Report to Inspector

ABP-319080-24

Development:	Proposed transition and conversion of the existing 900MW electricity generating station from coal to heavy fuel oil and associated ancillary development at Moneypoint Generating Station, Moneypoint, Co. Clare
Type of Application:	SID application
Topic:	Adequateness of information for purpose of Appropriate Assessment
Ecologist	Conor Donnelly
Senior Planning Inspector	Jimmy Green
Date:	23rd August 2024

Contents

1.0 Introduction

1.1. Scope of Report to Inspector

1.1.1. This report to the Inspector and available to the Board is a written record of my review and examination of the submitted information provided by the applicant as it relates to the requirements for Appropriate Assessment (including screening). In my capacity of Inspectorate Ecologist, I have the relevant expertise to provide a professional opinion as to the adequacy of the information for the Inspector and the Board to undertake Appropriate Assessment (AA) of the development consent sought for Moneypoint Generating Station.

1.1.2. I have also considered the submissions received and the applicant's response to those observations.

1.1.3. I have reviewed and examined the following documents including relevant appendices and figures (plans and particulars):

- AA Screening and Natura Impact Statement (NIS) (February 2024)
- Technical Land Use Planning (TLUP) Report (Issue C, 30 May 2024)
- EIAR (February 2024)
- Construction and Environmental Management Plan (CEMP) (February 2024)

1.1.4. The documents have been reviewed with respect to the following current best practice guidance:

- European Commission (2019). Managing Natura 2000 sites – the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC[1].
- European Commission (2021). Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC. 2021/C 437/01[2].

[1] https://op.europa.eu/en/publication-detail/-/publication/11e4ee91-2a8a-11e9-8d04-01aa75ed71a1
[2] https://op.europa.eu/en/publication-detail/-/publication/99a99e59-3789-11ec-8daf-01aa75ed71a1/language-en/format-PDF/source-search

1.2. Expertise and technical content of Appropriate Assessment report

1.2.1. The AA Screening report and NIS were prepared by suitably qualified and experienced Ecologists from Mott MacDonald using appropriate guidance.

1.2.2. Scientific information on surveys, nature conservation sites, species, and habitats is adequate and up to date (at the time of submission) and included desk study, two site surveys in 2023 and information from previous surveys:

- Bats in and around Moneypoint and surrounding woodland (2021),
- Marine mammals and seabirds (on-going since 2021),
- Drop-down video survey of marine habitats
- Ecological site walkover at Moneypoint
- Habitat surveys (non-marine) and breeding and wintering bird surveys at Moneypoint from 2022 and 2023 which overlapped with the development area.

2.0 Consideration of the Likely Significant Effects on a European Site

2.1. Article 6(3) of the Habitats Directive

2.1.1. The requirements of Article 6(3) as related to Appropriate Assessment of a project under part XAB of the Planning and Development Act 2000 (as amended) are considered in this section.

2.2. Screening for Appropriate Assessment

2.2.1. The first test of Article 6(3) is to establish if the proposed development is directly connected with or necessary to the management of a European site and where this is not the case, then whether the development (either alone or in combination with other plans and projects) could result in (likely) significant effects to a European site in view of the sites conservation objectives.

2.2.2. The project is not directly connected with, or necessary for, the management of any European Site and consequently is subject to the Appropriate Assessment Screening process.

2.2.3. No part of the development is within a European site however it is immediately adjacent to the Lower River Shannon SAC and River Shannon and River Fergus

Estuaries SPA. Given their proximity, these sites are those for which the proposed development presents the most significant risk.

2.2.4. Ecological connection between the development and other European sites has also been identified. This connection largely relates to risk of accidental oil spill. The report identifies that marine habitats and species including mobile Annex II species such as Atlantic salmon (*Salmo salar*) may be impacted up to 120km from the site in the case of a catastrophic oil spill in the estuary, citing a range of technical documents and guidance to support this impact range. Accordingly, a distance of 120km from the development site was chosen as the range to consider potential impacts on the QI and SCI of marine and coastal European sites.

2.2.5. A total of 25 SPAs and 45 SACs were considered at screening. These sites, their distance from the development site, the qualifying interests (QI) / special conservation interest (SCI) of each site and their conservation objective (i.e. maintain/restore) and a source – pathway – receptor assessment are detailed in Table 5.1 of the screening report.

2.2.6. The potential impact mechanisms that were initially identified included those arising during construction phase, for example from noise disturbance to bird SCIs and otter (*Lutra lutra*) QI, light disturbance and discharges of construction-related chemicals and substances. During operation and maintenance, potential impacts included generation of air pollutants, noise disturbance, discharges to water including from accidental oil spillage, light disturbance and the risk of spread of invasive species via biofouling from HFO delivery vessels.

2.2.7. With regards impacts that may arise from decommissioning activities associated with the proposed development, namely the partial dismantling and removal of coal handling plant, these have been assessed as part of the construction phase. Final decommissioning of the station and any future use of the site beyond 2029 will be the subject of a separate grant of planning permission.

2.2.8. A number of the potential impact mechanisms initially identified were ruled out at screening stage:

- Noise disturbance during construction. Underwater noise will not increase as a result of the proposed development as the number of ships will not change (i.e. 24 deliveries per year) and there are no underwater works. Results from

modelling show that surface noise during construction may reach up to 62 dB at the shoreline to the south of the proposed development during the partial dismantling of the coal yard. Cutts *et al*. (2013)[3], assessed disturbance effects on waterbirds and regular noise between 60 and 72 dB is defined as a 'moderate' noise level effect. This moderate, temporary effect is not considered to give rise to likely significant effect as animals are habituated to noise from the site as an industrial site.

- Noise during operation. The site operates in line with an existing Industrial Emissions License (Register Number P0605-04) and it is not proposed to change any of the existing emission limit values in the IE license. Ship delivery numbers are proposed to remain the same in frequency at up to 24 ships per year but HFO vessels take significantly less time to unload (2-4 days compared to 2-3 weeks for a coal vessel) so underwater noise will be less. Operational noise is modelled at c. 30-40 dB which is well within the 55 dB daytime emission limit[4] and is considered a low noise level effect that is not likely to have a significant effect on water birds with reference to Cutts *et al*. (2013).
- Air pollutants during operation. Direct impacts from atmospheric NOx and SO_2 are negligible – the process contributions (PCs) and predicted environmental concentrations (PECs) are small relative to background concentrations and would not result in exceedances of the air quality standards (AQS) for NOx or SO_2. In relation to nutrient and acid deposition, critical loads for nitrogen and acid deposition from the proposed development are less than the current coal operation and there is no likely significant effect.

