Pier extension – Droim, Leitir Mor, Co. Galway

Natura Impact Statement

November 2026

Prepared for: Galway County Council

www.jbaconsulting.ie

Document Status

Issue date: 24/11/2026

Issued to Rhiannon Simpson

BIM reference ……RTV

Revision ……..A3-C01

Revision History

Revision Ref/Date	Amendments	Issued to
S3-P01 / 26-06-22		Rhiannon Simpson
A3-C01 / 24/11/2026	Project description	Rhiannon Simpson

Prepared by …… Jai Dolan BSc (Hons), MSc

…….. Ecologist

…….. Johanna Healy BSc (Hons), MSc

…….. Ecologist

Reviewed by …… Patricia Byrne BSc (Hons), PhD, MCIEEM

…… Principal Ecologist

Authorised by …….. Bernadette O'Connell (JBA Managing Director)

Carbon Footprint

JBA is committed to championing sustainability and has made The Ten Principles of the UN Global Compact part of its culture and operations. We have a Group-wide objective to be a Net Zero carbon emissions business.

The format of this report is optimised for reading digitally in pdf format; duplex printing in B&W on 100% post-consumer recycled A4 will result in a carbon footprint of 412g CO_2e. This will increase to 525g CO_2e if primary-source paper is used. Please consider the environment before printing.

Project Manager

Patricia Byrne

2/F Lincoln House

Lincoln Lane

Smithfield, Dublin

D07Y75P

2026s0101

Contract

This report describes work commissioned by Rhiannon Simpson, on behalf of MKO, by an instruction dated 20/01/2026. The Client's representative for the contract was Rhiannon Simpson. Jai Dolan, Johanna Healy and Dominic Tilley of JBA Consulting carried out this work.

Purpose and Disclaimer

JBA Consulting Engineers and Scientists Limited ("JBA") has prepared this Report for the sole use of Galway County Council and its appointed agents in accordance with the Agreement under which our services were performed.

JBA has no liability for any use that is made of this Report except to Galway County Council for the purposes for which it was originally commissioned and prepared.

No other warranty, expressed or implied, is made as to the professional advice included in this Report or any other services provided by JBA. This Report cannot be relied upon by any other party without the prior and express written agreement of JBA.

The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by JBA has not been independently verified by JBA, unless otherwise stated in the Report.

The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken in March 2026 and is based on the conditions encountered and the information available during the said period. The scope of this Report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this Report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

JBA disclaims any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to JBA's attention after the date of the Report.

Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JBA specifically does not guarantee or warrant any estimates or projections contained in this Report.

Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Where field investigations are carried out, these have been restricted to a level of detail required to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in issuing this Report.

Copyright

© JBA Consulting Engineers and Scientists Limited 2026

Contents

1 Introduction 1

1.1 Background 1
1.2 Summary of Screening Assessment 1
1.3 Legislative Context 1
1.4 Appropriate Assessment Process 2
1.4.1 Stage 1 – Screening for AA 2
1.4.2 Recent judgements of the Court of Justice of the European Union (CJEU) and how they are used in this assessment 3
1.5 Methodology 4
1.5.1 Desktop Study 5
1.5.2 Ecological Site Survey 5
1.6 Assessment criteria 6
1.6.1 The adverse effect on site integrity test 6
1.6.2 In-Combination Effects 8
1.6.3 Competent Persons 8
1.6.4 Limitations and Constraints 8

2 Project Description 10

2.1 The 'Project' 10
2.2 Site Location 10
2.3 Proposed Project 10
2.3.1 Client Proposed Pier Extension and Slipway Construction Methodology 11
2.3.2 Drainage 14
2.3.3 Construction Duration 14
2.3.4 Machinery to be used on site 14
2.4 Project Zone of Influence 14
2.5 Project AA Screening Summary and Conclusion 14
2.5.1 Concluding Statement 17

3 Screening Assessment 18

3.1 Natura 2000 sites 18
3.1.1 Kilkieran Bay and Islands SAC [002111] 18
3.1.2 Qualifying Interests 19
3.1.3 Conservation Objectives 20
3.1.4 Threats and pressures Kilkieran Bay and Islands SAC [002111] 23
3.2 Summary of Natura 2000 site Qualifying Interests in Zone of Influence 23

4 Environmental Baseline 24

4.1 General Baseline conditions 24
4.2 Habitats 24
4.2.1 Stone walls and other stonework (BL1) 26
4.2.2 Buildings and artificial surfaces (BL3) 26
4.2.3 Sea walls, jetties and piers (CC1) 28
4.2.4 Upper salt marsh (CM2) 29
4.2.5 Tidal rivers (CW2) 29
4.2.6 Spoil and bare ground (ED2) 30
4.2.7 Recolonising bare ground (ED3) 31
4.2.8 Exposed siliceous rock (ER1) 31
4.2.9 Reed and large sedge swamps (FS1) 31
4.2.10 Eroding/upland rivers (FW1) 32
4.2.11 Drainage ditches (FW4) 33
4.2.12 Wet grassland (GS4) 33
4.2.13 Montane heath (HH4) 34
4.2.14 Sheltered rocky shores (LR3) 35
4.2.15 Mixed substrata shores (LR4) 35
4.2.16 Sea inlets and bays (MW2) 36
4.2.17 Scrub (WS1) 36
4.3 Protected Species 37
4.3.1 Otter 37
4.3.2 Harbour Seal 37
4.4 Invasive Non-Native Species 37
4.5 Waterbodies within the Vicinity of the Proposed Site 38
4.6 Ecology of Kilkieran Bay and Islands – Leitir Moir and surrounding islands 39
4.6.1 Water Quality 40
4.6.2 Non-Qualifying Interests, Protected Species within the Zol 40

