

## **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<sup>2</sup>.

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 ( <i>Rana temporaria</i> ), 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 <b>considered further in Section 15.3.</b>
Roosting bats	Pipistrelle bats ( <i>Pipistrelle</i> 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 <b>not considered further.</b>

Receptor	Evaluation Rationale
Foraging/commuting bats	<p>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 <b>considered further in Section 15.3.</b></p>
Ornithological species	<p>Breeding red-throated diver (<i>Gavia stellata</i>), black-throated diver (<i>Gavia arctica</i>), golden eagle (<i>Aquila chrysaetos</i>), merlin (<i>Falco columbarius</i>), golden plover (<i>Pluvialis apricaria</i>), dunlin (<i>Calidris alpina schinzii</i>) and greenshank (<i>Tringa nebularia</i>) 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).</p> <p>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).</p> <p>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.</p> <p>Due to the known presence of breeding birds, potential impacts to birds are <b>considered further in Section 15.3.</b></p>
Invertebrates	<p>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 <b>not considered further.</b></p>
Otter	<p>Otter (<i>Lutra lutra</i>) are known to be present within the River Creed (which is situated &lt;1km from the DWS development site) and the surrounding marine habitats. Thus, potential impacts to otter are <b>considered further in Section 15.3.</b></p>

Receptor	Evaluation Rationale
Reptiles	The site of the DWS development lies within the known range of slow-worm ( <i>Anguis fragilis</i> ), 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 <b>considered further in Section 15.3.</b>
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 <b>not considered further.</b>

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<sup>2</sup>. 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 or 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 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 or 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 height 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 is 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 or 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 or 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<sup>3</sup>, 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<sup>3</sup>. 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 2<sup>nd</sup> 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. NPF4 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<sub>2</sub>e) (Scottish Government, 2021), reduced from over 75 MtCO<sub>2</sub>e in 2000. The trend of Scottish GHG emissions 1990-2021 is illustrated in Figure17.1.

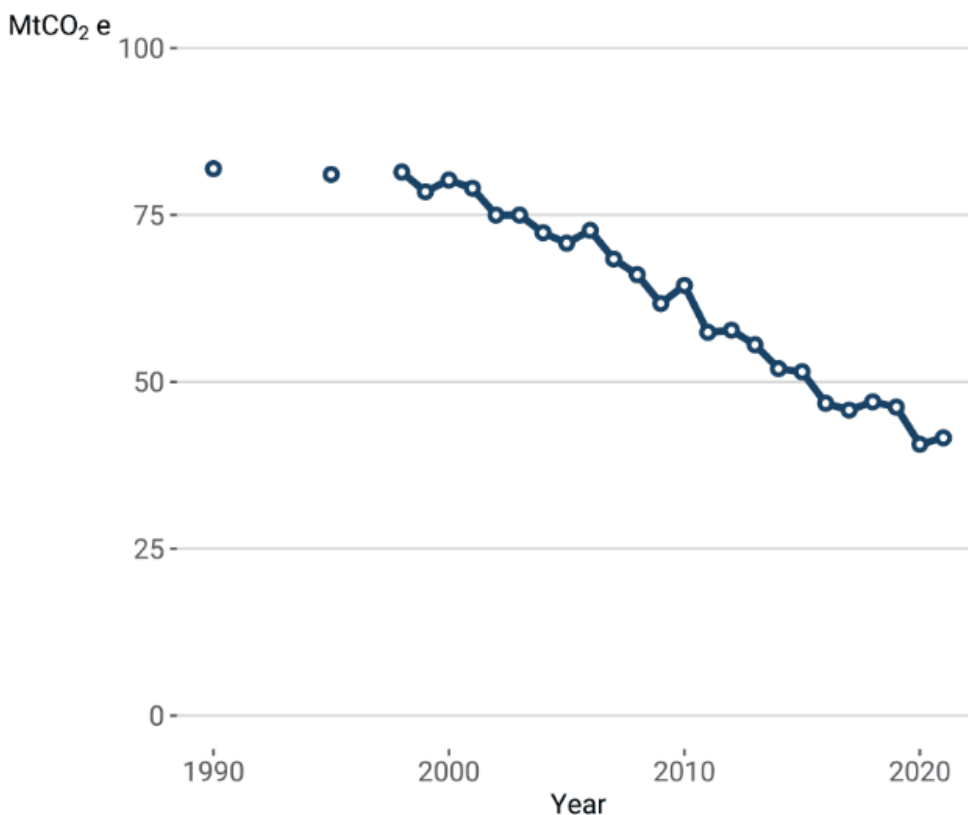


Figure 17.1: Scottish Greenhouse Gas Emissions, 1990-2021 (Scottish Government, 2021)

