potential impacts of a release of hazardous substances are discussed in Section 8: Water Quality and Coastal Processes and the impacts of such an event occurring during the operational phase are considered to be low. Operation of the facility under direction of SPA with strict management protocols in place will prevent changes from baseline conditions occurring in terms of the risk of pollution events.

12.4.3 Physical Injury

Increased vessel movements within Stornoway Harbour may present the risk of physical injury to marine mammals. Ship strikes are a significant threat to marine mammals globally and can result in injury and death (WDC, 2023; NOAA, 2023). As previously discussed, however, densities of marine mammals within Stornoway Harbour are expected to be low. Strikes most often occur in critical whale habitat where there is high density and where shipping activities overlap. Though records exist for larger whale species, this area has not been identified as significant habitat and is generally low value with low densities of cetaceans. It is also not anticipated that ships travelling in the area of the harbour would be doing so at considerable speeds due to strict rules within harbour waters for safe navigation.

12.5 Mitigation Measures

Mitigation measures will follow those detailed in the DWP EIAR in order to ensure significant effects on marine mammals do not arise during construction of the proposed DWS development. These relate to piling and dredge disposal operations, as detailed in 12.5.1 and 12.5.2.

Additionally, to avoid marine mammal harassment or potential for strikes from vessels working on the DWS development, all vessels will be required to follow the guidance set out in the 'Scottish Marine Wildlife Watching Code' (SNH, 2016b). This document provides best practice guidance on how to navigate vessels in the vicinity of marine mammals.

With no increased risk of injury to marine mammals from vessel strike or increased underwater noise impacts identified, no specific mitigation is identified in relation to operations at the proposed DWS facility. Mitigation in relation to potential impacts from reduced water quality is addressed in Section 8: Water Quality and Coastal Processes.

12.5.1 Piling Marine Mammal Protocol

Modelling of underwater noise from impact piling for the DWP development indicates that there is the potential for piling operations carried out as part of the DWS proposed development to cause disturbance and auditory injury to marine mammal species in the vicinity of the development site. In line with best practice, the mitigation identified will apply to all marine mammal species and will be implemented for both vibro and impact piling operations. This is in accordance with mitigation measures applied at DWP.

The mitigation measures will be aligned to the Joint Nature Conservation Committee's (JNCC) protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010). It is noted that the protocol states that a developer may propose an amended protocol if it is deemed that the standard protocol is unduly restrictive and unproportional. This will be assessed during Marine Mammal Risk Assessment which will be submitted as part of the application for a European Protected Species licence from the Marine Directorate.

12.5.2 Spoil Disposal Marine Mammal Protocol

Should at-sea dredge disposal at the licenced Stornoway spoil ground (HE035) be utilised, appropriate mitigation will be implemented with regards to potential injury of marine mammals and behavioural impacts from increased sediment loading. As with piling, a Marine Mammal Risk Assessment will be completed which will inform the development of the Spoil Disposal Marine Mammal Protocol. If taking account of mitigation there is still a potential for dredging to cause an offence under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) then the EPS licence application will include dredge activities.

12.6 Proposed Impact Assessment

It is proposed that Biodiversity – Marine Mammals is **scoped out** of the DWS EIA, on the basis that the mitigation identified in Section 12.5 and Appendix 1 is implemented. No impacts additional to those assessed for DWP have been identified throughout this scoping process. Significant effects identified within the DWP EIAR without mitigation, will be prevented by the implementation of robust mitigation. EPS licences will be applied for where appropriate for the construction of the DWS development.

13 Biodiversity – Fish Ecology

This section considers the potential impacts on fish ecology from construction and operation of the proposed DWS development. As the DWS location and construction methodology are similar to that of the adjacent DWP, reference to the assessment undertaken for DWP has been utilised in this section.

13.1 Legislation, Policy, and Guidance

The nature conservation legislation and policy relevant to fish ecology is detailed in Sections 4: Consenting and Policy Context and 11: Biodiversity.

13.2 Baseline

13.2.1 Data Review

A desk study has been undertaken to inform characterisation of the fish ecology baseline. This includes an assessment of the fish species which may be utilising the proposed DWS development area and surrounding waters and information on seasonal trends and behavioural characteristics. The following data sources have been consulted:

- NatureScot SiteLink Portal (NatureScot, 2023d);
- The UK PMF list (Tyler-Walters et al., 2016);
- National Marine Plan Interactive (Marine Scotland, 2023);
- OSPAR Intermediate Assessment 2017 (OSPAR Commission, 2017a);
- The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) List of Threatened and/or Declining Species and Habitats (OSPAR Commission, 2017b);
- Scotland's Marine Atlas: Information for the National Marine Plan (Baxter et al., 2011); and
- Various scientific reports and journal articles regarding marine fish distribution and movements in the northeast Atlantic region.

13.2.2 Designated Sites

There are no designated sites for fish within the proposed development area however, sites are present within the wider area, as detailed in Table 11.3.4.

The North-East Lewis MPA lies approximately 0.6km southeast of Stornoway Harbour and is designated for Raitt's sandeel (*Ammodytes marinus*). The MPA encompasses a former Raitt's sandeel fishing ground that supports an important component of a larger, patchy sandeel population on the west coast. The aim of the MPA is to aid recovery of an otherwise declining population of Raitt's sandeel due to overfishing. Sandeels are highly nutritious and are the preferred prey for many species of fish, seabirds, and marine mammals. There is potential connectivity between the proposed DWS development and the MPA due to proximity and mobile nature of the protected Raitt's sandeel feature, and due to the Stornoway dredge disposal site being situated within the MPA. The North-East Lewis MPA is therefore considered further.

13.2.3 Habitat

The proposed DWS development is situated on the western coastline of Glumaig Harbour to the south of the Stornoway DWP, as described in Section 3.1. Glumaig Harbour itself is a small shallow bay, located within Stornoway Harbour, just west of the Eye Peninsula, which meets The Minch on the eastern coast of the Isle of Lewis. The waters of Glumaig Harbour are relatively shallow and rarely reach depths exceeding 15m. Most notably, two watercourses flow into Stornoway Harbour, from the north and from the west.

The River Creed (Abhainn Ghrloda) flows into Stornoway Harbour from the west, and is situated just north of the proposed DWS development and Glumaig Harbour. This watercourse water classification is high overall, with high overall ecology, fish and fish barrier classifications (SEPA, 2020). A high overall fish barrier classification means that <1% of the system is inaccessible due to manmade structures, supporting the migration of fish. The River Creed has been highlighted as a good spawning site, with gravel habitat suitable for use by both salmon and sea trout (Envirocentre, 2018).

In the inner harbour to the north, a small river known as the Glen River or Bayhead River runs through the outskirts of Stornoway and into Glumaig Harbour. Upstream, the watercourse flows from the eastern end of Loch Airigh na Lic. The catchment, despite being small, holds good areas of spawning gravels, potentially suitable for use by both salmon and sea trout, each of which are known to be present throughout the catchment (Envirocentre, 2018). The watercourse does however, contain various obstacles including natural debris, water gates and an accumulation of urban waste which may inhibit migration and subsequent spawning. This is most prevalent in the lower reaches, and which migratory fish would have to pass before reaching the spawning sites available further upstream.

13.2.4 Species Accounts

A data review provided little specific data on fish species inhabiting the waters surrounding the DWS construction area. However, it was identified that the relevant protected receptors that should be considered by this assessment include:

- Diadromous Fish, including Atlantic salmon, sea trout, and European eel;
- Basking sharks; and
- Raitt's Sandeel.

13.2.4.1 Diadromous Fish Species

There are two categories of diadromous fish, anadromous and catadromous: anadromous fish reproduce in freshwater rivers but spend the rest of their adult lives in salt water, while catadromous fish reproduce in saltwater, and spend the rest of their lifecycle in freshwater.

The Western Isles are known to be inhabited by three diadromous species, Atlantic salmon (*Salmo salar*), sea trout (*Salmo trutta* morpha *trutta*) and European eel (*Anguilla anguilla*).

13.2.4.1.1 Atlantic Salmon

Atlantic salmon are widely distributed in Scotland's river systems but are also found across temperate and Arctic regions of the northern hemisphere. Salmon are anadromous, living in freshwater as juveniles then migrating to sea as post-smolts, where they mature. Once sexual

maturity is reached, they return to their native rivers to spawn (Godfrey et al., 2014). Migratory routes of Atlantic salmon to spawning sites are poorly understood since returns to the Scottish coast occur from a range of directions however, the greatest returns are expected from northerly and westerly marine waters, given the distribution of marine feeding areas (Malcolm et al., 2010). Juvenile salmon populations within the Western Isles River systems are generally lower compared to rivers supporting salmon elsewhere in Scotland (Godfrey, 2005).

Atlantic salmon are known to return to the River Creed annually. From eleven sites which were surveyed to best represent the entirety of the river system, eight locations were identified as having high or very high densities of salmon fry and/or parr (juvenile salmon). Salmon fry and/or parr were not identified in the Glen River (Envirocentre, 2018).

Due to the presence of salmon fry and/or parr in the River Creed, the western shores of Glumaig Harbour may provide a migratory route for salmon to return to spawning sites situated in the watercourse. This species will therefore be considered further with regards to the proposed development.

13.2.4.1.2 Sea Trout

Like Atlantic salmon, sea trout may spend several years in freshwater habitats prior to migrating. Sea trout post-smolts may stay within estuaries for extended periods of time, prior to moving into the wider sea (Malcolm et al., 2010). Research from the west coast of Scotland suggested that sea trout post-smolts move from rivers to sea lochs/estuaries between April and early June, prior to moving to the open sea in late June to July, and eventually returning to the river system in August to September (Pemberton, 1976).

Similar to salmon, trout densities are higher in smaller streams and tributaries than larger river networks in the Outer Hebrides (OHFT, 2012). Despite this, both the River Creed and the Glen River were identified as holding areas of high or very high densities of juvenile sea trout (Envirocentre, 2018). Further consideration will therefore be given to sea trout in the area of the proposed development.

13.2.4.1.3 European Eel

The European eel is a critically endangered catadromous fish which is widely distributed across European freshwater and estuarine habitats (Daverat et al., 2006; SNH, 2017b). Since the 1970s, the population of European eel has declined by up to 99% in some parts of its distribution range (Correia et al., 2018). The lifecycle consists of 4 stages: glass eel, elver (juveniles), yellow eel and silver eel (adults). It is suggested that adults may pass through Scottish coastal waters during migration (Malcolm et al., 2010).

Silver eels inhabit over 80% of catchments in the Western Isles (OHFT, 2012). However, distribution and population dynamics of European eels in the Western Isles are poorly understood. Populations of silver eels potentially inhabiting riverine habitats near the DWS development site are likely to enter Glumaig Harbour from the nearby River Creed. Baseline data identified seven sites throughout the River Creed which held significant numbers of adult European eel, with the highest densities closest to the coastline (Envirocentre, 2018) and as a result, the species will be considered further.

13.2.4.2 Basking Shark

The basking shark (*Cetorhinus maximus*) is the largest coastal-pelagic shark found within Scottish waters, growing to lengths of over 11 meters and weighing around 4 tonnes (Sims, 2008a). Basking sharks are filter feeders and feed in areas of high plankton concentrations. Feeding generally occurs from surface waters to depths of 320m (Skomal et al., 2004). Monitoring of feeding behaviour shows that basking sharks aggregate in coastal waters off continental shelfs dominated by transitional waters, where steep bathymetry combined with strong ocean currents result in areas of high productivity with high phytoplankton and zooplankton density (Drewery, 2012).

In Scottish waters, basking sharks are particularly prevalent on the west coast during the summer months, with highest densities observed in the Sea of the Hebrides (Paxton et al., 2014). There is some evidence to suggest that relatively high summer densities of this species are also found in the waters to the west of the Outer Hebrides, although data is limited (Paxton et al., 2014).

Basking sharks are not expected to be present in high densities within the Minch, to the east of the Outer Hebrides, although some sightings have been recorded (Marine Scotland, 2020). The shallow waters of Glumaig Harbour are not anticipated to provide valuable habitat for basking sharks, and no sightings have been reported (Marine Scotland, 2020). Although the wider Stornoway Harbour provides deeper waters in comparison with Glumaig Harbour, only one sighting of basking shark has been recorded (HWDT, 2023). The sighting shows a basking shark at the entrance to Stornoway Harbour, east of Arnish Point in 2019. It is considered unlikely that basking shark will be present in the immediate vicinity of the DWS development. A review of the Marine Scotland NMPi, NBN Atlas and HWDT sightings map did not show any sightings of basking shark within or within close proximity to the Stornoway spoil ground suggesting it is unlikely they will occur in this area. The species will therefore not be considered further.

13.2.4.3 Raitt's Sandeel

Five species of sandeel can be found in Scottish seas with Raitt's sandeel (*Ammodytes marinus*), and the lesser sandeel (*Ammodytes tobianus*) being the most common. The Raitt's sandeel is typically found in waters from 10 to 150m deep, where the sediment at the seabed is made up of sandy substrates (HELCOM, 2019). The distribution of sandeels within Scotland's seas is patchy and is generally concentrated on or nearby banks and areas of suitable sediment. Sandeels are a PMF in Scotland's seas and as noted in Section 13.2.2, a protected feature within the North-East Lewis MPA.

The Raitt's sandeel reaches maturity within 1 to 2 years. Generally, the lifecycle of a Raitt's sandeel is 10 years, but they have been known to live for less time depending on the level of change to their habitat (Froese, 2012). Spawning from November to February, eggs are deposited on sand or fine gravel substrate. Sandeels are largely stationary after settlement. Data show sandeels to be present between Tolsta Head and the Butt of Lewis. Abundance within the North-East Lewis MPA was found to be greatest towards the Butt of Lewis, as well as directly east and northeast of the Eye Peninsula, at water depths between 50 and 150m. Raitt's sandeels were absent around the entrance to Stornoway Harbour and within and

around the Stornoway spoil disposal ground (Scottish Government, SNH, & Conservation, 2014) and will therefore not be considered further with regards to the proposed development.

13.3 Potential Construction Impacts

Construction activities may result in a variety of direct and indirect impacts on the marine environment which may in turn affect fish ecology. This section assesses the impact of water quality and underwater noise specifically on fish ecology and is supported by Sections 8: Water Quality and Section 10: Underwater Noise and Vibration.

13.3.1 Increased Sediment Loading

Increased sediment loading can result in increased turbidity which may induce behavioural changes in fish. It can also reduce foraging efficiency, provoking avoidance of areas in which foraging is inhibited due to large sediment plumes. Likewise, increased sediment loading of the water column can create barrier effects for migrating species by preventing fish from passing through affected areas (Robertson et al., 2007; Stuart-Smith et al., 2004; Wenger et al., 2017).

Multiple studies have highlighted that impacts on fish from increased sediment loading are dependent on the concentration of the sediment in the water column and exposure time, with avoidance responses unlikely unless concentrations are relatively high (Wenger et al., 2017). Studies in the Dutch Wadden Sea identified shifts in local abundance of salmonids associated with increased sediment loading, although these occurred when turbidity levels remained high for several years (Jonge et al., 1993; Wenger et al., 2017). It has been shown that outward migrating smolt are particularly sensitive to increased sediment loading (Wenger et al., 2017). Studies of increased sediment loading on sharks (elasmobranchs) identified similar avoidance of areas with high water column sediment loading (Higham et al., 2015).

Rock placement, infilling works, and dredging will all be conducted within the boundary of the DWS development. Section 8: Water Quality and Coastal Processes did not identify any significant impacts with regards to increased sediment loading from these activities. Any sediment mobilised into the water column is expected to be localised and short-lived, with sediments likely to settle quickly due to the low silt fraction. It is also noted that there are no strong tidal currents in the area which would transport suspended sediments further from the site (RPS, 2020).

Atlantic salmon are known to be present in the River Creed, north of the proposed DWS development. With published scientific data illustrating that smolt and adult salmon migration routes tend to follow shallow coastline, there is the potential for overlap between the marine construction works for DWS and possible migratory pathways. European eel are also found in the River Creed, and are anticipated to follow similar migration routes to Atlantic salmon. Research has also highlighted that short-term increases in suspended sediments decrease the foraging ability of juvenile salmon (Roberston et al. 2007). However, as increased sediment loading as a result of construction of the DWS development is expected to be localised and settle quickly, along with a limited scale of dredging activity, there is not anticipated to be any lasting or significant effect on Atlantic salmon or European eel ecology.

Sea trout are anticipated to follow different migratory routes and therefore the effects of increased sediment loading within the water column are not considered to be the same as for other fish species. Local sea trout densities were found to be highest in the Glen River, north of the proposed DWS development. Sea trout at-sea migrations generally occur approximately 3m below the surface of the water, with no preference as to whether they follow the coastline or not. As such, it is possible that without specific migratory pathways, sea trout may more readily avoid sediment plumes. In addition, increased sediment loading from works at DWS will be localised and is not anticipated to travel to and affect the mouth of the Glen River. It is therefore not anticipated that increased sediment loading in the water column will have a lasting or significant effect on sea trout.

Basking sharks are extremely unlikely to be present in the immediate vicinity of the proposed DWS works due to the shallow (<15m) confined waters, which offer no valuable habitat to the species. It is therefore unlikely increased sediment loading from works at the DWS site will have any effect on the species.

As discussed in Section 13.2.4.3 Glumaig Harbour and Stornoway Harbour do not provide valuable habitat for Raitt's sandeel and therefore the species are unlikely to be present. As any increases in sediment loading due to construction activities will be localised within the Glumaig Harbour area, it is not anticipated that increased sediment loading in the water column will have a lasting or significant effect on Raitt's sandeel or the North-East Lewis MPA.

Dredged material not reused in construction is likely to be disposed of at the designated Stornoway disposal ground, located to the southeast of Arnish Point. The spoil ground is within the North-East Lewis MPA, of which Raitt's sandeel are a protected feature, and approximately 105km from the Sea of the Hebrides MPA designated for basking sharks. The Stornoway dredge spoil disposal area does not provide suitable substrate for Raitt's sandeel and the species were identified to be absent around the entrance to Stornoway Harbour and the Stornoway spoil disposal ground (Scottish Government, SNH, & Conservation, 2014). As dredge material is expected to drop rapidly towards the seafloor, increases in sediment loading in the water column will be localised and short-lived, therefore it is highly unlikely that Raitt's Sandeel will be impacted by dredge disposal activities.

As noted in Section 13.2.4, basking sharks are a migratory species travelling great distances so it is possible that they could be present in the disposal area. It is also possible that basking sharks in the area have connectivity to the MPA. Few basking shark sightings have however been reported within 5km of the spoil disposal ground (National Marine Plan Interactive, 2023; NBN Atlas, 2023; HWDT, 2023). It is therefore considered highly unlikely that basking shark will be present within the spoil disposal ground or within the immediate vicinity. It is therefore anticipated that there is a low likelihood that there will be any lasting or significant effects on basking sharks or the Sea of Hebrides MPA from spoil disposal.

While the volume of dredge spoil from the proposed DWS works is to be determined by final design and BPEO, it is expected that the DWS dredge spoil volume will be in the region of one-fifth the volume of DWP. It should be noted that the DWP EIAR assessed the impact on fish receptors of dredge disposal as non-significant as increases in sediment loading in the water column at the disposal site were anticipated to be localised and very short lived. The probability of fish receptors being in the spoil ground, and directly under the spoil vessel at

the time of release is extremely low and as such, it is unlikely that physical injury would occur in this way. Due to the low value habitat and the low probability of fish presence in the spoil ground, potential impacts on all fish species are unlikely to have a lasting or significant effect, as was also concluded in the DWP EIAR (Affric, 2020).

13.3.2 Release of Hazardous Substances

The release of a hazardous substance can have a detrimental impact on water quality and marine species including fish. High concentrations of pollutants or substances toxic to aquatic environments can result in increased mortality rates over short periods of time (Hutchinson et al., 2013; Wenger et al., 2017). The release of hazardous substances also has the potential to cause chronic impacts, where pollutants affect species over extended periods by accumulating in organic tissue, allowing contamination to pass through the wider ecosystem (Hamilton et al., 2017; Oleksiak, 2008). Effects including physiological harm, behavioural disturbance, reduced fertility and, mortality in fish have been reported after both short and long-term exposure to contaminants following a pollution event. The studies also identified that juvenile fish are more vulnerable to pollution events than adults, with lower doses having an effect (Costa et al., 2011; Limburg & Waldman, 2009; Wenger et al., 2017).

The magnitude of potential impacts arising from a release of contaminants would depend on the nature and quantity of material released into the environment. However, the adoption of the mitigation measures and standard industry best practice techniques for pollution prevention identified in Section 8: Water Quality and Coastal Processes significantly reduces or removes the risk of such an event occurring. As such it is considered extremely unlikely that the release of hazardous material of a scale with the potential to negatively impact on fish receptor species, the North-East Lewis MPA or the Sea of Hebrides MPA, will occur. It is therefore considered unlikely that there will a lasting or significant effect, as was concluded within the DWP EIAR.

13.3.3 Underwater Noise

Underwater noise emissions will result from the construction activities associated with the proposed DWS development, which have the potential to result in disturbance, displacement, and injury to fish. This section considers the potential impacts upon fish and is supplemented by information in Section 10: Underwater Noise.

Potential noise effects on fish include:

- Disturbance which causes a species to act differently from normal but does not cause any direct physical harm;
- Temporary Threshold Shift (TTS) – where hearing is temporarily affected but will recover once the animal is no longer exposed to the sound; and
- Permanent Threshold Shift (PTS) – where hearing is permanently damaged.

An underwater noise assessment was carried out for the adjacent DWP development, as detailed in Section 10. This found that the greatest potential impact would arise from impact piling with all other noise sources being significantly less powerful. This section will consider

the potential DWS impacts of underwater noise on fish, based upon modelling results from the DWP assessment.

In order to estimate the ranges from the piling works at which different magnitudes of acoustic impact may occur, outputs of the piling noise model detailed in Section 10 have been compared against the latest fish auditory injury impact criteria provided by Popper et al. (2014). The criteria groups the types of fish into functional hearing groups as shown in Table 13.3.3.

Table 13.3.3: Functional Hearing Groups, and Relevant Fish Receptors (after Popper et al., 2014)

Hearing Group	Relevant Fish Receptors	Sensitivity to Underwater Noise
Fish: No Swim Bladder (P-)	Basking Shark (Sea of the Hebrides MPA)	Least Sensitive
Fish: Swim Bladder Not Involved in Hearing (P-)	Atlantic Salmon Sea Trout European Eel Raitt's Sandeel	↓
Fish: Swim Bladder Involved in Hearing (P+)	None	Most Sensitive

As highlighted in Section 10, the worst-case scenario with regard to piling noise is associated with 1230mm diameter king piles. The impacts assessed were performed on the basis of impact-piling of a 1230mm pile, working continuously with at least 1000 strikes occurring. As such, the impact of piling on fish receptors has been informed on this basis.

The DWP assessment concluded that an element of masking will be likely to occur within tens of metres during piling activities. Severe behavioural responses can therefore be expected within close range to the noise source. These could include startle responses and strong avoidance resulting in exclusion. Behavioural responses are likely to drop to moderate as distance increases between the noise source and the receptor. Moderate behavioural responses include changes in swimming speeds and a reduction of time spent in the area and are likely to occur within hundreds of metres of the noise source. As distance increases further from the noise source, exceeding 1000m, behavioural responses to noise reduce to low.

It was noted that TTS may occur within 150m of the source for species within the P- hearing groups. This includes basking shark, Atlantic salmon, sea trout, European eel, and Raitt's sandeel as shown in Table 13.3.3. It is predicted that any behavioural effects that may occur are to decrease to low within 1,000m of the works. As a single major river discharges into Glumaig Harbour, noise emissions have the potential to disrupt migrations of fish to or from their riverine habitats. However, due to the localised and temporary nature of the predicted acoustic impacts on diadromous fish, together with the low expected densities of these receptors within the affected area, the piling noise impacts are not anticipated to have significant effect in EIA terms, as was concluded within the DWP EIAR (Affric, 2020).

Basking sharks do not have swim bladders, making them less sensitive to underwater noise than the other species noted. In order to suffer injury, a basking shark would need to remain within 1m of the works during 24hr of continuous piling. As this is unrealistic, no risk to the species is identified. The maximum TTS range for basking sharks is predicted to extend to

150m from the piling works with potential for behavioural disturbance within 1000m. However, the waters within 1000m of the works are <15m deep, and extremely confined, making them unsuitable for such a large fish. It is therefore not anticipated, in EIA terms, that there will be a significant effect on basking shark (including the Sea of the Hebrides MPA), as was also concluded within the DWP EIAR (Affric, 2020).

As Raitt's sandeel are likely absent from the development area and where they have been identified to occur is outwith the limits for TTS and PTS, it can be assumed there will be no impact on the species.

13.4 Potential Operational Impacts

Any impacts on fish during operations would be associated with changes in water quality. As discussed in Section 8: Water Quality and Coastal Processes, appropriate arrangements for fuel and chemical storage will greatly reduce the risk of pollution incidents occurring. This will be coupled with procedures for dealing with losses of containment should they occur, in alignment with the SPA's environmental management system. The biosecurity requirements for visiting vessels will also protect water quality. As no significant effects are predicted on water quality with appropriate mitigation measures in place no operational impacts on fish are predicted.

13.5 Mitigation Measures

Potential impacts on fish ecology associated with deterioration in water quality are prevented by the mitigation identified within the Section 8: Water Quality and Coastal Processes.

While the impacts on basking sharks resulting from piling noise and harm during spoil disposal operations were considered not to be of significance, as a matter of best practice, the marine mammal protocols discussed in Section 12.5 will also be applied to basking sharks.

13.6 Proposed Impact Assessment

It is proposed that fish ecology is **scoped out** of the DWS EIA as with mitigation to protect water quality in place, no significant impacts are anticipated.

14 Biodiversity - Benthic Ecology

This section considers the potential impacts of the proposed DWS development on seabed habitats and species, collectively termed benthic ecology. The DWS location is similar to that of DWP, and indeed overlaps with the areas assessed for benthic ecology within the DWP EIA. The proposed construction methodologies of DWS are also anticipated to be largely indistinguishable from those of DWP. As such, reference to previous assessment undertaken for DWP is utilised within this section.

14.1 Legislation, Policy, and Guidance

Benthic habitats and species are considered in the context of nature conservation legislation and relevant policy as detailed in Sections 4: Consenting and Policy Context and 11: Biodiversity.

14.1.1 Data Review

A desk-based assessment was carried out by APEM Ltd in November 2019 as part of the EIA for the adjacent DWP in order to investigate the benthic habitat within the area (Affric, 2020). This involved reviewing a range of data sources to obtain ecological and sediment composition data for the proposed dredge and surrounding area. The APEM Ltd study area covers the site now proposed for the DWS development. Data sources consulted included:

- NatureScot SiteLink Portal (SNH, 2019);
- Results of project-specific geotechnical ground surveys (Causeway Geotech, 2018a, 2018b);
- Broadscale habitat maps from the HHOME (Highland, Hebridean and Orkney Marine Environment) GIS Project provided by Scottish Natural Heritage;
- Broadscale habitat map from EMODnet (EMODnet, 2014);
- Broadscale habitat map from 'Maps NMPI' Marine Scotland portal (Marine Scotland, 2016);
- SEPA Infaunal Quality Index data for Loch Erisort (used as a proxy for Water Framework Directive status assessment for Stornoway Harbour area), (SEPA, 2015);
- Underwater imagery of wrecks in vicinity of the dredge area;
- National Biodiversity Network (NBN) Atlas.

Biotopes identified were classed in accordance with the Joint Nature Conservation Committee (JNCC) Marine Habitat Classification system and the European Nature Information System (EUNIS). Where quoted together, JNCC Classification has been stated first, followed by the EUNIS Code.

HHOME indicated the potential presence of PMF '*Laminaria saccharina* and red seaweeds on infralittoral sediments' (JNCC Classification: SS.SMP.KSwSS.LsacR and EUNIS Code: A5.521) habitat within the DWP dredge area. To the north east of the DWP dredge area there was an area indicated to be potentially representative of a combination of the '*Laminaria saccharina* and red seaweeds on infralittoral sediments' biotope, the '*Echinocardium cordatum* and *Ensis spp*. in lower shore and shallow sublittoral slightly muddy fine sand' (SS.SSA.IMuSa.EcorEns; A5.241) biotope and '*Zostera marina/angustifolia* beds on lower shore or infralittoral clean or muddy sand' (SS.SMP.SSgr.Zmar; A5.5331) biotope. *Zostera marina* beds (seagrass beds) are a PMF. The HHOME mapping also indicated that maerl beds could potentially be present approximately 500m to the east of the DWP dredge area (SS.SMp.Mrl; A5.51) which are another PMF habitat.

A review of the bathymetry of the proposed DWS development site shows an area of disturbance immediately adjoining to the southeast of the proposed quayside and dredge area. Communication with SPA indicates that the area was dredged in the 1970's to facilitate mooring of oil rigs in Glumaig Harbour (SPA, 2023a). The area which was historically dredged can be seen on Drawing WS2139-XX-XX-DR-C-9011 (P15).

14.1.2 Designated Sites

As noted in Table 11.3.4.1 there are no designated sites within the DWS development area, including those selected specifically for benthic features. The North-east Lewis Marine

Protected Area lies approximately 0.6km southeast of Stornoway Harbour and is designated for Risso's dolphin (*Grampus griseus)*, Raitt's sandeel (*Ammodytes marinus)* and geodiversity features associated with the Quaternary of Scotland and Marine Geomorphology of the Scottish Shelf Seabed. Of the designated features only Raitt's sandeel directly utilise the seabed. The area covered by the North-east Lewis MPA is extensive and incorporates the full of extent of a coastal sandeel ground and predicted sandeel habitat. As noted, the proposed DWS development area does not lie within the MPA, and with a sediment type dominated by gravels (see Section 8.2.1) does not provide suitable substrate for Raitt's sandeel. The Northeast Lewis MPA is therefore not considered further.

14.1.3 Benthic Survey

The desk-based assessment undertaken for the adjacent DWP as detailed in Section 14.1.1 identified there to be the potential for PMFs to be present within the development area. This informed the specification of benthic survey works, utilising video transects and still image capture as agreed with NatureScot. The vessel-based survey was completed by Ocean Ecology Limited in March 2020, in line with JNCC epibiota remote monitoring operational guidelines (Hitchin *et al*, 2015). Five transects were initially completed and footage assessed in-situ which informed a further four transect lines to obtain a clear indication of the habitats present. These transects are illustrated in Drawing 113_DRG_03_1 Benthic Transects & EUNIS Habitats, with an indicative layout of the proposed DWS development shown in addition to the consented DWP facility. It should be noted that access for surveying to the west of Glumaig Harbour was restricted by shallow water depths.

Data collected from transects TRV1, TRV4 and TRH2 can be used to identify habitats within the area of the proposed DWS development as TRV1 passes directly through the area, and TRH2 and TRV4 show what is present in the wider area.

Data from the transects was analysed to identify the habitats present according to EUNIS biotopes. Within the area identified for development of the proposed DWS facility (TRV1, TRV4, TRH2), habitats were identified as A5.24 Infralittoral muddy sand, possibly A5.33 Infralittoral sandy mud within areas to the south, and A5.43 Infralittoral mixed sediments. Fauna was noted as relatively sparse with few species identified. These included brittlestars (*Ophiura* sp.), burrowing anemones (likely *Cerianthus lloydii*) and occasional sea pens (*Pennatulacea* sp.). Other species observed included heart urchin (*Brissopsis lyifera*), sand goby (*Pomatoschistus minutus*) and plumose anemones (*Metridium* sp.).

EUNIS biotope identifications from the transects was synthesised into a habitat map for the area, as shown in Drawing 113_DRG_03_1. This identified the majority of the area of the proposed DWS development to be infralittoral muddy sand and/or infralittoral sandy mud with very small patches of infralittoral mixed sediments.

An area of kelp and seaweed communities on sublittoral sediment located to the west of Seid Rocks, east north-east of the proposed DWS development, was identified as a PMF habitat. No other PMFs were identified during the survey.

14.2 Potential Construction Impacts

Construction activities may result in a variety of direct and indirect impacts on the benthic environment and the habitats identified within the proposed development area.

14.2.1 Land Reclamation

Construction of the land reclamation area will result in certain loss of benthic habitat. Habitat biotopes within the area have been identified as Infralittoral muddy sand/Infralittoral sandy mud (SS.SMu.ISaMu; A5.33/A5.24) with small patches of Infralittoral mixed sediments (SS.SMx.IMx; A5.43). The direct loss of these biotopes will result in the loss of individuals, habitats and potential spawning and foraging sites for benthic species utilising the area and associated communities. However, the reclamation area makes up a small proportion of this habitat within the wider area, and although there will be direct loss of individuals and habitat, there will be significant habitat remaining for spawning and foraging. As such, it is not anticipated that habitat loss due to land reclamation will have a population-level effect on the wider area.

The habitats identified within the area were considered to be of moderate value within the DWP EIA and impacts were assessed as minor and non-significant (Affric, 2020). It is not anticipated that the additional reclamation area proposed for DWS and subsequent loss of a small proportion of moderate-value habitat will be significant in EIA terms.

14.2.2 Dredge and Dredge Disposal

Dredging will have an impact on benthic habitats through a combination of direct habitat loss, disturbance, injury, and mortality of benthic organisms. This will occur within the dredge area itself, and if dredged material is to be disposed of at sea, there will also be benthic impacts at the site where material is deposited. These are each considered in turn below.

Habitat within the proposed DWS dredge area has been identified as Infralittoral muddy sand/Infralittoral sandy mud (SS.SMu.ISaMu; A5.33/A5.24) with small patches of Infralittoral mixed sediments (SS.SMx.IMx; A5.43). Within the DWP EIA these habitats were considered to be of moderate value and impacts from dredging were assessed as minor and non-significant (Affric, 2020). While a disturbance additional to current DWP works, the proposed DWS dredge area of approximately 4000m^2 makes up a small proportion of infralittoral muddy sand/Infralittoral sandy mud and infralittoral mixed sediment biotopes within the wider area. Studies have shown that these habitats can undergo recovery following dredging activity (Goldberg *et al*., 2014) and with no maintenance dredging envisaged following construction it is anticipated that benthic species are likely to recolonise and recover over time. It is therefore not anticipated that the dredge proposed for the DWS development will have a significant effect in EIA terms.