5 Other Relevant Plans and Projects 42

5.1 In-combination Effects 42
5.2 Plans 42
5.2.1 Galway County Development Plan 2022 - 2028 42
5.2.2 River Basin Management Plan for Ireland 2022-2027 43
5.2.3 Other projects 43

6 Appropriate Assessment 45

6.1 Introduction 45
6.2 Potential Sources of Impact 45
6.2.1 Construction Phase – Direct impacts 45
6.2.2 Construction Phase – Indirect Impacts 49
6.2.3 Operational Impacts 50

6.2.4 Do Nothing Impact 50

7 Mitigation 51

7.1.1 Construction Phase Mitigations 51
7.1.2 Standard Environmental Best Practice 51
7.1.3 Environmental Management of Site Compound 52
7.1.4 Water Quality 53
7.1.5 Concrete Management Procedures 53
7.1.6 Pollution Control and Spill Prevention 54
7.1.7 Dust Minimisation 55
7.1.8 Noise and Vibration 55
7.1.9 Timing of works (Harbour Seal) 56
7.1.10 Lighting 56
7.1.11 Retention of Reef Habitat 56
7.1.12 Enhancement of New Artificial Surfaces (pier and slip way) 57
7.2 Residual Impacts 58
7.2.1 Water quality 58
7.2.2 Otter and Harbour Seal 58
7.2.3 Annex I habitats; Large shallow inlets and bays, and Reefs 58
7.2.4 Additional Note on Non-QI, Protected Species potentially present within the Zol 66
7.3 Significance of in-combination Effects 66

8 Conclusions 67

Appendices I

A - Site location and High-water mark I

B - Site Layout Plan II

C - Cross Section through Slipway and Pier Extension III

D - Habitat Map at low tide (©OSM, 2026) IV

E - Protected species recorded within 2km V

List of Figures

Figure 2-1: Site location with site boundary (©OSM, 2026) 10

Figure 3-1: Kilkieran Bay and Islands SAC and site location (©OSM, 2026) 18
Figure 3-2: Seal breeding and moulting sites (©OSM, 2024, NPWS, 2014) 20
Figure 4-1: Habitat map at low tide (©OSM, 2026) 25
Figure 4-2: Stone wall 26
Figure 4-3: Existing bridge with tidal inlet and sheltered rocky shore habitat below 27
Figure 4-4: Cow shed to the south of the site 28
Figure 4-5: Existing pier and bridge with Sheltered rocky shore habitat on the right of the image 28
Figure 4-6: Area of salt marsh 29
Figure 4-7: Tidal river to the west which flows under the bridge to a small barrier of boulders 30
Figure 4-8: Bare ground beyond the existing pier. 31
Figure 4-9: Patch of Common Reed found in a field adjacent to the south-east of the site 32
Figure 4-10: Small stream entering the site from the North 33
Figure 4-11: Stream to the south of the site, with drainage ditch coming from the reedbed 33
Figure 4-12: Montane heath found on site 34
Figure 4-13: Example of sheltered rocky shore showing zonation of lichen and seaweed 35
Figure 4-14: Mixed substrata shore on site 36
Figure 4-15: Scrub lining the path to the east of the site 37
Figure 4-16: Sub Catchments and Coastal waterbodies within the vicinity of the proposed site (©OSM, 2026) 39
Figure 7-1: Hole (a and c) and groove (b and d) enhancements creating refuges for intertidal organisms. Typical hole and groove dimensions are shown on the left (Hall, 2018). 57

List of Tables

Table 2-1: Summary of project elements relevant to the ecology of the Natura 2000 site 14
Table 3-1: Conservation objectives for Kilkieran Bay and Islands SAC QIs within the ZoI. 21
Table 3-2: Threats and pressures posed to Kilkieran Bay and Islands SAC. 23
Table 4-1: Habitats recorded during site visit (Fossit classification and Annex 1 status) 24
Table 4-2: Proximity of high impact invasive non-native species to the site 38
Table 4-3: The WFD waterbodies within the ZoI of the proposed works (EPA, 2026) 38
Table 4-4: Bird species recorded in the vicinity of the site, with reference to Bird of Conservation Concern (BoCCI). IUCN listing (LC: Least Concern, NT: Near Threatened), Annex status, and during which survey they were recorded. 40

Table 5-1: Other projects within the locality which may have in-combination effects with the proposed project 44