2.2.9. I have a few detailed comments about the information presented in Table 5.1, following review against information presented on the NPWS Designations Viewer[5] and European site pages on the NPWS website including Conservation Objectives, supporting information and Statutory Instruments / Amendment Notifications:

[3] Cutts, Hemingway & Spencer. Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. Version 3.2, March 2013. University of Hull. https://www.tide-toolbox.eu/tidetools/waterbird_disturbance_mitigation_toolkit/

[4] IE License Reg. No. P0605-04 https://epawebapp.epa.ie/licences/lic_eDMS/090151b2808bc32d.pdf

[5] NPWS Designations Viewer: https://experience.arcgis.com/experience/edf34d92e28040fd87d3d14f55d8d95f

- With regards calculating distance from the development site, the applicant's report has used a straight line from the proposed works to the closest point of the European site. Given the potential impact identified for most sites is water-borne (i.e. oil spill or spread of invasive species via shipping vessel), it would make more sense to base the assessment on distance from the site over water. Nonetheless, the straight-line assessment in effect is more precautionary, encompassing a larger area of potential impact than would be covered by an assessment based on hydrological connectivity.
- For the sites listed, QIs and SCIs and their conservation objectives have in the main been identified correctly. The exceptions relate to four SACs where harbour porpoise (*Phocoena phocoena*) has been recently added as a QI, after the NIS report was published (Inishmore Island SAC, Kenmare River SAC, Kilkieran Bay and Islands SAC and West Connacht Coast SAC)[6,7,8,9]. These sites are all distant from the development site (100km or more distance via water). Nonetheless, Table 5.1 of the applicants screening assessment identified a remote likelihood of effects from the proposed development on the existing QIs of these sites in the unlikely event of a catastrophic oil spill. Accordingly, they are considered further at appropriate assessment stage. The risk posed to the harbour porpoise QI would also be from an accidental oil spill. The risk posed to these sites and their QI, including harbour porpoise, is considered further in section 3.1 of this report.
- 26 SPAs are listed in Table 5.1 but Mid-Clare Coast SPA is listed twice so only 25 separate sites have actually been considered.
- Corncrake (*Crex crex*) is the sole SCI of Inishbofin, Omey Island and Turbot Island SPA. Table 5.1 of the applicant's screening assessment states that this SCI is 'screened out'. This is an appropriate conclusion given the species is

[6] Inishmore Island SAC: https://www.npws.ie/sites/default/files/protected-sites/amendment_notifications/AN000213.pdf
[7] Kenmare River SAC: https://www.irishstatutebook.ie/eli/2024/si/143/made/en/pdf
[8] Kilkieran Bay and Islands SAC: https://www.irishstatutebook.ie/eli/2024/si/144/made/en/pdf
[9] West Connacht Coast SAC: https://www.npws.ie/sites/default/files/protected-sites/amendment_notifications/AN002998.pdf

associated with grassland habitats[10,11] and so, taking into account its habitat preferences and distance from the proposed development site, an impact pathway does not exist. Despite this, Inshbofin, Omey Island and Turbot Island SPA is included in the list of European sites in Section 5.6 'Screening Outcome' of the screening assessment for which the applicant has concluded that likely significant effects from the proposed development cannot be excluded and must be considered further in appropriate assessment. This therefore appears to be an error in the report. For the reasons set out previously, I consider there is no likely significant effect of the proposed development on this European site in view of the site's conservation objectives and as such potential impacts upon the integrity of this European site do not need to be considered at appropriate assessment stage.

- There are also some errors in the SACs listed in Section 5.6 'Screening Outcome' of the applicant's screening assessment. Both Mount Brandon SAC and Glanmore Bog SAC are identified in this list, despite all the QIs of these sites being 'screened out' in Table 5.1 of the screening assessment. I agree with the conclusion for these sites in Table 5.1 since these QIs are all terrestrial or freshwater-based and as such there isn't an impact pathway linking the proposed development with these QIs given distance from the development site and the lack of connectivity. As such, I consider that there is no likely significant effect of the proposed development on these European sites in view of the sites' conservation objectives and as such potential impacts upon the integrity of these European sites do not need to be considered at appropriate assessment stage. Conversely, Slyne Head Peninsula SAC is not included in the list in Section 5.6 despite the potential for likely significant effect on this site being identified in Table 5.1. However, whilst the SAC is not included in Section 5.6, it has been assessed further in the applicant's NIS, in Table 6.1.

[10] NPWS (2024) Conservation Objectives: Inishbofin, Omey Island and Turbot Island SPA 004231. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004231.pdf
[11] https://www.corncrakelife.ie/

- Notwithstanding the points referred to above, the rationales provided for the identification of impacts for each site is sufficiently reasoned and reasonable conclusions reached.

2.2.10. The AA Screening report prepared by the applicant in Table 5.2 assessed projects that might have in-combination effects with the proposed development. Projects assessed include the Prospect to Tarbert Cable Project (granted by Kerry and Clare County Councils in January 2024), Tarbert Temporary Generation Plant (Recommendations signed by Minister), Kilpaddoge High Inertia Synchronous Compensator (granted August 2021, not constructed) and Cross Shannon Cable Project (approved June 2021, under construction). No potential for in-combination effects have been identified with any of the projects due to the absence of residual impacts after the implementation of mitigation in these other projects, distance from the proposed development, differences in construction timings or the nature of the potential impacts arising from each development is such that they are otherwise not likely to interact to produce significant effects.