A BPEO process will be undertaken with regards to the dredge spoil material as part of the Marine License process. Should material be disposed of it will most likely be deposited at the licensed Stornoway disposal ground (HE035) nearby. The site has previously been used to dispose of dredge material and it is likely that previous spoil deposits at the site have reduced the quality of the benthic communities in the area through repeated burial and smothering of

the habitat. As such benthic impacts within the disposal area as a result of the proposed DWS dredge works are not considered further,

14.2.3 Remobilisation of Sediments

Dredging, disposal of dredged material and land-reclamation works have the potential to release fines and increase sedimentation in the marine environment. Sedimentation can produce smothering effects to benthic organisms and habitat depending on their resilience (Miller *et al*., 2002). The attenuation of light as a result of sedimentation can prevent photosynthetic benthic flora from obtaining energy (Pineda *et al.,* 2016). The effect of this on benthic habitats identified within the dredge and reclamation areas are not considered as they will be lost and/or disturbed, however habitat in the surrounding area may be impacted.

As noted in Section 14.1.3., a PMF habitat was identified to the west of Seid Rocks, east north-east of the proposed DWS development, containing photosynthetic organisms that may be affected by reduced light levels and smothering. Relative to operations already underway in Glumaig Harbour, the proposed dredge area of DWS is significantly smaller than that of DWP, is situated further from Seid Rocks and will be carried out over a shorter period of time. As outlined in Section 8: Water Quality and Coastal Processes, the material to be dredged is anticipated to comprise largely of gravels and sands with low silt content. As such, sedimentation is likely to be localised and settle in a short period of time. In addition to this, mitigation identified within Section 8 will minimise the effects on benthic ecology. It is therefore not anticipated that the remobilisation of sediments from the proposed DWS construction works will have a significant effect in EIA terms on the surrounding benthic habitats or the PMF.

14.3 Potential Operational Impacts

No specific operational activities have been identified which would have an impact on benthic ecology. It is not anticipated that routine maintenance dredges will be required.

14.4 Mitigation Measures

No significant impacts on benthic ecology are anticipated as a result of the construction of the proposed DWS development. As such, no specific mitigation measures are identified. The absence of significant impacts is in part due to the inherent mitigation provided by the design which minimises the extent of the proposed dredge by the location of the development adjacent to an existing area of suitable water depth. Mitigation detailed in Section 8: Water Quality and Coastal Processes will also provide mitigation to minimise effects on benthic ecology.

14.5 Proposed Impact Assessment

It is proposed that benthic ecology is **scoped out** of the DWS EIA as no significant impacts are anticipated, and no impacts additional to those assessed as part of the DWP EIAR have been identified throughout this scoping process.

15 Biodiversity - Terrestrial Ecology and Ornithology

This section considers the potential impacts on terrestrial ecology from the proposed DWS development. With the proposed terrestrial works for DWS being similar in both location and methodology to DWP, reference to previous assessment undertaken for DWP is utilised within this section.

15.1 Legislation, Policy, and Guidance

Terrestrial habitats and species are considered in the context of nature conservation legislation and relevant policy as detailed in Section 4: Consenting and Policy Context and Section 11: Biodiversity.

15.2 Baseline

15.2.1 Background

The wider locality of the development site has been assessed on several occasions due to other projects in progress. The area was partially assessed in April 2020 and December 2021 via Phase 1 Habitat Mapping and an Extended Phase 1 Habitat Survey, respectively (Tracks Ecology, 2020; and Affric 2023). These surveys were undertaken to determine the baseline ecological nature of the area proposed for the DWP development. A Preliminary Ecological Appraisal (PEA) was also undertaken in support of the adjacent Arnish Road Upgrade Development (ARUD) in February and March 2023 (Affric, 2023a). The PEA survey comprised of an Extended Phase 1 Habitat Survey of the site of the ARUD, a 100m terrestrial buffer and all water systems within 200m. The land proposed for the DWS development was included in this survey, and as such its findings are deemed appropriate to support this scoping document. The habitat map produced as part of the PEA document has been overlain with the red line boundary for DWS and is provided as Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3).

A survey for otter was conducted in July and August of 2020. The otter survey included an assessment of all suitable waterbodies within 200m of the DWP development site and the installation and monitoring of camera traps (Affric, 2020b). In addition, pre-construction surveys for otter in relation to the DWP development were carried out in February 2022 (Affric, 2022a), and a pre-construction survey for otter, ground nesting bird and slow worm was completed in August 2023 in relation to a path from DWP to Lews Castle grounds (Tyler, 2023a). Ongoing observations by the Environmental Clerk of Works (ECoW) of the DWP development have been relayed to Affric throughout the construction process. These observations are also considered with this report, with particular interest to otter and breeding birds, due to their known presence locally to the DWP development.

Breeding bird surveys were undertaken between May to July 2023. The findings of which have been appended to this scoping report (see Appendix 2, Tyler, 2023b).

15.2.2 Designated Sites

As identified within Table 11.3.4.1, there is potential for ecological connectivity between the DWS site and otter and ornithological qualifying features associated with the Lewis Peatlands SAC, SPA and Ramsar site, Tong Saltings SSSI and Loch Laxavat Ard and Loch Laxavat Iorach

SSSI. Thus, these features are considered further within Section 15.2.4, as otter and ornithology respectively.

15.2.3 Habitats

The following terrestrial and shoreline habitats were found to be present within the expected area of the DWS development site (see Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3)):

- Semi-improved neutral grassland, which encompass a wide range of communities occurring on neutral soils (i.e. pH 5.5-7.0);
- Marsh/marshy grassland, dominated by rush (*Juncus* spp);
- Bare rock;
- Hard cliff;
- Bare ground, predominantly bare peat;
- Shingle and boulders above the high tide mark; and
- Intertidal shingle and boulders with brown algal beds.

It is noted that the extent of each habitat type potentially affected by the development site will depend on the final project design, particularly with regards to shore-side ground works. However, it is expected that the maximum total area of terrestrial and shoreline habitat loss will not exceed 0.052km^2.

None of the habitats identified within the expected area of the DWS development site are considered to be unique or of high value within the wider locality, as shown in Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3. Ultimately, the habitats identified to be potential lost due to the proposed development are abundant within the local area and wider locality.

15.2.4 Protected Species

The PEAR written in support of the ARUD included an assessment of the site's suitability to support protected species (Affric, 2023a). An overview of the species assessed and their potential to be receptors of the proposed DWS development is provided within Table 15.2.4.

Table 15.2.4: Protected Species Associated with the DWS Development

Receptor	Evaluation Rationale
Amphibians	Although there are no amphibians native to the Isle of Lewis, the DWS development site is within the known range of common frog (*Rana temporaria*), which is protected under the WCA. Appropriate habitats for common frog were identified during the PEA (i.e. heathland). Thus, potential impacts to amphibians are **considered further in Section 15.3.**
Roosting bats	Pipistrelle bats (*Pipistrelle* sp.) are known to be present within the wider context of the site. However, no tree works or alterations to built structures are anticipated to facilitate the DWS development. Hence, no loss or disturbance to suitable roosting habitat is expected as such roosting bats are **not considered further.**

Receptor	Evaluation Rationale
Foraging/commuting bats	Habitats within the site of the DWS development are considered to be suboptimal for bats. However, bats are present within the wider locality there is considered to be potential for foraging/commuting bats to fly through the site on an infrequent basis. Therefore, foraging/commuting bats are **considered further in Section 15.3.**
Ornithological species	Breeding red-throated diver (*Gavia stellata*), black-throated diver (*Gavia arctica*), golden eagle (*Aquila chrysaetos*), merlin (*Falco columbarius*), golden plover (*Pluvialis apricaria*), dunlin (*Calidris alpina schinzii*) and greenshank (*Tringa nebularia*) are known to reside locally, within the Lewis Peatlands Ramsar and SPA (situated approximately 5.6km from the DWS development). Terns, waders and wildfowl are known to overwinter, breed and forage locally, within the Tong Saltings SSSI (situated approximately 3.1km from the DWS development site). Furthermore, great black-backed gull, lesser black-backed gull, common gull, tern species and greylag geese are known to breed and forage locally, within the Loch Laxavat and Loch Laxavat Iorach SSSI (approximately 18.3km from the DWS development site). A breeding bird survey undertaken within the DWS development site during May and June 2023 identified breeding meadow pipit, wren, stone chat pied wagtail and lesser black-backed gull. A number of other species were sighted within the area: greylag goose, mallard, red-breasted merganser, cuckoo, oystercatcher, ringed plover, snipe, herring gull, red-throated diver, hooded crow, raven, hen harrier, white-tailed eagle and buzzard. However, no evidence of these species breeding within the development site or 300m buffer was recorded (Tyler, 2023b). Some of the bird species known to breed within the wider locality are overwintering and associated with coastal habitats. However, none of the habitats within proximity to the DWS development have been identified as winter roosts or of particular high value to wintering birds. Furthermore, there is an abundance of high-quality habitat for wintering birds within the wider locality that would be more suited to supporting wintering bird populations. Hence, although it cannot be discounted that wintering birds may be present within proximity to the proposed works, distributions are expected to be low and infrequent. Due to the known presence of breeding birds, potential impacts to birds are **considered further in Section 15.3.**
Invertebrates	Habitats within the DWS development site have suitability to support a diverse range of common and widespread invertebrate species. However, no protected species have been recorded within close proximity to the proposed development site and no high-quality or unique habitats likely to support rare or vulnerable invertebrate species were identified. Hence invertebrates are **not considered further**.
Otter	Otter (*Lutra lutra*) are known to be present within the River Creed (which is situated <1km from the DWS development site) and the surrounding marine habitats. Thus, potential impacts to otter are **considered further in Section 15.3.**

Receptor	Evaluation Rationale
Reptiles	The site of the DWS development lies within the known range of slow-worm (*Anguis fragilis*), which is protected under the WCA. Appropriate habitats for slow-worm were identified during the PEA (i.e. heathland). Thus, potential impacts to reptiles are **considered further in Section 15.3.**
Protected plant species	No protected plant species were identified during the PEA. Furthermore, there are no records of protected plant species within the DWS development site. As the development site not anticipated to support this feature, protected plant species are **not considered further.**

In conclusion, there is considered to be potential for amphibians and reptiles (collectively referred to as 'herptiles'), foraging/commuting bats, ornithological species and otter to be present within the DWS development site. Thus, the possible impacts to these species as a result of the proposed development are considered in section 15.3. It is of note that all of the species identified have previously been considered within the EIAR for the DWP. Thus, inclusion within the EIA for the proposed DWS development will only be required if new impacts are anticipated or the likely risk exceeds that already considered within the DWP EIA.

15.2.5 Invasive Species

The WCA protects native biodiversity by establishing offences in relation to the control of invasive non-native species (INNS) listed under Schedule 9 of the Act (see Section 11.2). The WCA aims to limit the spread of INNS by making it a legal offence to knowingly or recklessly allow INNS to spread into the wild.

Rhododendron is present throughout the wider locality of the DWS development site due to its proximity to Lews Castle (i.e. the original source of the plant). Rhododendron is an INNS which has spread rapidly throughout the UK after being introduced as an ornamental shrub (Brasier, 2008). Rhododendron is an aggressive coloniser, reducing biodiversity and obstructing growth of other species (Scottish Forestry, 2006). Therefore, all rhododendron plants within the site of the DWP were killed and managed *in situ* during its construction. Thus, efforts to reduce the spread of the INNS have already been undertaken by the SPA. Although there is a possibility that there will be some rhododendron plants within the DWS development site, the number is expected to be low as a result of remedial works already undertaken.

15.3 Potential Impacts

15.3.1 Potential Construction Impacts

15.3.1.1 Habitat Loss

The development will result in the loss of terrestrial and shoreline habitat including the loss of semi-improved neutral grassland, marsh/marshy grassland, bare ground, hard cliff, bare rock and shingle and boulders above high tide and intertidal boulders and rock within the development boundary (see Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3). These habitats will be affected by the process of soil stripping prior to levelling works and creation of the reclamation area. The total area of terrestrial and shoreline habitat loss is not expected to exceed 0.052km^2. The exact area will be dependent on the finalised design in

terms of size of the DWS onshore laydown area and potential levelling of the area at the southern end of the link road.

None of the affected habitat types are considered to be unique or of high value within the local area. Subsequently, the species that utilise these areas are considered to have ample alternative habitat within the immediate vicinity to support local populations (as shown in Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3). As such, no significant effects of habitat loss are anticipated.

15.3.1.2 Spread and Introduction of Invasive Non-native Species

As identified in Section 15.2.5, the number of rhododendron plants within the locality of the DWS development site has already been reduced by INNS management efforts during the construction of the DWP. However, due to the nature of the species, it is likely that a low number of plants will remain. As INNS management has already been undertaken as part of the construction of the DWP, general management to monitor the presence of rhododendron within the development site and treat in situ is likely to be sufficient in preventing the accidental spread or introduction of INNS. Thus, it is anticipated that any potential for negative impacts associated with INNS can be suitably managed and that efforts to eradicate rhododendron within the development site are likely to have beneficial effects upon mitigating spread of INNS within the local area.

15.3.1.3 Accidental Physical Damage

It has been identified that herptiles, foraging/commuting bats, birds and otter may be present within the DWS development site on an infrequent basis. The undertaking of construction activity within environments where protected species may be present has the potential to increase risk of accidental physical damage to individuals. This is due to increased footfall, vehicular traffic and the storage and usage of materials and machinery. Individuals may be accidentally injured, killed or become trapped in excavations or stored materials. The impact of such effects during construction of the adjacent DWP were previously assessed within the EIAR. Provided that general best-practice was followed, impacts were deemed to be non-significant except in relation to otter and breeding birds, where specific mitigation was required.

Land-side construction techniques for the proposed DWS development are within the scope of those assessed for the adjacent DWP, smaller in scale and anticipated to be shorter in duration. It is therefore anticipated that the effects associated with accidental physical damage due to construction of the proposed DWS development will not exceed that of the DWP.

As already noted, otters are a very mobile species and are likely to pass through the proposed DWS site. Otter, if present, may therefore be subject to accidental physical damage from construction works. Appropriate mitigation is discussed in Section 15.4.2.

During the bird breeding season (generally March to September), immobile ornithological features such as nests and chicks will be vulnerable to accidental physical damage. In particular, the removal of shrubs and ground vegetation has the potential to impact upon nesting birds. Nonetheless, general good practice is expected to minimise potential for adverse impacts, and appropriate mitigation is discussed in Section 15.4.2.

15.3.1.4 Disturbance

Construction activity may result in disturbance to protected fauna, such as herptiles, otter, birds and foraging/commuting bats, due to increased visual disturbance, human presence and noise.

Protected species, including herptiles, otter, birds and foraging/commuting bats may avoid areas where there is high visual and noise disturbance, which can impact upon localised spatial distributions. However, habitats within the proposed development area are not expected to independently support any population of herptiles, otter, birds of foraging/commuting bats.

In particular, habitats for herptiles and foraging/commuting bats are largely suboptimal, and there is an abundance of higher quality habitats suitable for these species within the wider locality (see Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3). As such, it is expected that, should herptiles and foraging/commuting bats utilise the site, it is likely to be on an infrequent basis. In addition, in the case of foraging/commuting bats, works are expected to be completed in daylight, therefore, disturbance to crepuscular and nocturnal foraging activity is not anticipated. Hence, temporary localised spatial distributions to herptiles and bats are not expected to impact upon the ability of individuals to survive. Subsequently, no noticeable decline is expected to local populations of herptiles or bats are expected due to disturbance. Thus, no significant effect on herptiles or foraging/commuting bats is expected due to disturbance associated with construction activity associated with the DWS development.

It has been identified during previous ecological survey works (as detailed in Section 15.2.1) that otter are unlikely to utilise habitats within the development area on a frequent basis. Furthermore, there are no resting places for otter within close proximity to the proposed works area. Otter are a very mobile and wide-ranging species and may to pass through the site, potentially using habitats within the DWS development site for foraging and feeding. However, the data collected during the ecological surveys suggest that the DWS development site is largely suboptimal for the species. Furthermore, there is an abundance of higher quality habitats within the wider locality.

Hence, should disturbance result in temporary localised alterations to the spatial distribution of the species, it is not expected to result in a change in the ability of individuals to survive or access optimal habitat or resources. As such, disturbance is not expected to result in any significant impacts upon local populations of the species. Should it be the case, however, that an otter inhabits the site during the interim and an otter resting place of a couch, layup, or holt, or more importantly, a natal holt are present and in use during construction of the DWS, disturbance may have greater effects. This is due to the sensitive nature of resting places relative to mobile otter. Hence, impacts associated with disturbance of a couch, layup or holt have been considered. However, should such a feature be present at the time of works, an EPS licence will be sought from NatureScot and suitable mitigation will be implemented (as per Section 15.3). Therefore, no significant effect is anticipated to the species.

Construction activity has the potential to cause disturbance to birds due to noise, lighting and/or human presence. This is of most concern during the breeding bird season (generally March to September), as disturbance to nesting birds is an offence under the WCA and can result in birds abandoning the nest, which could impact upon local populations. The presence

of nesting birds during the 2023 breeding bird season was confirmed during the breeding bird surveys (Tyler, 2023). Therefore, it can be assumed that there is potential for nesting birds to be present within the DWS development site in the future. Thus, suitable mitigation will be implemented within the SPP to prevent disturbance to breeding birds. For example, pre-construction surveys and the installation of appropriate exclusion zones. Thus, no significant effects are anticipated.

15.3.1.5 Spread and Introduction of High Pathogenic Avian Influenza (HPAI)

An outbreak of HPAI in recent years has resulted in drastic population declines in Scotland's ornithological species (NatureScot, 2023c). The movement of people, machinery and equipment can cause the spread of HPAI, therefore, the accidental spread or introduction of HPAI is considered to be a new potential impact that could occur during the construction phase. HPAI has the potential to infect all ornithological species (NatureScot, 2023b). HPAI is expected to cause large, but temporary declines in bird populations, that may last for several years (NatureScot, 2023c). However, providing the most current general guidance is followed, it is unlikely that construction activity will result in the accidental spread of introduction of HPAI (see Section 15.3).

15.3.2 Potential Operational Impacts

15.3.2.1 Accidental Physical Damage

Once operational, the DWS development will result in increased traffic within the immediate area. Thus, there is potential for accidental damage and incidental death of mobile fauna, such as birds and otter to occur on roads. Increased traffic flows are anticipated on the access road as vehicles attend the DWS site during operations, and also the link road adjoining the DWS facility and Arnish Point Industrial Estate. The increased risk of accidental physical damage from road traffic is considered to be greatest for otter, as a highly mobile species. However, otter are anticipated to preferentially utilise watercourses to commute inland, generally avoiding roads. Furthermore, as otter are highly mobile, they are likely capable of avoidance behaviour to keep away from traffic. Potential impacts of accidental physical damage to otter are not anticipated to exceed those already assessed during the EIA of the DWP, which were determined to be minor, non-significant effects.

Operations at DWS will include the assembly and pre-commissioning of offshore wind turbines within the port. These activities will be undertaken at the quayside and reclamation area of the proposed DWS facility, with one fully constructed turbine anticipated to be in place at a time, and components for others held within the laydown areas.

There are negative impacts related with the erection of wind turbines for birds and foraging/commuting bats associated with the risk of birds and foraging/commuting bats colliding with the rotary blades of the turbines (Cook, et al., 2018; and Barré, *et al*., 2023).

Although there is evidence to suggest that birds do collide with stationary objects (Smallwood & Bell, 2020), the risk of birds colliding with wind turbines is linked with the speed at which the blades are rotating. This is likely due to birds' ability to actively avoid collision with turbines (Martin & Banks, 2023). For the most part, the turbines at the dock will be undergoing assembly and hence, be stationary. Nonetheless, as some activities at DWS will require the temporary

rotation of the blades, the potential for negative ornithological impacts associated with bird collision risk have been considered in more detail here.

Once a turbine is assembled the rotor will be allowed to yaw in all directions and will rotate at less than one rotation per minute (RPM). Some pre-commissioning and initial testing activities will require the rotor to rotate up to 7RPM for 4 to 6 hours, with occasional short overspeed tests increasing the rotational speed up to 12RPM for a maximum of 1 minute. Only one turbine will be fully assembled at a time hence only one can be tested at a time, and assuming there are no issues each turbine will be tested on one occasion.

The number of hours of testing required will be determined by the throughput of the assembly line. Initially it may take a few weeks for each floating turbine to be fully assembled, but as the process matures, it is envisaged that a turbine could be assembled within a week. As deployment to windfarm sites will be weather dependant, it is presumed full assembly will avoid the winter months, although preparatory works could be completed year-round. Hence, it is predicted that in the region of 25 to 40 turbines could be assembled per annum, so in a year there will be between 100 and 240 hours in which turbines could be turning at greater than 1RPM.

Bird collision risk is dependent on several factors, including rotor speed (Balmori-de la Puente & Balmori, 2023), number of blades (Chamberlain, *et al.*, 2006; Scottish National Heritage, 2017b; and Band, 2012), flight hight vs. minimum blade clearance from sea level (Band, 2011; Cook et al., 2012 and Furness, Wade & Masden, 2013), bird species (i.e. size and flight speed) (Masden, *et al.*, 2021; Eichhorn, *et* al., 2012; Scottish National Heritage, 2017b, and Chamberlain, *et al.*, 2006) and visibility (May, *et al.*, 2020). Thus, each of these factors has been considered to anticipate whether the pre-commissioning and initial testing of wind turbines at DWS is likely to result in a significant ornithological affect.

The flight height of a particular bird species in considered to be one of the key factors in determining the risk of collision with wind turbines (Band, 2011, Cook et al., 2012 and Furness, Wade & Masden, 2013). Bird species that fly below the minimum blade clearance from the sea are unlikely to collide with the rotors. A study by Johnston, *et al.*, 2014 was undertaken to model flight heights of marine birds to assess collision risk with offshore wind turbines. The results of the study found that the majority of marine bird species fly within 5m of the sea surface. Whilst gulls fly more regularly at 20m off the sea surface. Ultimately, for all species of bird included within the assessment, the majority of flights were within 20m of the sea surface (Johnston, *et al.*, 2014). The turbines to be commissioned are anticipated to have a minimum blade clearance of 22m from the sea to comply with Safety of Navigation Guidance (Maritime & Coastguard Agency, 2021). Therefore, it would be considered justifiable to assume that the majority of marine bird species will fly below the rotary blade and avoid interaction with moving blades, without the need for additional exertion or behavioural changes.

In the instance that birds fly above the minimum blade clearance other factors influencing collision risk have been considered such as, visibility. A study by Vattenfall, 2023 determined that there is a very low risk of marine birds colliding with offshore windfarms during daylight hours. During the study, marine birds were recorded avoiding turbines within <100m using three different behaviours. Changing flight height, reducing flight speed and changing the direction of travel in relation to the orientation of the moving rotor (Vattenfall, 2023). Similar

results were recorded in Larsen & Guillemette, 2007, where the effects of wind turbines on common eider (*Somateria molissima*) were assessed. The results implied that collision risk is negligible in good visibility conditions (Larsen & Guillemette, 2007). The wind turbines assessed during these studies were at full power.

Even during pre-commissioning and initial testing works the blades will be rotating at relatively low speeds for short periods of time, with full speed only being reached for a matter of minutes. Furthermore, the testing works where turbines could be rotating at greater than 1RPM, are anticipated to primarily be undertaken during daylight hours. Therefore, should a bird fly above 22m (the minimum blade clearance from the sea), it is probable that it will be able to suitably avoid the turbine due to visibility and reduced speeds (in comparison to operational turbines).

Ultimately, bird collision risk due to turbine pre-commission and testing works, which are envisaged to comprise 240 hours per year of single turbine rotation >1RPM during daylight hours, is considered to be negligible. Thus, impacts associated with collision are not anticipated to have any significant effect on local bird populations.

Bats are not expected to use the DWS development site on a frequent basis. However, as a precautionary approach, the potential for accidental physical damage to bats due to collision has been considered. It is expected that the blades of the wind turbines at the DWS development will only turn during the working day, predominantly within daylight hours. Hence, it is unlikely that the blades will be turning during the crepuscular and nocturnal active period for bats. A study was previously undertaken to assess the risk of bats being killed any stationary turbine structures (Horn, Arnett & Kunz, 2008). During which, no cases of a bat striking a turbine monopole nacelle, or stationary blade were identified. This is likely due to avoidance. Hence, likelihood of impact during operations are anticipated to be negligible and non-significant.

15.3.2.2 Disturbance

Once operational, the DWS development may result in increased visual disturbance and noise. This may arise from vehicular movements to, from and within the site, and activities during the assembly and pre-commissioning of offshore wind turbines.

Protected species, including herptiles, otter, birds and foraging/commuting bats may avoid areas where there is high visual and noise disturbance, which can impact upon localised spatial distributions. However, habitats within the proposed development area are not expected to independently support any population of herptiles, otter, birds of foraging/commuting bats.

Habitats within the development area largely suboptimal for these species, and there is an abundance of higher quality habitats suitable for these species within the wider locality (see Drawings 113_DRG_04_1, 113_DRG_04_2 and 113_DRG_04_3). As such, it is expected that, should protected fauna utilise the site, it is likely to be on an infrequent basis. Hence, a very localised alteration to the spatial distributions to protected fauna is not expected to impact upon the ability of individuals to survive. Subsequently, no noticeable decline is expected to local populations of protected fauna as a result of disturbance due to operations. Thus, no significant effect is expected.

As discussed in section 15.2.7.1, birds and foraging/commuting bats are likely to avoid turbine blades by changing flight height, reducing flight speed and changing the direction of travel. Thus, there are additional pathways to disturbance for these species. However, as neither birds or foraging/commuting bats are not expected to fly over the DWS on a frequent basis, disturbance is not anticipated to have any significant impact on individuals. Furthermore, as the blades of the turbines will only be turning at a significantly reduced speed, birds are unlikely to need to make sudden, or unexpected changes to flight patterns that may cause any considerable disturbance. As blades are only expected to be operational during the day, bats are unlikely to be impacted by requirements for sudden change in orientation.

Increased artificial light levels have the potential to cause disturbance to bats. However, no significant effect is anticipated as bats are unlikely to frequent the area and lighting installations will be designed in line with best practice guidelines, to be included within the SPP (Bat Conservation Trust & Institution of Lighting Professionals, 2023).

15.3.2.3 Spread and Introduction of High Pathogenic Avian Influenza

An outbreak of HPAI in recent years has resulted in drastic population declines in Scotland's ornithological species (NatureScot, 2023c). It is expected that HPAI will cause large, but temporary declines in bird populations, that may last up to several years (NatureScot, 2023c). Hence, it is possible that bird populations will still be recovering from the disease once the development is operational. The movement of people, machinery and equipment can cause the spread of HPAI, therefore, the accidental spread or introduction of HPAI is considered to be a new potential impact that could occur during the operations phase (NatureScot, 2023b). However, providing the most current general guidance is followed, it is unlikely that construction activity will result in the accidental spread of introduction of HPAI (see Section 15.3).

15.4 Mitigation

Given the close proximity of DWP and DWS and similar construction processes it is recommended that the mitigation developed for DWP in relation to terrestrial habitats, protected species and INNS be carried through to the DWS development. This is detailed in the Initial Schedule of Mitigation provided in Appendix 1. Mitigation to be implemented during the proposed DWS construction will be set out within a Construction Environmental Management Document (CEMD). The CEMD will also include any additional mitigation measures identified as a result of pre-construction surveys (see Sections 15.4.1).

15.4.1 Protected Species

No protected features associated with protected species have been identified during any of the ecological survey works previously undertaken in the local area (as detailed in Section 15.2.1). However, it is understood that protected fauna are often mobile and there is potential for them to inhabit habitats within the development area in the future. Hence, a precautionary approach has been adopted and pre-construction surveys for protected species will be undertaken within the appropriate seasons and prior to works, where necessary. Furthermore, Species Protected Plans (SPP) for herptiles, bats, birds and otter will be produced, and updated, if necessary after the completion of pre-construction surveys. Should a licensable feature be

identified within development area of likely disturbance distance, for example, an otter holt, an EPS licence will be sought.

The potential for the accidental spread of introduction of HPAI due to increased activity at the development site during the construction and operational phases is unlikely providing general best practice guidance is followed. HPAI control measures in line with NatureScot guidance will be included within the Ontological SPP.

15.4.2 Invasive Species

Management of rhododendron previously undertaken during the development of the DWP will be further implemented in the area of the DWS development. This will include pre-construction surveys for INNS and ongoing management throughout the construction phase.

15.5 Proposed Impact Assessment

Potential receptors in relation to the proposed DWS development have been identified as terrestrial habitats, birds, otter and herptiles.

It is proposed that terrestrial habitats, bats, birds, otter and herptiles be **scoped out** of the DWS EIA, on the basis that the mitigation outlined in 15.4 and Appendix 1 is implemented. Extensive terrestrial baseline surveys already completed over the proposed DWS site have not indicated a gap in current knowledge or specific concerns that require more information for any of the receptors proposed to be scoped out. In addition, it is noted that expected impacts on these receptors are not anticipated to exceed those already assessed within the DWP EIA, which were deemed to be non-significant with appropriate mitigation. The mitigation proposed in 15.4 and Appendix 1 is consistent with that applied for DWP. Thus, terrestrial ecology and ornithology will be **scoped out.**

16 Resource Usage and Waste

This section considers the potential impacts associated with materials utilised in the construction of the proposed DWS facility, and waste that may arise during construction. It also covers the anticipated resource use and waste streams associated with expected activities at the proposed site once operational. Consideration of Resource Usage and Waste was included within the DWP EIAR, however as DWS is a new development in its own right, and therefore additive, reference to DWP is not relevant in this section.

16.1 Policy and Guidance

There are currently no regulations on, or pertaining to, sustainable resourcing in Scotland, outwith the Public Sector. However, in 2010 the Scottish Government published Scotland's Zero Waste Plan (Scottish Government, 2010), which sets out the government's vision for a sustainable and resource efficient future. While the sustainable resourcing aspect of the vision is still to be brought into legislation, developments should strive to fulfil the following two components of the vision:

'Individuals, the public and business sectors - appreciate the environmental, social and economic value of resources, and how they can play their part in using resources efficiently'; and

'Reduce Scotland's impact on the environment, both locally and globally, by minimising the unnecessary use of primary materials, reusing resources where possible, and recycling and recovering value from materials when they reach the end of their life.' (Scottish Government, 2010).

Relevant Scottish Government policy as part of Scotland's National Marine Plan (NMP) includes:

- **GEN 11 Marine Litter:** *Developers, users and those accessing the marine environment must take measures to address marine litter where appropriate. Reduction of litter must be taken into account by decision makers* (Scottish Government, 2015).

Scotland's National Marine Plan also contains a series of good environmental status descriptors. These include:

- **GES 11:** *Properties and quantities of marine litter do not cause harm to the coastal and marine environment* (Scottish Government, 2015).

Other relevant Guidance and information sources used in the section include:

- **GPP 6:** Working on Construction and Demolition Sites (SEPA et al., 2023); and
- Guidance on Applying the Waste Hierarchy (Scottish Government, 2017).

Relevant legislation includes:

- The Environmental Protection (Duty of Care) (Scotland) Regulations 2014;
- The Waste (Scotland) Regulations 2012;
- Section 34 of the Environmental Protection Act 1990 (as amended) (UK Government, 1990); and
- Control of Substances Hazardous to Health (COSHH) Regulations 2002 (UK Government, 2002).

It is recognised that other waste management legislation may be applicable to specific waste items and activities that could arise; these would be considered on a case-by-case basis as appropriate.

16.2 Potential Construction Impacts

16.2.1 Materials

Materials required to construct the proposed DWS development are expected to include the following bulk materials:

- Metals for piles, quayside fixtures (bollards, ladders etc) and reinforcing within the concrete quayside;
- Plastics within the fenders;
- Rock and aggregates for rock armour revetments and land reclamation; and

- Concretes for the quayside and heavy-lift area deck.

The above materials are all finite resources, although some such as steel may have a recycled component. Materials also have an intrinsic carbon cost associated with their production, in particular metals, plastics and cements. They have however, been selected for their structural suitability, durability and lack of degradation over the considerable operational lifetime expected of the DWS facility.

Carbon cost associated with the transport of materials to the construction site depends on their source and mode of transport. With estimated rock requirement for construction of DWS being up to an estimated 550,000m^3, location of its source(s) and hence transport distance to site will have a substantial bearing on the carbon cost of the project. As per Section 3.3.1 Construction Methods, rock removed to create a levelled laydown area west of the DWP-Arnish Point Industrial Estate link road and adjacent to the DWS reclamation area will be used to produce rock armour and infill for the DWS development. Further rock may be sourced from an area adjacent to the southern end of the link road. As such, locally won material is expected to provide the majority of infill for the reclamation area and rock armour for the surrounding revetment, minimising the need for materials transport. Therefore, as also discussed in Section 17: Climate Change and Flooding, the carbon cost associated with the development is expected to be minimised as far as practicable. Note the impacts of material transport on traffic and transport are discussed in Section 24: Access, Traffic and Transport.

Consumables used during DWS construction works will include fuels, oils and other substances covered by COSHH. This will be serviced from on-site storage or existing bunkering services within Stornoway Harbour. Volumes used will be relatively small, and their carbon cost is discussed in Section 17: Climate Change and Flooding. Loss of containment is considered in Section 8: Water Quality and Coastal Processes.

Electricity and water will be required for site welfare and office facilities during construction. Water will also be used for the dowsing of construction materials to suppress dust. Electricity and water usage is however not likely to be significant.

16.2.2 Waste

Waste arising during construction of the proposed DWS development will include:

- Cement washings;
- Dredge-spoil;
- Arisings from welfare facilities (i.e., litter and/or sewage); and
- Various other miscellaneous materials such as packaging, wood from shuttering etc.

The proposed dredging operations are anticipated to give rise to a volume of dredge-spoil in the region of 8,000m^3. In accordance with the Waste Hierarchy, the preference should be for re-use of dredge material where practicable, for example within the reclamation area. This is however, dependent on suitable properties of the dredge-spoil material. Should material not be of suitable composition for re-use, it may be considered for at-sea disposal. Disposal would most likely be at the licensed Stornoway disposal site (HE035), located south of Arnish Point. This will be determined as part of a BPEO assessment undertaken in support of any Marine

License application for the proposed DWS development. Note the impacts of dredge spoil disposal on local water quality are considered in Section 8: Water Quality and Coastal Processes.

Inappropriate management of waste from welfare facilities, packaging or other site activities could give rise to litter. This could include waste plastics entering the marine environment.