Table 6-1: Potential direct impacts on the attributes of the designated features of the Kilkieran Bay and Islands SAC within the Zol of the proposed project 47

Table 6-2: Potential indirect impacts on the attributes of the designated features of the Kilkieran Bay and Islands SAC within the Zol of the proposed project. 49

Table 7-1: Pathways of impact on the attributes of the designated features of Kilkieran Bay and Islands SAC. 59

Table 8-1: Integrity of Natura 2000 site checklist 68

Abbreviations

AA	Appropriate Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
DEHLG	Department of Environment, Heritage and Local Government
DHPLG	Department of Housing, Planning and Local Government
EC	European Communities
ECJ	European Court Judgement
EPA	Environmental Protection Agency
GCC	Galway Count Council
GIS	Geographic Information Systems
GSI	Geological Survey Ireland
IAQM	Institute of Air Quality Management
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Over-riding Public Interest
LSE	Likely Significant Effect
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Services
QI	Qualifying Interest
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SPA	Special Protection Area
WFD	Water Framework Directive
Zol	Zone of Influence

1 Introduction

1.1 Background

JBA Consulting Ireland Ltd. was commissioned by Rhiannon Simpson of MKO on behalf of Galway County Council to undertake a Natura Impact Assessment (NIS) in relation to a proposed pier extension and slipway at Droim, Leitir Móir, Co. Galway.

A screening for Appropriate Assessment has already been carried out (JBA, 2024) and updated in 2026. The area of works lies within the Kilkieran Bays and Islands SAC. Likely significant effects on the qualifying interests of the Natura 2000 site were identified in at the screening stage.

The Zone of Influence within which potential impacts from any proposed project must be considered for significance, depends on a variety of factors. This includes the nature, location and extent of the proposed works, the ecological receptors present within the Natura 2000 sites within the area and the potential for in combination impacts (DEHLG 2009).

This Natura Impact Statement provides the results of the assessment conducted for the proposed development, in accordance with Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).

1.2 Summary of Screening Assessment

Following initial screening and based upon best scientific judgement it is concluded that there are likely significant effects from the project on the Kilkieran Bays and Islands SAC (002111). Full details of the Natura 2000 site are given in Section 4. The likely significant effects screened into the NIS are that designated QIs of Kilkieran Bays and Islands SAC may be impacted by habitat loss and general disturbance, and following the potential release of construction pollutants into the surface water. The following QIs are likely to be impacted:

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Otter *Lutra lutra* [1355]
- Harbour Seal *Phoca vitulina* [1365]

1.3 Legislative Context

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora, known as the 'Habitats Directive' - provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000 sites. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79 / 409 / EEC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans or projects affecting Natura 2000 sites.

Article 6(3) establishes the requirement for Appropriate Assessment:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

Article 6(4) deals with the steps that should be taken when it is determined, as a result of Appropriate Assessment, that a plan/project will adversely affect a European site. Issues dealing with alternative solutions, imperative reasons of overriding public interest and compensatory measures need to be addressed in such a case.

Article 6(4) states:

"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and / or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

The requirements of Articles 6(3) and 6(4) of the Habitats Directive have been transposed into Irish legislation by means of inter alia the European Communities (Birds and Natural Habitats) Regulations 2011-2015 (S.I. No. 477 / 2011) as amended.

1.4 Appropriate Assessment Process

Guidance on the AA process was initially produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009, rev 2010). Office of the Planning Regulator (OPR) produced a Practice Note in 2021, PN01 - Appropriate Assessment Screening for Development Management (OPR, 2021). These guidance documents identify a staged approach to conducting an AA. More recent guidance is contained in EC (2021) 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.

1.4.1 Stage 1 – Screening for AA

The initial, screening stage of the Appropriate Assessment is to determine:

- whether the proposed plan or project is directly connected with or necessary for the management of the European designated site for nature conservation (Natura 2000
- site)
- if it is likely to have a significant adverse effect on the European designated site, either individually or in combination with other plans or projects.

For those sites where, potential adverse impacts are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse impact on the integrity of a European designated site, in view of the site's conservation objectives (i.e., the process proceeds to Stage 2).

Stage 2 – AA

This stage requires a more in-depth evaluation of the plan or project, and the potential direct and indirect impacts of them on the integrity and interest features of the European designated site(s), alone and in-combination with other plans and projects, taking into account the site's conservation objectives. Where required, mitigation or avoidance measures will be suggested.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where mitigation cannot be achieved, then a derogation from Article 6(3) may be sought in Stage 3, in accordance with the provisions of Article 6(4).

Stage 3 – Procedure under Article 6(4)

Article 6(4) allows for exceptions to the general rule of 6(3). It is up to the authority to decide whether a derogation from Article 6(3) can be applied.

The provisions of Article 6(4) entail three key requirements that must be met and documented;

Step 1- Identification of alternative solutions

Step 2- Comparative assessment of the alternatives considered

Step 3- Examining imperative reasons of overriding public interest (IROPI)

This report is in support of a Stage 2 Appropriate Assessment.