2.2.11. Whilst the AA screening report prepared by the applicant considers relevant projects as discussed above for potential in-combination effects, plans have not been considered in the screening stage (nor within the applicants Natura Impact Statement). I do not consider that this omission prevents the Board from making a screening determination (or completing an Appropriate Assessment) in relation to the project as in-combination adverse effects will not arise from relevant national or regional plans (such as the National Planning Framework or Regional Spatial and Economic Strategy for the Southern Region) as any projects arising to achieve the objectives of such plans must comply with the requirements of Irish Planning and Environmental Law including the relevant land use plans (such as the Clare County Development Plan, 2023 – 2029) which contain appropriate environmental and biodiversity protection policies and objectives that ensure the integrity of the relevant European Sites. These plans have also themselves have been subject to SEA and Appropriate Assessment. Similarly, any current or future planning applications will have to adhere to the requirements of the relevant landuse plans. Accordingly, no potential for in-combination effects can arise from plans or projects on European sites in the context of the Proposed Development.

2.2.12. On the basis of my consideration of the information in the screening report for Appropriate Assessment prepared by the applicant and my previous detailed comments above, it cannot be excluded beyond reasonable scientific doubt that the development will not have a significant effect 'alone' on 23 of the SPAs and 32 of the SACs in view of their conservation objectives and Appropriate Assessment is required of the proposed development in relation to these sites, see Table 1 below. In the absence of mitigation or further detailed assessment, the identified impacts may have, or could lead to the adverse effects which could undermine the attainment of the conservation objectives set for these European Sites.

2.2.13. 2 SPAs and 13 SACs considered in the screening report have been excluded from further assessment on the basis of objective information, with sites lying outside of any likely zone of impact due to distance and lack of impact pathways.

Table 1: Could the project undermine the conservation objectives 'alone'					
European Site and qualifying feature	**Conservation objective**	**Could the conservation objectives be undermined (Y/N)?**			
		Discharges to water during construction & operation (excluding oil spill)	**Accidental oil spill**	**Invasive species via HFO vessels**	**Disturbance (noise, lighting, human presence)**
River Shannon and River Fergus Estuaries SPA					
Cormorant *Phalacrocorax carbo* [A017]	Maintain	Y	Y	Y	N
Whooper Swan *Cygnus cygnus* [A038]	Maintain	Y	Y	Y	N
Light-bellied Brent Goose *Branta bernicla hrota* [A046]	Maintain	Y	Y	Y	N
Shelduck *Tadorna tadorna* [A048]	Maintain	Y	Y	Y	N
Wigeon *Anas penelope* [A050]	Maintain	Y	Y	Y	N
Teal *Anas crecca* [A052]	Maintain	Y	Y	Y	N
Pintail *Anas acuta* [A054]	Maintain	Y	Y	Y	N
Shoveler *Anas clypeata* [A056]	Maintain	Y	Y	Y	N
Scaup *Aythya marila* [A062]	Maintain	Y	Y	Y	N
Ringed Plover *Charadrius hiaticula* [A137]	Maintain	Y	Y	Y	N
Golden Plover *Pluvialis apricaria* [A140]	Maintain	Y	Y	Y	N
Grey Plover *Pluvialis squatarola* [A141]	Maintain	Y	Y	Y	N
Lapwing *Vanellus vanellus* [A142]	Maintain	Y	Y	Y	N
Knot *Calidris canutus* [A143]	Maintain	Y	Y	Y	N
Dunlin *Calidris alpina* [A149]	Maintain	Y	Y	Y	N
Black-tailed Godwit *Limosa limosa* [A156]	Maintain	Y	Y	Y	N
Bar-tailed Godwit *Limosa lapponica* [A157]	Maintain	Y	Y	Y	N
Curlew *Numenius arquata* [A160]	Maintain	Y	Y	Y	N
Redshank *Tringa totanus* [A162]	Maintain	Y	Y	Y	N
Greenshank *Tringa nebularia* [A164]	Maintain	Y	Y	Y	N
Black-headed Gull *Chroicocephalus ridibundus* [A179]	Maintain	Y	Y	Y	N

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Wetlands [A999]	Maintain	Y	Y	Y	N
Other SPAs					
Other SPAs and their SCIs, as detailed in Table 5.1 of the AA Screening report prepared by the applicant. The sites are listed here: Mid-Clare Coast SPA, Illaunonearaun SPA, Magheree Islands SPA, Blasket Island SPA, Skelligs SPA, Loop Head SPA, Cliffs of Moher SPA, Tralee Bay Complex SPA, Kerry Head SPA, Dingle Peninsula SPA, Puffin Island SPA, Castlemaine Harbour SPA, Inner Galway Bay SPA, The Bull and the Cow Rocks SPA, High Island, Inishshark and Davillaun SPA, Inishmore SPA, Iveragh Penninsula SPA, Beara Penninsula SPA, Slyne Head to Ardmore Point Islands SPA, Cruagh Island SPA, Deenish Island and Scariff Island SPA, Connemara Bog Complex SPA.	Maintain and Restore objectives	N	Y	N	N
Lower River Shannon SAC					
Sandbanks which are slightly covered by sea water all the time [1110]	Maintain	Y	Y	Y	N
Estuaries [1130]	Maintain	Y	Y	Y	N
Mudflats and sandflats not covered by seawater at low tide [1140]	Maintain	Y	Y	Y	N
*Coastal lagoons [1150]	**Restore**	Y	Y	Y	N

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European Site and qualifying feature	**Conservation objective**	**Could the conservation objectives be undermined (Y/N)?**			
		Discharges to water during construction & operation (excluding oil spill)	**Accidental oil spill**	**Invasive species via HFO vessels**	**Disturbance (noise, lighting, human presence)**
Large shallow inlets and bays [1160]	Maintain	Y	Y	Y	N
Reefs [1170]	Maintain	Y	Y	Y	N
Perennial vegetation of stony banks [1220]	Maintain	Y	Y	Y	N
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Maintain	No pathway	Y	Y	N
Salicornia and other annuals colonising mud and sand [1310]	Maintain	Y	Y	Y	N
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	**Restore**	Y	Y	Y	N
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	**Restore**	Y	Y	Y	N
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	Maintain	No pathway	Y	Y	N
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	Maintain	No pathway	Y	Y	N
*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]	**Restore**	No pathway	Y	Y	N
Freshwater Pearl Mussel *Margaritifera margaritifera*	**Restore**	Y	Y	Y	N
Sea Lamprey *Petromyzon marinus* [1095]	**Restore**	Y	Y	Y	N
Brook Lamprey *Lampetra planeri* [1096]	Maintain	No pathway	Y	Y	N