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<sub>2</sub> equivalent per m<sup>3</sup> 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<sub>2</sub> is a by-product of a chemical conversion process used in the production of cement. An estimated 622kg of CO<sub>2</sub> 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<sup>3</sup> 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 19<sup>th</sup> 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, Shrandabhal 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)
<b>0 - 5 km</b>		
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
<b>5 - 15 km</b>		
8. Gress (NB 49244 41879)	Residents Road users	- Turbine & Crane
9. Druin Dubh Stone Circle (NB 38260 30530)	Visitors Road users	- Turbine & Crane
<b>15 - 30 km</b>		
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
<b>30 - 60 km</b>		
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 20<sup>th</sup> 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 20<sup>th</sup> 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 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
<b>AAWT</b>	5,267	7,672	14,636	9,808	14,909
<b>HGV Count</b>	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 Sandwich Road Liquefied 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).

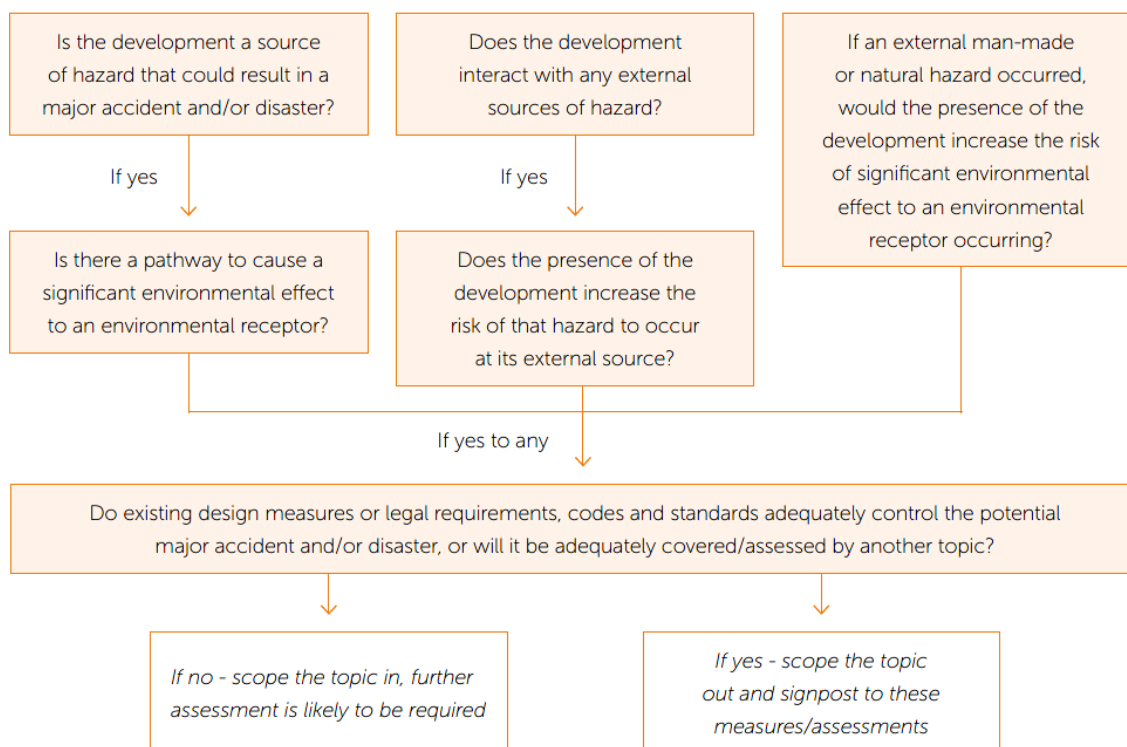
Periods of drought are also a known occurrence, as across much of the UK. SEPA monitoring and analysis through their Drought Risk Assessment Tool shows the Creed Bridge monitoring station on the River Creed west of Stornoway to be experiencing prolonged periods of low river flow (SEPA, 2023e). Periods 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**

<b>Major Accidents and Disasters</b>	<b>Location Risk</b>	<b>Proposed Use Risk</b>	<b>Comments</b>	<b>Design Measures or Legal Requirements, Codes and Standards (if applicable)</b>	<b>Topic Section (if applicable)</b>	<b>Scope In/Out</b>
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 from 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 <sub>2</sub>	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 <sup>2</sup>	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 <sup>2</sup>	Metres-squared
m <sup>3</sup>	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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	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 <sub>peak</sub>	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