1.4.2 Recent judgements of the Court of Justice of the European Union (CJEU) and how they are used in this assessment

The CJEU has been asked to issue rulings on development plans, which are used to inform this assessment.

The CJEU issued a ruling on the consideration of avoidance and reduction measures as a result of People over Wind, Peter Sweetman v Coillte Teoranta (C-323/17) [2018]. This judgement stated that measures intended to reduce or avoid effects on a Natura 2000 site should only be considered within the framework of an Appropriate Assessment, and it is not permissible to take into account such measures at the screening stage.

The decision of the CJEU in case C-721/21 (Eco Advocacy CLG v An Bord Pleanála), delivered in June 2023, found that Article 6(3) of the Habitats Directive must be interpreted as meaning that: "in order to determine whether it is necessary to carry out an appropriate

assessment of the implications of a plan or project for a site, account may be taken of the features of that plan or project which involve the removal of contaminants and which therefore may have the effect of reducing the harmful effects of the plan or project on that site, where those features have been incorporated into that plan or project as standard features, inherent in such a plan or project, irrespective of any effect on the site." (Para. 53(3) of the Judgement). This indicates that an AA screening can take into account "standard features", i.e. all the constituent elements of that project inherent in it/elements that are incorporated into a projects design, not with the aim of reducing its negative effects (even where these have the effect of reducing harmful effects on a European site).

The CJEU ruling in Grace & Sweetman (C-164/17) [2018] clarified the difference between avoidance and reduction (mitigation) measures and compensation. Measures intended to compensate for the negative effects of a project cannot be taken into account in the assessment of the implications of a project and instead are considered under Article 6(4). This means that any project where an effect on the integrity of a Natura 2000 site remains and can only be offset by compensation, would need to proceed under Article 6(4), demonstrating "imperative reasons of overriding public interest".

The CJEU ruling in the case of Holohan v An Bord Pleanála (C-461/17) [2018] also clarified the importance in Appropriate Assessment of taking into account habitat types and species outside the boundary of the Natura 2000 site where implications of the impacts on those habitat and species may impact the conservation objectives of the Natura 2000 site. In this assessment functionally linked and supporting habitat for species outside of Natura 2000 sites are assessed where they could potentially impact the conservation objectives of any Natura 2000 sites within the zone of Influence (ZoI).

1.5 Methodology

The Natura Impact Statement has been prepared having regard to the Birds and Habitats Directives, the European Communities (Birds and Natural Habitats) Regulations 2011-15 as amended and relevant jurisprudence of the EU and Irish courts. The following documents have also been used to provide guidance for the assessment:

- DEHLG (2009 rev 2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (DEHLG 2009);
- Office of the Planning Regulator (2021) OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management (OPR 2021);
- European Communities (EC) (2019) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission 2019);
- EC (2021/ C 437/01) 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 ;
- EC (2022) Guidance document on assessment of plans and projects in relation to Natura 2000 sites - A summary (European Commission 2022);
- EC (2021) Guidance document on the strict protection of species of Community interest under the Habitats Directive 92/43/EEC; and

- (CIEEM 2024). Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal, Second Ed.

This report has been produced using currently available information, with the most up-to-date version available at the time.

1.5.1 Desktop Study

A desktop study was conducted of available published and unpublished information, along with a review of data available on the National Parks and Wildlife Service (NPWS) and National Biodiversity Data Centre (NBDC) web-based databases, to identify key habitats and species, including legally protected and species of conservation concern, that may be present within ecologically relevant distances from the project as explained below. The data sources below were consulted for the desktop study:

- National Parks and Wildlife Service (NPWS) (2025). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report (NPWS 2025a).
- NPWS (2025). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report (NPWS 2025b).
- NPWS (2025). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report (NPWS 2025c).
- Aerial photography available from www.osi.ie and ESRI World Imagery.
- NPWS website (www.npws.ie) where Natura 2000 site synopses, data forms and conservation objectives were obtained along with Annex 1 habitat distribution data and status reports.
- River Basin Management Plans
- NBDC Biodiversity Maps (maps.biodiversityireland.ie)
- Catchments (www.catchments.ie)
- Environmental Protection Agency Maps (https://gis.epa.ie/EPAMaps)
- Geological Survey Ireland (GSI) (www.gsi.ie)
- GSI - Groundwater data viewer (https://dcenr.maps.arcgis.com)
- Planning Applications (myplan.ie)

1.5.2 Ecological Site Survey

To inform the ecological baseline of this AA Screening report an ecological walkover survey was conducted on 03/05/2024 by JBA Ecologist Matthew Hosking, and with an updated survey on 18/03/2026 by JBA Ecologist Dominic Tilley. The results of these surveys can be found in Section 3.

The ecological walkover survey recorded habitats and protected species, following the methods outlined in the documents below:

- Heritage Council (2011). Best Practice Guidance for Habitat Survey and Mapping (Smith et al. 2011).
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA 2009).