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River Lamprey *Lampetra fluviatilis* [1099]	Maintain	Y	Y	Y	N
Atlantic salmon *Salmo salar* (only in fresh water) [1106]	**Restore**	Y	Y	Y	N
Bottlenose Dolphin *Tursiops truncatus* [1349]	Maintain	Y	Y	Y	N
Otter *Lutra lutra* [1355]	**Restore**	Y	Y	Y	Y
Other SACs					
Other SACs and their QIs, as detailed in Table 5.1 of the AA Screening report prepared by the applicant. The sites are listed here: Black Head Poulsallagh Complex SAC, Inagh River Estuary SAC, Glengarriff Harbour and Woodland SAC, Inishmaan Island SAC, Inishmore Island SAC, Galway Bay Complex SAC, Inishbofin and Inishshark SAC, Slyne Head Islands SAC, Akeragh, Banna and Barrow Harbour SAC, Ballinskelligs Bay and Inny Estuary SAC, Castlemaine Harbour SAC, Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, Lough Yganavan and Lough Nambrackdarrig SAC, Carrowmore Point to Spanish Point and Islands SAC, Dog's Bay SAC, Inisheer Island SAC, Omey Island Machair SAC, Connemara Bog Complex SAC, Tralee Bay and Magharees Peninsula, West to Cloghane SAC, Slyne Head	Maintain and **Restore** objectives	N	Y	N	N

Table 1: Could the project undermine the conservation objectives 'alone'					
European Site and qualifying feature	**Conservation objective**	**Could the conservation objectives be undermined (Y/N)?**			
		Discharges to water during construction & operation (excluding oil spill)	**Accidental oil spill**	**Invasive species via HFO vessels**	**Disturbance (noise, lighting, human presence)**
Peninsula SAC, Kilkieran Bay and Islands SAC, Murvey Machair SAC, Kenmare River SAC, Blasket Islands SAC, Carrowmore Dunes SAC, Magharee Islands SAC, Valencia Harbour/Portmagee Channel SAC, Kerry Head Shoal SAC, Kilkee Reefs SAC, Kingstown Bay SAC, West Connacht Coast SAC.					

2.3. Screening Determination (recommendation)

2.3.1. Having regard to my detailed consideration of the information presented in the AA Screening report, including the nature, size and location of the development and its likely indirect effects either alone or in combination with other plans and projects, the source pathway receptor model and sensitivities of the ecological receptors, I consider that potential significant effects of the project 'alone' have been identified and that Appropriate Assessment is required in order to determine if adverse effects on site integrity can be excluded for the 23 SPAs and 32 SACs listed in Table 1 of this report including the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA in view of the conservation objectives of these sites.

2.3.2. I consider that the information is adequate for the Board to make a robust screening determination based on objective information presented in the AA Screening report and the further assessment presented in this report.

3.0 Appropriate Assessment

3.1. General comments

3.1.1. Table 6.1 and 6.2 of the NIS prepared by the applicant sets out an assessment of the potential adverse effects of the proposed development on the QIs and SCIs (respectively) of the European sites where an impact pathway was identified in their Appropriate Assessment screening report. I have reviewed the information presented in both tables against the conservation objectives, to check attributes, measures and targets and relevant European sites are identified correctly together with the potential impacts and implications for site integrity.

3.1.2. There are some errors in Tables 6.1 and 6.2 of the NIS, listed below.

- Perennial vegetation of stony banks is incorrectly listed as a QI for Blasket Islands SAC.
- Submerged or partially submerged seacaves is omitted as a QI for Blasket Islands SAC.
- As previously discussed, harbour porpoise is omitted as a QI for Inishmore Island SAC, Kenmare River SAC, Kilkieran Bay and Islands SAC and West Connacht Coast SAC.

- The full set of attributes for cormorant (*Phalacrocorax carbo*) were not included in Table 6.2. Attributes relating to the breeding cormorant interest in the River Shannon and River Fergus Estuaries SPA, Mid-Clare Coast SPA, Inner Galway Bay SPA and Connemara Bog Complex SPA have been omitted.
- Light-bellied brent goose (*Branta bernicla hrota*) is omitted as an SCI for River Shannon and River Fergus Estuaries SPA and Tralee Bay Complex SPA.
- Bar-tailed godwit (*Limosa lapponica*) is omitted as an SCI for River Shannon and River Fergus Estuaries SPA.
- Wetlands is omitted as an SCI for River Shannon and River Fergus Estuaries SPA and Tralee Bay Complex SPA.
- Black-headed gull (*Chroicocephalus ridibundus*) is omitted as an SCI for River Shannon and River Fergus Estuaries SPA.
- Fulmar (*Fulmarus glacialis*) is omitted as an SCI for Puffin Island SPA, Iveragh Peninsula SPA, Beara Peninsula SPA, High Island, Inishshark and Davillaun SPA and Deenish Island and Scariff Island SPA.
- Puffin (*Fratercula arctica*) is omitted as an SCI for Puffin Island SPA and The Bull and The Cow Rocks SPA.

3.1.3. In each of the omissions referred to above, potential impacts from the proposed development upon these QIs or SCIs have been considered in the NIS for other European sites and the conclusions reached hold for the sites for which these QIs or SCIs have been omitted.

3.1.4. As previously noted, harbour porpoise has been recently added as a QI to Inishmore Island SAC, Kenmare River SAC, Kilkieran Bay and Islands SAC and West Connacht Coast SAC. No site-specific attributes and targets have been set for the species in these European sites as yet, but conservation objectives exist for this species in the Blasket Islands SAC, the potential impact of the proposed development on which is considered in the NIS prepared by the applicant. All these SACs are some distance from the proposed development site and potential impacts are limited to the risk posed by accidental oil spill. As such, the conclusions reached in the NIS for Blasket Islands SAC also apply to porpoise as a QI of the Inishmore Island, Kenmare River, Kilkieran Bay and Islands and West Connacht Coast SACs. The mitigation proposed in the form

of measures to prevent oil spills and oil spill response procedures is sufficient to ensure that there will be no adverse effects on the integrity of these European sites.