16.3 Potential Operational Impacts

The DWS facility once operational will fall under SPA's operational management system. As a Port Authority SPA do not directly utilise large quantities of materials or produce significant waste, however, in recognition of activities undertaken on their premises by tenants, a comprehensive management system is in place which includes:

- Securing of stored equipment/materials in laydown areas;
- Safe storage of COSHH materials;
- Site housekeeping;
- Provision of waste reception facilities;
- On-site waste management including segregation to facilitate recycling and secure storage;
- Waste categorisation and Duty of Care;
- Use of approved waste contractors;
- Strategies for connecting into existing services (i.e., water and electricity); and
- Refuelling procedures.

The above are covered within SPA's Health, Safety and Environmental Guidelines for Facility Users (SPA, 2021), Port Waste Management Plan (SPA, 2020), Site Operations Declaration Form and Fuel Bunkering Form.

As with activities at existing SPA facilities, operators utilising DWS will be required to align with SPA's management system and have appropriate procedures and licenses in place for activities they are undertaking at the DWP site. As such, no materials or waste impacts requiring specific consideration are identified, and mitigation in place through SPA's management system is suggested to be sufficient.

16.4 Mitigation Measures

Primary mitigation is provided by the design of the DWS construction, with use of locally-won rock material to be used for infill of the reclamation area and rock armouring. Concrete will also be sourced from an on-island supplier. In terms of waste, the Waste Hierarchy will be implemented, and relevant waste legislation adhered to. These measures represent best practice during construction, and are aligned with the mitigation implemented at the adjacent DWP facility currently undergoing construction. They are included in the Initial Schedule of Mitigation provided in Appendix 1.

16.5 Proposed Impact Assessment

It is proposed that Resource Usage and Waste be **scoped out** of the DWS EIA. This is on the basis that through the proposed construction methodology, utilising locally sourced rock

material including that produced from creation of the on-shore laydown space, and the application of best practice with regards to waste management, impacts are anticipated to be non-significant. These measures are documented within the Initial Schedule of Mitigation (Appendix 1) which will be incorporated into the CEMD for the DWS development. During operation, activities at the facility will be covered by SPA's established management system.

17 Climate Change and Flooding

This section considers the potential Greenhouse Gas (GHG) emissions and/or savings, and the resultant carbon footprint associated with construction and operational phases of the proposed DWS scheme. The ways in which the effects of climate change, such as extreme weather events and rising sea levels, may impact the development during its lifetime are also considered.

The proposed DWS facility has much in common with the adjacent DWP in terms of construction methods and materials. In a climate change context, materials and their sourcing have a considerable bearing on the carbon footprint of a development. Within the DWP EIA process, climate change was scoped out, with emissions associated with construction considered to be negligible (Envirocentre, 2017). DWS is however, a development in its own right and therefore effects are additional to those considered for DWP, and as such direct comparison to DWP is not utilised in this section.

17.1 Policy and Guidance

The following data sources and information were used to inform this section:

- Climate Change (Emissions Reduction Targets) (Scotland) Act 2019;
- NPF4 (Scottish Government, 2023);
- Scotland's National Marine Plan (Scottish Government, 2015a);
- Institute of Environmental Management and Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition (IEMA, 2022a);
- Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (IEMA, 2020a);
- GHG Protocol Corporate Standard (World Resources Institute, 2015); and
- Pathways to Net Zero: Using the IEMA GHG Management Hierarchy (IEMA, 2020b).

With regards to international policy context, the UK is a signatory to a number of the United Nations Framework Convention on Climate Change (UNFCCC) agreements (UNFCCC, 2022), including:

- **The Kyoto Protocol –** transposed into the Climate Change Act 2008 (as amended), which committed the UK to achieving a net carbon account for the year 2050 to be 100% lower than the 1990 baseline;
- **The Paris Agreement –** a legally binding international treaty agreed in 2016, that aims to limit global warming to below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. It requires countries to reach global peaking of GHG emissions as soon as possible to achieve a climate neutral world by mid-century; and

- **Glasgow Climate Pact -** an agreement in which countries will intensify efforts to build climate change resilience, to curb GHG emissions and to provide the necessary finance for both.

Also relevant is the Fifth Carbon Budget. This report produced by the Committee on Climate Change (CCC) details carbon budgets within UK sectors and identifies reductions that are required to meet the 100% reduction target by 2050.

Scotland has its own national targets to reduce GHG emissions, which are set out in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. This Act aims to ensure Scotland contributes appropriately to the world's efforts to deliver on the Paris Agreement. Emissions Reduction Targets includes a reduction of all GHGs to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, and 90% by 2040, as per the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

The Scottish Government have a number of planning policies detailed in National Planning Framework 4 (NPF4) (Scottish Government, 2023), which aim to deliver the aforementioned targets. NPH4 Policies that are relevant to climate change and the proposed DWS development are as follows:

- **Policy 1 Tackling the Climate & Nature Crises:** *When considering all development proposals significant weight will be given to the global climate and nature crises*;
- **Policy 2 Climate Mitigation & Adaptation:** *To encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change*;
- **Policy 5 Soils:** *To protect carbon-rich soils, restore peatlands and minimised disturbance to soils from development;*
- **Policy 10 Coastal Development:** *To protect coastal communities and assets and support resilience to the impacts of climate change;*
- **Policy 11 Energy:** *To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage*;
- **Policy 13 Sustainable Transport:** *To encourage, promote and facilitate developments that prioritise walking, wheeling, cycling and public transport for everyday travel and reduce the need to travel unsustainably*; and
- **Policy 20 Blue & Green Infrastructure:** *To protect and enhance blue and green infrastructure and their networks* (Scottish Government, 2023).

Scottish Government policy as part of Scotland's National Marine Plan (NMP) relevant to climate change and the proposed DWS development includes:

- **GEN 1 General Planning Principle:** *There is a presumption in favour of sustainable development and use of the marine environment when consistent with the policies and objectives of this Plan;*

- **GEN 3 Social Benefit:** *Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan;*
- **GEN 5 Climate Change:** *Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change*; and
- **GEN 14 Air Quality:** *Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits* (Scottish Government, 2015a).

17.2 Baseline

17.2.1 Carbon Emissions

Since the mid-1800s, the human population has actively contributed towards the release of carbon dioxide and other GHGs into the atmosphere, causing global temperatures to rise and driving long-term changes in climate patterns. This is mainly associated with burning of fossil fuels, which began at scale during the Industrial Revolution (Met Office, 2023a). In recent decades, there has been much focus on reducing carbon emissions. Latest statistical data available shows that in 2021, Scotland's total emissions of GHGs were estimated to be 41.6 million tonnes carbon dioxide equivalent ($MtCO_2e$) (Scottish Government, 2021), reduced from over 75 $MtCO_2e$ in 2000. The trend of Scottish GHG emissions 1990-2021 is illustrated in Figure17.1.

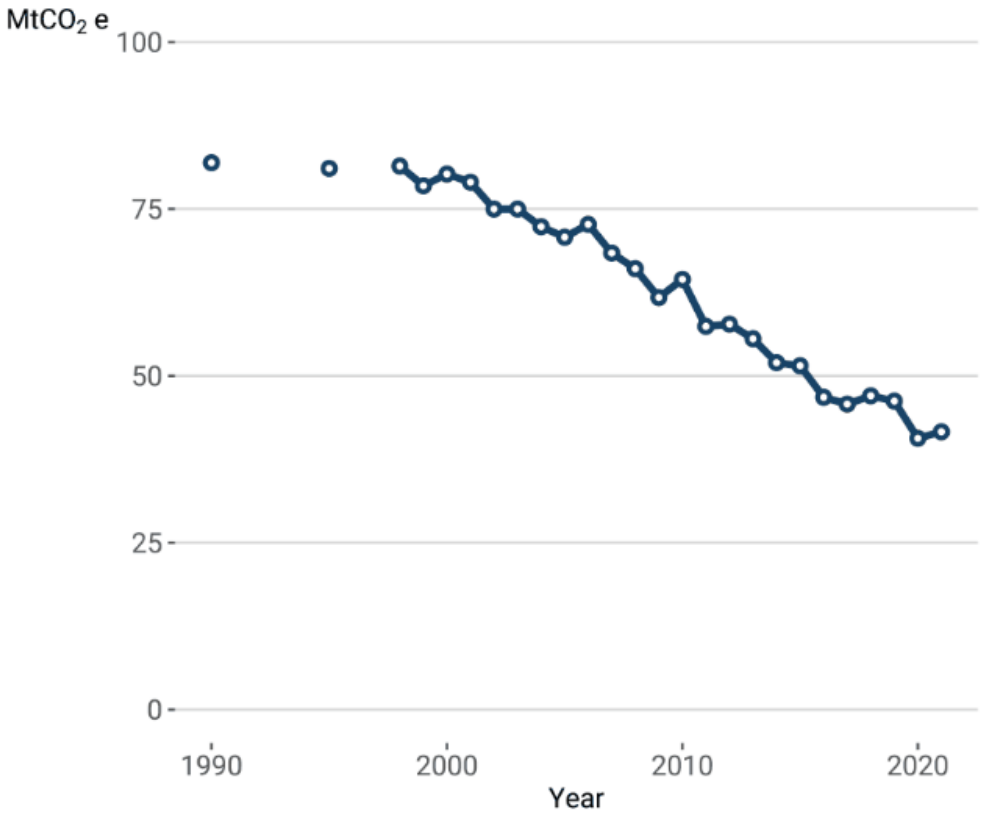

Figure 17.1: Scottish Greenhouse Gas Emissions, 1990-2021 (Scottish Government, 2021)

Peatland acts as a carbon sink, and the removal and redistribution of peat can result in significant carbon emissions. In Scotland, there is an estimated 1.7 billion tonnes of carbon stored within peat, which is the equivalent of 140 years of Scotland's total GHG emissions (NatureScot, 2019). It is generally accepted that peatland sequesters around 172kg of CO_2 equivalent per m^3 of peat (National Trust Scotland, 2016). As detailed in Section 7: Land and Soil Quality, peat is known to be present on site.

17.2.2 Climate Change

Associated with GHG emissions since the start of the Industrial Revolution (1850) until 2022, the global mean temperature has increased by over 1°C (Met Office, 2023a).

Scotland in general has cool summers, mild winters, and rainfall throughout the year. However, in recent times the climate has started to change as a result of global warming. Over the last few decades, Scotland has experienced a warming trend, with shifting rainfall patterns. It is expected that in the future, winters will be warm and wet, with summers being hot and dry (Scotland's Environment, 2023). It is predicted that by 2070 in Scotland:

- Winters will be between 1 and 4.5°C warmer and up to 30% wetter; and
- Summers will be between 1 and 6 °C warmer and up to 60% drier (Met Office, 2023a).

To put this into context, from 1997 onwards Scotland has experienced 10 of its warmest years since records began.

Furthermore, we can also expect an increase in the number of extreme weather events, such as storms and heavy rainfall, which may be more intense than previously experienced. In the UK, coastal water levels are also rising at rates of up to 2mm per year due to climate change, and as a net result, the whole of Scotland is now experiencing sea-level rise, which is also expected to increase in rate (NatureScot, 2022). SEPA Flood Risk maps indicate that the proposed DWS development lies within the medium to high flood risk category, mostly as a result of coastal influence, which will only be exacerbated by rising sea levels (SEPA, 2023c). The level of a 1-in-200-year flood event is anticipated to be 3.4m above ordnance datum (AOD) in this area (SEPA, 2023c).

17.3 Potential Construction Impacts

17.3.1 Carbon Emissions

As with all developments, construction activities have an associated carbon cost. This carbon cost can arise from a multitude of activities, with main contributors relevant to DWS being materials, vehicle movements during material delivery, construction works or staff commuting, and disturbance of carbon-sequestering peat soils. These topics are considered in turn below.

17.3.1.1 Materials

There is an intrinsic carbon-emission cost associated with materials used for construction. As outlined in Section 16: Resource Usage and Waste, the notable bulk raw materials that will be utilised during in the construction of DWS include concrete, rock, aggregates, metals, and plastics.

Concrete is a mixture of sand and cement, and CO_2 is a by-product of a chemical conversion process used in the production of cement. An estimated 622kg of CO_2 is released per tonne of cement produced (Imperial College London, 2021). As such, there will be an inherent carbon emission associated with the concrete to be used within the DWS heavy-lift area and quayside deck.

In terms of metals, steel will be used in the DWS construction, primarily in the form of piles and reinforcing within the concrete of the heavy-lift area and quayside deck. Steel's value and physical properties mean it is highly recycled. All steel used in construction is anticipated to have a recycled component, with average recycled content for steel in the UK estimated to be in the region of 60% (Institution of Structural Engineers, 2021). With steel being the primary metallic material utilised in the DWS design, it is anticipated that use of virgin metals will be suitably minimised.

17.3.1.2 Vehicle Movements

Fossil fuel carbon emissions from use of vehicles during construction will primarily be associated with delivery of the bulk materials to the DWS site. With rock being the principal material, by volume, within the DWS design, transport of rock materials will be a significant determinant of carbon cost for materials delivery. As detailed in Section 16.2.1: Materials, rock produced in the creation of the levelled on-shore laydown area is expected to provide the majority of infill and rock armour for the DWS development. As such, it is considered that the material transport carbon cost will be minimised as far as practicable.

17.3.1.3 Peat

As detailed in Section 7: Land and Soil Quality, it is anticipated that creation of the on-shore laydown area will require removal of in the region of 8,000m^3 of peat, based on the largest expected area of the laydown and existing information on depth of peat cover (note, this figure will be confirmed based on final design and further ground investigation). It is however, planned that removed peat will be reinstated, as will be defined within a PMP developed for the DWS construction. This will minimise the carbon emission associated with disturbance of peat.

17.3.2 Climate Change

Construction activities at DWS are not expected to contribute to an increase in extreme weather events and flooding. Although creation of the land-reclamation area does technically result in encroachment on the volume of the coastal waterbody, the impact of this will be negligible and is not anticipated to increase the risk of coastal flooding.

Extreme weather may hamper progress of works but is unlikely to impact the development as a whole. This is also discussed in Section 25: Major Accidents and Natural Disasters.

17.4 Potential Operational Impacts

17.4.1 Carbon Emissions

Carbon emissions from the operational phase of the proposed DWS development are likely to arise from the following:

- Vessels utilising the port facilities;

- Services associated with the port facilities i.e. electric;
- General operational maintenance activities; and
- Vehicle movements due to deliveries of cargo and workers commuting to and from the development.

Considering the wider context, the DWS development is proposed to be utilised to facilitate the offshore renewables sector. The offshore renewables sector is being developed in order to contribute to meeting of Scotland's net zero targets, ultimately reducing the national carbon footprint. Thus, the DWS development may be considered to offset its operational carbon cost by facilitating the production of renewable energy. As such, an overall positive impact on carbon emissions is anticipated as a result of operations at the DWS facility.

17.4.2 Climate Change

The design of the DWS development takes into consideration likely sea level rise. The proposed height of the land-reclamation area is in the region of +7.2m to +7.5m relative to CD.

SEPA predict that a 1-in-200 year storm event will result in coastal flooding at a height of 3.4m AOD (SEPA, 2023c), and CnES have previously advised a figure of 3.44m AOD. SEPA guidance (2023d) predicts that the sea level in the Western Isles will rise by 0.93m by 2100. Chart Datum in Stornoway is 2.71m below Ordnance Datum, and Highest Astronomical Tide for the port is some +5.53m CD (National Tidal and Sea Level Facility, 2023). This gives a maximum anticipated flood level of 7.19m above CD. As such, even 1-in-200 year storm events occurring during high spring tides are not anticipated to result in tidal inundation of the land reclamation platform. Furthermore, no permanent buildings are proposed on the platform.

The siting of the development, within the shelter of Stornoway Harbour, is also such that exposure to extreme weather events of increasing frequency and severity will be minimised. As such, no detrimental impacts as a result of climate change are anticipated with respect to operation of the DWS development.

17.5 Mitigation Measures

Opportunities to minimise carbon emissions and mitigate potential climate change impacts are inherent within the proposed design of the DWS development. This primary mitigation achieves:

- Minimisation of carbon emissions from delivery of bulk materials for construction of the DWS, through the use of local sources;
- Implementation of the Waste Hierarchy, with reuse of rock material generated in the creation of an on-shore laydown area for construction of the land reclamation area;
- Resilience against predicted sea level rise associated with climate change; and
- Facilitation of offshore renewable energy developments.

As such, no additional specific mitigation is identified.

Impacts in terms of carbon-rich peat soils will be assessed as outlined in Section 7: Land and Soil Quality, with identification of appropriate mitigation through a Peat Management Plan (PMP.

Mitigation relevant to the topic of climate change is also detailed in Section 16: Resource Usage and Waste. This outlines that in addition to use of locally sourced rock, other local materials will be utilised where available. For example, on-island sourcing of aggregates for concrete. This will ensure carbon emissions associated with transport of materials for construction of the facility are minimised as far as practicable.

17.6 Proposed Impact Assessment

It is proposed that Climate Change and Flooding is **scoped out** of the DWS EIA. It is recognised that there will be carbon emissions associated with construction of the proposed DWS development, primarily associated with the intrinsic carbon cost of materials and use of fossil fuels during construction works. However, this a one-off carbon cost, and averaged over the considerable operational lifetime of the proposed DWS development is not deemed to be significant in EIA terms.

This is supported by primary mitigation provided by the design of the proposed DWS, and mitigation outlined in Appendix 1 in relation to Section 16: Resource Usage and Waste. This ensures that carbon emissions as a result of bulk material transport are minimised through use of local sources, and the Waste Hierarchy is appropriately implemented to minimise use of virgin materials.

In addition, specific assessment proposed within Section 7: Land and Soil Quality (Section 7) will result in the development of a PMP, relevant to climate change impacts associated with disturbance of peat soils. The PMP will detail how peat removal will be minimised, and where peat removal is proposed, will document agreed protocols for handling, storage and reinstatement to minimise carbon loss.

Finally, the DWS development will facilitate production of renewable energy through support of the offshore wind sector. This will offset the carbon emissions associated with construction of DWS, and balanced over the operational lifetime of the development, carbon cost of the project is anticipated to be, at worst, neutral, and therefore non-significant. While facilitation of the offshore wind sector may be considered a permanent impact of the DWS development during its operational lifetime, it by definition constitutes the purpose of the project and as such does not require specific assessment in EIA terms.

18 Landscape, Seascape and Visual Effects

This section addresses the potential direct and indirect effects of the proposed DWS development on landscape, seascape, and visual interests. These are defined respectively within the Guidelines for Landscape and Visual Impact Assessment (GLVIA) as:

> '*The constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape*';

'*Landscapes with views of the coast or seas, and coast and adjacent marine environments with cultural, historical, and archaeological links with each other*'; and

'*The people who will be affected by changes in views or visual amenity at different places*' (Landscape Institute and Institute of Environmental Assessment, 2013).

With the proposed DWS facility a complementary yet distinct development relative to the adjacent DWP, reference has not been made to the previous assessment undertaken within the DWP EIA. The DWP itself will however, be taken into account within the baseline and further assessment of the proposed DWS development, with the visual effects of the two facilities being cumulative.

To help inform the scope of a Landscape, Seascape and Visual Impact Assessment (LSVIA) as part of the EIA process, an initial appraisal has been undertaken as a desk study exercise to identify the following:

- The landscape character of the site and surrounding area;
- The seascape character of the site and surrounding area;
- The coverage of any landscape designations across the site and surrounding area;
- Important views and viewpoints towards the site from the surrounding landscape/seascape;
- Any potentially significant landscape and visual effects during construction and post-completion; and
- Proposed impact assessment.

In support of this, zone of theoretical visibility (ZTV) analysis has been undertaken, which utilises a Digital Terrain Model to determine areas where the development is likely to be visible. This is detailed fully in Section 18.2: Baseline.

18.1 Policy and Guidance

As part of Scotland's National Marine Plan, Scottish Government policy that relates to landscape includes:

GEN 7 – Landscape/Seascape:

'*Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account*' (Scottish Government, 2015).

As outlined in Section 4: Consenting and Policy Context, the local development plan relevant to this proposal consists of the adopted Outer Hebrides Local Development Plan (OHLDP). Key objectives of the Plan are to facilitate:

- a good place to live in and move to;
- a successful place for working in; and
- an attractive place enjoyed by residents and visitors (CnES, 2018).

In taking forward these objectives, the OHLDP includes the following landscape-related policies to be considered as context for this scoping report:

Policy PD1: Placemaking and Design

'Development proposals must demonstrate a satisfactory quality of place-making, siting, scale and design that respect and reflect positive local characteristics and will complement or enhance the surrounding built and natural environment, while taking account of the guidance contained within the Outer Hebrides Design Guide.'

Policy NBH1: Landscape

'Development proposals should relate to the specific landscape and visual characteristics of the local area, ensuring that the overall integrity of landscape character is maintained.

The Western Isles Landscape Character Assessment (WI-LCA) will be taken into account in determining applications and developers should refer to Appendix 1 of this Plan for a summary of this guidance.

Development proposals should not have an unacceptable significant landscape or visual impact. If it is assessed that there will be a significant landscape or visual impact, the applicant will be required to provide mitigation measures demonstrating how a satisfactory landscape and visual fit can be achieved.

Development that affects a National Scenic Area (NSA) will only be permitted where:

a) the objectives of designation and the overall integrity of the area will not be compromised; or

b) any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.

Development proposals should be able to demonstrate no unacceptable adverse impact on the character of areas of Wild Land, as identified on the 2014 SNH Maps, and that any significant effects on these qualities can be substantially overcome by siting, design or other mitigation.'

Policies **NBH5: Archaeology – Impact on Scheduled Monuments or their Settings** and **NBH6: Historic Areas** of the OHLDP are relevant to landscape, seascape and visual effects in terms of impact on historic assets, and are also applicable to Section 19: Archaeology and Cultural Heritage:

Policy NBH5: Archaeology – Impact on Scheduled Monuments or their Settings

'Development proposals that will adversely impact upon scheduled archaeological remains or the integrity of their settings will only be permitted in exceptional circumstances where there is no practical alternative site and where there are imperative reasons of overriding public interest.'

Policy NBH6: Historic Areas

'Any proposal assessed to have a negative effect on the Conservation Area and its setting will not be permitted….

….Any development proposal must preserve and, where appropriate, seek to enhance Lews Castle and Lady Lever Park as described in the Inventory of Gardens and Designed Landscapes.'

18.2 Baseline

The purpose of the baseline desk study is to identify the existing landscape, seascape and visual resources against which the potential effects of the proposed development can be judged. To inform this, the following are appraised:

- Landscape character
- Seascape character;
- Landscape designations; and
- Key views and visual receptors.

As noted in the Section introduction, ZTV analysis has been undertaken to support appraisal of the above. ZTV analysis has been based upon a receptor viewing height of 1.8m and 'unscreened' or 'bare earth' scenario whereby the screening effects of vegetation and manmade features are not taken into account. Two ZTV scenarios have been considered: 'Development Platform ZTV', comprising of the quayside and laydown areas of the DWS development, and 'Crane & Turbine ZTV' representing the structures that will be in place during operations at the DWS facility. The Crane & Turbine ZTV differentiates locations where both the turbine and crane are likely to be visible, and those where just the taller turbine structure would be visible.

The ZTVs are presented in the Drawings section accompanying this report, as detailed in Table 18.2.1 below. For each ZTV scenario, the ZTV itself has been presented as a Drawing, and separate Drawings detail the overlay of the ZTV with relevant landscape character and visual receptors. The Drawings also include 5km and 50km extents from the DWS development, for the Development Platform and Crane & Turbine ZTVs respectively.

Table 18.2.1: Details of ZTV Drawings

ZTV	Drawing Title	Description
Development Platform	Figure 1 Development Platform ZTV	ZTV of development platform.
	Figure 2 Development Platform ZTV Landscape & Visual Receptors	ZTV of development platform overlaid with landscape and visual receptors.
Crane & Turbine	Figure 3 Crane & Turbine ZTV	ZTV of crane and turbine, differentiating areas where both structures are visible vs turbine only.
	Figure 4 Crane & Turbine ZTV Landscape Character	ZTV of crane and turbine overlaid with landscape character types.
	Figure 5 Crane & Turbine ZTV Landscape & Visual Receptors	ZTV of crane and turbine overlaid with landscape and visual receptors.

18.2.1 Landscape Character

As illustrated in Figure 4 Crane & Turbine ZTV Landscape Character (NE Sector), the site of the proposed development is located within the *Rocky Moorland* landscape character type (LCT). To the east of Stornoway, the landscape is characterised by a *Gentle Sloping Crofting* LCT, and to the west and north of the town, *Boggy Moorland* LCT.

Within the Outer Hebrides, the *Rocky Moorland* LCT forms extensive inland areas in central Lewis and South Uist and smaller areas along the east coast of Harris, North Uist, Benbecula and Barra. Its key characteristics are:

- Rocky, stepped landscape with irregular topography;
- Rocky knolls interlocked with peaty moorland vegetation and small lochans;
- Considerable diversity of form and texture;
- Occasional areas of forestry, small woodlands and shelter planting;
- Medium scale; and
- Predominantly uninhabited and sense of remoteness.

18.2.2 Seascape Character

Seascape character is made up of physical characteristics of hinterland, coast and sea, a range of perceptual responses to the seascape, as well as visual aspects. Although no detailed seascape character assessment has been undertaken for the study area, a regional/national coastal character assessment was undertaken in support of a study on the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms (SNH, 2005).

As detailed within this study, the site of the proposed development is located within the *Low Rocky Islands Coast* seascape character type (SCT) which exhibits the following key characteristics:

- Low rocky coastline, cliffs and fragmented coastline in places backed by moorland;
- Sparsely settled, small crofting settlements along coastline, large settlement at Stornoway with some industrial development, airport and busy port;
- Views of the Minch and beyond views of distant hills on the mainland particularly distinctive Assynt; and
- Parts of this landscape feel remote except Stornoway area.

In assessing sensitivity, the study identifies key seascape sensitivities that provide a framework in which to assess the potential impacts of the proposed development. These are summarised in Table 18.2.2.1.

Table 18.2.2.1: Analysis of Relevant Seascape Sensitivities

Sensitivity criteria	Analysis
Scale and Openness	Fairly open and large to medium scale, apart from to the south of this area where the landscape is more contained and smaller scale around Loch Eireasort.
Form	Horizontal emphasis particularly to the north of Stornoway and on the Eye Peninsula, gently undulating with cliffs at coast. The form becomes more complex further south with a more fragmented and contained seascape.
Settlement	Sparse settlement in the north, major settlement including some industry around Stornoway and crofting settlements elsewhere. Some uninhabited areas.
Pattern/Foci	Foci and pattern varied. Foci include views to Assynt on clear days, important headlands and peninsulas e.g. Tolsta and the Eye peninsula.
Lighting	Stornoway is lit but the rest of the seascapes and out at sea are dark.

Sensitivity criteria	Analysis
Movement	Busy port at Stornoway but generally the rest of the area is fairly quiet including some uninhabited areas to the north of Tolsta.
Aspect	Easterly aspect across sea, from settlement, roads and ferries. There is a heritage trail from Tolsta to the North of Lewis and open sea views over to Skye are important here.
Modification, Remoteness & sense of Naturalness	There is modification in parts, around Stornoway, and some telecommunications masts etc. The crofting patterns, whilst traditional, can in places appear in contrast to the rougher, wilder and more natural surroundings. Generally, a largely natural and remote area, particularly in the hinterland of Lewis.
Exposure	Feels exposed to the north of this area where coastline becomes more linear, hinterland is flatter and sheltered areas are fewer.

In considering the above factors, the study identifies a *medium-high* sensitivity to offshore wind turbines and in assessing capacity, notes:

'Turbines would relate to the linear coastline and simpler hinterland to the north but conflict with qualities of remoteness and naturalness. Further south a windfarm would conflict with more complex landform although ***the port and industry at Stornoway provides an area of developed nature where turbines could relate****. Elsewhere settlement is small scale and traditional and development would not relate to this character. Distinctive views of mainland mountains create greater sensitivity in this unit as a windfarm would conflict with the focus of these important views.'* (SNH, 2005)

18.2.3 Landscape Designations

As illustrated within the Drawings section in Figure 2 Development Platform ZTV Landscape & Visual Receptors and Figure 5 Crane & Turbine ZTV Landscape & Visual Receptors, the proposed DWS site itself is not covered by any landscape designations. However, the Lews Castle and Lady Lever Park Garden and Designed Landscape (GDL) designation is located approximately 800m to the north-west at its closest point. As detailed in the designation citation, the GDL is:

'a prime example of a mid-late 19th century ornamental and estate landscape, rare on Lewis, laid out with coastal and riverside carriage drives and walks. The designed landscape comprises a series of distinctive wooded parklands contrasting dramatically with the prevailing openness of the island landscape…. The GDL also makes outstanding contribution to the setting of Stornoway' (Historic Environment Scotland, 2023a).

With a large number of Listed Buildings, most of Stornoway town centre is designated a Conservation Area and on Arnish Point, there are two Listed Buildings and a Scheduled Monument. These are discussed further in Section 19: Archaeology and Cultural Heritage.

The closest National Scenic Area (NSA) is the *South Lewis, Harris and North Uist* NSA, which is located approximately 26 km south-west of Stornoway. Two parts of this NSA are also

identified as Wild Land Areas. As described by NatureScot, the Special Qualities of the NSA are:

- A rich variety of exceptional scenery;
- A great diversity of seascapes;
- Intervisibility;
- The close interplay of the natural world, settlement and culture;
- The indivisible linkage of landscape and history;
- The very edge of Europe;
- The dominance of the weather;
- The wild, mountainous character;
- Deep sea lochs that penetrate the hills;
- The narrow gorge of Glen Bhaltos;
- The rockscapes of Harris;
- Extensive machair and dune systems with expansive beaches;
- The drama of Ceapabhal and Tràigh an Taoibh Thuath;
- The landmark of Amhuinnsuidhe Castle;
- The distinct, well-populated island of Sgalpaigh; and
- The enclosed glens of Choisleitir, Shranndabhal and Roghadail (SNH, 2010).

Although not specifically a landscape designation, the Callanish Sensitive Area is also a relevant landscape-related consideration. The OHLDP states (as part of Policy NBH5: *Archaeology - Impact on Scheduled Monuments or their Settings*):

> "*The Greater Callanish area is a significant prehistoric landscape incorporating a complex of 15 Scheduled Monuments and many more undesignated heritage assets. Views from and between the monuments, and their presence in views from the surrounding landscape are an important part of our understanding, experience and appreciation of their setting and this has led to the development of a planning tool, the Callanish Sensitive Area, as shown on the Plan Area Context Map.*"

18.2.4 Key Views and Visual Receptors

As illustrated within the Drawings section in Figure 1 Development Platform ZTV, the ZTV of the quayside and laydown areas is relatively localised as this is restricted by containing rising ground to the west of the site, large areas of mature woodland to the north-west, and extensive built development across Stornoway. However, as the site of the proposed development is located in quite close proximity to town, there are a relatively large number of receptors with open views towards it. This includes residents and road users alongside the harbour, visitors to the town, and other recreational users. Daily ferries from Stornoway to Ullapool also pass in very close proximity to the site.

Overlooking the town, Lews Castle commands panoramic views and is prominent on the sea approach to Lewis. With a dense network of Core Paths leading through the grounds, views from Lews Castle and Lady Lever Park overlook Stornoway, the inner harbour and sea beyond.

Extensive views are also obtained from the summit of Cnoc Croich across to Lews Castle, the island's hinterland and the harbour. Similar views of the site are also experienced from areas of low rising moorland to the south of the harbour.

Within the wider study area, the Hebridean Way leads in a south-westerly direction from Stornoway and although the site is unlikely to be visible from this in close proximity, long-range views are possible. Very long-range views (50 km+) towards Lewis are also experienced from the mainland coastline and associated inland mountainous summits.

18.3 Potential Construction Impacts

As noted previously, the site benefits from a relatively contained setting. Areas of low-rising ground and headlands, extensive woodland cover across Lews Castle and Lady Lever Park, and built development in Stornoway, is likely to restrict the extent of landscape, seascape and visual impacts of the development platform to a very localised area.

The construction phase for the proposed DWS development is expected to be in the region of 12 months. During this time, activity would include the extraction of rock, dredging of the seabed, and reclamation of land. With the presence and operation of plant machinery, delivery vehicles/vessels and construction of infrastructure, this is likely to affect the views of some nearby boat/ferry users in the harbour, and visitors to the Arnish Lighthouse, for the duration of the construction phase. The views of some recreational users from Lews Castle and Lady Lever Park (and associated Core Path Network) also have the potential to be affected by the construction works. However, given the effects of the existing DWP development and harbour operations, effects on residents and visitors to the town are unlikely to be significant, as are effects on local landscape and seascape character.

Although the extent of effects arising from construction of the development platform are likely to be very localised, the construction and commissioning of the heavy-lift capacity crane will be more obvious and widespread, due to the height of the structure. However, as the timing of the crane construction is anticipated to be closely associated with operational use of the DWS facility, further consideration is included in Section 18.4: Potential Operational Impacts.

18.4 Potential Operational Impacts

Considering the influence of large-scale industrial development at Arnish Point and the ongoing construction and imminent operation of the adjacent DWP, the effects of the DWS development platform are unlikely to be significant. Cumulative effects could, however, have the potential to be significant. Given the considerable height of the proposed heavy-lift crane and the wind turbines undergoing construction and pre-commissioning at the site, there is potential for effects on the following receptors:

- Landscape and seascape character;
- Lews Castle and Lady Lever Park GDL;
- The setting of the Conservation Area and associated Listed Buildings, and Scheduled Monuments around the harbour (see Section 19: Archaeology and Cultural Heritage for further discussion);
- Views and amenity of residents within Stornoway and surrounding areas;

- Views and amenity of road users in and around Stornoway;
- Views and amenity of Core Path and Hebridean Way users;
- Views and amenity of visitors to Arnish Lighthouse; and
- Views and amenity of ferry passengers and other recreational boat users.

Significant effects on the South Lewis, Harris and North Uist NSA are considered unlikely, as the NSA is located approximately 26km south-west of Stornoway and the ZTV is relatively limited in this direction. While there could be some visibility from some summits closest to the development, including parts of the Callanish Sensitive Area (but not the Stones), it is unlikely that landscape and visual effects would be significant at this distance.

While as the ZTV analysis indicates, the proposed crane and turbine would theoretically be visible from the mainland, effects are very unlikely to be significant over such distance.