Aerial photographs and site maps assisted the surveys. Habitats have been named and described following Fossitt (2000). Nomenclature for higher plants follows that given in The New Flora of the British Isles 4th Edition (Stace 2019). Identification of Irish plants generally follows Webb's An Irish Flora (Parnell and Curtis 2012).

1.6 Assessment criteria

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of qualifying interest. The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Upon the conclusion of the AA, the competent authority may grant consent to the plan or project only after having ascertained that it will not adversely affect the integrity of the Natura 2000 site(s) concerned.

1.6.1 The adverse effect on site integrity test

An assessment of whether there could be an adverse effect on site integrity is done using the source-pathway-receptor model which is used to determine the risk of impact to a site or Qualifying Interests (QIs) (OPR 2021). Risk is the likelihood or expected frequency of a specified adverse consequence or impact.

Applied to the Scheme, it expresses the likelihood of an adverse impact arising because of the Scheme activities. A hazard presents a risk when it is likely to affect something of value (i.e. the Natura 2000 sites and their QIs). It is the combination of the probability of the hazard occurring and its consequences that is the basis of a risk assessment which an NIS essentially is:

Risk = probability of an event x consequential damage

The source-pathway-receptor model is a useful tool to determine if a risk is present, and to help quantify the risk to see if the threshold of an adverse effect on site integrity is reached. For a risk to be present, all three elements must be present.

Source: The source considered in this NIS is the proposed works or activity that will occur as a result of the Scheme. Key considerations in assessing the source are the nature and scale of the potential impacts that may arise, e.g. type of contaminants that may arise, the contaminant loading and other physical attributes. The point of occurrence is a critical reference point for assessing the attributes of the source of any potential adverse impacts.

Pathway: Pathways are established by surface water, ground water, and land and air connections. The pathway includes everything between the source and the receptor; from point of release of potential adverse impacts, such as contaminants, to the receptor. The location, nature, connectivity and extent of wells, groundwater dependent ecosystems, aquifers and faults can all influence the nature of a pathway. Rivers, streams and drainage ditches could all act as potential pathways for potential waterborne impacts. The pathway includes assessment of surface and groundwater bodies, and WFD status may be reviewed as relevant. Land and air pathways to be considered include those that may transfer direct physical impacts, noise and visual disturbance (vibrations) and dust or other airborne particles.

Receptor: The receptor is the QI features of the relevant Natura 2000 sites, their site specific Conservation Objectives (COs) and the overall integrity of the Natura 2000 sites. To determine the significance of potential adverse impacts on the integrity of the Natura 2000 site, the COs of each site are assessed relative to the potential impacts that may occur because of the proposed works. The conservation objectives are the fundamental unit on which the assessment is based. If the project were to undermine or make these objectives more difficult to achieve, the conservation status of the QI features becomes harder to achieve, and the quality and condition of the site will be reduced, reducing the 'integrity' of the Natura 2000 site. Each Natura 2000 site will either have specific or generic conservation objectives.

The overall aim of COs is to maintain or restore the favourable conservation conditions of the Annex I habitats and/or the Annex II species for which a Natura 2000 site has been selected, under which the site-specific objectives contain more detailed attributes, measures and targets.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.
-

The conservation objectives for SPAs are also to maintain or restore the favourable conservation condition of the bird species listed as QIs for SPAs, which are defined by the following list of attributes and targets:

- Population trend: Measure of percentage change and whether the long-term population trend is stable or increasing.
- Distribution: Number, range, timing and intensity of use of areas. There is to be no significant decrease in the range, timing or intensity of use of areas by specific or generic bird species, other than that occurring from natural patterns of variation.

The conservation objectives for non-breeding birds QIs for SPAs are as follows:

- To maintain the favourable conservation condition of the non-breeding water bird Special Conservation Interest species listed for a SPA.
- To maintain the favourable conservation condition of the wetland habitat for a SPA as a resource for the regularly occurring migratory water birds that utilise it.

Each of the Natura 2000 sites within the ZoI have site specific Conservation Objectives (SSCO).

Site integrity is assessed on the basis of each conservation objective of each qualifying interest feature. Should any conservation objective be undermined by the proposed Scheme, the site integrity will therefore be adversely affected. Low-impact effects that are too small or short-lived to undermine the achievements of the conservation objectives are therefore not likely to adversely affect the site integrity.

1.6.2 In-Combination Effects

The in-combination impacts are considered only after the assessment of the project alone. If the result of this is that the project will have no effect at all on a European site, then no in-combination assessment would be necessary. However, where there is no adverse effect on site integrity, but some adverse effect locally an assessment of this adverse effect in-combination with other plans or projects is carried out. Other plans or projects were searched for using the National Planning Application Database, EIA portal and Myplan.ie databases all accessed online. If no other plans or projects are identified, then the assessment is complete. Where other plans or projects are identified then initially a review is made of its AA screening, or AA, and if the Competent Authority for the plan or project has made a final determination of no effect on the integrity of any European site, either alone or in-combination, this determination is used in this assessment. Where there is not a full AA, or the findings are unclear or out of date, the plan or project documentation is checked for credible evidence of real (not hypothetical) risk to a European site.