3.1.5. The AA screening report noted a potential indirect impact upon freshwater pearl mussel via potential impact of the proposed development upon salmon – the larval stage of the mussel uses a temporary salmonid host, typically Atlantic salmon and sea trout in Ireland. The NIS acknowledges this connection in its assessment of potential adverse effects on the QIs of European sites (Table 6.1, Atlantic salmon QI). A potential impact on salmon is identified in relation to the conservation objectives via accidental oil spill affecting salmon in the estuary. I have also identified a potential impact from discharges to water during construction and operation and from introduction of invasive species (see Section 3.1.9 of this report below). The mitigation proposed in the form of measures to prevent oil spills and oil spill response procedures as well as measures to prevent discharges to water and measures to prevent the introduction of invasive species is sufficient to address these risks and ensure that there will be no adverse effects on the integrity of these European sites.

3.1.6. As previously described in section 2.2. of this report, corncrake and Inishbofin, Omey Island and Turbot Island SPA appear to have been erroneously included in the applicant's NIS (Table 6.1). For the reasons previously stated, I consider there is no likely significant effect of the proposed development on this European site in view of the site's conservation objectives and as such potential impacts upon the integrity of this European site do not need to be considered at appropriate assessment stage.

3.1.7. Whilst the NIS, in Table 6.2, did not include the attributes relating to breeding cormorant, I have reviewed these in relation to the potential impacts of the development on the River Shannon and River Fergus Estuaries SPA. The location of the breeding colony is in the upper estuary (see Figure 1 below) as such potential impact would be limited to risk of accidental oil spill and also potentially impact from discharges to water during construction and operation and from introduction of invasive species. The breeding colonies present in the other SPAs which include cormorant as breeding interest (Mid-Clare Coast SPA, Inner Galway Bay SPA and Connemara Bog Complex SPA) are distant from the proposed development and potential impacts would be limited to risk of accidental oil spill. The mitigation proposed in the form of measures to prevent oil spills and oil spill response procedures as well as measures to prevent discharges to water and measures to prevent the

introduction of invasive species is sufficient to address these risks and ensure that there will be no adverse effects on the integrity of these European sites.

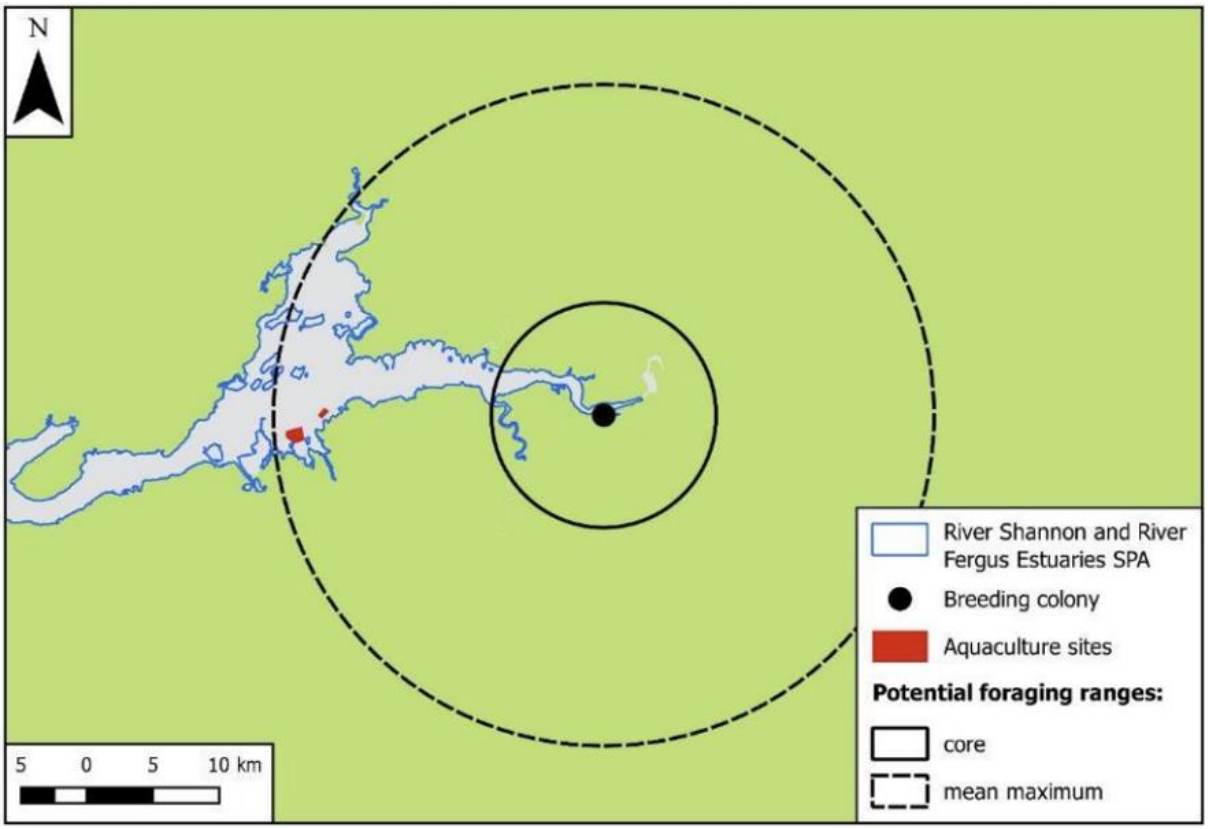


Figure 1. Location of the cormorant breeding colony in the River Shannon and River Fergus Estuaries SPA and potential foraging ranges from this colony (source: Atkins Ecology, 2019[12]).

3.1.8. I have summarised the findings of the NIS in the Tables in Annex 1 of this report, accounting for the shortcomings identified in Tables 6.1 and 6.2 of the applicant's NIS. Please note, the Tables in Annex 1 are focused on potential impacts upon the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA only. In the applicant's NIS, potential impacts to other sites are limited to the risk of accidental oil spill and also, in the case of some SACs, Table 6.1 identifies a risk from the introduction of invasive species. I consider this is a reasonable and precautionary assessment.