18.5 Proposed Impact Assessment

Based on the findings of this desk-based appraisal and the potential for significant effects during construction and operational phases as detailed above, it is recommended that Landscape, Seascape and Visual Effects be **scoped in** to the DWS EIA. A full Landscape, Seascape and Visual Impact Assessment (LSVIA) should be undertaken, in accordance with the *Guidelines for Landscape and Visual Impact Assessment* (GLVIA), Version 3 (Landscape Institute and the Institute of Environmental Management and Assessment, 2013). As an overview, the objectives of this would be to:

- Describe the methodology and criteria used to inform the assessment process;
- Identify the landscape related policy context and guidance;
- Identify and assess the key landscape and visual baseline conditions and associated sensitivities;
- Identify design principles and other mitigation measures embedded into the design of the project to help minimise any likely significant adverse effects; and
- Identify and evaluate any residual landscape, visual and cumulative effects, including direct and indirect, based on the worst-case parameters as currently known.

This LSVIA would be informed by a desk-based analysis of existing data and other information gathered through a field survey. Given the substantial height of the proposed crane and wind turbines that may be present at the DWS during operations, a 60 km radius study area is suggested. The assessment would identify the baseline against which the effects of the proposed DWS development are assessed, and focus on predicting the likely adverse effects during the operational phase.

Although inter-related, landscape and seascape effects are assessed separately to the effects on views and visual amenity.

Landscape/seascape effects consider the fabric, character and quality of the site and surrounding landscape/seascape and are concerned with:

- Landscape/seascape elements (e.g. woodlands, coastline and settlements);

- Landscape/seascape character (local and regional distinctiveness); and
- Special interests and values (e.g. designations, conservation areas and cultural associations).

Visual effects are primarily concerned with the changes in people's views through intrusion or obstruction and whether important opportunities to enjoy views may be improved or reduced.

As part of the LSVIA, a detailed Viewpoint Assessment should be undertaken and informed by photomontages to illustrate the appearance of the proposed development. This will identify the static visual effects and the magnitude of landscape/seascape effect at a given location. The viewpoint findings would also inform a wider assessment of landscape, seascape and visual effects. Table 18.5.1 sets out the proposed viewpoint locations to be used for the assessment, and the associated justification for selection in terms of receptors.

Table 18.5.1: Proposed Viewpoint Selection

Viewpoint (Approx. NGR)	Visual Receptors	Photomontage(s)
0 - 5 km		
1. South Beach (NB 42240 32738)	Residents Visitors	- Development Platform - Development Platform with Turbine & Crane
2. Newton Street/Marina (NB 43017 32348)	Residents Visitors	- Development Platform - Development Platform with Turbine & Crane
3. Harbour (offshore) (NB 42608 31772)	Visitors Recreational users	- Development Platform - Development Platform with Turbine & Crane
4. Lower Sandwick (NB 43849 31643)	Residents Recreational users	- Development Platform - Development Platform with Turbine & Crane
5. Lews Castle (NB 42030 33153)	Visitors	- Development Platform - Development Platform with Turbine & Crane
6. Lewis War Memorial (NB 41727 34329)	Visitors	- Development Platform - Development Platform with Turbine & Crane
7. Iolaire Monument (NB 44396 30768)	Visitors	- Development Platform - Development Platform with Turbine & Crane
5 - 15 km		
8. Gress (NB 49244 41879)	Residents Road users	- Turbine & Crane
9. Druin Dubh Stone Circle (NB 38260 30530)	Visitors Road users	- Turbine & Crane
15 - 30 km		
10. Barvas (NB 35968 49563)	Residents Hebridean Way	- Turbine & Crane
11. Beinn Mhor summit (NB 25567 09352)	Recreational users	- Turbine & Crane
12. Portvoller Lighthouse (NB 57304 37681)	Visitors	- Turbine & Crane
30 - 60 km		
13. Kneep (NB 09507 36958)	Residents Visitors	- Turbine & Crane
14. An Cliseam summit	Recreational users	- Turbine & Crane

Viewpoint (Approx. NGR)	Visual Receptors	Photomontage(s)
(NB 15484 07304)		
15. Ullapool Ferry Route (NB 90031 01475)	Visitors	- Turbine & Crane

In addition to a detailed assessment of landscape, seascape and visual effects, the LSVIA should also provide an assessment of cumulative effects with proposed and operational windfarms. Although a further search of relevant schemes to be considered will be undertaken at the time of assessment, the following projects have been identified for consideration:

- Monan Windfarm
- Uisenis Windfarm
- Muaitheabhal Windfarm
- Stornoway Windfarm

In assessing all landscape, seascape and visual effects, the degree of significance (in context of EIA Regulations) would be identified. The significance level of the landscape/visual effect increases from negligible to substantial with increasing receptor sensitivity and greater magnitude of effect. The assessment of significance level is based on pre-defined criteria. Field survey assessment tables will be used to provide a framework that helps to ensure consistency and transparency in the decision-making process, but are not to be used as prescriptive tools, allowing for the exercise of professional judgement in determining sensitivity, magnitude and significance. The LSVIA, including the detailed Viewpoint Assessment, should provide details of how the significance of effects has been determined in each case.

19 Archaeology and Cultural Heritage

The focus of this section is potential effects on the historic environment associated with the construction and operation of the proposed DWS development. It aims to identify the nature and extent of any known heritage assets or areas of archaeological potential, onshore and offshore, that may be affected by the proposal.

Construction of DWS is proposed to take place within an area well-characterised by onshore and offshore investigations undertaken for the neighbouring DWP development. With the implementation of appropriate mitigation including an archaeological Written Scheme of Investigation (WSI) (Wessex Archaeology, 2021a), Watching Brief (WB) and Protocol for Archaeological Discoveries (PAD) during works, the impacts of DWP on archaeology and cultural heritage were deemed to be non-significant (Affric, 2020). The construction of DWS does however, involve disturbance of areas, both on and off-shore, additional to those affected by DWP. The potential impacts of this are addressed in this section utilising information gathered during the DWP EIA and WB process.

19.1 Policy and Guidance

Relevant guidance and information sources include:

- PAN 2/2011: Planning and Archaeology (Scottish Government, 2011c);
- Managing Change in the Historic Environment: Setting (Historic Scotland, 2016); and
- PASTMAP, Exploring Scotland's Historic Environment (Historic Environment Scotland, 2023b)

Scottish Government policy as part of Scotland's National Marine Plan (NMP) relevant to archaeology and cultural heritage includes:

- **GEN 6 Historic Environment**: *Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance* (Scottish Government, 2015)
-

The National Planning Framework 4 sets out under 'Sustainable Places - Historic Assets and Places' Policy 7 which aims to '*To protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places'* (Scottish Government, 2023).

In a local context the OHLDP covers Natural and Built Heritage under Policy NBH4: Built Heritage, Policy NBH5: Archaeology and Policy NBH6: Historic Areas (CnES, 2018). These are detailed in Section 18: Landscape, Seascape and Visual Effects.

Scheduled Monuments and Listed Buildings are protected by the following legislation:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997; and
- The Historic Environment Scotland Act 2014.

19.2 Baseline

The proposed DWS development lies within an area well characterised in terms of archaeological and heritage assets, in part due to the DWP project currently under construction. In relation to DWP desk-based and field surveys of the area have been undertaken, and a WSI developed by SPA's Archaeologist for both onshore and offshore assets. During DWP works an archaeological WB has been maintained, yielding further information as to the archaeological context of the area. In the following sections, onshore and offshore assets have been considered in turn, taking into account records available from Historic Environment Scotland and relevant information gained through DWP.

For assets that may interact in physical terms with the DWS development, the relevant baseline area has been considered as the development footprint, defined as shown in Drawing 113_DRG_1 Indicative Development Boundary, and a 100m buffer around this boundary. These are illustrated in Drawing 113_DRG_05_01 Heritage Assets. For assets whose setting may be affected in visual terms by the proposed DWS development, the Zone of Theoretical Visibility (ZTV) detailed in Section 18: Landscape, Seascape and Visual Effects has been used to determine relevant areas. These assets are illustrated in Drawing DRG_113_06_01 Heritage Asset Setting.

19.2.1 Onshore Baseline

19.2.1.1 Known Onshore Assets

There is one known onshore heritage asset within the proposed DWS development footprint, defined as the indicative site boundary, as shown in Details of the asset, a navigation beacon of unassigned period located on the rocky outcrop of Sgeir na Pacaid, are provided in Table 19.2.1.

Table 19.2.1: Known Onshore Heritage Assets within the Proposed DWS Footprint

Reference	Description	Easting	Northing
Canmore 296439	Beacon, Sgeir Na Pacaid	142467	931100

A further three onshore assets are identified within a 100m buffer of the proposed DWS indicative site boundary, as detailed in Table 19.2.2.

Table 19.2.2: Known Onshore Heritage Assets within 100m Buffer of Proposed DWS Footprint

Reference	Description	Easting	Northing
Canmore 206868 HER MWE142507	Earth and stone field boundary dyke	142311	930587
Canmore 184413 HER MWE142510	Arnish factory / offshore oil-rig construction yard	142770	930529
Canmore 4318 HER MWE4318	Arnish findspot / possible weight	142502	930399

Investigation during the WB for DWP shows the earth and stone field boundary dyke (Canmore 206868, HER MWE142507) to comprise of redeposited peat. The asset is deemed to be of regional importance due to relative rarity outside of the Hebrides, and a lack of excavated examples (McHardy, 2023). The DWP WB report provides a record of this asset.

Table 19.2.3 details the archaeological finds made during the WB undertaken during soil stripping for DWP, July 2022 – February 2023 (McHardy, 2023). These sites are outwith the area of proposed works for DWS, but are within the 100m buffer of the indicative development boundary. As such, they require consideration in relation to DWS. They also highlight the potential for discovery of previously undocumented assets to be present and the importance of a WB.

Table 19.2.3: Onshore Finds during DWP Watching Brief

Watching Brief ID	Description	Easting	Northing
Site D	Circular/sub-circular building near Sgeir Na Pacaid	142348	931097
Site E	Putative shieling site / lookout post	142241	930919
Site F	Rock shelter	142229	930900

Prior to groundworks for DWP, Site D, identified by the WB, was excavated. Post-excavation work is yet to be reported, but the site was found to contain modern features alongside those of greater antiquity. A circular or sub-circular building with worked quartz and imported flint lithics was identified, and a separate hearth outside of the building (AOC Archaeology 2022,

McHardy 2023). As the site has been excavated and is within the DWP footprint it will not be considered further in relation to the DWS proposals.

Sites E and F were documented in-situ by the WB, with both locations avoided by groundworks for DWP following their identification as sites of potential archaeological interest prior to soil stripping. Full details of the sites are provided in the WB report (McHardy, 2023).

The location of the assets identified in this section are illustrated in Drawing 113_DRG_05 Heritage Assets.

19.2.1.2 Heritage Designations

There are no designated heritage sites or assets within the footprint of the proposed DWS development. In determining relevant heritage designations in the surrounding area, intervisibility with the proposed development has been considered, based upon the ZTV assessment outlined in Section 18: Landscape, Seascape and Visual Effects. The Development Platform ZTV, consisting of the quayside and laydown areas, and the Crane ZTV have been utilised, as shown withing the Drawings section in Figure 1 Development Platform ZTV and Figure 3 Crane & Turbine ZTV respectively. The Development Platform ZTV represents the permanent structures of the DWS facility, and the Crane ZTV the feature anticipated to be in place for the longest duration during wind turbine pre-commissioning operations. The presence of Scheduled Monument, Listed Building, Garden Designed Landscape and Conservation Area designations within the ZTVs are detailed below, and are as illustrated in Drawing DRG_113_06 Heritage Asset Setting.

19.2.1.3 Scheduled Monuments

There are five Scheduled Monuments within 5km of the proposed development (Historic Environment Scotland, 2023b). All of these have intervisibility with the development, being within the Development Platform ZTV, Crane ZTV or a combination of both, as summarised in Table 19.2.4. As Scheduled Monuments, all are considered to be of High importance.

Table 19.2.4: Scheduled Monuments with Intervisibility within 5km of the Proposed Development

Reference	Name & Description	Easting	Northing	Intervisibility with:	
				Platform	Crane
SM5347	Arnish Point Gun Emplacements, World War II coastal battery	143131	930573	Yes	Yes
SM5397	Loch Arnish Dun, probable early-medieval fortified islet	142309	930237	No	Yes
SM6550	Cnoc na Croich Chambered Cairn, remains of prehistoric cairn	141718	932319	Yes	Yes
SM5253	Rubha Shilldinish Promontary Fort and Homestead, remains of fortified Iron Age settlement	145474	930630	No	Yes
SM5504	Druim Dubh Stone Circle, fallen standing stone circle	138253	930530	No	Yes

There are a further twelve Scheduled Monuments within 15km of the proposed development that have intervisibility, being within the Crane ZTV. These are summarised in Table 19.2.5.

Table 19.2.5: Scheduled Monuments with Intervisibility within 15km of the Proposed Development

Reference	Name & Description	Easting	Northing
SM1684	St. Columba's Church, Aignish, Uidh	148470	932262
SM5365	Loch an Duin Dun, Lower Bayble	151683	930437
SM5366	Dun Mor Dun, Garrabost	151438	933925
SM5357	Dursainean Chambered Cairn, Garrabost	152396	933078
SM5342	Standing Stone 500m North-east of Cnoc Na Dursainean	152824	933417
SM5453	Loch An Duin Dun, Aird	155632	935903
SM5346	Caisteal Mhic Creacail Chambered Cairn, Fleisirin	154312	936679
SM5330	Chambered Cairn 40m North of All-An-T-Sniomh	145192	938690
SM1660	Carn A'Mharc, Chambered Cairn North-west of Gress Lodge	147230	943846
SM5701	Gress Lodge Souterrain	149365	941843
SM5349	Loch an Duna Dun, North Lochs	139041	926149
SM4355	Achmore Stone Circle	131735	929262

19.2.1.4 Listed Buildings, Garden & Designed Landscapes and Conservation Areas

There are nine Category A Listed Buildings (LBs) which have intervisibility with the proposed DWS development, as detailed in Table 19.2.6 (Historic Environment Scotland, 2023b). The majority of these are in the immediate locality of Stornoway, within the Development Platform and Crane ZTVs. One is located to the east of Stornoway, on the Eye Peninsula, and is within the Crane ZTV only.

Table 19.2.6: Category A Listed Buildings with Intervisibility with the Proposed Development

Reference	Name & Description	Easting	Northing	Intervisibility with:	
				Platform	Crane
LB18677	Lews Castle, Stornoway, Lewis	142009	933175	Yes	Yes
LB19206	Sea Gate Lodge, Lews Castle, Stornoway, Lewis	142131	933002	Yes	Yes
LB19206	Cuddy Point Sea Wall And Slipway, Lews Castle, Stornoway, Lewis	141917	932785	Yes	Yes
LB19206	Sea Wall And Tower, Lews Castle, Stornoway, Lewis	142121	932975	Yes	Yes

Reference	Name & Description	Easting	Northing	Intervisibility with:	
				Platform	Crane
LB41735	4 North Beach, Stornoway, Lewis	142135	932816	Yes	Yes
LB41735	2 North Beach, Stornoway, Lewis	142126	932816	Yes	Yes
LB41735	Mission, 5 North Beach, Stornoway, Lewis	142135	932809	Yes	Yes
LB41735	1 North Beach, Stornoway, Lewis	142119	932816	Yes	Yes
LB19210	St Columba's Churchyard, Aignish, Lewis	148484	932247	No	Yes

There is a Garden Designed Landscape (GDL), Lews Castle and Lady Lever Park (GDL00263), comprising of the mid-nineteenth century landscaped grounds of Lews Castle, on the low hills west of Stornoway harbour (Historic Environment Scotland, 2023b). The GDL has intervisibility with the proposed DWS development, being within the Crane ZTV and with portions, predominantly on the GDL's eastern side, within the Development Platform ZTV. Category A LBs 18677 and 19206, detailed above, are within the GDL.

Stornoway Conservation Area (CA) (CA317) encompasses the nineteenth-century planned town at the centre of Stornoway, and also a portion of the GDL detailed above, within Lews Castle estate (Historic Environment Scotland, 2023b). The CA has intervisibility with the proposed DWS development, being within the Crane ZTV and also largely within the Development Platform ZTV.

19.2.2 Offshore Baseline

Glumaig Harbour, within which the proposed DWS development is sited, is an area which has been used by vessels for many centuries. As such, there is considerable potential for maritime assets within the bay.

There is one known offshore heritage asset within the development footprint of the proposed DWS facility. This comprises the wreck of a 20th Century motorised wooden fishing vessel, Marjory, as detailed in Table 19.2.7 (Historic Environment Scotland, 2023b). This was identified within the DWP EIAR as being of low importance (Affric, 2020).

Table 19.2.7: Known Offshore Heritage Assets within the Proposed DWS Footprint

Reference	Name/Location	Type/Date	Easting	Northing
Canmore 102846 HER MWE102846 UKHO 748	Marjory: Arnish Point, Stornoway	Motor Fishing Vessel, 20th Century	142549	931119

A further eight known offshore assets are identified within a 100m buffer of the proposed DWS development boundary. These comprise undesignated wrecks and/or documented losses, recorded in the Canmore Maritime and Historic Environment Record databases (Historic Environment Scotland, 2023b). These are detailed in Table 19.2.8.

Table 19.2.8: Known Offshore Heritage Assets within 100m Buffer of Proposed DWS Footprint

Reference	Name/Location	Type/Date	Easting	Northing
Canmore 102813 HER MWE102813	Unknown: Stornoway	Craft, Obstruction	142353	930866
Canmore 217463 HER MWE147701	Fair Hibernian	Rigged Cargo Ship, Lost 1796	142364	930811
Canmore 325047	Unknown	Wooden Ship	142400	930510
Canmore 102844 HER MWE102844	Unknown: Glumaig Harbour	Craft	142639	930460
Canmore 21417	Unknown	Obstruction (possible)	142646	930462
Canmore 102843 HER MWE102843	Unknown: Stornoway	Craft	142670	930460
Canmore 321416	Unknown	Trawler (possible)	142678	930460
Canmore 102822 HER MWE102822	Unknown	Wreck, Trawler (possible)	142660	930430

It is understood that unknown wreck Canmore 102813 / HER MWE102813 has been disturbed by DWP construction works, being situated within the footprint of the link road. The wreck was assessed and recorded prior to the works taking place, and was described as a widely distributed site, concluded to be the remains of a very broken up wreck of modern construction (McHardy, 2022).

An archaeological review of geophysical datasets of the area was also undertaken prior to marine works commencing for DWP, to assess for unknown sites of potential heritage significance (Wessex Archaeology, 2022). Known wrecks within the study area, which encompassed the whole of Glumaig Harbour up to MHWS, were identified, and no further measures recommended. Two previously unknown sites were identified, possibly indicative of unknown wrecks (7071 and 7146). The study also identified a number of sites of potentially high archaeological value, classified as possible debris fields. Those relevant to the proposed DWS development are detailed in Table 19.2.9.

Table 19.2.9: Offshore Sites Identified during Geophysical Data Review

Report ID	Description	Easting	Northing
7071	Possible debris field, potentially a wreck site not present in the UKHO record	142653	931091
7146	Probable debris field, potentially the remains of a wreck site but could be a more modern feature	142447	930694
7137	Debris field, possibly associated with Unknown wreck Canmore 102813 / HER MWE102813	142362	930856
7138	Debris field, possibly associated with Unknown wreck Canmore 102813 / HER MWE102813	142353	930847
7139	Debris field, possibly associated with Unknown wreck Canmore 102813 / HER MWE102813	142357	930846
7140	Debris field, possibly associated with Unknown wreck Canmore 102813 / HER MWE102813	142346	930825
7141	Debris field, possibly associated with Unknown wreck Canmore 102813 / HER MWE102813	142356	930813

Site 7071 has subsequently been identified as debris from oil rig works in Glumaig Harbour and has been removed (SPA, 2023a). Site 7146 has not been identified, despite further investigation (SPA, 2023a); it does lie outwith the area of the proposed DWS construction, and although within the 100m of the indicative development boundary, works in the vicinity are restricted to on-shore earthworks rather than marine construction activities. As such, neither site 7071 or 7146 are suggested to require further consideration in relation to the DWS proposal. Sites 7137 to 7141 are understood to remain in situ, although as per unknown wreck Canmore 102813/HER MWE102813 with which they are likely to be associated, will have been disturbed by DWP works as they are situated adjacent to the link road.

The Watching Brief maintained during marine works for DWP has yielded one find to date, an ammunition casing. This was found during dredging operations, and identified as ammunition from a 20th Century autocannon, likely from a naval ship's armament (Object ID 247961_5001, Wessex Archaeology, 2023).

The location of the assets identified in this section are illustrated in Drawing 113_DRG_05 Heritage Assets.

19.3 Potential Construction Impacts

Impacts may arise due to the following activities during construction of the proposed DWS development:

- Topsoil stripping;
- Excavation;
- Placement of site compound;
- Land reclamation;
- Piling; and
- Dredging.

There is also the potential for accidental damage to heritage assets in the vicinity of construction works if plant movement is not appropriately controlled.

The navigation beacon located at Sgier Na Pacaid (Canmore 296439) is within the footprint of the proposed DWS development. This feature sits just to the east of the previously consented bollard island structure of DWP, which as noted in Section 2: Background, is replaced by the proposed DWS development. The Sgeir Na Pacaid beacon will be affected by the DWS construction, as it is located within the area of the proposed land reclamation. The heritage sites identified in Table 19.2.2 and Sites E and F detailed in Table 19.2.3 also have the potential to be disturbed during construction works, due to their proximity to the indicative development boundary.

Offshore, the wreck site of 20th Century wooden motorised fishing vessel 'Marjory' (Canmore 102846, HER MWE102846, UKHO 748) is within the indicative DWS development boundary. The site will likely be affected by the land reclamation and quayside construction (piling), and potentially dredging. The further eight wrecks detailed in Table 19.2.8 have the potential to be affected by construction activities, for example through siltation, being within 100m of the indicative development boundary. Similarly, the sites of archaeological potential detailed in Table 19.2.9, with the exception of Sites 7071 and 7146, could be affected. However, given that only minor, non-significant increases in sediment loading during construction activities are expected (see Section 8: Water Quality & Coastal Processes), this is considered unlikely.

There is also the potential for unknown assets to be disturbed by both onshore and offshore works, through activities such as topsoil removal, excavation, general construction works and dredging.

19.4 Potential Operational Impacts

The DWS quayside and laydown areas will introduce a new built structure visible within the Stornoway Harbour area. Furthermore, as the purpose of DWS is to facilitate offshore wind developments, there will be times when a floating wind turbine will be located at the quayside, along with a large-capacity crane used for its construction. Due to the height of such structures, there is the potential for extensive intervisibility between the development and its surroundings. This could give rise to impacts on the setting of designated assets as identified in Section 19.2.1.2.

19.5 Proposed Impact Assessment

It is recommended that Archaeology and Cultural Heritage be **scoped in** to the DWS EIA.

Construction of the proposed DWS development interacts with two known heritage assets, one onshore and one offshore. It is also adjacent to a number of other recorded sites, on and offshore. Furthermore, context provided by works to date on DWP indicates there is the potential for discovery of unknown assets.

In line with undertakings for DWP, suitable archaeological investigations and protocols will be established for DWS. Pre-construction, sediment sampling within the DWS development area as part of Ground Investigations will be cognisant of submerged prehistoric and paleo-archaeological potential. A proportionate programme of geoarchaeological assessment and sampling will be undertaken following a phased approach, in line with current guidance and

best practice (Gribble & Leather, 2011; WAWTI 2014; Wessex Archaeology, 2016 & 2021b). This will be in consultation and agreement with Historic Environment Scotland as advisor to the Marine Directorate, and the Western Isles Archaeology Service as advisor to CnES. For implementation during construction, a Watching Brief (WB) and Protocol for Archaeological Discoveries (PAD) will be developed. The output of pre-construction sediment sampling, the WB and PAD will be detailed within the DWS EIAR. The PAD will also be included within the DWS CEMD to ensure its utilisation in the event of an archaeological find.

Assessment is also required to understand the potential impacts of DWS on the setting of heritage assets. It is proposed that an assessment be completed in relation to designated cultural heritage assets including Scheduled Monuments, Category A Listed Buildings, Garden Designed Landscapes and Conservation Areas within 5km of the development and where intervisibility is identified. This is proposed to include the assets summarised in Table 19.5.1, and as illustrated in Drawing DRG_113_06 Heritage Asset Setting. The assessment will be undertaken in accordance with relevant guidance including Managing Change in the Historic Environment (Historic Environment Scotland, 2016). It is suggested that the Category A Listed Buildings may be assessed together, grouped according to their location.

Table 19.5.1: Proposed Sites for Inclusion in Assessment of Impact on Setting

Designation	Name & Description	Reference	Intervisibility with:	
			Platform	Crane
Scheduled Monument	Arnish Point Gun Emplacements	SM5347	Yes	Yes
	Loch Arnish Dun	SM5397	No	Yes
	Cnoc na Croich Chambered Cairn	SM6550	Yes	Yes
	Rubha Shilldinish Promontary Fort and Homestead	SM5253	No	Yes
	Druim Dubh Stone Circle	SM5504	No	Yes
Category A Listed Building	Lews Castle, Stornoway, Lewis	LB18677	Yes	Yes
	Sea Gate Lodge, Lews Castle, Stornoway, Lewis	LB19206	Yes	Yes
	Cuddy Point Sea Wall And Slipway, Lews Castle, Stornoway, Lewis	LB19206	Yes	Yes
	Sea Wall And Tower, Lews Castle, Stornoway, Lewis	LB19206	Yes	Yes
	4 North Beach, Stornoway, Lewis	LB41735	Yes	Yes
	2 North Beach, Stornoway, Lewis	LB41735	Yes	Yes
	Mission, 5 North Beach, Stornoway, Lewis	LB41735	Yes	Yes
	1 North Beach, Stornoway, Lewis	LB41735	Yes	Yes
	St Columba's Churchyard, Aignish, Lewis	LB19210	No	Yes
Garden Designed Landscape	Lews Castle and Lady Lever Park	GDL00263	Partial	Yes
Conservation Area	Stornoway Conservation Area	CA137	Partial	Yes

20 Human Health

As defined in the World Health Organisation's (WHO) constitution, health is a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity (WHO, 1946). From an EIA perspective, public health is considered in terms of both potential positive and negative impacts on the health of the population. Health and safety for employees is covered under other regulatory frameworks and is not considered within an EIA.

An assessment of human health impacts was considered within the EIA for the adjacent DWP. Consideration of the topic was combined with population effects and in terms of health primarily focussed on the risk of communicable disease spread, with effects deemed to be non-significant (Affric, 2020). While potential construction and operational impacts may be similar between the DWS and DWP projects, the approach to scoping for human health has changed since the DWP was consented. The IEMA guide to Effective Scoping of Human Health in EIA was issued in 2022, and this sets out a framework for considering all aspects of Human Health through the EIA scoping process. This section is aligned with this new guidance, and as such, direct comparison to the previous assessment undertaken for DWP has not been utilised.

20.1 Policy and Guidance

The new IEMA Guide to Effective Scoping of Human Health in EIA (IEMA, 2022b) has provided the framework for this scoping assessment. No external stakeholder engagement has been carried out as input from the Western Isles Health Board has not been deemed appropriate at this stage due to the nature of the project and potential effects. The Scottish Public Health Observatory (ScotPHO) website has been utilised as a source of relevant information with regards to the health of the Scottish Public (ScotPHO, 2023).

20.2 Baseline

As discussed in Section 3.1, the project will be situated adjacent to the DWP in Glumaig Harbour, Stornoway, on the isle of Lewis. Scoping will consider population health influencing factors such as behavioural, social, economic, and bio-physical factors for the site-specific workforce at DWS, the local population of the town of Stornoway, and the wider regional population.

There are a range of clinical, behavioural and lifestyle risk factors which impact upon human health. A 2009 report from WHO identified five behaviours which contribute to approximately 90% of the total burden of disease in high income country populations. These are noted as tobacco use, alcohol consumption, poor diet, physical inactivity, overweight and obesity, all of which have an impact on the health and wellbeing of people living in Scotland. For example, 63% of the adult population are categorised as "overweight including obesity" resulting in health care impacts with an estimated economic cost of £4.6 billion per year (ScotPHO, 2023). The sum of these contributing factors results in Scotland having one of the lowest life expectancies in Western Europe with the life expectancy at birth for males being 76.6 years, on average and females being 80.8 years, on average (ScotPHO, 2023).

In the CnES Council area, life expectancy is slightly higher than the Scottish average at 77.9 years and 82.8 years for males and females respectively. The population density of the Western Isles is joint lowest in Scotland (9 persons per square kilometre) (National Records of Scotland,

2023). As discussed in Section 21.2, the Western Isles has an ageing population, and is expected to decrease at the fastest rate out of the 32 councils in Scotland, mainly due to natural change (more deaths than births).

In addition, deprivation also has an impact on health, wellbeing, and overall life expectancy. At present, almost one in five working-age adults in Scotland live in poverty (ScotPHO, 2023). However, none of the 10% most deprived areas of Scotland are found in the Western Isles (Scottish Index of Multiple Deprivation, 2020), so this is not seen as a particular health concern in this area.

20.3 Potential Impacts

The IEMA Guide to Effective Scoping of Human Health in EIA proposes a list of determinants of health to be considered in scoping and a number of steps to be undertaken to identify whether any of the determinant factors should be scoped into the EIA. In the first instance there needs to be a source – pathway – receptor linkage to make an impact likely. Where a determinant factor is likely to occur, then the scale of the change be it positive or negative needs to be assessed to identify if it could be significant. In the event that a negative effect could be significant, then committed mitigation can be taken into account to determine if it can be scoped out. In the event of a potentially positive effect, consideration is given to whether committed enhancements are sufficient to maximise the benefits; if they are the topic can be scoped out (IEMA, 2022b). Table 20.3.1 provides a list of determinants, identifies if there is a likelihood of an effect, considers significance and presents the committed mitigation / enhancements to inform the scoping in or out of each determinant.

Table 20.3.1: Consideration of Potential Human Health Effects

Category	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
Health Related Behaviours	Physical Activity	None.	The development does not have any elements which would give rise to any direct change in health-related behaviours of the population.			Out
	Risk Taking Behaviour	None.				Out
	Diet and Nutrition	None.				Out
Social Environment	Housing	Potential during construction.	The construction phase of the development will necessitate rental properties for site personnel. The DWP has utilised between 10 and 15 properties throughout the construction period, and it is probable that DWS may require a similar number. This could put pressure on rental housing availability but could also increase the status of housing stock due to increased demand. The human health impacts of an increase in housing need are however, considered to be negligible, as has been illustrated with the DWP development currently under construction.	Positive and Negative – non - significant.		Out
		Potential during operation.	The operations at DWS will involve direct jobs at the facility as well as indirect jobs through the supply chain. It is expected these jobs will be fulfilled by both existing residents and people moving to the area. This may lead to increased pressures on housing, but also provide an opportunity for increasing housing stock in the local area. These perceived positive and negative impacts relating to human health are considered negligible for this development.	Positive and Negative – non - significant.		Out

Category	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
	Relocation	Potential during construction.	It is recognised there will likely be a temporary relocation of workforce personnel during the DWS construction. On average, the DWP construction phase has utilised between 45 and 60 site personnel, and a portion of these have been from outside of the area. Although not experienced during the DWP construction phase, an influx of new people into a community can cause social concerns both for the local population and for the incoming workforce, with consequential health effects associated with mental wellbeing. However, this impact is not considered significant for the DWS development.	Negative – non - significant.		Out
		Potential during operation.	The operation of DWS will involve direct jobs at the facility as well as indirect jobs through the supply chain. It is expected these jobs will be fulfilled by both existing residents and people moving to the area. The movement of people into an existing community can cause social concerns both for the local population and for the incoming workforce and put existing services under pressure. However, this is not seen as a significant effect for a development the scale of DWS. Rather, relocation effects are anticipated to be an organic, gradual process of encouraging previous inhabitants to move back to the island or relocate to the island from further afield, and therefore is not seen as a significant negative issue for the DWS project. Indeed, it may lead to positive impacts to human health by encouraging relocation, promoting economic growth and improvements to services.	Positive and/or Negative – non - significant.		Out

Category	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
	Open space, leisure, and play	None.	The development is not located in an area where it will impact upon availability of or access to open space, leisure or play facilities.			Out
	Transport modes, access, and connections	Potential during construction.	There is potential for impacts to traffic and transport from the DWS construction phase, through commuting construction staff and material/plant deliveries. However, human health impacts from increased traffic in terms of road and route safety, decreasing air quality, and mental health impacts are all considered non-significant for this project. As noted in Section 24, construction traffic impact will be assessed through a Traffic Assessment, and any mitigation will be addressed through a Traffic Management Plan, if required, following the assessment.	Negative – non - significant.		Out
		Potential during operation.	The operational impacts for traffic and transport are considered as negligible, therefore any related human health impacts can also be assumed as negligible. No specific mitigation was identified (see Section 24.4).	Negative - negligible.		Out
	Community safety	None.	No linkages from the project to this determinant have been identified.			Out
	Community identity, culture, resilience, and influence	Potential during operation.	The DWS development promotes a feeling of pride belonging to a community involved in the promotion of maritime trade, and green energy production through facilities at DWS directly enabling the renewable energy sector. Stornoway has been the centre for maritime trade on the Isle of Lewis throughout history, and this project promotes SPA's vision for continued growth of this sector. The project will also have positive impact through provision of employment and economic benefits, and	Positive – non - significant.		Out

Category	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			opportunities to tackle population decline. This will have a positive health impact (although non-significant in EIA terms) on the mental wellbeing of the local community.			
	Social participation, interaction, and support	None.	No linkages from the project to these determinants have been identified.			Out
Economic Environment	Education and training	Potential during construction.	The DWS project will provide opportunities for work-experience placements, apprenticeships, and further training during the construction phase, as noted in Section 21.3. This may have a positive health impact (although non-significant in EIA terms) on the mental wellbeing of the local community.	Positive – non - significant.	Promotion of work-experience, apprenticeships and training opportunities during DWS construction phase.	Out
		Potential during operation.	During operations, the DWS will provide opportunity for work-experience placements, apprenticeships and other training, as noted in Section 21.4. This may have a positive health impact (although non-significant in EIA terms) on the mental wellbeing of the local community	Positive – non - significant.		Out
	Employment and income	Potential during construction.	DWS presents local employment opportunities during construction and opportunities within the wider supply chain. This may have a positive health impact (although non-significant in EIA terms) on the mental wellbeing of the local community.	Positive – non - significant.		Out
		Potential during operation.	Operations at DWS present local employment opportunities, both directly and within the supply chain. This will have a positive health impact (although non-significant in EIA terms) on the mental wellbeing of the local community.	Positive – non - significant.		Out

Category	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
Bio-physical Environment	Climate change mitigation and adaptation	Potential during operation.	Climate change has been taken account of within the DWS design to improve resilience against climate change. See Section 8.4, Section 17.4, and Section 25.3 for further information. Human health aspects related to climate change mitigation are deemed negligible for DWS.	Negative – negligible.		Out
	Air quality	Potential during construction.	Human health impacts associated with air quality are considered in Section 6 with no significant effects identified and therefore no consequential health implications.	Negative – non-significant.	Development of a Dust Management Plan.	Out
	Water quality or availability	Potential during construction.	Water quality is considered in Section 8 with no significant effects identified and therefore no knock-on health implications.	Negative – non-significant.		Out
	Land quality	None.	Land and Soil Quality is considered in Section 7 with no significant effects identified that relate to human receptors.			Out
	Noise and vibration	Potential during construction.	In-air acoustics is considered in Section 9 with non-significant effects identified and therefore no knock-on significant human health implications.	Negative – non-significant.		Out
	Radiation	None	The development does not give rise to any radiation.			Out
Institutional and Built Environment	Health and social care services	Potential during construction.	The construction phase of DWS could give rise to a potential increase in demand due to the creation of employment, however this is deemed a non-significant impact.	Positive and/or Negative – non-significant.		Out
		Potential during operation.	As the DWS is expected to increase long-term employment opportunities, and therefore increase the local population, there would be a potential increase in demand for health care services. It is recognised that the operational phase of the DWS could improve the	Positive and/or Negative – non-significant.		Out

Category	Wider Determinants of Health	Likelihood (Source, Pathway, Receptor)	Comments	Significance (Positive or Negative)	Committed Mitigation/ Enhancements	Scoped In/ Out
			resources available for local health-related services for the community due to an increasing population, giving rise to a non-significant positive impact.			
	Built environment	None.	No linkages from the project to this determinant have been identified.			Out
	Wider societal infrastructure and resources	Potential during operation.	It is recognised that the DWS project contributes to addressing the ageing population by providing employment opportunities. Additionally, as DWS facilitates the development of offshore energy infrastructure, it in turn contributes to securing green energy supply for the local and wider community. In relation to health these impacts are both deemed positive, although non-significant for the operation of DWS.	Positive – non-significant.		Out

20.4 Mitigation Measures

Although all potential impacts to human health are deemed negligible or non-significant for the DWS development, a number of mitigation measures or enhancements are committed to within the construction phase of the project. DWS will present local employment opportunities during construction and opportunities within the wider supply chain, and actively promote work-experience, apprenticeships and training opportunities during the construction phase. This will have an associated positive influence on mental health within the local community. Construction impacts to air quality have been noted, and although non-significant to human health, a DMP will be developed for the construction phase of the project. Potential impacts from increased traffic through the construction phase have been identified, although these are not considered significant to human health. A Traffic Assessment will be undertaken, as noted in Section 24: Access, Traffic and Transport, and if required following assessment a CTMP will be developed and included within the CEMD.