Potential sources of cumulative impacts were identified based on the ecology of valued ecological features only for features where this is a residual or non-significant impact. Potential sources of cumulative impacts were sought within an area where there is the potential for a significant impact on relevant Natura sites identified in Section 3.

1.6.3 Competent Persons

The assessment has been carried out by Jai Dolan BSc (Hons), MSc and updated by Johanna Healy BSc, MSc, and Dominic Tilley BSc, PhD. All are ecologists with JBA and have experience undertaking Appropriate Assessments. The assessment has been reviewed by Patricia Byrne BSc (Hons), PhD, MCIEEM. Patricia is Principal Ecologist with JBA Consulting, with over 20 years' experience in environmental and ecological research, teaching and reporting; and with nine years in ecological consultancy. Patricia is a full Member of the Chartered Institute of Ecological and Environmental Management (CIEEM).

1.6.4 Limitations and Constraints

The NIS assessment necessarily relies on some assumptions, and it was inevitably subject to some limitations. These would not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- Information on the works and conditions on site are based on current knowledge at the time of writing. Changes to the site since the site survey was undertaken cannot be accounted for, however the site survey has followed the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance provided on suitable lifespan for surveys (CIEEM 2019).

- Information on the works and conditions on site are based on current knowledge at the time of writing. Changes to the site since the survey was undertaken cannot be accounted for.
- This assessment is based on the methodology for proposed works as described in this report. Where changes to methodology occur, an ecologist will need to be consulted to determine if the changes need reassessment.
- Adverse weather can cause delays to the schedule and alter the timing of works. This has been accounted for using a worst-case scenario where necessary.
- The precautionary principle is used at all times when determining potential ecological sensitivity of the site.
- The NIS addresses issues around European designated sites and does not exempt works from responsibilities related to habitats and species covered under separate national legislation.

2 Project Description

2.1 The ‘Project’

The proposed development meets the criteria of a 'Project' as defined in the Habitats Directive and is not directly connected with or necessary to the management of any Natura 2000 site. Therefore, the Project is subject to the requirements of the Appropriate Assessment process.

2.2 Site Location

The proposed development will consist of an upgrade and extension to the existing pier located at Droim Pier, Maumeen, Shanacavas, Co. Galway. The site is located along the southern coastline of Gorumna Island within a sheltered inlet, southeast of Ballynakill Lough (Figure 2-1). The isle of Illaunnanownim and Loughcarrick Island are located several hundred meters offshore to the south-west of the site. The site is connected to the R374, which is situated 2km north of the site, by an unnamed local road.