3.1.9. There are some inconsistencies in the information presented between different sections of the applicant's NIS. Some potential impacts identified in Section 6.2 of the

[12] Atkins Ecology (2019). Annex II. Marine Institute Bird Studies. River Shannon and Fergus Estuaries SPA: Appropriate Assessment of Aquaculture. May 2019. https://alab.ie/media/alab/content/boarddeterminations/2019/ap10-2019shannonscheduleofdocuments/12.%20AnnexIIShannonFergusEstuariesSPAMay2019240619.pdf

applicants NIS were not included in Tables 6.1 and 6.2 of their report, for example from discharge of pollutants in water, or were not considered for certain QIs, for example the risk posed by the introduction of invasive species is identified for 'Estuaries' and 'Large Shallow Inlet and Bay' QIs in Table 6.1 but not for the 'Reef' and 'Sandbanks which are slightly covered by sea water all the time' QIs, despite the former listing sandbank and reef communities under their community distribution targets (incidentally the community distribution information presented in Table 6.1 comes from the Lower River Shannon SAC alone – it doesn't list the community types present in all the SACs listed in Table 6.1 which include these QIs). The rationale for excluding these impacts or not considering them in relation to certain QIs, does not appear to be stated in the report, so I have taken a precautionary approach and added potential impacts to QIs/SCIs to the tables in Annex 1, where a pathway potentially exists. In each of these cases the risk posed by each potential impact is addressed by the mitigation identified in the NIS such that no adverse effect on site integrity of the European sites exists.

3.1.10. A number of the QIs of the European sites assessed in the NIS prepared by the applicant have 'restore' targets. This is of particular importance in relation to the Lower River Shannon SAC given its proximity to the proposed development. In this SAC, relevant QIs with restore targets are the coastal lagoons priority habitat, Atlantic salt meadows, Mediterranean salt meadows, sea lamprey, Atlantic salmon and otter (note there are other QIs in this site with restore targets, but no impact pathway has been identified). As noted in the EU methodological guidance (2021)[13], the conservation objective, i.e. 'restore' or 'maintain' must be taken into account as they set the level of ambition and predetermine the necessary conservation measures. In this case, I consider the NIS prepared by the applicant has adequately considered potential impact on these European sites in view of their conservation objectives, including the restore targets, and taking into account the proposed mitigation measures, no reasonable scientific doubt remains as to the absence of adverse effects on the sites' integrity.

[13] Commission notice Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC 2021/C 437/01 (OJ C, C/437, 28.10.2021, p. 1, CELEX: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021XC1028(02))

3.1.11. The NIS prepared by the applicant identifies no other projects that would act in-combination with the proposed development (referring back to Table 5.2 of the AA Screening). Taking into account the nature of the proposed development and that of the other projects identified, together with the plans considered previously in this report, I agree that there are no in-combination effects with these projects due to the absence of residual impacts after the implementation of mitigation in these projects, distance from the proposed development, differences in construction timings or the nature of the potential impacts arising from each development is such that they are otherwise not likely to interact to produce adverse effects on integrity of the European sites.

3.2. Mitigation

3.2.1. Mitigation is set out in Section 6.4 of the NIS prepared by the applicant. 'Pre-construction confirmatory surveys' are identified to ensure up-to-date understanding of otter holts and crouches, breeding and wintering birds (if start of works is more than 12 months after last survey) and distribution of invasive species. This is important, for instance in relation to otter, although surveys found no holts in the site there was evidence of possible active holts just outside the red line boundary (section 3.3. of the Appropriate Assessment Screening and NIS report). If holts are found, then the mitigation identified in the EIAR (Volume 2, Section 10.8.1.7) should be followed.

3.2.2. Mitigation is identified to address disturbance including from lighting during construction and operation and from noise during construction. Pollution control mitigation measures are identified which, amongst other things addresses potential impacts arising from stockpiling of material, run-off of concrete and other hazardous substances arising from construction. Construction-related mitigation is incorporated into the Construction Environmental Management Plan (CEMP).

3.2.3. Measures to address invasive species during construction are set out in the CEMP and measures to address risk posed by transfer of invasives on HFO vessels are set out in the NIS. The latter includes a requirement for vessels to adhere to the International Convention for the Control and Management of Ships' Ballast Water and Sediments. The NIS also refers to the 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Resolution MEPC.378 (80), adopted on 7 July 2023) although it is not clear from the

NIS whether the HFO vessels that supply Moneypoint adhere to this. I would recommend a condition be applied to ensure this measure is applied and address this uncertainty.

3.2.4. Measures to address accidental oil spillage from HFO vessels in transit or unloading at the pier or leakage on-site are described in the NIS and given detailed consideration in the Technical Land Use Planning Assessment Report (30 May 2024). These measures include improvements to physical barriers through upgrading of the bund around the HFO storage tanks, equipment to contain an oil spill and contingency planning, in particular the Shannon Estuary Anti-Pollution Team (SEA-PT) Oil Spill Plan[14], which has received formal approval by the Irish Coast Guard.

3.2.5. The above mitigation measures include details specified in industry specific guidelines and I am satisfied that these measures should be effective in avoiding adverse effects.

3.3. Conclusions

3.3.1. Having reviewed the NIS and the supporting documentation including appendices, submissions and response received to these, and in consideration of my detailed comments above, I am satisfied that together this provides adequate information in respect of the baseline conditions, identifies the possible impacts and any potential adverse effects and uses the best scientific information and knowledge to determine those effects in view of the conservation objectives of the European sites. Details of mitigation measures to exclude adverse effects are provided and will be implemented via the CEMP.

3.3.2. I consider the mitigation measures as detailed to be standard, best practice and will be effective in achieving their aims. Detail is provided on measures to address disturbance from noise and lighting, control of hazardous substances and discharges to water, control of invasive species and accidental oil spill.

3.3.3. The applicant concludes that there have not been and will not be adverse effects on European Sites associated with the proposed development (alone, no in-combination effects have been identified). No adverse effects as a result of the development in relation to disturbance, displacement or mortality of faunal species has been identified. Taking mitigation measures into account, the applicant determined that the

[14] Shannon Estuary Oil Spill Contingency Plan. https://www.seapt.ie/wp-content/uploads/2021/02/Shannon-Estuary-OSCP_Final-Approved_CoreDoc.pdf

development will not result in any adverse residual effects on European Sites and has not contributed and will not contribute to any cumulative effect when considered in combination with other plans and projects.