20.5 Proposed Impact Assessment

As all identified potential impacts to human health are deemed negligible or non-significant, it is proposed that Human Health be **scoped out** of the DWS EIA. It is recognised there may be negative human health impacts such as increases in for demand for housing, healthcare, and potential for impacts to air quality, however these are all deemed non-significant. Some of the potential impacts are considered positive (on a non-significant basis), and indeed the project is promoted on these positive impacts such as improving employment opportunities and potential safeguarding or improvements to community health facilities and services.

21 Population and Socio-Economics

The focus of this section is the potential impacts of the proposed DWS development on population and socio-economics in the local area. Consideration is given to both the construction and operational phases of the project.

An assessment of population and socio-economic impacts was previously undertaken as part of the EIAR for the adjacent DWP. While the proposed DWS facility is a complementary development to DWP, the construction phase and operations at DWS will be distinct activities warranting consideration in their own right. As such, reference has not been made in this section to the previous assessment undertaken within the DWP EIA.

21.1 Policy and Guidance

Relevant policy and guidance which should be taken into account for socioeconomic assessments include:

- Scotland's National Marine Plan (NMP) (Scottish Government, 2015);
- National Planning Framework 4 (NPF4) (Scottish Government, 2023); and
- Outer Hebrides Local Development Plan (OHLDP) (CnES, 2018).

Scottish Government policy within Scotland's NMP relevant to the development includes:

- **GEN 2 Economic benefits**: *Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan*; and
- **GEN 3 Social benefits**: *Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan* (Scottish Government, 2015).

Within its National Spatial Strategy for Scotland 2045 NPF 4 sets out headline objectives of 'Liveable Places' and 'Productive Places', alongside Regional Spatial Priorities for the North and West Coast and Islands. The regional strategy sets a Planning priority to '*work with the area's exceptional assets and natural resources to build a more resilient future for island and coastal communities*', maximising the benefits of renewable energy and opportunities to develop skills and diversify employment (Scottish Government, 2023).

Furthermore, the Offshore Wind Sector Deal makes commits to increasing local (UK) content of offshore wind projects to 60% by 2030 (UK Government, 2019). This includes improving access for SMEs and increasing the number of highly skilled workers throughout the supply chain.

Relevant policies within the OHLDP include Policy EI8: Energy and Heat Resources, where commitment is made to support proposals that contribute to meeting climate change and renewable energy generation targets. Policy EI 8 also sets out requirements for renewables developments, including land-based infrastructure supporting offshore projects, to demonstrate their local economic impact (CnES, 2018).

21.2 Baseline

According to the 2022 Census, the Outer Hebrides support a population of around 26,200, a population that decreased by 5.5% since the 2011 Census. This is the highest percentage decrease in Scotland and contrasts with a 2.7% increase in the overall population of the country (Scotland's Census, 2023). In terms of population structure, latest published data (2019) indicates an ageing population. The median age in the Outer Hebrides is 49.5 compared to 42 across Scotland, with a lower percentage of working age people (58.8%) and higher percentage of the population over state pension age (25.3%) when compared to Scotland as a whole (64.5% and 18.7% respectively) (Office for National Statistics, 2023a).

In GVA per head terms the Outer Hebrides are in the bottom third of Local Authority areas in Scotland. In 2017 GVA per head was £21,744, the lowest of the Highlands and Islands region and behind other island areas: Shetland Islands £35,495 and Orkney Islands £26,032 (Office for National Statistics, 2023b).

It is recognised that there are both recent and ongoing changes to the socio-economic landscape, due to the COVID-19 pandemic and changing global situations associated with Brexit and the invasion of Ukraine by Russia. These changes are significant and ongoing, hence it is deemed premature to present further baseline data at this point.

21.3 Potential Construction Impacts

During construction, DWS has the potential to have a positive impact on population and socio-economics by providing:

- Direct jobs associated with construction works;
- Local sourcing of materials; and
- Indirect jobs through the supply chain and service industry sectors.

It is anticipated that a proportion of the workforce involved in the DWS construction will be transient, moving to the Stornoway area for the duration of the project works. There will be social interaction between the construction workforce and the local community. As outlined in Section 20: Human Health, this will include aspects such as housing, community identity and education/training.

21.4 Potential Operational Impacts

During operations, DWS has the potential to have a continued positive impact on population and socio-economics by providing:

- Direct jobs and income associated with SPA staff required to operate the facility;
- Direct jobs and income associated with the offshore renewable activity accommodated /carried out at the facility;
- Education and training opportunities associated with the above; and
- Indirect jobs and income through the supply chain.

SPA have developed a Port Masterplan which includes an assessment of market opportunities and consideration of the socio-economic context in which the port operates. A full market assessment identified priorities with regards to a range of sectors in the short, medium and long term. This included objectives to develop quay and laydown areas to support windfarm projects, and the promotion of Stornoway as a support base for offshore wind projects, including future large-scale developments (Fisher Associates, 2017). The proposed DWS development is key to meeting these objectives of the plan.

In terms of windfarm developments, Crown Estate Scotland's (CES) ScotWind Round 1 leases include three sites for offshore windfarms close to the Isle of Lewis. CES has appointed developers for these sites and detailed proposals are now being progressed. These sites have a total capacity of 2,835MW, of which 1,995MW are floating turbines. Stornoway is ideally located to support these developments.

21.5 Proposed Impact Assessment

It is proposed that Population and Socioeconomics be **scoped in** to the DWS EIA. It is anticipated that positive, significant impacts additional to those generated by DWP will arise during the construction and operation of DWS. In addition, there is the potential for social interactions with the local community which also need to be considered.

A socio-economic impact assessment is proposed to address the following:

- Baseline to provide an understanding of:
  - The local population and economy, set in the context of Scotland as a whole;
  - Social aspects of the area; and
  - Facilities in the vicinity of the development.
- Consideration of construction impacts associated with:
  - Direct jobs associated with construction works;
  - Local sourcing of materials;
  - Indirect jobs through the supply chain and service industry sectors; and
  - Social interaction considerations.
- Operational impacts associated with:
  - Direct jobs and income associated with SPA staff required to operate the facility;
  - Direct jobs and income associated with support of the offshore wind sector;
  - Indirect jobs and income through the supply chain; and
  - Social interaction considerations.
- Economic impact in terms of:
  - Employment;
  - Income (earnings); and
  - Gross Value Added (GVA).

22 Shipping and Navigation

The focus of this section is the potential impacts of the proposed DWS development on shipping and navigation, during both construction and operational phases.

The impacts on navigation of the adjacent DWP facility were assessed as part of the DWP EIAR, with no significant effects from construction or operational activities identified (Affric, 2020). As the location of the proposed DWS works is adjacent to DWP, and therefore the developments have both navigational routes and other marine user receptors in common, reference to DWP has been utilised in this section.

22.1 Policy and Guidance

Relevant policy and guidance which should be considered for navigational assessments includes:

- Port Marine Safety Code (Department for Transport and Maritime & Coastguard Agency, 2016) – which requires harbour authorities to develop a risk-assessment based Marine Safety Management System for the safe operation of their harbours;
- International Regulations for Preventing Collisions at Sea as amended (International Maritime Organization, 1972); and
- Scotland's National Marine Plan (Scottish Government, 2015).

Scotland's National Marine Plan has a section on Shipping, Ports, Harbours and Ferries, with policies relevant to the proposed DWS development including:

- **TRANSPORT 1**: *Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UN Convention on the Law of the Sea (UNCLOS);* and
- **TRANSPORT 4:** *Maintenance, repair and sustainable development of port and harbour facilities in support of other sectors should be supported in marine planning and decision making* (Scottish Government, 2015).

22.2 Baseline

Stornoway Harbour, in which the proposed DWS development is situated, is the primary port facility for the Outer Hebrides. Within harbour limits there are currently four operational piers, including two Roll-on Roll-off (RoRo) linkspans and a pier at Arnish Point Industrial Estate, three quays and two marinas. Once operational the DWP development currently under construction will provide an additional quay with deep water berth and a freight-ferry/ro-ro linkspan facility. There is also an operational slipway at Goat Island suitable for small commercial vessels and pleasure craft.

The port accommodates key services for the Western Isles. Lifeline freight and passenger ferry links to mainland Scotland operate multiple daily services from the port. The Stornoway Royal National Lifeboat Institution (RNLI) all-weather lifeboat is also stationed in the Inner Harbour marina. Berthing facilities throughout the port are utilised by a variety of vessels including bulk freight, industrial, cruise ship, fishing, Ministry of Defence and pleasure vessels. Industrial users of the harbour include the aquaculture sector and vessels associated with activities at the Arnish Point Industrial Estate in Glumaig Harbour. This includes use of Arnish Pier for deliveries to and from the Arnish fabrication yard, and fish-carrying vessels making regular deliveries to the fish harvesting station at Arnish Point Industrial Estate. Once DWP becomes operational, freight, industrial and cruise vessels will be accommodated at the new facilities.

SPA is responsible for navigational safety within Stornoway Harbour limits. Safe navigation is facilitated through the implementation of their Marine Safety Management System (MSMS) which complies with the Port Marine Safety Code (PMSC) (Department for Transport and Maritime & Coastguard Agency, 2016). No serious vessel incidents have occurred within Stornoway Harbour in relation to operations under SPA's control (SPA, 2023b).

The main navigation route through the harbour utilises the deep-water channel from the Minch towards Stornoway town centre. The passenger ferry, which is the vessel most frequently navigating the harbour, enters the harbour limit and heads in a west north-west direction past the mouth of Glumaig Harbour before turning on a more northerly course towards the linkspan pier adjacent to the town centre.

During works for DWP an area of the harbour to the north of Glumaig Harbour has been dredged to -10m CD to allow safe navigation of large vessels in to the new DWP facility.

Drawing WS2139_XX-00-DR-C-9011 (P15) illustrates the main navigation channels within Stornoway Harbour and Glumaig Harbour, used for access to passenger ferry facilities, Arnish Point Industrial Estate and DWP. The drawing also includes a potential layout of the DWS quay, indicating its location relative to the navigation channels.

The site of the proposed DWS development, situated south of DWP, currently comprises of rocky coastline. As part of the DWP development, three mooring buoys are due to be installed at the DWS location to assist with the mooring of large vessels at the main berth of DWP. As noted in Section 2: Background, these will be removed in full prior to commencement of DWS construction and attached to new anchor points built in the new DWS platform. Immediately adjoining to the east of the DWS site lies an area of seabed which has historically been dredged, to allow mooring of oil rigs within Glumaig Harbour. This area of previously dredged seabed can be seen on Drawing WS2139-XX-00-DR-C-9011 (P15). To the south-east of the historically dredged area lies the Arnish Point Industrial Estate pier.

22.3 Potential Construction Impacts

Construction of the proposed DWS facility will necessitate additional vessel movements within the port, particularly within Glumaig Harbour. This will be as a result of activities including material deliveries, dredge operations and piling. The additional vessel movements during construction does increase the probability of an incident such as a vessel collision occurring. There is also the potential for vessel access to DWP and Arnish Point Industrial Estate facilities to be impeded by the additional vessel movements during construction of DWS.

The proposed use of locally-obtained rock to provide infill and rock armour for the DWS reclamation area means that the requirement for shipping-in of materials is expected to be minimal. Aggregates for concrete are also proposed to be sourced on-island, with transport made by road. Material delivery by sea is envisaged to be limited to piles, fendering and other quay fittings such as ladders and lighting columns. Vessels making deliveries will follow standard shipping routes through the port, under the control of SPA in accordance with their MSMS and coordinated with other activities within the port area. As such vessel movements associated with material deliveries do not pose a particular navigation risk.

Vessels involved in the construction work will be present in the harbour area for long periods of time either in fixed locations or making short journeys. Such activities, for example pile driving or dredging, will be taking place localised to the DWS development.

The nature and scale of vessel movements associated with the proposed DWS development are anticipated to be within the scope of those considered for DWP. The total number of piles proposed for DWS is less than for DWP (approximately one third for DWS relative to DWP), meaning that vessel movements for pile delivery and vessel-based pile driving will be no greater. Vessel activity associated with dredging will also be significantly less for DWS works relative to DWP, with an estimated dredge volume of approximately 2% of the DWP volume.

22.4 Potential Operational Impacts

In operation DWS will provide additional deep-water berthing facilities within Stornoway Harbour, in support of offshore renewables projects. This additional space is envisaged to accommodate infrastructure including floating wind turbines and associated vessels.

With the new DWS facility intended to promote the use of Stornoway Harbour by the offshore renewables sector, an increase in level of activity within the port is expected. This will include

vessel movements to and from DWS quayside and berth, and manoeuvring of floating wind turbines. More vessel movements and manoeuvring of floating infrastructure will result in an increased potential for incidents such as collisions. However, all operations will take place under the control of SPA in accordance with their MSMS, and will be coordinated with other activities within the port area to ensure navigational safety.

Ultimately, the provision of facilities at DWS to support offshore renewables will benefit navigational safety across the region. Firstly, the facility will provide a location for the construction, pre-commissioning and maintenance of wind turbine structures in relatively close proximity to sites identified for offshore wind developments. It will also provide suitable port facilities for vessels servicing the offshore windfarm sites. In the absence of such facilities, longer transits of infrastructure and service vessels would be necessary, and larger vessels required for such operations. With the proposed DWS development providing facilities close to the point of need, optimal shipping efficiency will be supported, with associated navigational safety benefits of reducing the requirement for lengthy transits of vessel and infrastructure.

22.5 Mitigation Measures

During the construction phase all vessel movement will be coordinated by SPA, with appropriate Notice to Mariners issued prior to the works to inform all vessel traffic of the construction activity. SPA will also ensure that there are regular ongoing communications between the Harbour Master and the construction contractors. Each vessel will be required to adhere to relevant legislation including the International Regulations for Preventing Collisions at Sea (as amended) and SPA's MSMS procedures for vessel management. A summary of the mitigation is provided in Appendix 1, Initial Schedule of Mitigation, and is in line with that in place for the current DWP construction works. The mitigation will be included in the CEMD for DWS. Vessel movement during construction of DWP has been managed in this manner, by SPA working closely with the contractor. SPA has communicated with relevant port users via Notices to Mariners and direct engagement. As a result, vessel movements associated with DWP construction activities have not had an adverse impact on navigation in Stornoway Harbour.

Moving into the operational phase, SPA's navigational risk assessment and MSMS will be updated to include the new DWS facility. Vessel movements will be in accordance with these procedures, which will comply with the PMSC and relevant legislation.

Requirements for navigational markers and/or lighting advised by the Northern Lighthouse Board will be complied with. This will include both temporary Aids to Navigation (AtoN) during the construction phase and permanent installations at the DWS facility. No unauthorised navigational markers or lights will be displayed.

22.6 Proposed Impact Assessment

It is proposed that Shipping and Navigation be **scoped out** of the DWS EIA, on the basis that the mitigation outlined in 22.5 and Appendix 1 is applied.

In terms of operational effects, development of the DWS facility constitutes a positive change to shipping and navigation both within Stornoway Harbour and the wider operational area. This is in respect of the additional deep-water berth capacity within the port and support of the offshore wind sector local to identified windfarm development sites. Although these effects will be beneficial, permanent and potentially significant, by definition they constitute the purpose of the project and do not require specific assessment in EIA terms.

23 Aviation

Once operational the proposed DWS facility will accommodate offshore wind turbines undergoing construction and pre-commissioning. The turbines themselves and the heavy-lift capacity crane utilised in their assembly are structures of significant height. As such, potential aviation interactions need to be considered.

Potential aviation interactions during construction of the adjacent DWP have been addressed through engagement with the appropriate authorities. Due to the smaller scale in terms of the maximum height of structures involved in the DWP development, aviation as a topic was not included within the DWP EIAR and therefore no previous assessment has been undertaken. This section does however, make reference to DWP relative to the arrangements in place to manage potential aviation interactions during the construction phase, as they are similarly relevant to construction of the proposed DWS development.

23.1 Legislation, Policy and Guidance

The Civil Aviation Authority (CAA) regulates aviation in the UK. CAA produce Civil Aviation Publications (CAP), which provide policy and guidance. CAA 'Policy and Guidelines on Wind Turbines' (CAP 764) includes a recognition of the need to co-exist, while ensuring that safety is not compromised (CAA, 2016). CAP 738 'Safeguarding of Aerodromes' is also relevant to the project (CAA, 2020).

Planning Circular 2/2003 (revised): 'Safeguarding of Aerodromes, Technical Sites and Military Explosives Storage Areas' sets out the legislative context and process for considering development proposals in relation to safe operation of aerodrome sites (Scottish Government, 2016). Relevant sites are protected under The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) (Scotland) Direction 2003.

UK Air Regulations are underpinned by Acceptable Means of Compliance (AMC), Guidance Material (GM) and, where appropriate, Certification Specifications (CS). These provide the framework for minimising risks.

23.2 Baseline

Highlands and Islands Airports Limited (HIAL) operate Stornoway Airport, situated east of the town of Stornoway and around 3.4km north-east of the proposed DWS development. In addition to accommodating commercial and private flights, His Majesty's Coastguard Search and Rescue (HMCG SAR) helicopter services are based at the airport. Stornoway Airport is an

Officially Safeguarded Aerodrome (CAA, 2020), and the proposed DWS development is located within the designated CAA Safeguarding Zone for the airport (CnES, 2018).The Western Isles Hospital is located on the northern outskirts of Stornoway. The hospital has a helipad on-site, which will be frequented by Air Ambulance and potentially also HMCG SAR helicopters.

The Ministry of Defence has a presence in the Outer Hebrides, with MOD Hebrides sites located on South Uist, Benbecula and St Kilda. Military operations are known to be undertaken over the surrounding area. The proposed DWS development lies within the MOD Low Flying Area (LFA) 14.

The topography of the local area is relatively flat, ranging from sea level to around 300m (984ft) at the top of Beinn Mholach (292m), north-west of Stornoway. The maximum elevation on the Stornoway peninsula, which is the area of land between Stornoway Airport and the proposed DWS development, is 35m (Topographic Map, 2023).

In terms of aviation safety, Air Accident Investigation Branch (AAIB) records show there has been one aviation incident in the Stornoway area in the last 10 years. This occurred in 2015 at Stornoway Airport and involved a commercial domestic passenger flight departing the runway during attempted take-off (AAIB, 2015).

23.3 Potential Construction Impacts

Potential impacts on aviation may arise as a result of blasting activity and operation of large plant during the construction of DWS. With DWS having a comparable construction methodology to DWP and being no larger in scale in terms of rock-blasting area or overall development footprint (for example: DWS rock blast area is estimated to be two-thirds of DWP), construction activities at DWS are anticipated to be within the scope of those currently taking place at the adjacent DWP site. For these DWP works, a Construction Plan detailing the blasting schedule and parameters for operation of large plant has been submitted to CnES and communications are maintained with HIAL with regards to planned activities. For any crane or plant higher than 10m a permit is sought prior to commencement of works. It is expected that potential impacts of blasting and plant operation during construction of DWS can be similarly managed through dialogue with HIAL, and as such no further consideration of these activities is proposed.

Once the quayside and heavy lift area are complete, installation and commissioning of a ring-crane on the heavy lift area during the operational phase of DWS will introduce structures of a significant height, with the maximum jib-height of the crane estimated to be in the order of 216m to 250m. Such structures could interact with aviation. As installation of the crane will be subsequent to the main construction phase, its consideration is included in 23.4 Potential Operational Impacts.

23.4 Potential Operational Impacts

With proposed use of the DWS facility including the assembly and pre-commissioning of offshore wind turbines, the lifting plant and turbines undergoing assembly at the quayside will be very tall and could interact with aviation.

Lifting plant will be required for the assembly of wind turbines. The heavy lift area of the DWS quayside will be designed to take the load of a 3500T ring crane, however the exact type and specification of the crane used will be determined by the contractors undertaking the turbine assembly. The crane will be delivered to site by sea in sections and will be built at the quayside. The largest anticipated size of crane would have a fully-extended jib height in the region of 250m above quay level.

The turbines proposed for the two floating offshore windfarm sites off the coast of Lewis are 15MW capacity. This size of turbine has a maximum tip height of 330m above sea level.

The proposed DWS quayside will accommodate one full height floating wind turbine at any one time. Once assembled, each turbine will be towed to the installation site by tugs. Following completion of the windfarm installation, turbines may be returned to the DWS quayside for maintenance or repairs.

The wind turbine at the quayside will not be operational, however, during pre-commissioning activities, low-speed controlled movement of the blades for short periods is anticipated. Potential impacts associated with wind turbine construction and pre-commissioning are as follows:

- Physical presence of tall structures giving rise to a collision risk;
- Unwanted radar returns; and
- Unwanted communication, navigation and surveillance (CNS) returns.

As detailed in 23.2 the topography of the area is relatively flat, and below the maximum expected turbine tip height of 330m. It is therefore physically possible for aircraft to be flying at heights which could give rise to a collision risk if appropriate mitigation is not in place. Full data on local civilian and military radar systems has not as yet been collated to provide an understanding of possible unwanted CNS returns.

23.5 Proposed Impact Assessment

It is proposed that Aviation be **scoped in** to the DWS EIA. it is recognised that in both the construction and operational phases there is the potential for interaction with aviation. Specifically, this is in relation to installation of the large crane structure and the assembly and maintenance of offshore wind turbines to be accommodated at the operational DWS facility.

In line with CAA recommendations for pre-application consultation, it is proposed that SPA undertake a programme of consultation with relevant civilian and military aviation stakeholders to understand the extent of any aviation issues and how they can be overcome. These stakeholders include:

- HIAL;
- Maritime and Coastguard Agency;
- Bristow (operator of HMCG SAR helicopters);
- Scottish Ambulance Service;
- Comhairle nan Eilean Siar;
- NATS (the air traffic control service provider)

- Ministry of Defence; and
- Civil Aviation Authority.

SPA will commission an airport safeguarding review from an appropriately qualified air traffic consultant in consultation with HIAL. SPA and its consultant will work with HIAL and the other airport stakeholders to develop proposals for any mitigations required to avoid an adverse impact on air traffic. This will be done in accordance with relevant CAA guidance and submitted for approval by the CAA.

It is envisaged that a protocol will be developed for use by operators planning to use the DWS facility for assembling wind turbines, inclusive of installation and operation of a heavy-lift capacity crane. This protocol will facilitate compliance with the appropriate legislation, guidance and safety requirements to ensure acceptability to aviation stakeholders. If necessary, arrangements for agreement in relation to specific activities will be included in the protocol. It is expected that the agreed route map will be presented in the DWS EIAR.

24 Access, Traffic and Transport

The focus of this section is the potential impacts on the local transport network during construction and operation of the proposed DWS facility.

Traffic and transport impacts from the adjacent DWP were previously assessed as part of the DWP EIA, and were deemed non-significant following mitigation, which included the development and implementation of a Construction Traffic Management Plan (CTMP) (Affric, 2020). As the location of DWS and nature of the proposed construction works are comparable to the adjacent DWP development, reference to the assessment undertaken as part of the DWP EIAR is used within this section.

24.1 Policy and Guidance

Relevant information and guidance which should be taken into account for traffic and transport assessments include:

- National Planning Framework 4 Policy 13: Sustainable Transport;
- Planning Advice Note (PAN) 75: Planning for Transport;
- Transport Assessment Guidance (Transport Scotland, 2012);
- HITRANS Regional Transport Strategy (Draft) (HITRANS, 2017);
- Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993); and
- Environmental Assessment of Traffic and Movement (IEMA, 2023).

At a local level relevant policy includes the OHLDP. Policy 'EI9: Transport Infrastructure' lays out the priority areas for the upgrading and development of transport infrastructure within the Outer Hebrides. In relation to traffic and transport associated with the construction and operations of DWS, policy EI9 sets out an obligation of *'secure, improved road safety… in particular around schools, community and leisure facilities.'* (CnES, 2018).

24.2 Baseline

24.2.1 Access

The A859 is the primary road serving the area in which the proposed DWS development lies. It is a good standard single-carriageway road, routing south-west to the most southerly point of Lewis and Harris, and north-east to the town of Stornoway. Within Stornoway the A859 becomes Willowglen Road, which meets the A857. The A857 itself routes south to Stornoway town centre and north to the north-easterly point of Lewis, Port of Ness.

Arnish Road runs between the A859 in the north and Arnish Point Industrial Estate to the south, where it terminates. It is a single-track road with passing places, and provides the only route to Arnish Point and associated facilities. As noted in Section 2: Background, proposals are currently developed for the upgrading of Arnish Road to two-way adoptable standard.

The DWP and DWS sites are situated some few hundred meters apart, and as such, will share common access routes. The DWP/DWS access road adjoins Arnish Road, approximately half-way along its course between the A859 and Arnish Point Industrial Estate. Also providing local access, suitable for large loads, a link road between DWP/DWS and the Arnish Point Industrial Estate is currently undergoing construction as part of the DWP project.

In terms of non-vehicular access, there is a network of footpaths within the Lews Castle Grounds and Lady Lever Park. Permission has recently been granted (February 2023) for construction of an additional section of footpath, that will connect the DWP facility with the existing path network within the castle grounds. This will allow the DWP/DWS location to be readily accessed on foot from Stornoway.

24.2.2 Traffic

A Transport Assessment (TA) was undertaken as part of the DWP EIA process, focussing on the effects of the development on the road network (Affric, 2020). As the DWP will be operational by the time DWS is being constructed, it is assumed that the traffic volumes identified within the TA for the operational stage of DWP are in the effect baseline for consideration of the DWS proposal.

The DWP TA encompassed the following sections of the local road network:

1. A859 South of the junction with Arnish Road;
2. A859 Willowglen Road;
3. A857 South (Macaulay Road);
4. Matheson Road; and
5. A857 North.

The projected traffic flows for each of these locations during DWP operations, as 18-hour Annual Average Weekly Traffic (AAWT) and HGV counts, are provided in Table 24.2.2 (Appendix O.1 DWP EIAR, Affric 2020). This is based on a worst-case assumption of activities at DWP adding 60 two-way HGV movements, 96 two-way coach trips and 200 car journeys per day to the forecast existing flows on the local road network.

Table 24.2.2: Baseline Daily Two-Way Traffic Flows

Location	1. A859 South of Arnish Road Junction	2. A859 Willowglen Road	3. A857 South / Macaulay Road	Matheson Road	A857 North
AAWT	5,267	7,672	14,636	9,808	14,909
HGV Count	502	492	529	260	372

In terms of traffic safety, a review of vehicle accident information shows a relatively low incidence on the local road network, with 21 occurrences relating to cars and goods vehicles over the last 5 years of available data (2017 – 2021). Classifying these in terms of severity, there have been no fatal accidents, 5 serious (all involving cars) and 16 slight (15 involving cars, 1 involving a goods vehicle) (CrashMap, 2023).

24.2.3 Transport

The town of Stornoway has a ferry port, connecting to Ullapool on the west coast mainland, and an airport providing links to Benbecula, Inverness, Glasgow, Edinburgh and Southampton. There are regular weekday bus services centred on Stornoway, providing public transport options for workers to and from the junction of Arnish Road and the A859. Active travel options are also possible. The planned footpath connecting DWP to the existing path network in Lews Castle Grounds will facilitate walking and cycling access to the site from Stornoway (approximately a 4.5km route).

24.3 Potential Construction Impacts

Construction impacts associated with the proposed DWS development could affect road safety, pedestrians, cyclists, cause driver delays and disrupt local amenity. These impacts may arise from:

- Construction personnel commuting to work;
- Material deliveries (aggregates, cement and components);
- Delivery and removal of heavy plant to carry out works; and
- Removal of waste from site (small volume anticipated).

As described in Section 3.3.1 the bulk of materials for the DWS development (i.e. rock armouring and infill for land reclamation) will come from sources local to the site. There will also be the ability for materials and equipment to be delivered by sea to Arnish or DWP where practicable, for example for piling activities. Inherently, this will limit HGV movements during construction, particularly with regards to the town of Stornoway.

Some deliveries however, such as materials for the concrete quayside and heavy lift area, are likely to be made by HGV. Plant and ancillary deliveries will also be made by road. Assessment previously undertaken for DWP identified that onshore deliveries would equate to a maximum of 100 two-way HGV movements per day. As the scale of the proposed works at DWS are no greater than DWP (for example, concrete use for DWS is estimated to be two-thirds of DWP), the assessment parameters used for the DWP TA can be considered to represent a worst-case

indication of increased HGV movements on the road network associated with the DWS construction. Full assessment was required with regards to Matheson Road, within Stornoway, which was predicted to experience a 39% increase in HGV traffic on a worst-case day. A total of 31,600 two-way trips including HGVs and staff traffic were predicted, with additional traffic volume contributing to an estimated accident rate of 0.13 accidents over the total construction period. However, due to a good standard of footways, pedestrian crossings and signalised junctions, impacts on Matheson Road were assessed as non-significant.

While this suggests a potentially non-significant impact on the local road network during construction of DWS, proposed works to upgrade Arnish Road need to be taken into account, Should construction phases of the two developments interact, this would lead to increased traffic impacts as deliveries and staff commuting to serve each project will utilise the same road network, and indeed works on Arnish Road will affect access to the DWS site. However, most deliveries for the Arnish Road project will originate from local quarries or the local tarmac plant. These are located off the A859 in close proximity to the Arnish Road, so will not generate additional traffic within Stornoway town centre. Conversely, should upgrade of Arnish Road be completed prior to works at DWS commencing, access to the DWS site for deliveries and personnel attendance will be improved.

24.4 Potential Operational Impacts

The DWS facility will support the construction, pre-commissioning and servicing of offshore wind infrastructure and as such it is envisaged that the majority of transport to and from site will be by sea directly to the facility or via the adjacent Arnish Point Industrial Estate. Traffic and transport impacts on the road network will therefore be primarily limited to staff commuting to and from the site.

The TA undertaken for DWP assessed the impact of staff commuting on the robust basis of 100 staff attending site daily, with no use of active or shared transport (200 two-way car trips per day). This worst-case assumption, combined with other operational traffic such as coaches associated with cruise-ship activities at DWP, resulted in a maximum 4% increase in total traffic flow on the local road network, on the A859 Willowglen Road (DWP EIAR Appendix O.1; Affric, 2020). This is well within the 10% increase identified as non-significant under IEMA guidelines (IEMA, 1993 & 2023).

The number of staff commuting to DWS is unlikely to be more than 100, and commuting routes of the workforce are anticipated to follow a similar pattern to that considered for DWP. Increases in commuter traffic flows comparable to those predicted for DWP are therefore anticipated during operation of DWS. Hence, even in combination with DWP, the overall increase in traffic flows associated with staff commuting during operations at DWS is anticipated to be less than 10%.

As such minimal operational impacts are identified as arising from the proposed DWS development, and no further consideration is proposed.

24.5 Proposed Impact Assessment

It is recommended that Access, Traffic and Transport for the construction phase be **scoped in** to the DWS EIA. It is proposed that consideration of operational effects be **scoped out** on the basis that no significant impacts are expected, with anticipated increases in traffic flows being below the 10% threshold identified by IEMA guidance (IEMA, 2023).