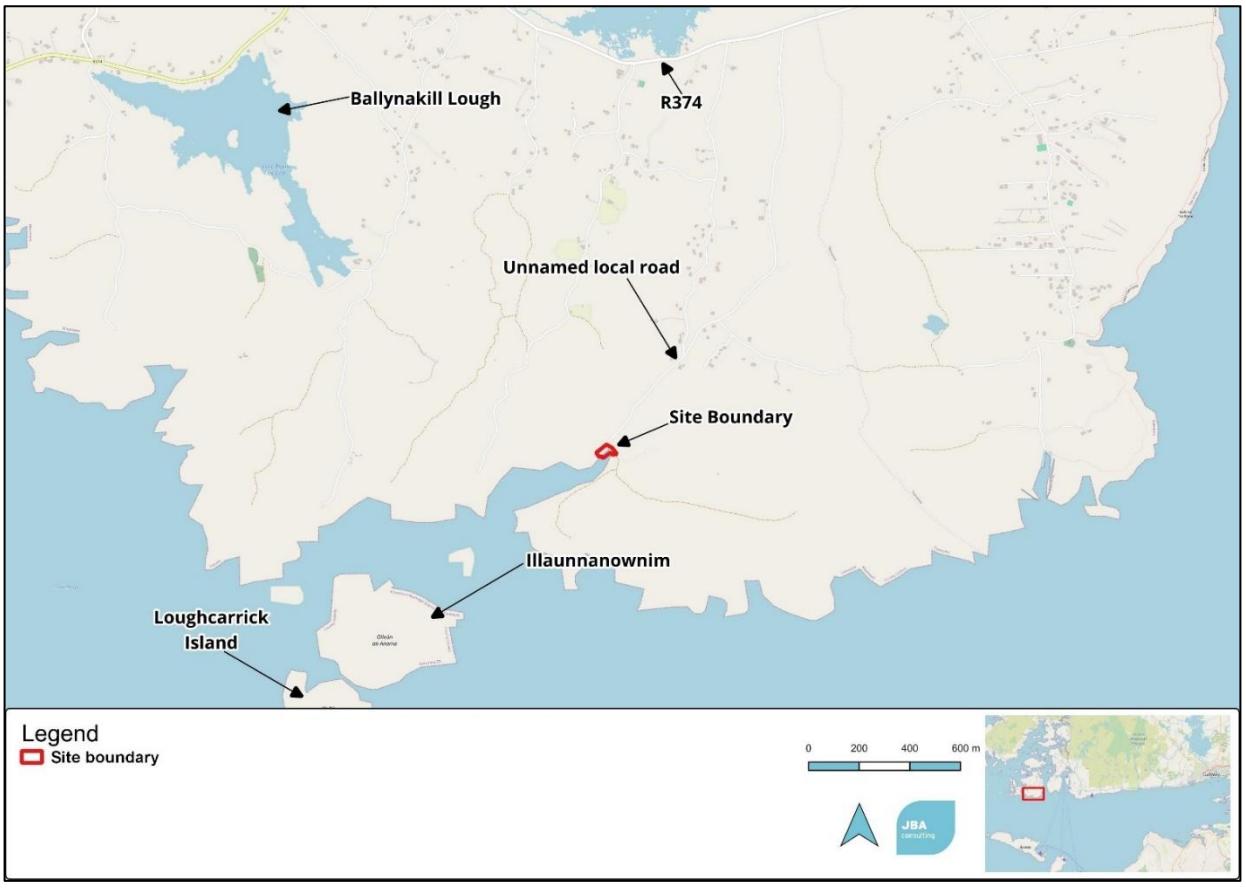


Figure 2-1: Site location with site boundary (©OSM, 2026)

2.3 Proposed Project

Galway County Council are proposing an upgrade to the existing pier located at Droim, Leitir Moir, Co. Galway. The proposed development will consist of a 15m extension to the existing pier, construction of a slipway (29m length x 5m width) and parking area, widening of the existing

bridge, provision of new lighting, boundary walls, and stormwater drainage, refurbishment of the existing access road within the site boundary, and all associated ancillary site development works.

Site location and highwater mark is seen in Appendix A.

Project Description

The proposed works will involve:

- Construction of 1 no. extension to the existing pier (202.5 sq. m) including pier steps and a vertical ladder providing access to the water;
- Construction of 1 no. new slipway (c 29.33m in length and c 5m wide) for launching and landing of small vessels;
- Construction of a vehicle and trailer parking hardstand area (providing 3 no. car parking spaces and 2 no. trailer parking spaces);
- Widening of existing the roadway and bridge from c 4.2m to c 8.2m to provide vehicular access to the proposed vehicle and trailer parking area;
- Provision of 6 no. solar powered street lights (6m height);
- Construction 1 no. 1.2m high roadside parapet boundary wall;
- Provision of new stormwater road gullies and extension of the existing culvert to drain the pier face;
- All ancillary site enabling and development works.
- Site compound to be located to the southeast of the car park area, subject to landowner agreement. No land outside the works boundary will be provided to the contractor for the provision of the site compound.

Site layout is seen in Appendix B, with cross sections of slipway and pier extension seen in Appendix C.

2.3.1 Client Proposed Pier Extension and Slipway Construction Methodology

The following points outline the construction methodology for the construction of the pier extension and slipway as proposed by the client:

Stage 1 – Site mobilisation:

- The appointed contractor will typically decide the location of the site compound that facilitates their requirements in terms of construction equipment and material storage. This compound will be within the extent of the existing Pier structure;
- No land outside the works boundary will be provided to the contractor for the provision of a site compound;
- The contractors work proposal should include provisions for locating a site compound. The site compound will be located on the existing concrete deck/hardstand area;
- It is not envisioned that the site compound will require a road surface;

- For the extent of the works to be carried out, a site compound will typically consist of a 2Nr shipping containers and a storage area for equipment contained within a heras fenced area;
- Blackwater will typically be contained onsite in portable toilets which are typically serviced on a weekly basis;
- Greywater arising from site activities such as cleaning will be collected and stored prior to transport to a suitable facility offsite for recovery/disposal. Run-off containing pollutants into surrounding soils, watercourses and open excavations will not be permitted;
- All fuel must be stored more than 50m from a watercourse and should be bunded to 110% capacity;
- A daily record of machinery inspections should take place to check for leaks and spills and a record kept for inspection;
- A spill kit and drip tray should be onsite at all times and available for refuelling operations;
- The plant refuelling procedures should be detailed in the contractors' methods statements.

Stage 2 – Rock Breaking and Excavation:

- Prior to commencement of construction works, a detailed method statement will be required from the contractor that details that they adhere to safe methods of best practice in terms of both environmental safety and construction works safety;
- Typically localised excavation of sediment/cobbles/stones to bedrock in some areas below the footprint of the slipway and pier development will be required (area/volume to be confirmed at construction stage);
- It is envisioned that the material will typically be reused to create the hardstanding area onsite. If, at the time of construction, the material is unable to be used, the material will be removed from site typically in 8-wheel tipper trucks to a waste disposal facility by a licensed contractor.

Stage 3 – Shuttering and Formwork

- Shuttering pans to be fixed to bedrock and tied at corners using diawag bars which have been chemical anchored into existing bedrock;
- Shuttering pans supported using steel Acrow props fixed to Lego blocks and by double bagged tonne bags of sand (which should be retrieved on completion of the pour).