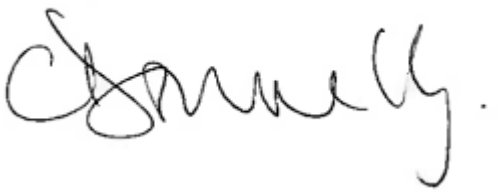
4.0 Submissions

4.1.1. I have considered the submissions received relevant to the appropriate assessment process including that from An Taisce (8th April 2024) and Peter Sweetman on behalf of Wild Ireland Defence CLG in preparing this report.

5.0 Conclusion

5.1.1. I am satisfied that the scientific information submitted, together with the further assessment presented in this report, will allow the Inspector and Board to come to complete, precise and definitive findings as part of the Appropriate Assessment of the implications of the proposed development on site integrity of the 23 SPAs and 32 SACs listed in Table 1 of this report including the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

5.1.2. I consider that adverse effects on the integrity of the European sites can be excluded and there is no reasonable doubt remaining as to the absence of such effects.



Conor Donnelly
Inspectorate Ecologist
23rd August 2024

6.0 Annex 1

Lower River Shannon SAC QIs

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Sandbanks which are slightly covered by sea water all the time								
Habitat distribution	Occurrence	The distribution of sandbanks is stable, subject to natural processes.	None	No	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	None	No				
Community distribution	Hectares	Conserve the listed community types in a natural condition.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes				
Estuaries								
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	None	No	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Community distribution	Hectares	Conserve the listed community types in a natural condition.	Discharges to water during construction and operation, Accidental oil spill, Introduction of	Yes				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
			invasive species					
Mudflats and sandflats not covered by seawater at low tide								
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	None	No	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Community distribution	Hectares	Conserve the listed community types in a natural condition.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes				
Coastal lagoons*								
Habitat area	Hectares	Area stable or increasing, subject to natural processes.	None	No	Lower River Shannon SAC	**Restore**	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Habitat distribution	Occurrence	No decline, subject to natural processes.	None	No				
Salinity regime	Practical salinity units (psu)	Median annual salinity and temporal variation within natural ranges.	None	No				
Hydrological regime	Metres	Annual water level fluctuations and minima within natural ranges.	None	No				
Barrier: connectivity between lagoon and sea	Permeability	Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.	None	No				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Water quality: chlorophyll a	µg/L	Annual median chlorophyll a within natural ranges and less than 5µg/L.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes				
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	Annual median MRP within natural ranges and less than 0.1mg/L.		Yes				
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Annual median DIN within natural ranges and less than 0.15mg/L.		Yes				
Depth of macrophyte colonisation	Metres	Macrophyte colonisation to maximum depth of lagoons.		Yes				
Typical plant species	Number and m²	Maintain number and extent of listed lagoonal specialists, subject to natural variation.		Yes				
Typical animal species	Number	Maintain listed lagoon specialists, subject to natural variation.		Yes				
Negative indicator species	Number and % cover	Negative indicator species absent or under control.		Yes				
Large shallow inlets and bays								
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	None	No	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent	No AEOI
Community distribution	Hectares	Conserve the listed community types in a natural condition.	Discharges to water during construction and operation,	Yes				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
			Accidental oil spill, Introduction of invasive species				invasive species set out in s.6.4.5 of NIS.	
Reefs								
Habitat Area	Hectares	The permanent habitat area is stable or increasing subject to natural processes.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Occurrence	The distribution of reefs is stable or increasing, subject to natural processes.		Yes				
Community structure	Biological composition	Conserve the listed community types in a natural condition.		Yes				
Perennial vegetation of stony banks								
Habitat Area	Hectares	The permanent habitat area is stable or increasing subject to natural processes, including erosion and succession.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.		Yes				
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions.		Yes				
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to		Yes				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		natural processes including erosion and succession.						
Vegetation composition typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones.		Yes				
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover.		Yes				
***Salicornia* and other annuals colonising mud and sand**								
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	None	No	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	None	No				
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions.	None	No				
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.	None	No				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime.	None	No				
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Discharges to water during construction and operation, Accidental oil spill.	Yes				
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward.		Yes				
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.		Yes				
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).	Introduction of invasive species	Yes				
Vegetation structure: negative indicator species- *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%.	None	No				
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)								
Habitat area	Hectares	Area stable or increasing, subject to	None	No	Lower River	**Restore**	Measures to prevent oil spills set out in s.6.4.4	No AEOI

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		natural processes, including erosion and succession.			Shannon SAC		of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	None	No				
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions.	None	No				
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession.	None	No				
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime.	None	No				
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Discharges to water during construction and operation, Accidental oil spill.	Yes				
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward.		Yes				
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of the saltmarsh area vegetated.		Yes				
Vegetation composition: typical species	Percentage cover at a representative	Maintain range of sub-communities with typical species listed in	Introduction of invasive species	Yes				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
and sub-communities	sample of monitoring stops	Saltmarsh Monitoring Project (McCorry and Ryle, 2009).						
Vegetation structure: negative indicator species- *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*).	None	No				
Mediterranean salt meadows (*Juncetalia maritimi*)								
Habitat area	Hectares	Area increasing, subject to natural processes, including erosion and succession.	None	No	Lower River Shannon SAC	**Restore**	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	None	No				
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions.	None	No				
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.	None	No				
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime.	None	No				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Discharges to water during construction and operation, Accidental oil spill.	Yes				
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward.		Yes				
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.		Yes				
Vegetation composition: typical species	Percentage cover	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).	Introduction of invasive species	Yes				
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%.	None	No				
Freshwater Pearl Mussel *Margaritifera margaritifera*								
Distribution	Kilometres	Maintain at 7km.	None	No	Lower River Shannon SAC	**Restore**	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent	No AEOI
Population size	Number of adult mussels	Restore to 10,000 adult Mussels.	None	No				
Population structure: recruitment	Percentage per size class	Restore to least 20% of population no more than 65mm in length; and at least 5% of population	None	No				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		no more than 30mm in length.					invasive species set out in s.6.4.5 of NIS.	
Population structure: adult mortality	Percentage	No more than 5% decline. from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution.	None	No				
Habitat extent	Kilometres	Restore suitable habitat in more than 3.3km and any additional stretches necessary for salmonid spawning.	None	No				
Water quality: macroinvertebrate and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality-macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93.	None	No				
Substratum quality: filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality-filamentous algae: absent or trace (<5%); macrophytes: absent or trace (<5%).	None	No				
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment.	None	No				