An updated TA will be completed for the construction phase of DWS to provide understanding of traffic and transport effects on the local road network and associated receptors. This will encompass consideration of operational activities at DWP and potentially other projects in the vicinity, including the impact of the proposed Arnish Road upgrade. The assessment will be undertaken in accordance with IEMA Environmental Assessment of Traffic and Movement guidelines (IEMA, 2023). Receptors that may be sensitive to changes in traffic conditions that will be considered include:

- Non-motorised users;
- Motorists and freight vehicles;
- Public transport; and
- Emergency services.

The assessment will include consideration of the following:

- Severance of communities;
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Non-motorised user amenity;
- Fear and intimidation on and by road users;
- Road user and pedestrian safety; and
- Large loads.

Due to the location of DWS being equivalent in access terms to that of DWP, it is proposed that the study area considered by the DWP TA be similarly adopted for the DWS assessment. This includes the sections of the local road network detailed in 24.2.

The TA will be presented as part of the DWS EIAR, and will be used to inform development of a CTMP for inclusion in the CEMD for the DWS construction phase.

25 Major Accidents and Natural Disasters

According to the Institute of Environmental Management Assessment (IEMA) guidelines, a major accident can be caused by both man-made and natural hazards, and may be defined as:

'*an event, such as a train derailment or major road traffic accident, which threatens immediate or delayed serious environmental effects to human health, welfare and/or the environment, and requires the use of resources beyond those of the client or its appointed representatives (i.e., contractors) to manage*.' (IEMA, 2020c).

The topic of Major Accidents and Natural Disasters was not included in the EIA undertaken for the DWP development adjacent to DWS, hence no reference to previous assessment undertaken for DWP is applicable in this section.

25.1 Policy and Guidance

Relevant policy and guidance which should be considered for Major Accidents & Natural Disaster assessments include:

- Control of Major Accident Hazards (COMAH) Regulations; and
- Major Accidents and Disasters in EIA: A Primer - IEMA Guidelines (IEMA, 2020c).

25.2 Baseline

Several existing potential sources of man-made and natural hazards that could contribute to major incidents have been identified. These are detailed in turn within the following sections.

25.2.1 Biological Hazards

With Stornoway Port functioning as a major hub for people accessing the Outer Hebrides, relevant biological hazard primarily relate to communicable human diseases. The introduction of communicable disease agents via movement of people through the port has the potential to result in outbreaks of illness in the local population, and contribute to wider spread. Two specific examples, norovirus and SARS-CoV-2 (the causative agent of COVID-19) are discussed further below.

Within the last 10 years there have been cases of gastrointestinal illness outbreaks due to norovirus associated with the Cruise Ship industry. Health officials track gastrointestinal illnesses occurring on Cruise Ships, hence outbreaks are identified and reported quickly negating the requirement for further incident management. Some norovirus-affected vessels have berthed at ports in Scotland. As outbreaks were contained within the vessels themselves, they did not impact the local community.

As the COVID-19 pandemic has highlighted, the spread of communicable diseases through the global population is a potential risk. While there are currently no COVID-19 management measures in force in the UK (UK Government, 2023), there is a risk that COVID-19 or another communicable disease could present an issue. As a critical infrastructure provider SPA maintained Stornoway Port open for the duration that governmental COVID-19 measures were in place, providing lifeline transport services for the local community and businesses. SPA implemented protocols compliant with government guidance to ensure the health and safety of its employees, customers, contractors and members of the wider public. No issues requiring further incident management with regards to COVID-19 arose in relation to SPA controlled operations at the port during this time (SPA, 2023b).

25.2.2 Fire

No fires have occurred at Stornoway Port in relation to operations under SPA control (SPA, 2023b). There are, however, flammable materials including fuel oils stored and used throughout the port. These are appropriately managed in line with the Water Environment

(Controlled Activities) (Scotland) Regulations 2011 (as amended) and Control of Substances Hazardous to Health Regulations 2002 (COSHH) requirements.

To the east of the port facilities on the outskirts of Stornoway is the Scottish Gas Network Sandwick Road Liquified Petroleum Gas (LPG) Storage site (Health and Safety Executive, 2023). It is some 0.5km from the closest port facility. It is a registered upper tier COMAH site due to the flammable nature of the material stored there, and undertakes regular inspections and drills in line with COMAH regulations.

25.2.3 Transport Incidents

Vehicles attending port facilities do so via the local road network in and around Stornoway, and vessels utilise established navigation routes according to the port's Marine Safety Management System (MSMS). Baseline information on shipping, aviation and traffic safety is provided in Section 22: Shipping and Navigation, Section 23: Aviation and Section 24: Access, Traffic and Transport.

25.2.4 Natural Disasters

Storm events bringing strong winds are a relatively regular occurrence for the Outer Hebrides. In recent years, there have been at least two Met Office recognised storm events bringing storm force winds to the Stornoway area, with 2022 storms seeing gusts of over 80mph recorded in Stornoway (Met Office, 2023b).

Periods of drought are also a known occurrence, as across much of the UK. SEPA monitoring and analysis through their Drought Risk Assessment Tool shows the Creed Bridge monitoring station on the River Creed west of Stornoway to be experiencing prolonged periods of low river flow (SEPA, 2023e). Periods of drought increase the risk of wildfires, and also flooding in the event of subsequent heavy rainfall.

Coastal flooding is also an identified risk. The immediate coastline around Stornoway Harbour is classified by SEPA as having a High Likelihood of coastal flooding, defined as a 10% chance of flooding each year (SEPA 2023c).

While earthquakes are occasionally recorded in Scotland, particularly around the Great Glen Faultline and Comrie in Perthshire (Musson, 2007), none have been recorded in the Outer Hebrides. The most recent in 2017, classified as Light (measuring 4.0 on the Richter Scale), was recorded as originating at Moidart, West Highland. The most recent record of a Moderate earthquake (measuring 5.0 on the Richter Scale) was in 1901 near Inverness (British Geological Survey, 2023).

25.3 Potential Impacts

The IEMA guidance Major Accidents and Disasters in EIA: A Primer (IEMA, 2020c) scoping decision process has been followed in considering the potential impacts of the proposed DWS development. As detailed in Figure 25.3.1, the decision flowchart considers whether a development is itself a source of hazard, or equally whether it interacts with any external hazard sources, that could result in a major accident/disaster. Where a hazard source or interaction is identified, it is then considered whether the hazard is adequately controlled through the project design and legislative/standards requirements relating to the development, or is assessed within another EIA topic. If so, the hazard can be scoped out of further consideration. If a hazard is not controlled or assessed elsewhere in the EIA, it requires inclusion as a Major Accidents and Disasters topic.

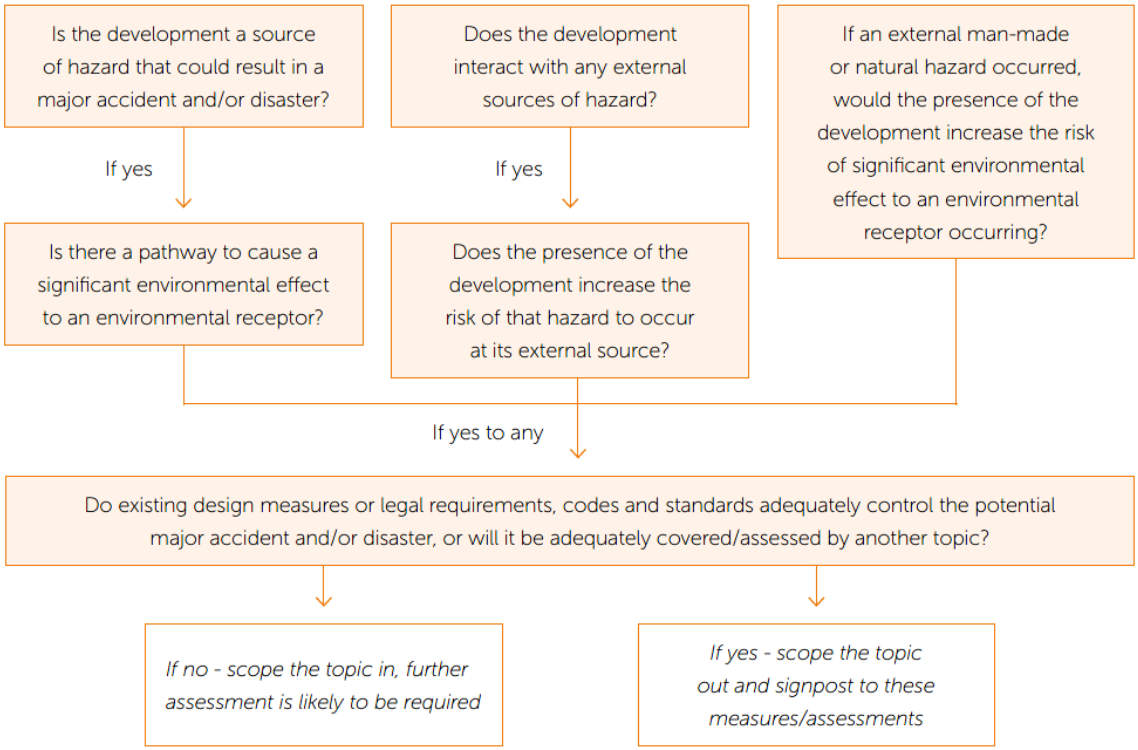

Figure 25.3.1: IEMA scoping decision flowchart (IEMA, 2020c)

A list of potential major accidents and disasters has been developed and considered in terms of how the location and proposed use of the DWS development may affect the risk of each scenario occurring. This is presented in Table 25.3.1. As per IEMA guidance (IEMA 2020c), whether each accident or disaster scenario is controlled or assessed elsewhere within the EIA is considered. Where relevant, Table 25.3.1 signposts to design measures, legal requirements, codes and standards or other sections within this document.

Table 25.3.1: Potential Major Accidents and Disasters

Major Accidents and Disasters	Location Risk	Proposed Use Risk	Comments	Design Measures or Legal Requirements, Codes and Standards (if applicable)	Topic Section (if applicable)	Scope In/Out
Biological Hazard: Communicable Disease	Yes	No	The potential for the introduction of diseases such as norovirus are managed by Vessel Sanitation Programmes. As these are more closely related to the Cruise Ship industry, no new potential impacts are identified in relation to DWS. In addition, SPA has management procedures in place to deal with disease outbreaks such as COVID-19.	The Public Health (Ships) (Scotland) Regulations 1971 (as amended).		Out
Biological Hazards: Animal / Insect Infestation	No	Yes	No sources relevant to major disasters identified. Risk of invasive non-native marine species introduction in connection with DWS operations has been considered.	International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004; and Guidelines for the Control and Management of Ships Biofouling to Minimize the Transfer of Invasive Aquatic Species (Marine Environment Protection Committee, 2011).	Section 8	Out
Fire	No	No	The DWS development does not interact with local COMAH site and does not introduce significant new fire sources. No new potential impacts are identified.			Out
Terror / Malicious Attacks	No	No	The DWS development is not considered to increase the risk of terror attacks. No new potential impacts are identified.			Out

Major Accidents and Disasters	Location Risk	Proposed Use Risk	Comments	Design Measures or Legal Requirements, Codes and Standards (if applicable)	Topic Section (if applicable)	Scope In/Out
Transport Incidents: Road Vehicles	No	No	No major incident sources identified. A Traffic Assessment in relation to construction works will be completed as part of the EIA and a CTMP included within the CEMD.		Section 24	Out
Transport Incidents: Shipping	Yes	Yes	Vessels movements within Stornoway Port, including operations associated with the DWS facility (e.g. tugs, floating wind turbines) could result in a shipping incident. However, vessel movements will be controlled under SPA's Marine Safety Management System.	Port Marine Safety Code; and International Regulations for Preventing Collisions at Sea 1972 (as amended).	Section 22	Out
Transport Incidents: Aviation	Yes	Yes	Construction and pre-commissioning of large wind turbines at DWS could in theory cause issues for aviation. This is to be considered within the DWS EIAR.	Civil Aviation Authority CAP 764 Policy and Guidelines on Wind Turbines; and CAP 738 Safeguarding of Aerodromes.	Section 23	Out
Severe Storm	No	No	The DWS development is located within sheltered harbour waters protecting it from the worst effects of severe storms. No new risk identified.	Design of DWS: sheltered location within existing harbour.		Out
Wildfire	No	No	The construction materials and location of the DWS development adjacent to existing hard standing minimises wildfire risk. No new risk identified.	Design of DWS: rock, concrete and steel quayside structure not conducive to wildfire risk.		Out
Coastal Flooding	Yes	No	No significant flood risk is identified due to the nature of the DWS development.	Design of DWS: quayside height of over +7.2m CD mitigates risk of coastal flooding.	Section 17	Out
Damaging Earthquake	No	No	Earthquakes are unlikely to occur to a scale at which significant impacts could arise. Therefore, no new potential impacts are identified.			Out

25.4 Proposed Impact Assessment

It is proposed that Major Accidents & Natural Disasters be **scoped out** of the DWS EIA. This is on the basis that all locational or use risks identified are adequately addressed by design of the DWS proposal, existing legislation or other topics within this report, as detailed in Table 25.3.1.

26 Cumulative Impacts

To comprehensively consider potential impacts of the proposed DWS development, its effects need to be considered in conjunction with other developments that are planned within the local or regional area. This needs to be within an appropriate geographical range relative to type of impact, and be reasonably foreseeable in terms of delivery of the other development.

It is likely that the number and nature of cumulative impacts may change between the submission of this scoping report and submission of the DWS EIA. As such, this section aims to outline how potential cumulative impacts associated with the proposed DWS development will be assessed within the EIA, rather than to identify with certainty all specific projects that need to be considered.

26.1 Offshore Developments

The main offshore project types that are anticipated to be considered in relation to DWS include the following:

- Ports and harbour developments within the Stornoway Port area;
- Subsea cables in the Stornoway area; and
- Offshore renewable energy developments, primarily in the Scottish west coast region, which may include projects in the ScotWind leasing rounds.

At this point it is thought unlikely that there will be any oil and gas, carbon capture, aquaculture or aggregate extraction projects (excluding dredging) likely to give rise to cumulative effects with DWS. Should however, any such projects be identified as the consenting process for the DWS proposal progresses, they will be duly considered.

26.2 Onshore Developments

Onshore developments which could give rise to cumulative impacts with the DWS development are anticipated to include:

- Onshore wind developments within 60km, due to potential landscape and visual impacts;
- Other major developments close enough to have impacts on the same receptors (human and the natural environment);
- Onshore port-related developments within the Stornoway Port area; and
- Potentially non-major developments in the immediate vicinity of DWS, which could impact upon the same receptors.

26.3 Proposed Environmental Impact Assessment

IEMA suggest a useful ground rule for cumulative impact assessment, which will be applied in the production of the DWS EIAR:

- Developments already built and operational are excluded from cumulative impact assessment, as they are included within the EIA environmental baseline;
- Projects that are consented but not yet developed or are within the consenting process need to be considered; and
- Projects that are earlier in the process (i.e. prior to consent submission) can be discounted, as the developer of that project will be responsible for considering the effects of other projects in their own EIA, and there is unlikely to be sufficient information to make a meaningful assessment.

In order to identify projects which should be included in terms of cumulative assessment, a review of the CnES online planning information portal and Marine Directorate's register of current projects will be undertaken.

Once relevant projects have been identified, a review of their potential effects will be completed to understand whether they could impact upon the same receptors as the DWS proposal. This will utilise information that is publicly available on the identified projects. The outcome will be recorded within the DWS EIAR, presented on a topic-basis, with cumulative assessment considered for each relevant topic area. Where required, mitigation measures will be outlined under each of the topics assessed within the EIA for DWS.

In terms of currently known projects relevant to DWS, the adjacent DWP development is undergoing construction at present, and is anticipated to be operational before works at DWS commence. As such DWP will be considered as part of the DWS EIA baseline rather than under cumulative impacts. The proposal to upgrade Arnish Road between the A859 and Arnish Point Industrial Estate is at an earlier stage in the consenting process, and as such it is envisaged that the Arnish Road upgrade project may require consideration in terms of cumulative impact within the DWS EIAR. Specifically, this will involve consideration of traffic and transport impacts, as noted in Section 24: Access, Traffic and Transport.

Also in close-proximity, electricity transmission network proposals are in development as part of the Western Isles Connection Project. This includes Lewis High-Voltage Direct Current (HVDC) converter station and substation, converter station to Arnish Point underground HVDC cable and Stornoway to Dundonnell subsea HVDC cable. The status of these proposals should be taken into account at the time of assessment and may require consideration in terms of cumulative impact within the DWS EIAR.

Four onshore wind developments are also identified which will require consideration within the DWS EIAR. These are Monan windfarm (Ardhasaig, Harris), where replacement of existing infrastructure with larger turbines is proposed, and new windfarm developments at Uisenis and Muaitheabhal (Eishken Lochs, Lewis) and Stornoway (Pentland Road to Achmore). It is proposed that these developments are considered in terms of potential cumulative impacts on Landscape, Seascape and Visual Effects.

27 Conclusion

SPA is proposing to build the Deep Water South facility as part of a programme of works to enhance facilities within the Outer Hebrides' primary port, Stornoway. Specifically, the DWS facility is proposed to accommodate likely requirements of the developing offshore wind sector.

A scoping opinion is sought form Marine Directorate and Transport Scotland under Part 4, Paragraph 14: 'Request for scoping opinions' of the EIA Regulations. This report has been produced to support that request, in line with Part 4, Paragraph 14 (2) and Schedule 4 of the EIA Regulations.

A full range of environmental topics relating to the development of the DWS facility has been considered. These are summarised in Table 27.1, including which topics which are proposed to be scoped in and scoped out of the DWS EIA assessment process.

Where relevant this scoping report has drawn upon experience and information gained through development of the DWP facility, currently undergoing construction adjacent to the proposed DWS site in Glumaig Harbour. By utilising existing knowledge and proposing tried and tested mitigation measures as implemented for DWP, this scoping report demonstrates that potential significant effects of the DWS proposal are relatively limited. It is proposed that EIA efforts are focused on areas where there are potential significant effects that are new or differ from those previously considered for DWP.

Topics proposed to be scoped out of consideration within the DWS EIA are excluded on the basis that no significant effect are predicted taking account of the mitigation identified in the Initial Schedule of Mitigation provided in Appendix 1. Where appropriate the mitigation reflects that identified and successfully implemented through the DWP EIA.

Table 27.1: Proposed Scoping for the DWS EIA Assessment

Topic	Construction	Operational
Air Quality	Out	Out
Land and Soil Quality	In	Out
Water Quality and Coastal Processes	Out	In (Coastal Processes)
In-Air Noise and Vibration	Out	Out
Underwater Noise and Vibration	Out	Out
Biodiversity – Marine Mammals	Out	Out
Biodiversity – Fish Ecology	Out	Out
Biodiversity – Benthic Ecology	Out	Out
Biodiversity – Terrestrial Ecology and Ornithology	Out	Out
Resource Usage and Waste	Out	Out
Climate Change and Flooding	Out	Out
Landscape, Seascape and Visual Effects	In	In
Archaeology and Cultural Heritage	In	In
Human Health	Out	Out
Population and Socio-Economics	In	In
Shipping and Navigation	Out	Out
Aviation	In	In
Access, Traffic and Transport	In	Out
Major Accidents and Natural Disasters	Out	Out

Key

	No Effect/Not Applicable – Scoped Out
	Non-Significant Effect – Scoped Out
	Potential Effect –Scoped Out as can be mitigated by measures proposed
	Potential Effect – Scoped In

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Glossary

Acronym	Definition
µPa	Micro-pascal
AA	Appropriate Assessment
AAIB	Air Accident Investigation Branch
AAWT	Annual Average Weekly Traffic
AMC	Acceptable Means of Compliance
AOD	Above Ordinance Datum
AQMA	Air Quality Management Areas
ARUD	Arnish Road Upgrade Development
AtoN	Aids to Navigation
BPEO	Best Practicable Environmental Option
BS	British Standard
CA	Conservation Area
CAA	Civil Aviation Authority
CAP	Civil Aviation Publications
CAR	The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)
CCP	Climate Change Plan
CCS	Carbon Capture and Storage
CD	Chart Datum
CEMD	Construction Environmental Management Document
CnES	Comhairle nan Eilean Siar
CNS	Communication, Navigation and Surveillance
CO_2	Carbon Dioxide
COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
COVID-19	Coronavirus Disease 2019
CS	Certification Specifications
CTMP	Construction Traffic Management Plan
CWSH	Coastal West Scotland and Hebrides
dB	decibels
DWS	Deep Water South
DWP	Deep Water Port
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPS	European Protected Species
EU	European Union
FSS	Food Standards Scotland
ft	Feet
GDL	Garden and Designed Landscape
GEN	General Planning Principles
GES	Good Environmental Status Descriptors
GHG	Greenhouse Gas
GI	Ground Investigations
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GM	Guidance Material
GPP	Guidance for Pollution Prevention

Acronym	Definition
GVA	Gross Value Added
Ha	Hectares
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HIAL	Highlands and Islands Airports Limited
HITRANS	Highlands and Islands Transport Partnership
HLMOs	High Level Marine Objectives
HMCG	His Majesty's Coast Guard
HRA	Habitat Regulations Appraisal
HRO	Harbour Revision Order
IAQM	Institute of Air Quality Management
IEMA	Institute for Environmental Management Assessment
IMO	International Maritime Organization
JNCC	Joint Nature Conservation Committee
km	kilometres
km^2	Kilometres-squared
LBs	Listed Buildings
LCT	Landscape Character Type
LDPs	Local Development Plans
LFA	Low Flying Area
LPG	Liquified Petroleum Gas
LSEs	Likely Significant Effects
LSVIA	Landscape, Seascape and Visual Impact Assessment
m	metres
m^2	Metres-squared
m^3	Metres-cubed
mbgl	Meters Below Ground Level
MD-LOT	Marine Directorate Licensing Operations Team
MHWS	Mean High-Water Springs
MOD	Ministry of Defence
mph	Miles Per Hour
MSMS	Marine Safety Management System
MU	Management Unit
NAR	Noise Assessment Report
NBN	National Biodiversity Network
NE	North East
NIEA	Northern Ireland Environment Agency
NM	Nautical Mile
NMP	Scottish National Marine Plan
NMPi	National Marine Plan Interactive
NNMS	Non Native Marine Species
NNR	National Nature Reserve
No.	Number
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPF	National Planning Framework
NSA	National Scenic Areas
NSRs	Noise Sensitive Receptors
NW	North West

Acronym	Definition
OHFT	Outer Hebrides Fisheries Trust
OHLDP	Outer Hebrides Local Development Plan
OSPAR	The Convention for Protection of the Marine Environment of the North-East Atlantic
PAC	Pre-Application Consultation
PAD	Protocol for Archaeological Discoveries
PAHs	Polyaromatic Hydrocarbons
PAM	Passive Acoustic Monitoring
PAN	Planning Advice Notes
PMF	Priority Marine Feature
PMP	Peat Management Plan
PMSC	Port and Marine Safety Code
pp	Peak Pressure
PPG	Pollution Prevention Guideline
PSA	Particle Size Analysis
PTS	Permanent Threshold Shifts
re	Reference
RNLI	Royal National Lifeboat Institution
RoRo	Roll-on Roll-off
s	seconds
SAC	Special Area of Conservation
SAR	Search and Rescue
SCOS	Special Committee on Seals
SCT	Seascape Character Type
SEL	Sound Exposure Level
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Areas
SME	Small-Medium Enterprise
SNH	Scottish Natural Heritage (now known as NatureScot)
SPA	Stornoway Port Authority
SPAs	Special Protected Areas
SPL_{peak}	Peak Sound Pressure level
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Urban Drainage System
SE	South East
SW	South West
SWPA	Shellfish Water Protected Area
T	Tonne
TA	Transport Assessment
TAN	Technical Advice Note
TNSR	Traffic Noise Sensitive Receptor
TraC-MImAS	Transitional and Coastal Morphological Impact Assessment System
TTS	Temporary Threshold Shifts
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea
UKHO	UK Hydrographic Office
VPs	Viewpoints
WB	Watching Brief
WEWS	Water Environment and Water Services Act
WFD	Water Framework Directive

Acronym	Definition
WHO	World Health Organisation
WI-LCA	Western Isles Landscape Character Assessment
WLA	Wild Land Areas
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

Appendix 1. Initial Schedule of Mitigation

The proposed mitigation measures for the DWS development is provided in Tables A1.1 & A1.2 for construction and operations respectively.

Table A 1.1 Initial Schedule of Mitigation for DWS Construction

Topic	Mitigation Measures	Reference
Air Quality	Dust Management Plan to be developed and implemented, including appropriate measures such as: • Appropriate planning to minimise the number of times dust-emitting material is moved; • Materials/surfaces with potential to generate dust will be kept moist; and • Finishing/covering of surfaces will be conducted as soon as practicable.	Section 6
Water Quality	The start of each activity that could give rise to increased sediment loading in the water column will be observed, to ensure that any plumes arising are localised and disperse quickly. If increases in sediments are not as predicted, the construction technique will be reviewed to identify areas for improvement to prevent reoccurrence.	Section 8
	Temporary surface water management requirements will be identified in RAMS.	
	Fuel storage on site will be under strict management controls, in compliance with the requirements of the relevant GBRs.	
	Refuelling will be carried out in designated areas, by trained operatives following site refuelling procedures. The refuelling procedure will take into account best practice laid out in GPP2 and PPG6.	
	Where practicable, bio-degradable hydraulic fluids will be utilised in machinery during construction.	
	Appropriately bunded oil and chemical storage cabinets will be provided on site. These will be kept locked, with the key under management control to ensure appropriate use and accountability.	
	All oils and chemicals will be subject to Control of Substances Hazardous to Health (COSHH) assessments under the COSHH Regulations 2002. All COSHH assessments will include a section on the environment to highlight any precaution or mitigation requirements.	
	Appropriate spill plans aligned to the pollution control hierarchy and spill kits will be in place. Construction operatives will be trained in the plans and in the use of spill kits.	
	Cement washings will be carried out in a dedicated area.	
	Cement washing arisings will be collected for onsite treatment. This will include settlement and, if required, pH correction. If not suitable for reuse liquids will be appropriately disposed and solids will be reused or disposed of as solid waste.	
	Contractors will be required to ensure all plant and equipment brought to site is properly cleaned prior to arrival.	
	All equipment will be inspected prior to mobilisation on site; any equipment carrying excessive sediment deposits will be returned to the supplier.	

Topic	Mitigation Measures	Reference
	All works will be carried out in accordance with the Code of Practice on Non-Native Species, adopting a precautionary approach to minimise the risk of releasing non-native species. Risk assessments relevant to planned activities will be completed and advice sought on best practice as necessary. Presence of non-native species will be reported.	
	All vessels visiting DWS during construction are expected to be compliant with the relevant requirements of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 and where appropriate follow Guidelines for the Control and Management of Ships Biofouling to Minimize the Transfer of Invasive Aquatic Species (Marine Environment Protection Committee, 2011).	
In-Air Noise & Vibration	Rock blasting will take place 9am – 7pm Monday to Saturday, with blasting normally taking place prior to 5pm.	Section 9 PAN1/2011 Noise and Vibration Control on Construction and Open Sites: BS 5228
	A Construction Traffic Management Plan will be implemented via the CEMD and take into consideration timing and volume of HGV movements.	
	Works will be appropriately sequenced in order to limit noise impacts.	
	Construction and operations will be undertaken during defined working hours, unless otherwise agreed and communicated to local residents.	
	A Section 61 will be applied for if necessary.	
	Reasonable and practicable measures will be implemented to reduce noise at source.	
	Plant and machinery will be modern and well maintained.	
	Local residents will be notified of noise sensitive activities (blasting, dredging at night etc), or those outwith normal working hours.	
	Blasts will be designed to maximise efficiency and reduce the transmission of noise/vibration.	

Biodiversity – Marine Mammals	The impact piling marine mammal mitigation will provide the following measures:
	• A 500m mitigation zone will be established around the piling rig for cetaceans and basking shark, whilst a 100m mitigation zone will be applied to seals and otters;
	• Trained marine mammal observers (MMO) will conduct a 20min pre-watch prior to the commencement of piling operations;
	  ○ If the 500m mitigation zone for cetaceans and basking shark and 100m mitigation zone for seals and otters remains clear during the watch, permission will be given to commence piling; but
	  ○ If a marine mammal/basking shark is sighted within the mitigation zone, piling will be delayed until the zone has been clear of marine mammals for at least 10min; and
	  ○ A 30minute soft start-up is required to protect HF hearing receptor groups;
		Section 12

Topic	Mitigation Measures	Reference

	• If conditions are unsuitable for visual observations (darkness, fog reducing visibility to <500m, or sea states >Beaufort 4); passive acoustic monitoring (PAM) will be utilised by a trained PAM operator to monitor the mitigation zone;
	  ○ A PAM watch of the mitigation zone will have a minimum duration of 20min;
	• Once piling has commenced there will be no requirement to stop works if a marine mammal/basking shark enters the mitigation zone, as long as piling has been continuous, with no breaks exceeding 10min;
	• If a break in piling operations exceeds 10min the following conditions will apply:
	  ○ During a break in piling operations, the noise generator will be utilised to produce sound at lower pressures to deter marine mammals away from the construction area and maintain a soft start procedure. Should the noise generator fail to be utilised for whatever reason, an MMO/PAM operator will be on watch during the break. The MMO/PAM operator will remain on watch during the break with or without the noise generator.
	  ○ If an MMO/PAM operator has been on watch during the break, with or without the utilisation of the noise generator, if the mitigation zone remains clear of marine mammals, piling can recommence immediately;
	  ○ If an MMO/PAM operator has been on watch during the break, with or without the noise generator running, and a marine mammal is observed within the mitigation, piling will not recommence until the zone has been clear of marine mammals for at least 10min; and
	  ○ If no marine mammal observations have been conducted during a break exceeding 10min and without the noise generator running, a 20min pre-watch will be conducted before piling can recommence, as detailed above.
	• All MMO/PAM operations will be recorded using the JNCC marine mammal reporting forms template and submitted to Marine Directorate once the works are complete.	

Topic	Mitigation Measures	Reference

	The dredged spoil disposal marine mammal and basking shark mitigation will provide the following measures:
	• A 200m mitigation zone will be established around the disposal vessel during disposal;
	• A mitigation zone is placed around the vessel as opposed to the disposal site as the vessel will be in transit during disposal;
	• Trained marine mammal observers (MMO) will conduct a 20min pre-watch prior to the commencement of spoil disposal, either on board the disposal vessel or from land:
	  ○ If the 200m mitigation zone remains clear of marine mammals and basking shark during the watch, permission will be given to commence disposal; and
	  ○ If a marine mammal or basking shark is sighted within the mitigation zone, disposal will be delayed until the zone has been clear for at least 5min.
	• If conditions are unsuitable for visual observations (darkness, fog reducing visibility to <300 on-board the vessel and <700m from the observation point on land, or sea states >Beaufort 4); passive acoustic monitoring (PAM) will be utilised by a trained PAM operator to monitor the mitigation zone:
	  ○ A PAM watch of the mitigation zone will have a minimum duration of 20min:
	  ○ If a marine mammal is detected within the mitigation zone during a PAM watch, disposal will be delayed until the zone has been clear of marine mammals for at least 10min.
	• All MMO/PAM operations will be recorded using the JNCC marine mammal reporting forms template and submitted to Marine Scotland once the works are complete.	

	All vessels to comply with the Scottish Marine Wildlife Watching Code.	
Biodiversity – Fish Ecology	Basking shark will be included within the marine mammal impact piling and dredge disposal mitigation.	Section 13
Biodiversity – Terrestrial Ecology, Habitats	Minimise the area of the habitats to be removed.	Section 15
	Rock armour revetments will be installed, where practicable, replacing coastal habitats used by otter.	
	Turves removed during soil stripping will be used to seal exposed peat where practicable, to prevent heathland and/or shrub habitats from drying out.	
Biodiversity – Terrestrial Ecology, Otter	Pre-construction survey.	Section 15
	Development of Species Protection Plan (SPP). EPS Licence sought if required.	
	Minimise area and duration of disturbance.	
	Artificial lighting within the site should only be used where required to light works sites and for safety reasons and should be directional towards the required works area.	
	Measures to prevent entrapment.	

Topic	Mitigation Measures	Reference
Biodiversity – Terrestrial Ecology, Herptiles	Pre-construction survey.	Section 15
	Development of Species Protection Plan (SPP).	
	Seasonal considerations when timing works where practicable.	
	Translocation of reptiles to suitable receptor site if required.	
	Minimise area and duration of disturbance.	
	Avoidance of hibernacula outwith active season where practicable.	
	Watching brief.	
Biodiversity – Terrestrial Ecology, Ornithology	Pre-construction survey.	Section 15
	Development of Species Protection Plan (SPP).	
	Exclusion zones implemented around nest sites where applicable.	
	HPAI control measures in line with NatureScot guidance will be included within the Ontological SPP.	
Biodiversity – Terrestrial Ecology, Bats	If tree works to be undertaken, potential roosting features to be inspected by an appropriately experienced ecologist prior to the commencement of works	Section 15 Guidance Note 8: Bats and Artificial Lighting
	Development of Species Protection Plan (SPP).	
	Artificial lighting within the site should only be used where required to light works sites and for safety reasons and should be directional towards the required works area.	
Biodiversity – Terrestrial Ecology, INNS	Pre-construction survey will be undertaken to identify any invasive non-native species in the onshore construction area.	Section 15
	Exclusion zones around rhododendron found in or adjacent to the construction site.	
	Removal of rhododendron if required, following appropriate methodology.	
	All equipment will arrive clean to site.	
Resource Use & Waste	Use of local materials where available.	Section 16
	Waste hierarchy to be implemented.	
	All relevant waste legislation to be followed.	
Shipping & Navigation	Appropriate Notice to Mariners placed.	Section 22
	Compliance with the Port Marine Safety Management System.	
	Good communications with the Harbour Master.	
	Navigational aids agreed with Northern Lighthouse Board prior to installation.	
	Development of protocol for safe operations at DWS, agreed with aviation stakeholders.	

Table A1.2: Operational Mitigation for DWS

Topic	Mitigation Measures	Reference
Shipping & Navigation	Update of SPA navigational risk assessment and MSMS to include DWS.	Section 22
	Operations in accordance with SPA's Port Marine Safety Code-compliant MSMS.	
	Navigational aids maintained in line with Northern Lighthouse Board requirements.	

Appendix 2. Breeding Bird Survey Report

Stornoway Deep Water South

Bird Survey Report

November 2023

Alison Tyler
34 Valtos
Miavaig
Isle of Lewis
HS2 9HR

Introduction

This report presents the results of a breeding bird survey of the site of the proposed Deep Water South development at Glumaig Bay, Stornoway, Isle of Lewis. The survey was commissioned by Affric Limited (Affric) to provide baseline information on the numbers, status and distribution of birds to inform the Scoping for Ecological Impact Assessment of the proposed development. The survey was undertaken between May and June 2023.

Survey Aims

To determine the abundance and locations of breeding birds across the survey area, and to determine the abundance and locations of non-breeding/foraging birds using the area.

Survey Area

The survey area comprised of the footprint of the proposed development, plus a 300m surrounding buffer area.

Methodology

The survey was carried out by Alison Tyler, an experienced ornithologist who is familiar with the area and the breeding birds of the Isle of Lewis.

Three visits were carried out to the site on the 30th May, 14th June and 28th June 2023.

All habitat was covered by the walkover survey. A route was walked such that all parts of the survey area were approached to within at least 100m and 20 minutes were spent in each 500m x 500m quadrant.

Results

Bird species accounts in systematic order.

Greylag goose *Anser anser*

No evidence of active nests within the survey area. Two family groups recorded on surveys in June, probably from nests in the Loch Arnish area. Seen foraging on shoreline around Glumaig Bay.

Mallard *Anas playrhynchos*

A single male, and a pair recorded by shore. No evidence of breeding in the survey area.

Red-breasted merganser *Mergus serrator*

Pair recorded foraging in Glumag Bay and on Loch Arnish. No evidence of breeding within the survey area.

Cuckoo *cuculus canorus*

Calling bird mobbed by meadow pipit within the survey area, on survey visits in June.

Oystercatcher *Haemotopus ostralegus*

Birds recorded on all survey visits, minimum count of 3 individuals. A pair has bred in the area on previous years, but there was no indication from the behavior of the birds of nesting within the survey area. A concentrated effort was made to establish if the birds were breeding, but no nests were found, and there was no alarm calling to indicate an active nest. The birds present were feeding along the shore.

Ringed Plover *Charadrius hiaticula*

One pair were seen with young (less than one week old) within the survey area. The probable nest site was 100m from the buffer zone.

Snipe *Gallinago gallinago*

A single bird recorded in the buffer zone to the west of the development footprint. No evidence of breeding.

Herring Gull *Larus argentatus*

Recorded on all three survey visits. There are large colonies within 5km of the site, and birds fly over the area to forage in the bay. All suitable nest sites were checked and there was no breeding behavior. It is possible that some early breeding birds had already fledged before the first survey visit, as immature birds were seen foraging on the shore.

Lesser Black-backed gull *Larus fuscus*

One breeding pair on the shore to the north of the development. At least 4 birds seen on each survey visit. Possible breeding location on steep cliffs above the development area.

Red-throated diver *Gavia stellata*

Adult birds recorded flying over survey area, calling and foraging in Glumaig Bay. No possibility of breeding within the survey area. An active nest was recorded within 1km of the survey area, and the adult birds from this site had flight lines between the nest and the foraging area in the bay directly over the development site.

Hooded crow *Corvus cornix*

Birds recorded flying over site, and a single individual seen foraging with gulls on one survey visit. No evidence of breeding.

Raven *Corvus corax*

Pair seen on all survey visits, mobbing raptors and gulls. There was a potential nest on the crags above the development site, however no adults were seen taking food into this nest and there was no evidence of successful breeding.

Wren *Troglodytes troglodytes*

One breeding pair within survey area.

Stonechat *Saxicola rubicola*

One pair breeding just outwith the survey area, and recorded foraging in the buffer zone.

Pied wagtail *Motacilla alba*

One breeding pair within survey area.

Meadow pipit *Anthus pratensis*

Minimum of one breeding pair within survey area. Seen mobbing cuckoo.

Hen harrier *Circus cyaneus*

No breeding birds in survey area. At least one active nest within 1.5km of the development site, and a male bird recorded hunting on shore within the survey area.

White-tailed eagle *Haliaeetus albicilla*

Adult seen flying over survey area, mobbed by gulls and raven. Not breeding within the survey area.

Buzzard *Buteo buteo*

Pair seen hunting in survey area. An old disused nest on the crag above the development site, and an adult bird seen flying around this area in May. No evidence of nesting at this location and the adult pair recorded hunting are likely to be the birds from a nesting location 1km to the west of the site.

Assessment

Although the breeding bird assemblage within the proposed development site was not of national significance, all wild birds are protected under the Wildlife and Countryside Act 1981 (as amended in Scotland) and appropriate mitigation methods should be implemented during the construction process through the construction environmental management documentation.

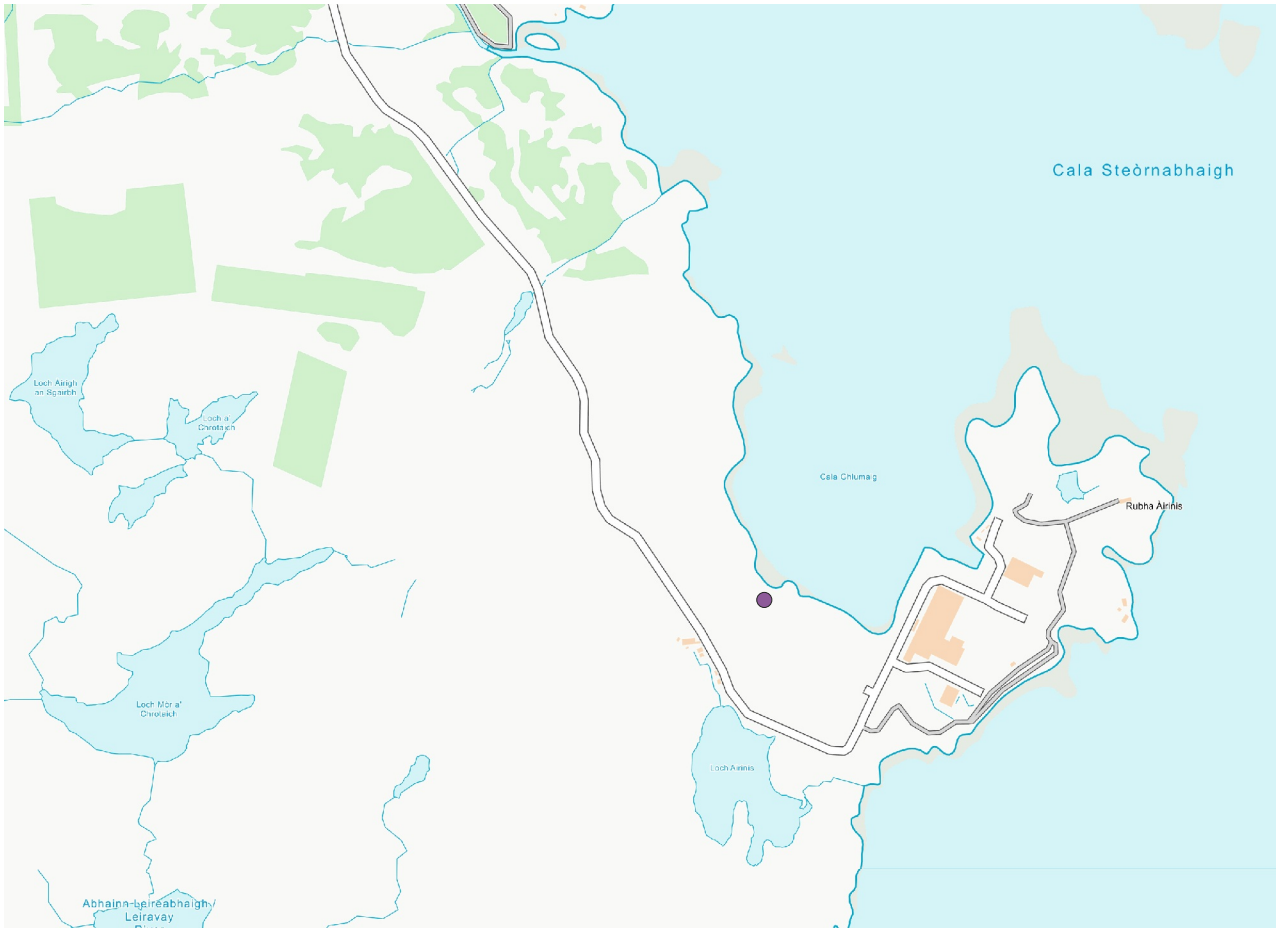
No Schedule 1, Schedule 1A or Schedule A1 birds were nesting within the survey area. However, Schedule 1 birds were breeding within 1km of the site, and the survey area lies within a regular flightline. Hence, the proposed mitigation should account for the potential for nests to be present within possible species-specific disturbance distances from the proposed works.

Stornoway Deep Water South
Map 1 Oystercatcher

Oystercatcher

0 250 500 m

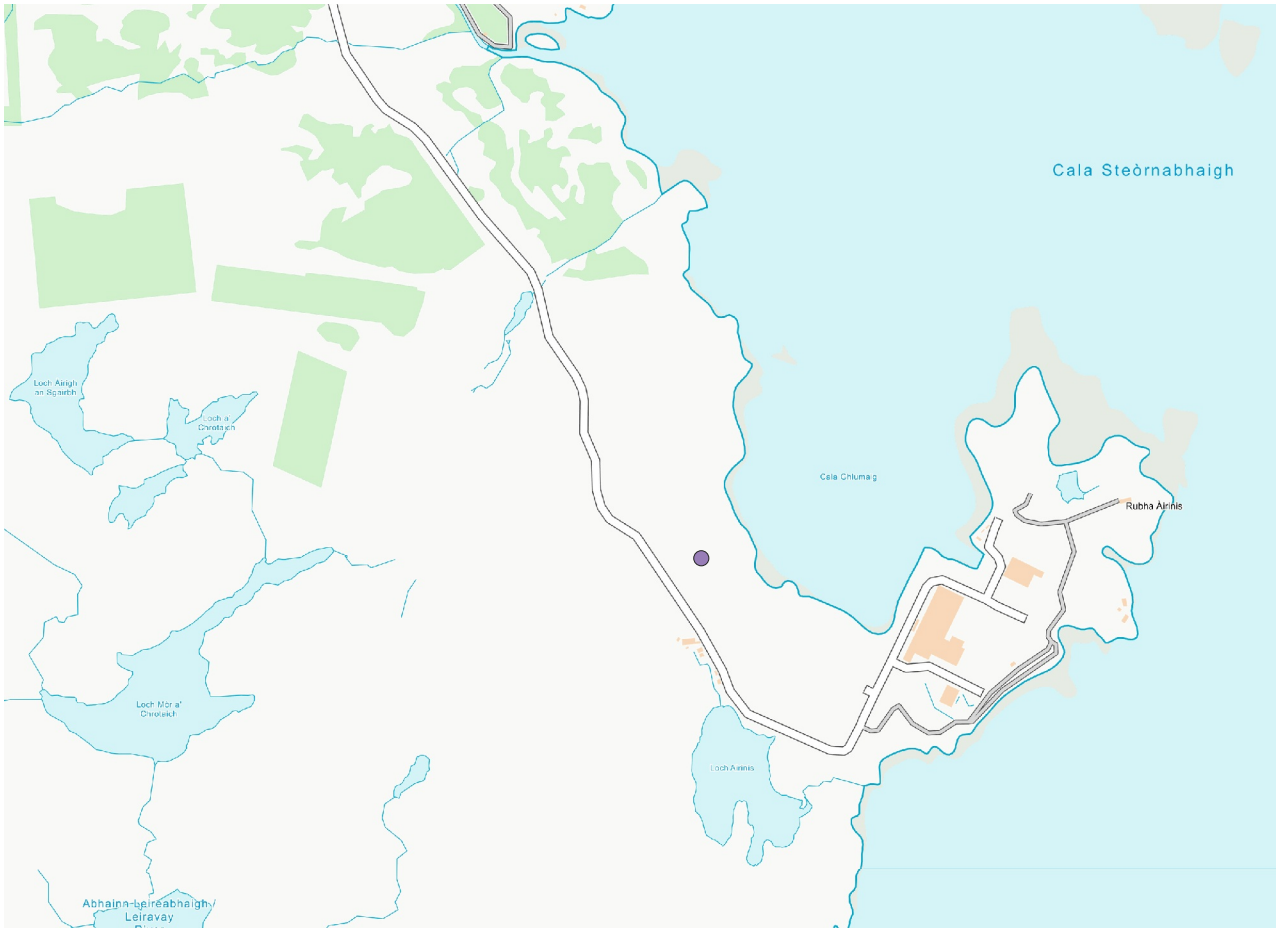
Stornoway Deep Water South
Map 2 Ringed Plover



Ringed plover

0 250 500 m

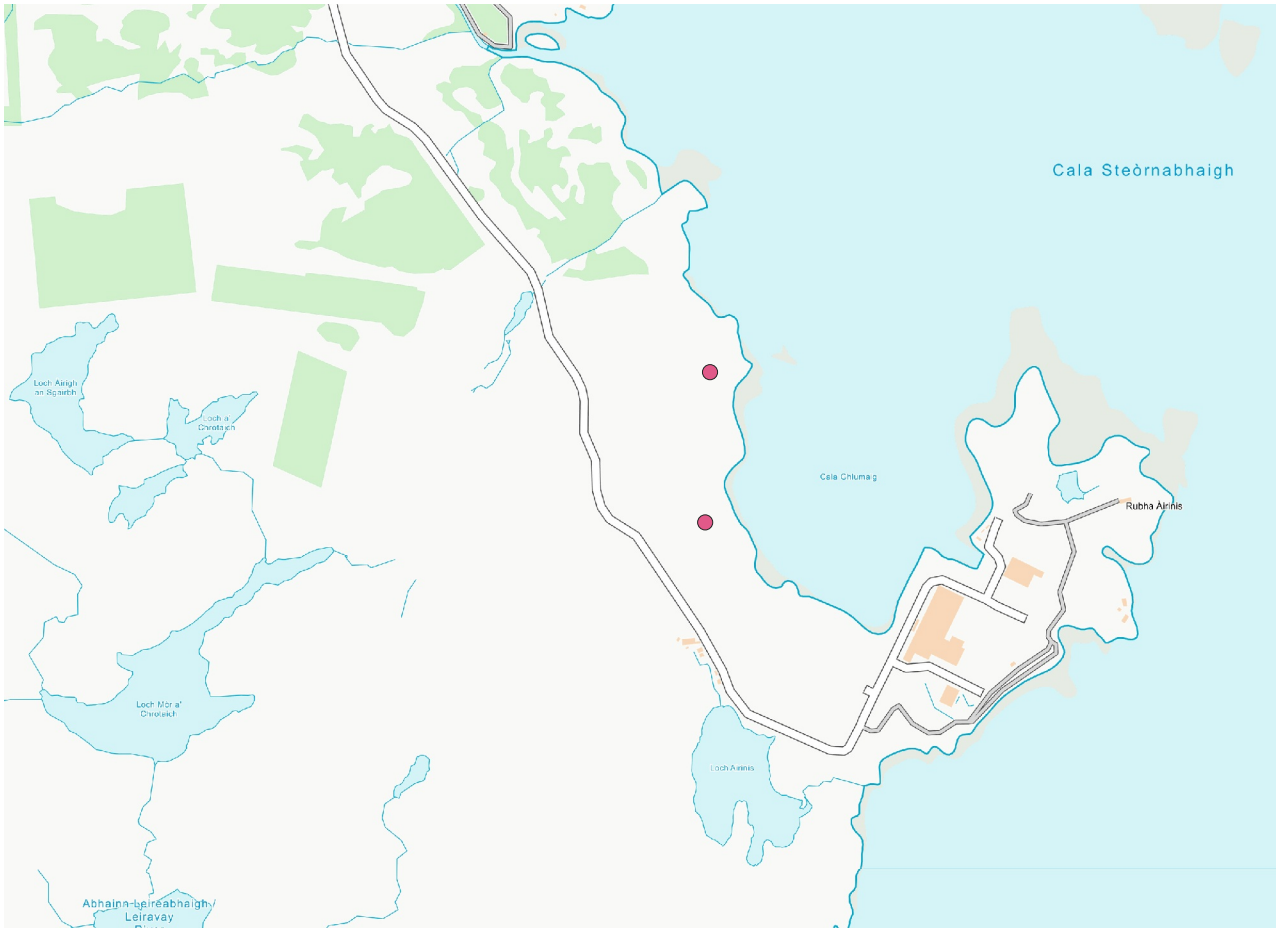
Stornoway Deep Water South
Map 3 Lesser black-backed gull



Lesser black-backed gull

0 250 500 m

Stornoway Deep Water South
Map 4 Raven



Raven

0 250 500 m

Stornoway Deep Water South
Map 5 Wren

Wren

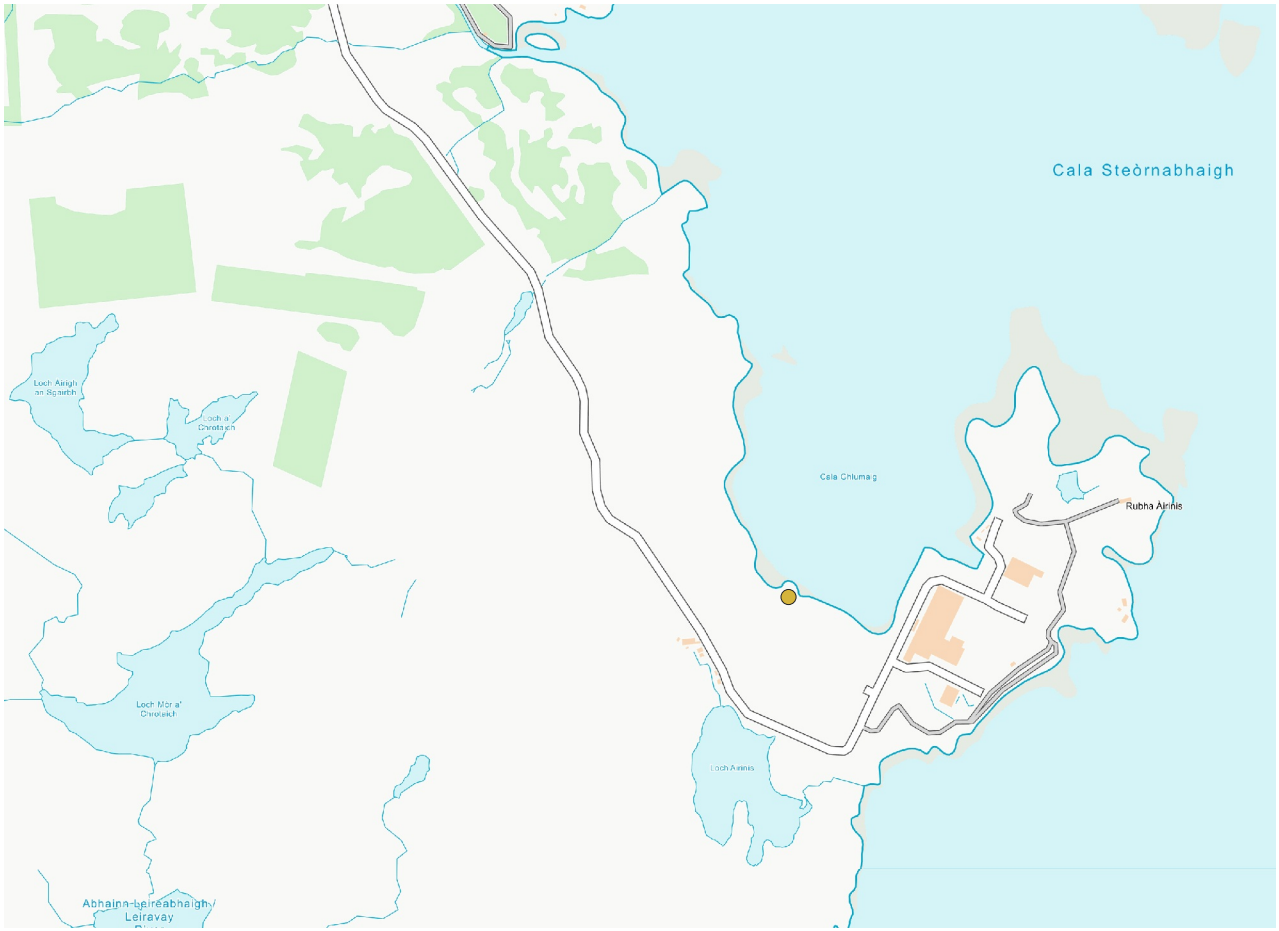
0 250 500 m

Stornoway Deep Water South
Map 6 Stonechat

Stonechat

0 250 500 m

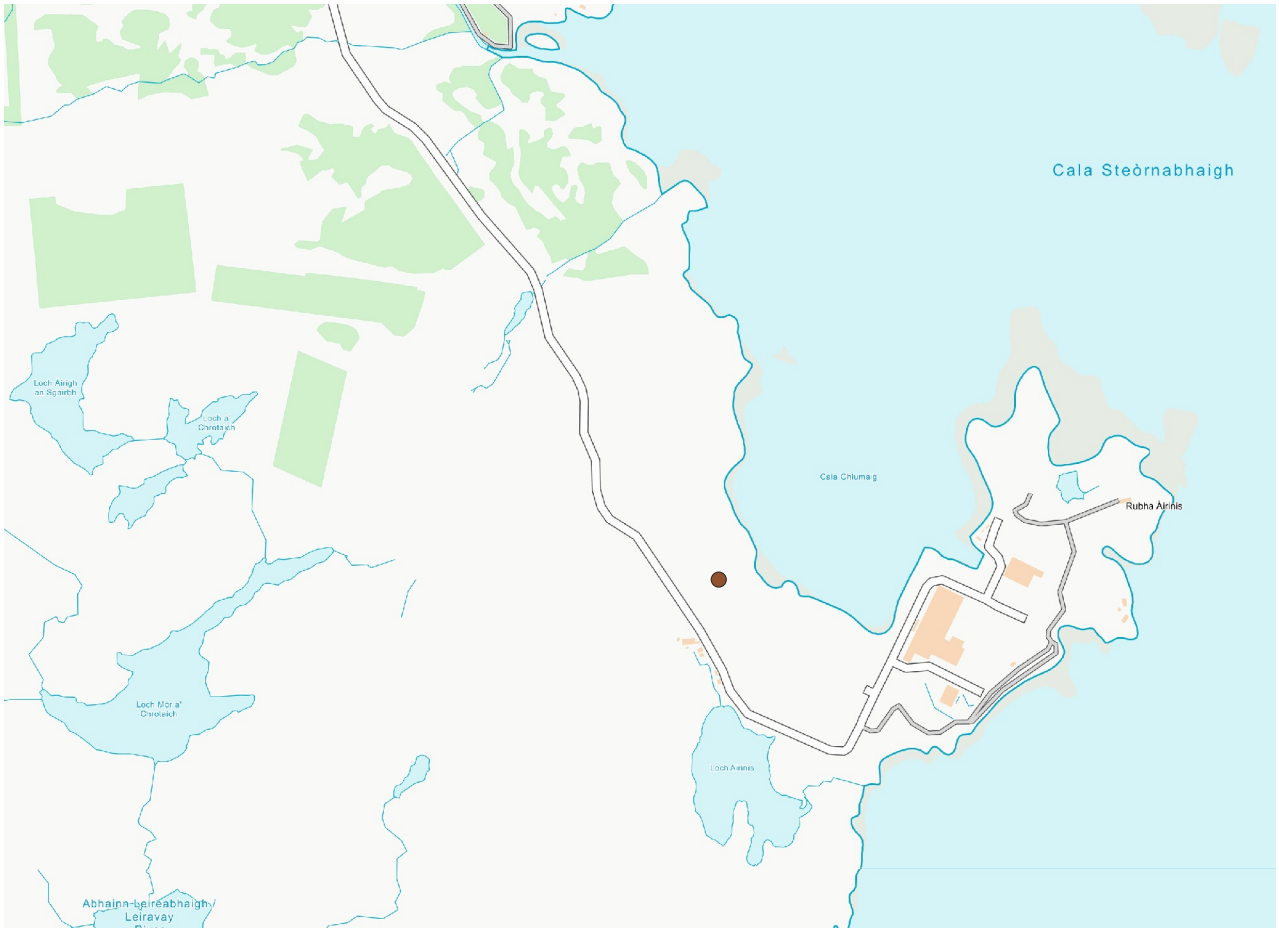
Stornoway Deep Water South
Map 7 Pied Wagtail



Pied Wagtail

0 250 500 m

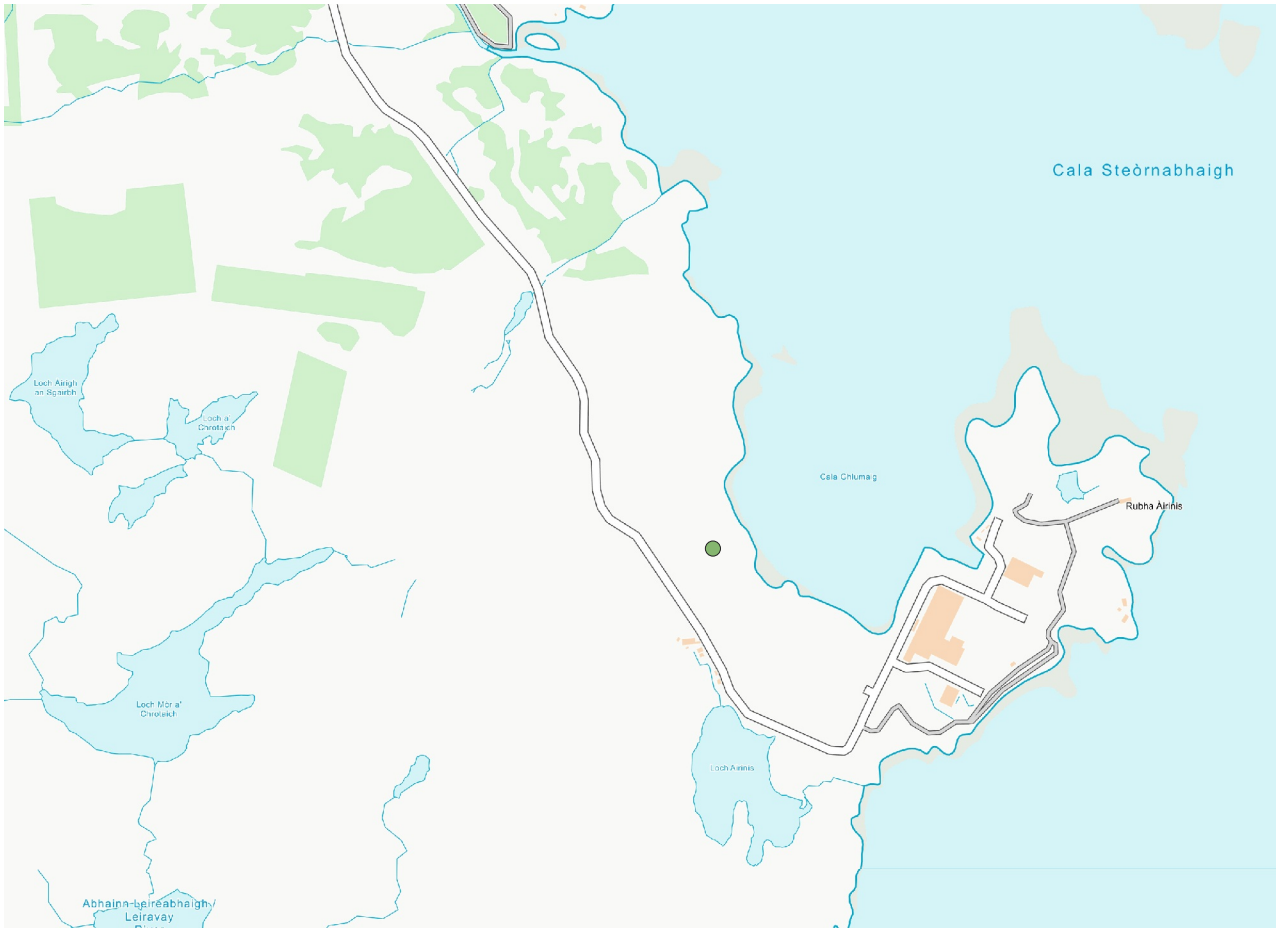
Stornoway Deep Water South
Map 8 Meadow pipit



Meadow pipit

0 250 500 m

Stornoway Deep Water South
Map 9 Buzzard



Buzzard

0 250 500 m

Drawings

SDWP-WS2139-XX-00-DR-C-9022 (P01)

SDWP-WS2139-XX-00-DR-C-9062 (P08)

WS2339-XX-XX-DR-C-9007 (P04)

113_DRG_01_2 Indicative Development Boundary

113_DRG_02_1 Peat Depth Contour Map

WS2139-XX-00-DR-c-9011 (P15)

113_DRG_03_1 Benthic Transects & EUNIS Habitats

113_DRG_04_1 ARUD Habitat Map & DWS

113_DRG_04_2 ARUD Habitat Map & DWS

113_DRG_04_3 ARUD Habitat Map & DWS

Figure 1 Development Platform ZTV

Figure 2 Development Platform ZTV Landscape & Visual Receptors

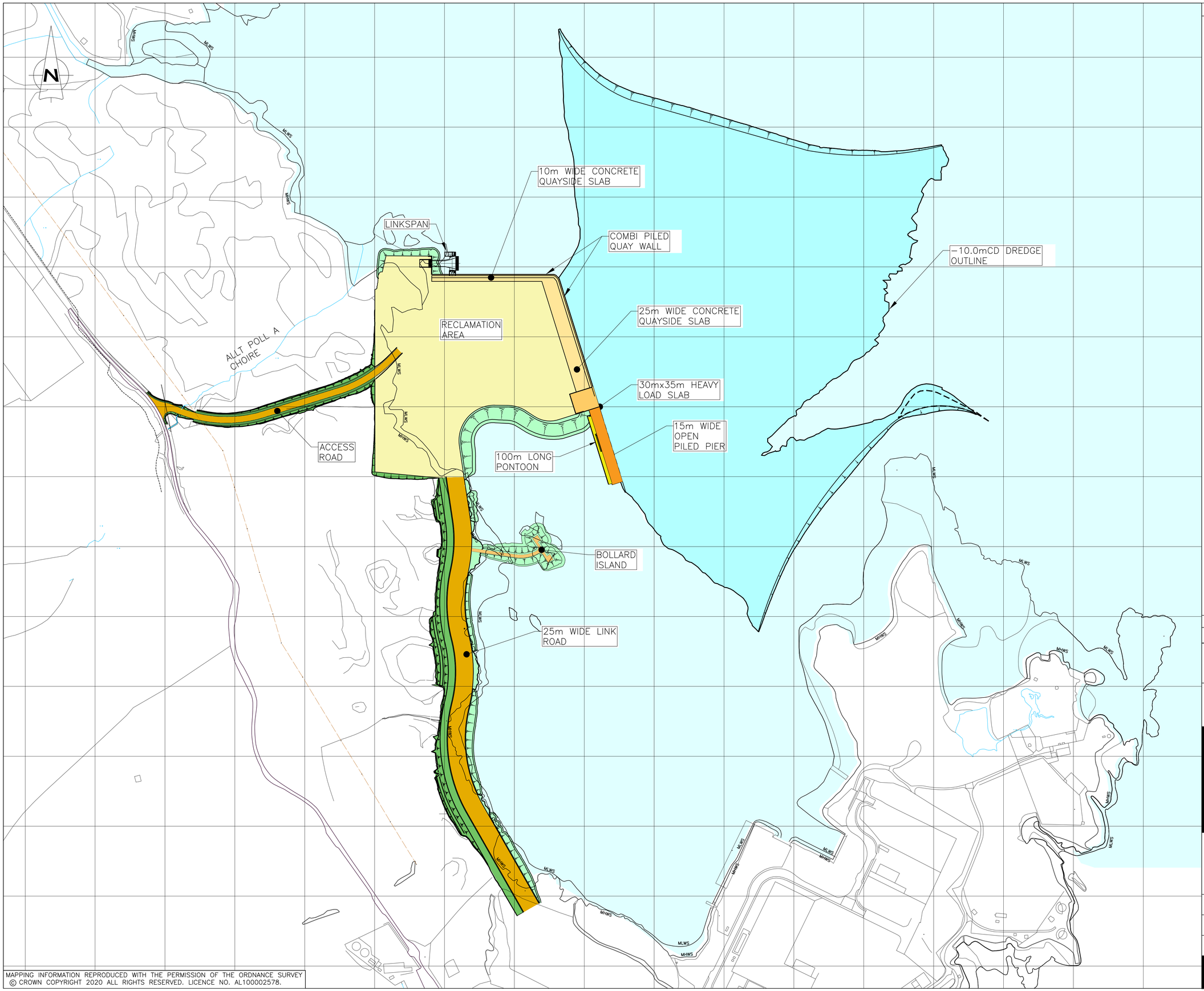
Figure 3 Turbine & Crane ZTV (NW, NE, SE & SW Sectors)

Figure 4 Turbine & Crane ZTV Landscape Character (NW, NE, SE & SW Sectors)

Figure 5 Turbine & Crane ZTV Landscape & Visual Receptors (NW, NE, SE & SW Sectors)

113_DRG_05_01 Heritage Assets

113-DRG_06_01 Heritage Asset Setting



GENERAL NOTES

1. ALL LEVELS ARE IN METRES AND RELATE TO CHART DATUM, UNLESS NOTED OTHERWISE.
2. CHART DATUM IS 2.71m BELOW ORDNANCE DATUM.
3. TIDE LEVELS:−

HAT=	+5.5mCD	(+2.79mOD)
MHWS=	+4.8mCD	(+2.09mOD)
MLWS=	+0.7mCD	(−2.01mOD)
LAT=	0mCD	(−2.71mOD)

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

CLIENT
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DRAWING TITLE
SCHEME LAYOUT

DRAWN	CHECKED	APPROVED
JR	JP	JP
DATE: MAY 20	DATE: MAY 20	DATE: MAY 20

SCALE (A1)	STAGE	REV
1:2500	INFORMATION	P01

DRAWING No.
SDWP−WS2139−XX−00−DR−C−9022

NORTH REVETMENT

LINKSPAN QUAY

DREDGED TO
−10.0mCD

MAIN QUAY

RECLAMATION AREA
+7.5mCD

EXISTING ACCESS ROAD

SOUTH REVETMENT

ANCHOR
POINT 1

LINK ROAD

ANCHOR
POINT 2

ANCHOR
POINT 3

N

931200.000

931100.000

931000.000

930900.000

142100.000

142200.000

142300.000

142400.000

142500.000

142600.000

142700.000

142800.000

142900.000

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES AND RELATE TO CHART DATUM.
3. CHART DATUM IS 2.71m BELOW ORDNANCE DATUM.
4. MHWS +4.8mCD
   MLWS +0.7mCD

LEGEND

- 270m CRUISE SHIP
- 270m CRUISE SHIP MOORING LINE
- 300m CRUISE SHIP
- 300m CRUISE SHIP MOORING LINE
- 330m CRUISE SHIP
- 330m CRUISE SHIP MOORING LINE

- B1 – 200t BOLLARD
- B2 – 75t BOLLARD
- B3 – 200t PILLAR BOLLARD

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D

AMENDMENTS

CLIENT

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DRAWING TITLE

PROPOSED MOORING BUOYS OPTION 1 – SINGLE CHAINS

DRAWN	CHECKED	APPROVED
JA	GB	GB
DATE	DATE	DATE
AUG 21	SEPT 21	SEPT 21

SCALE (A1)	STAGE	REV
1:1250	PRELIMINARY	P08

DRAWING No.