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate.	None	No				
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes.	None	No				
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes				
Sea Lamprey *Petromyzon marinus*								
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary.	None	Yes. Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species - affecting adult fish prior to entering rivers	Lower River Shannon SAC	**Restore**	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Population structure of juveniles	Number of age/size groups	At least three age/size groups present.	None					
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m².	None					
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds.	None					
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream	More than 50% of sample sites positive.	None					

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
	of spawning areas							
River Lamprey *Lampetra fluviatilis*								
Distribution	% of river accessible	Access to all water courses down to first order streams.	None	Yes. Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species - affecting adult fish prior to entering rivers	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present.	None					
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of river/brook lamprey at least 2/m².	None					
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds.	None					
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive.	None					
Atlantic salmon *Salmo salar* (only in fresh water)								
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary.	None	Yes. Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species -	Lower River Shannon SAC	**Restore**	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded.	None					
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at	None					

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		17 salmon fry/5 min sampling.		affecting adult fish prior to entering rivers				
Out-migrating smolt abundance	Number	No significant decline.	None					
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes.	None					
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA.	None					
Bottlenose Dolphin *Tursiops truncatus*								
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	None	No	Lower River Shannon SAC	Maintain	Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Habitat use: critical areas	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes				
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site.	None	No				
Otter *Lutra lutra*								
Distribution	Percentage positive survey sites	No significant decline	Surface noise, human activity during construction.	Yes	Lower River Shannon SAC	**Restore**	Pre-construction surveys to confirm otter holts and couches as set out in s. 6.4.2 of	No AEOI

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Extent of terrestrial habitat	Hectares	No significant decline	None	No			NIS. Measures to minimise disturbance set out in s. 6.4.3. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	
Extent of marine habitat	Hectares	No significant decline	None	No				
Extent of freshwater (river) habitat	Kilometres	No significant decline	None	No				
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline	None	No				
Couching sites and holts	Number	No significant decline	No couch/holts were identified along the boundary or within the proposed development site during the survey.	No				
Fish biomass available	Kilograms	No significant decline	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species	Yes				
Barriers to connectivity	Number	No significant increase	None	No				

River Shannon and River Fergus Estuaries SPA SCIs

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Cormorant *Phalacrocorax carbo*								
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Productivity rate	Mean number	No significant decline.						
Distribution: breeding colonies	Number; location; area (hectares)	No significant decline.						
Prey biomass available	Kilogrammes	No significant decline.						
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase.	None	No				
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding cormorant population.	None	No				
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes				
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by cormorant other than that occurring from natural patterns of variation.						
Whooper Swan *Cygnus cygnus*								

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by whooper swan other than that occurring from natural patterns of variation.						
Light-bellied Brent Goose *Branta bernicla hrota*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose other than that occurring from natural patterns of variation.						
Shelduck *Tadorna tadorna*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by						

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		shelduck other than that occurring from natural patterns of variation.						
Wigeon *Anas penelope*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by wigeon other than that occurring from natural patterns of variation.						
Teal *Anas crecca*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by teal other than that occurring from natural patterns of variation.						
Pintail *Anas acuta*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by						

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		pintail other than that occurring from natural patterns of variation.	invasive species.				invasive species set out in s.6.4.5 of NIS.	
Shoveler *Anas clypeata*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by shoveler other than that occurring from natural patterns of variation.						
Scaup *Aythya marila*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by scaup other than that occurring from natural patterns of variation.						
Ringed Plover *Charadrius hiaticula*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by						

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
		ringed plover other than that occurring from natural patterns of variation.	invasive species.				invasive species set out in s.6.4.5 of NIS.	
Golden Plover *Pluvialis apricaria*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by golden plover other than that occurring from natural patterns of variation.						
Grey Plover *Pluvialis squatarola*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by grey plover other than that occurring from natural patterns of variation.						
Lapwing *Vanellus vanellus*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil	Yes	River Shannon and River Fergus	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set	No AEOI
Distribution	Range, timing and intensity of use of	There should be no significant decrease in						

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
	areas	the range, timing or intensity of use of areas by lapwing other than that occurring from natural patterns of variation.	spill, Introduction of invasive species.		Estuaries SPA		out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	
Knot *Calidris canutus*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by knot other than that occurring from natural patterns of variation.						
Dunlin *Calidris alpina*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by dunlin other than that occurring from natural patterns of variation.						
Black-tailed Godwit *Limosa limosa*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil	Yes	River Shannon and River Fergus	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set	No AEOI
Distribution	Range, timing and intensity of use of	There should be no significant decrease in						

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
	areas	the range, timing or intensity of use of areas by black-tailed godwit other than that occurring from natural patterns of variation.	spill, Introduction of invasive species.		Estuaries SPA		out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	
Bar-tailed Godwit *Limosa lapponica*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit other than that occurring from natural patterns of variation.						
Curlew *Numenius arquata*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by curlew other than that occurring from natural patterns of variation.						
Redshank *Tringa totanus*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction	Yes	River Shannon and River	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of	No AEOI

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by redshank other than that occurring from natural patterns of variation.	and operation, Accidental oil spill, Introduction of invasive species.		Fergus Estuaries SPA		the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	
Greenshank *Tringa nebularia*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by greenshank other than that occurring from natural patterns of variation.						
Black-headed Gull *Chroicocephalus ridibundus*								
Population trend	Percentage change	Long term population trend stable or increasing.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation.						
Wetland and Waterbirds								

Attribute	Measure	Target	Potential impact(s)	Potential for adverse effect on site integrity (AEOI)	Site(s)	Conservation Objective	Mitigation	Residual impact / conclusion
Wetland habitat area	hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 32,261ha, other than that occurring from natural patterns of variation.	Discharges to water during construction and operation, Accidental oil spill, Introduction of invasive species.	Yes	River Shannon and River Fergus Estuaries SPA	Maintain	Measures to prevent discharges to water are set out in s.6.4.4 of the NIS. Measures to prevent oil spills set out in s.6.4.4 of NIS. Measures to prevent invasive species set out in s.6.4.5 of NIS.	No AEOI