SDWP–WS2139–XX–00–DR–C–9062

RECLAMATION AREA

MAIN BERTH

ACCESS ROAD

EXCAVATION	
VOLUME OF PEAT	6,913 m^3
VOLUME OF ROCK EXCAVATION	289,054 m^3 (BULKING TO 419,129 m^3)
TOTAL AREA OF EXCAVATION	13,992 m^2
USABLE AREA	11,374 m^2

THEORETICAL EDGE OF CURRENT EXCAVATION TO SUIT DWP PLATFORM DEVELOPMENT

THEORETICAL EXTENT OF DWP CONTRACT EXCAVATION

ADDITIONAL AREA OF EXCAVATION REQUIRED TO SOURCE SOUTH QUAY MATERIAL (BLAST TO +6.0mCD)

EXTENT OF EXCAVATION REQUIRED FOR SOUTH QUAY DEVELOPMENT

OUTLINE OF ALLOWANCE FOR DISTURBANCE (10m OFFSET FROM TOP OF EXCAVATION)

SOUTH QUAY

ROCK ARMOURED SLOPE

DREDGE TO −13.0m CD

INFILL	
VOLUME OF ROCK INFILL REQUIRED	419,129 m^3
USABLE RECLAMATION AREA (WITH RINGER CRANE)	30,579 m^2
USABLE RECLAMATION AREA (WITHOUT RINGER CRANE)	33,030 m^2

DREDGE TO −13.0m CD	
DREDGE VOLUME	1,800 m^3
TOTAL DREDGE AREA	2,017 m^2
USABLE DREDGE AREA	1,398 m^2

ROCK ARMOURED SLOPE

QUAY SLAB

LINK ROAD

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES AND RELATE TO CHART DATUM.
3. CHART DATUM IS 2.71m BELOW ORDNANCE DATUM.
4. TIDE LEVELS:

H.A.T	= +5.5mCD	(+2.79mOD)
M.H.W.S	= +4.8mCD	(+2.09mOD)
M.L.W.S	= +0.7mCD	(−2.01mOD)
L.A.T	= 0.0mCD	(−2.71mOD)

LIMIT OF DEVIATION LEGEND

- = WORK NO. 8 – RECLAMATION
- = WORK NO. 9 – FINGER PIER
- = WORK NO. 11 – ACCESS ROAD
- = WORK NO. 12 – LINK ROAD

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
P04	25.07.23	MINOR AMENDMENTS & QUANTITY TABLES ADDED	JM	JP	GB
P03	23.03.23	PLATFORM EXCAVATION AREA UPDATED	JM	GB	GB
P02	09.05.23	HRO LIMITS ADDED	JR	GB	GB
P01	03.05.23	PRELIMINARY ISSUE	JR	GB	GB

AMENDMENTS

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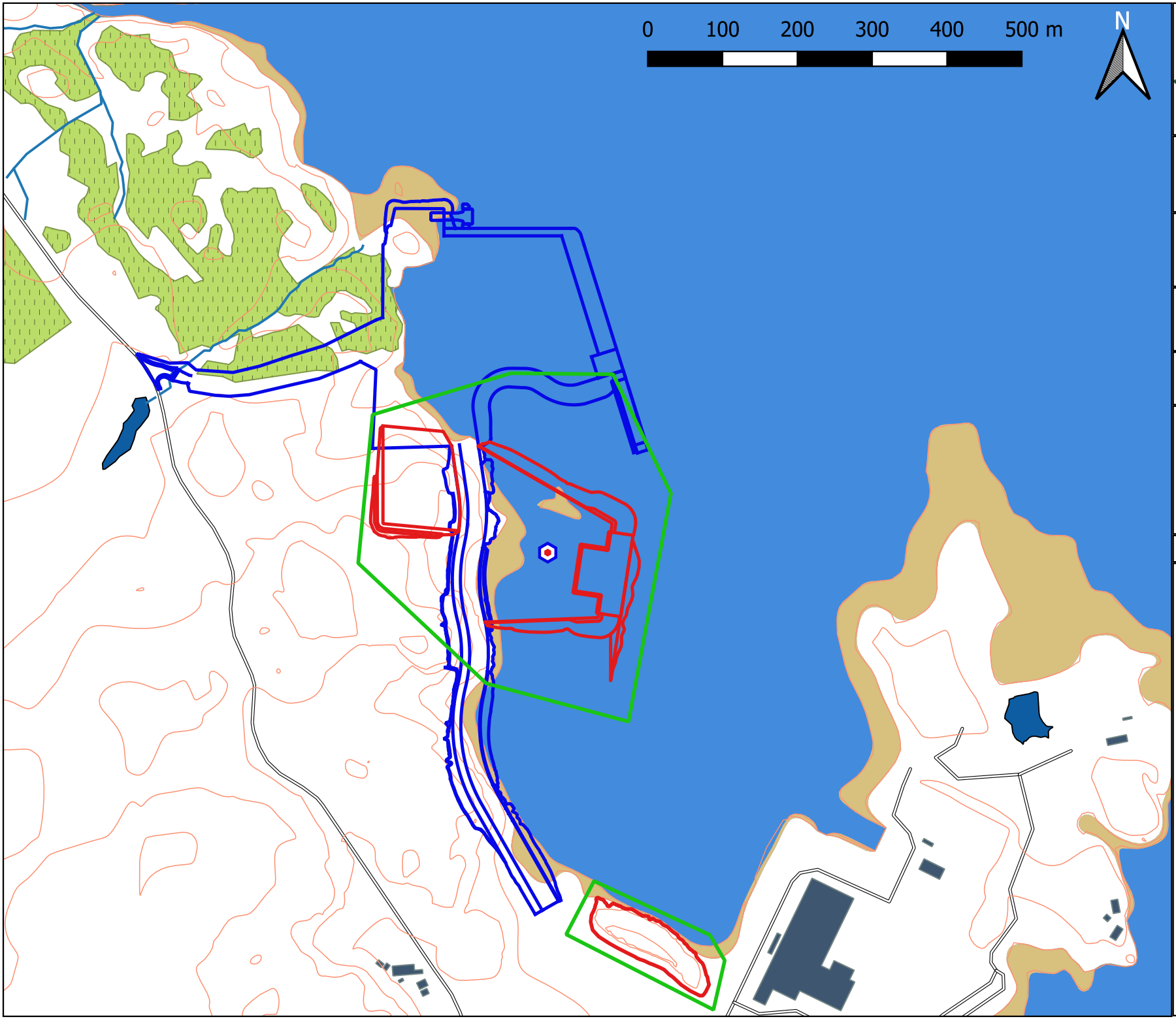
DRAWING TITLE

PROPOSED SOUTH QUAY – OPTION 3 GENERAL LAYOUT

DRAWN	CHECKED	APPROVED
JA	JP	JP
DATE	DATE	DATE
JUN 21	JUN 21	JUN 21
SCALE (A1) 1:1000	STAGE PRELIMINARY	REV P04

DRAWING No.

WS2339–XX–XX–DR–C–9007



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Title: 113_DRG_01 Indicative Development Boundary

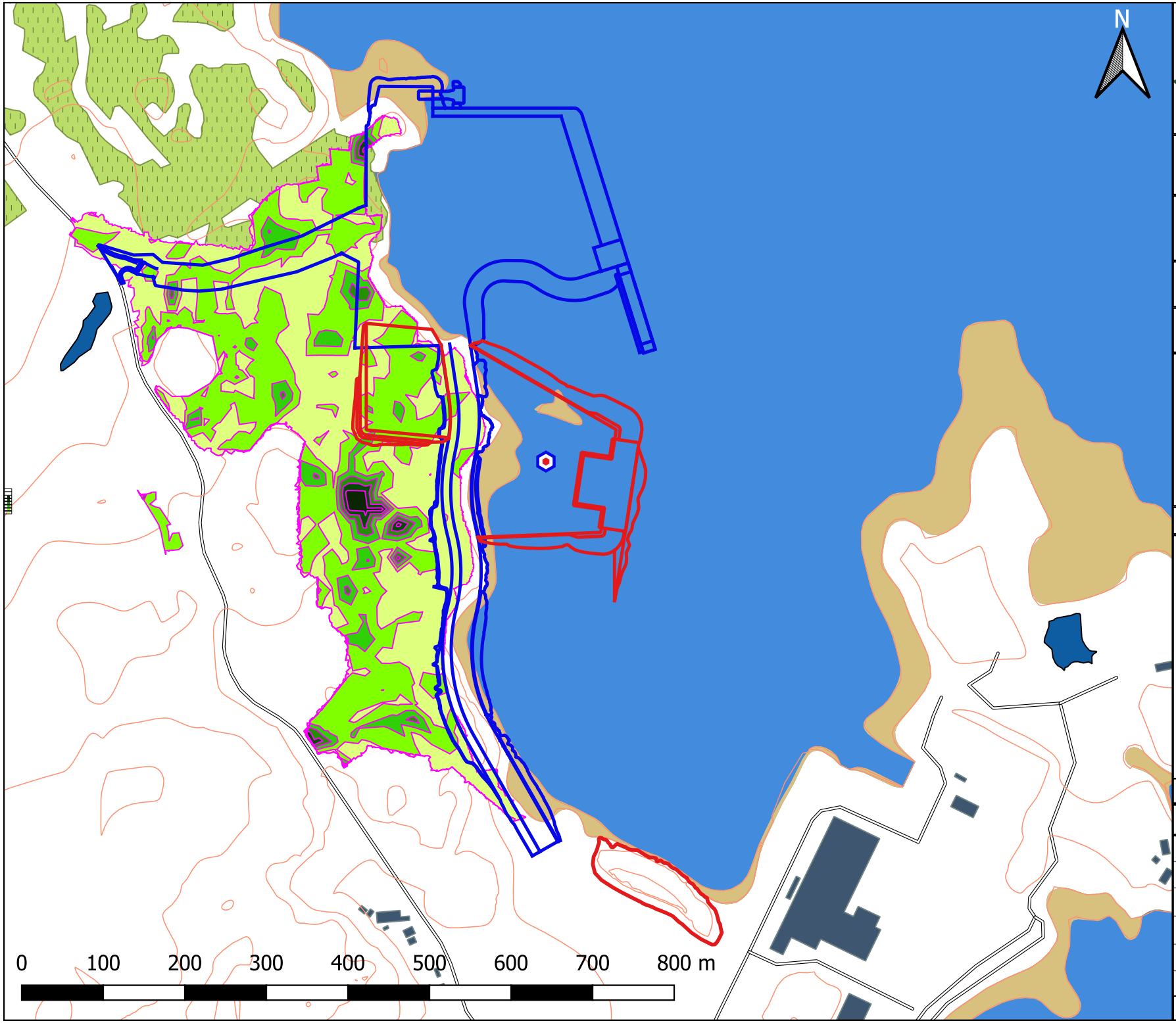
Projection: OSGB 1936/British National Grid EPSG: 27700

Page 1	Rev No: 2	17/11/2023

Legend

- Deep Water South
- Deep Water Port Layout
- Indicative Development Boundary
- Deep Water South Layout
- Buildings
- Contour Lines
- Foreshore
- Fresh Water
- Road
- Tidal Water
- Woodland

Stornoway Port



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Title: 113_DRG_02_1 Peat Depth Contour Map

Projection: OSGB 1936/British National Grid EPSG: 27700

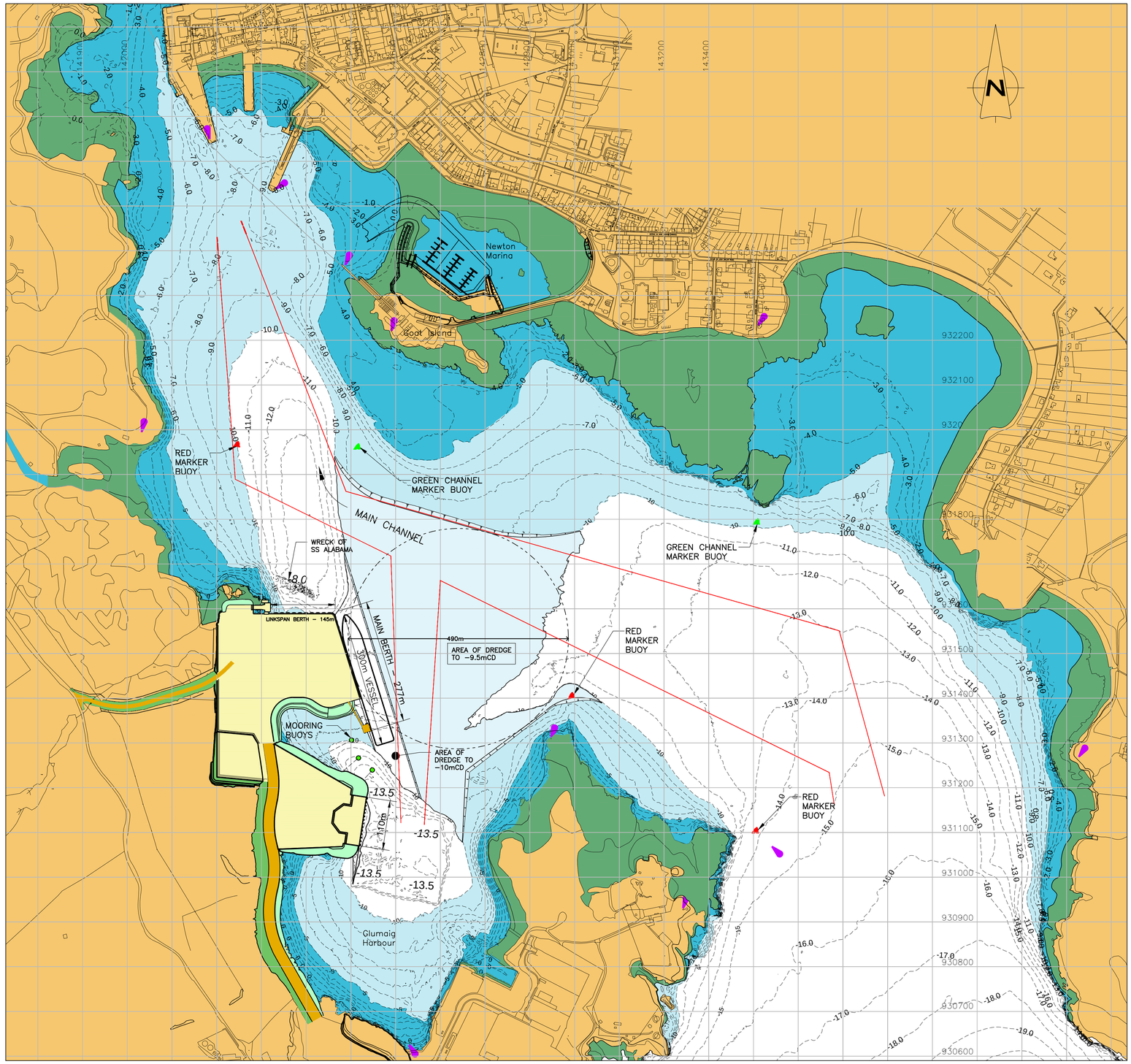
Page 1	Rev No: 1	11/07/2023

Legend

- Deep Water South
- Contour Lines
- Building
- Foreshore
- Road
- Fresh Water
- Tidal Water
- Woodland
- Deep Water Port Layout
- Deep Water South Layout

PEAT DEPTH COLOUR BANDING

NUMBER	DEPTH RANGE (m)	COLOUR
1	-2.7 TO -2.5	
2	-2.5 TO -2.0	
3	-2.0 TO -1.5	
4	-1.5 TO -1.0	
5	-1.0 TO -0.5	
6	-0.5 TO 0.0	



GENERAL NOTES

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
P15	02.10.23	DEEP WATER SOUTH QUAY ADDED.	JR	GB	JP
P14	20.04.22	MINOR AMENDMENTS.	AB	DA	JP
P13	18.01.22	DREDGE AREA SHADE AMENDED, SWINGING CIRCLE ADDED, ADDITIONAL MARKER BUOYS ADDED.	AB	DA	JP
P12	06.01.22	MOORING BUOYS AND ANCHORS ADDED.	AB	DA	JP

AMENDMENTS

CLIENT

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PROJECT

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DRAWING TITLE

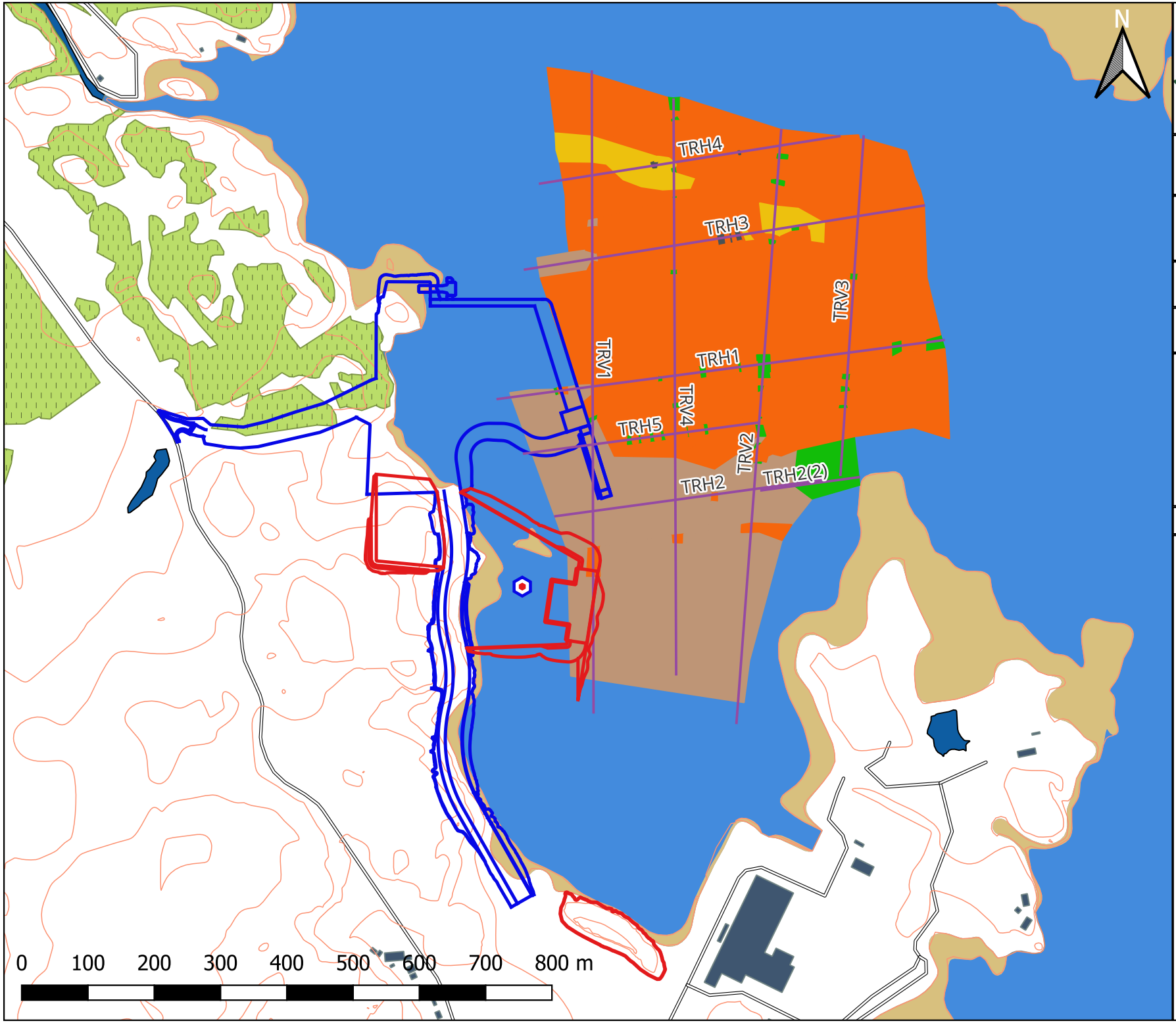
CHART SURVEY
SCALE 1:5000

DRAWN	CHECKED	APPROVED
AB	GB	GB
DATE	DATE	DATE
SEP 21	SEP 21	SEP 21

SCALE (A1)	STAGE	REV
1:5000	PRELIMINARY	P15

DRAWING No.

SDWP–WS2139–XX–00–DR–C–9011



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Title: 113_DRG_03_1 Benthic Transects & EUNIS Habitats

Projection: OSGB 1936/British National Grid EPSG: 27700

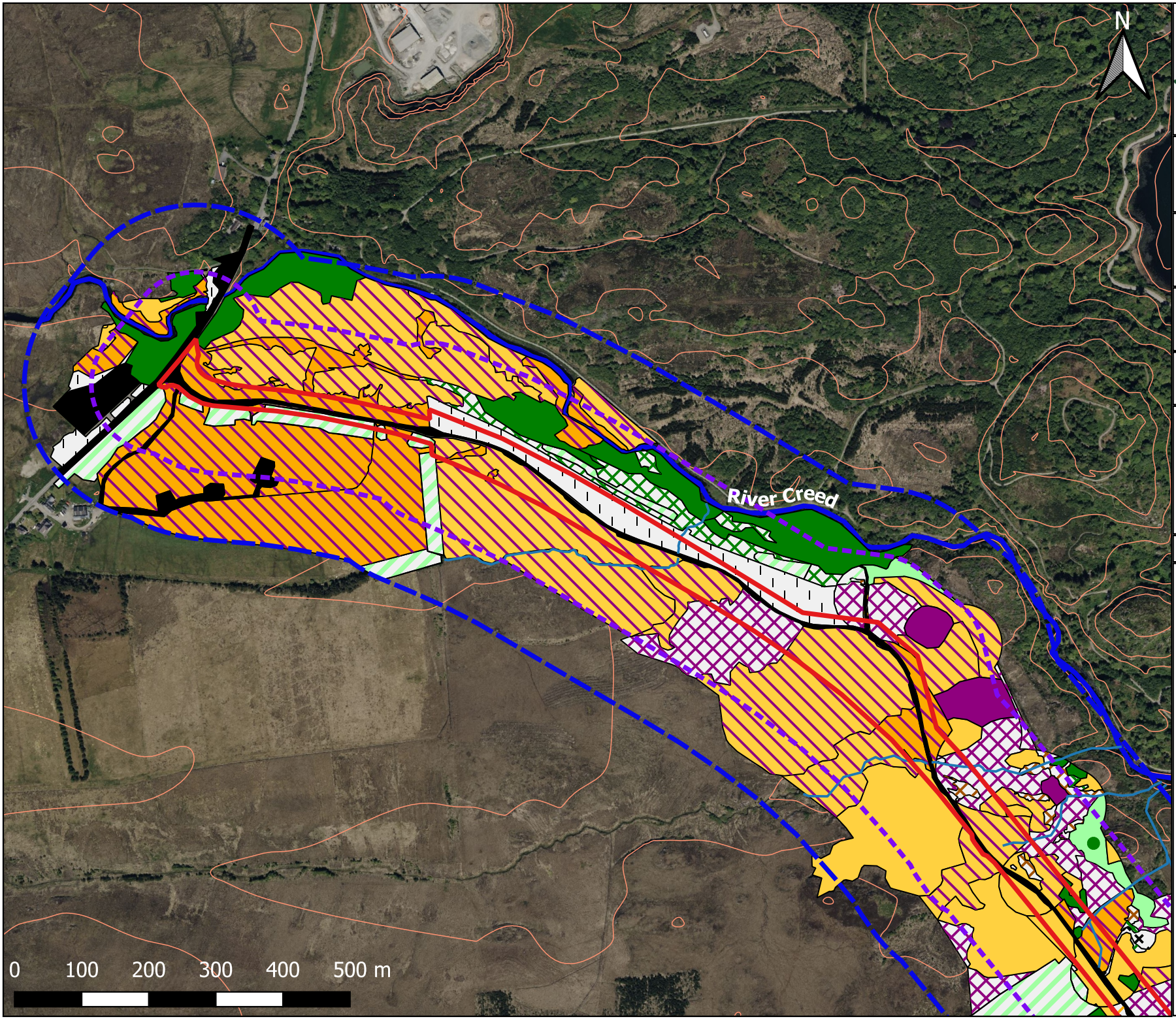
Page 1	Rev No: 1	11/07/2023

Legend

- Deep Water South
- Deep Water Port Layout
- Deep Water South Layout
- Building
- Contour Lines
- Foreshore
- Fresh Water
- Road
- Tidal Water
- Transect Lines
- Woodland

EUNIS_Habitats

- A3.24 - Faunal Communities on Moderate
- A5.13 - Infralittoral Coarse Sediment
- A5.24 - Infralittoral muddy sand / A5.33 -
- A5.43 - Infralittoral Mixed Sediments
- A5.52 - Kelp and seaweed communities o



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Title: 113_DRG_04_1 ARUD Habitat Map & Deep Water South Development Map

Projection: OSGB 1936/British National Grid EPSG: 27700

Page 1	Rev No: 1	14/11/2023

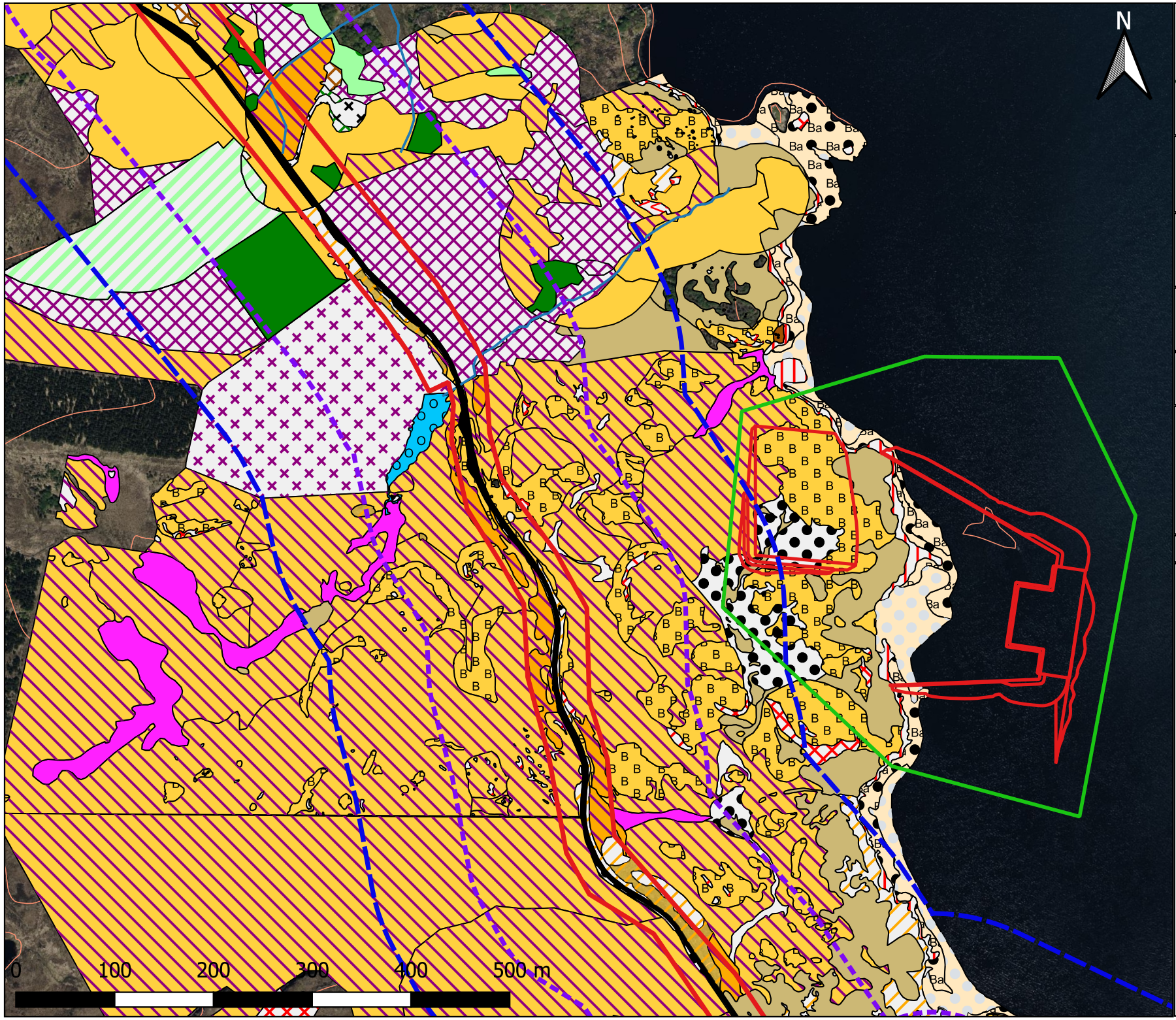
Legend

- Contour Lines
- ARUD Boundary
- 100m ARUD PEA Buffer
- 200m ARUD PEA Buffer
- River Creed
- Watercourses

Stornoway Port

Legend

Phase 1 Habitats



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Title: 113_DRG_04_2 ARUD Habitat Map & Deep Water South Development Map

Projection: OSGB 1936/British National Grid EPSG: 27700

Page 1	Rev No: 1	14/11/2023

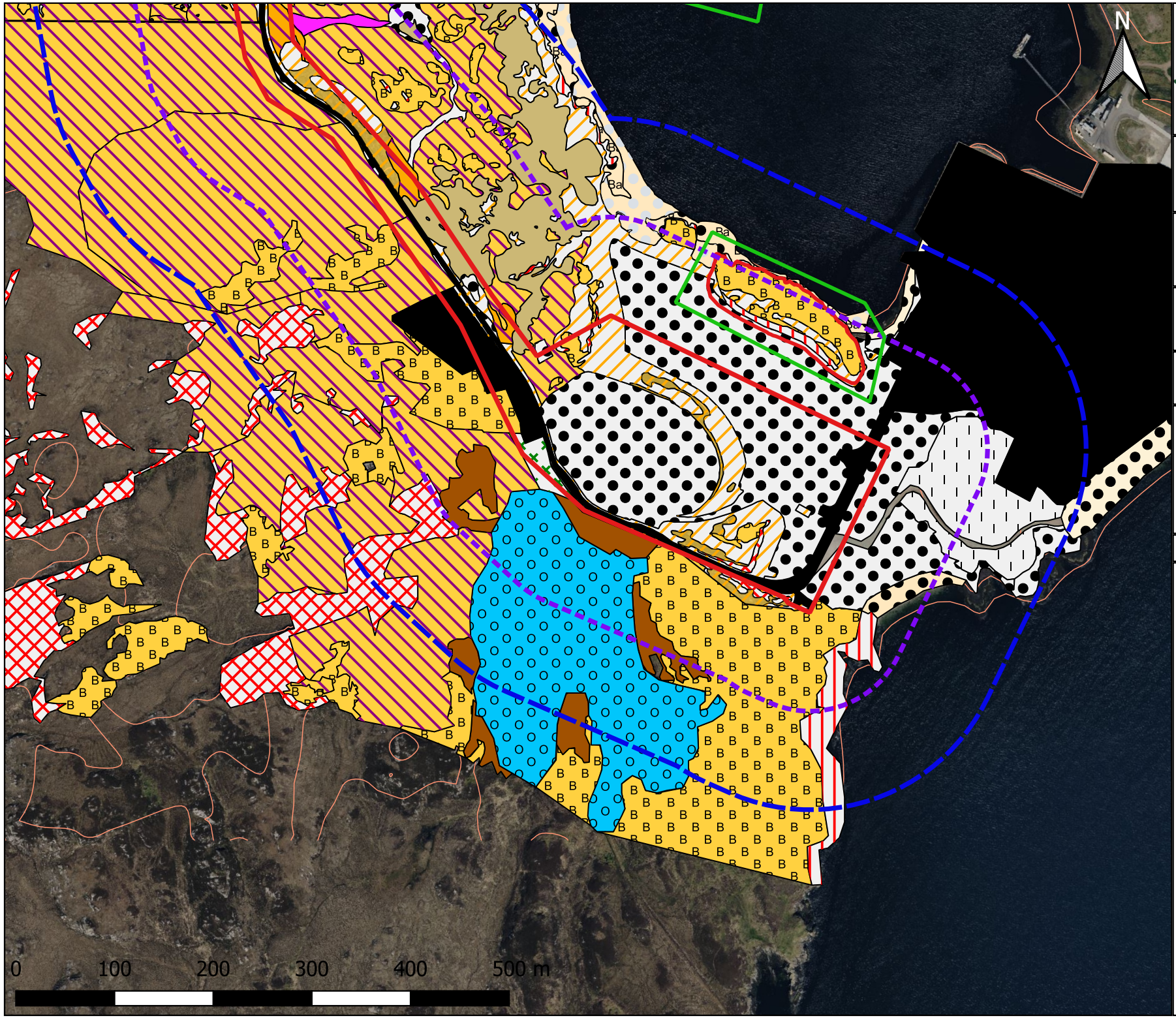
Legend

- Contour Lines
- ARUD Boundary
- 100m ARUD PEA Buffer
- 200m ARUD PEA Buffer
- Deep Water South Layout
- Indicative Development Boundary
- Watercourses

Stornoway Port

Legend

Phase 1 Habitats



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Title: 113_DRG_04_3 ARUD Habitat Map & Deep Water South Development Map

Projection: OSGB 1936/British National Grid EPSG: 27700

Page 1	Rev No: 1	14/11/2023

Legend

- Contour Lines
- ARUD Boundary
- 100m ARUD PEA Buffer
- 200m ARUD PEA Buffer

Stornoway Port

Legend

Phase 1 Habitats