Stage 4 – Concrete Works

- Precast concrete elements will be used, whenever possible, to negate the requirement for in-situ concrete;
- All in situ concrete works must be done during dry weather conditions and isolated from any water that may enter the drainage network/sea until the concrete has cured;
- Concrete delivery vehicles will be precluded from washing out at locations which would result in discharge to surface waters and will be required to wash into a concrete absorption sack or similar;
- No concrete will enter the sea. This is typically achieved by diverting the water away from the working area through the use of double bagged bags of sand;
- Shutters will typically be made watertight through a combination of Hessian and sandbags to retain the concrete during the pour and pours are typically timed to begin on the going/falling tide to allow for sufficient time for the concrete to set prior to the rising tide;
- An underwater concrete mix will be specified at detailed design stage for all in-situ works that will be intertidal;
- Removal of shutters will take place typically 24-48 hours upon completion of the pour and process repeated to completion of slipway/pier extension.

Stage 5 – Hardstand/Parking Area

- Area to be surveyed by contractor;
- Area to be levelled using excavator and surfaced with dredged material and locally sourced hardcore infill stone;
- Foundations for boundary wall to be excavated and poured using in-situ concrete;
- Boundary wall to be shuttered and poured in a similar manner to pier and slipway construction;
- Installation of stormwater gullies to drain to the pier face;
- Completion of pavement construction (material to be defined at detailed design stage).

Stage 6 – Widening of Bridge

- Excavate and construct foundations at bedrock;
- Extend bridge approx. 3m to the Northeastern side;
- Bridge construction is anticipated to be undertaken using a precast culvert.

Stage 7 – Demobilisation and Handover

- Removal of site compound;

- Inspection of works and handover.

2.3.2 Drainage

There will be negligible increase in stormwater run-off given the exposed rock and pavement surfaces already existing. There are no points of connection. There will be an outfall headwall equivalent to the existing storm scenario. The outfall location will be determined in detailed design. For planning it can be assumed it will be adjacent to the slipway (lowest point).

2.3.3 Construction Duration

The construction of the proposed site will last approximately 12 months.

2.3.4 Machinery to be used on site

The following construction machinery will likely be used by the contractor during the construction phase of the proposed site:

- 360 excavators with rock breaking attachments.
- Rollers
- Dumpers
- Telehandlers
- Concrete mixing trucks

2.4 Project Zone of Influence

The project will primarily affect the site only, but a wider area of influence is used for impacts relating to surface water (5km) and any supporting habitat for SAC species (5km). The proposed site lies within and along the border of the Kilkieran Bay and Islands SAC.

In respect to ZoI for air pollution (emissions and dust), a 250m buffer zone of the proposed site is considered as per the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM 2024). A 400m disturbance (including noise) buffer has been incorporated into the ZoI.

2.5 Project AA Screening Summary and Conclusion

Table 2-1: Summary of project elements relevant to the ecology of the Natura 2000 site

Project Elements	Comment
Size and scale	The proposed project works will involve: - Construction of a concrete pier extension (13.5m length x 15m width) added to south-west end of the existing pier. - Construction of a new slipway (29m length x 5m width), with a flat deck entry area. To be located immediately east of the small bridge connecting the existing pier to the eastern track. - Construction of new hardstand/parking area to the east of the existing bridge and at the base of the new slipway.

Project Elements	Comment
	- Construction of 1200mm high and 600mm wide boundary wall around the new hardstand/parking area to the east of the bridge, along the edges of the widened bridge, and along the northern section of the widened road to the west of the bridge. - Approximately 4m widening to the northeastern side of the existing bridge. (See Appendix B)
Land-take	There will be direct land take from the Kilkieran Bay and Islands SAC. Approximated 196.6m^2 of intertidal reef habitat is expected to be lost as a result of the proposed development. This includes: 1. 27.1m^2 due to the extension of pier on the west side of the bridge 2. 141.5m^2 from the construction of the slipway 3. 14.3m^2 from the proposed hardstand/parking area 4. 13.7m^2 from the widening of the bridge The habitat to be removed is designated by NPWS as intertidal reef community complex, within the designated Annex I habitats Reefs [1170] (196.6m^2/0.00022%,) and Large shallow inlets and bays [1160] (196.6m^2/0.0001%) There will be a small scale but nonetheless permanent direct loss of the Annex I habitat Reefs [1170] from the Kilkieran Bay and Islands SAC (NPWS 2024, 2026). This is seen as negligible, considering the accuracy of the calculation for the total area of this habitat within the SAC.
Distance from Natura 2000 site or key features of the site	The Natura 2000 site in closest proximity to the proposed site, namely Kilkieran Bay and Islands SAC, encompasses the proposed site.
Resource requirements (water abstraction etc.)	There will be no groundwater abstraction.

Project Elements	Comment
Emissions (disposal to land, water or air)	*Temporary Impacts:* **Water:** Several potential pollutants will be utilised at the site, including diesel, engine/hydraulic oils, and washout from mixing of concrete/cement etc. The potential for temporary impacts is through unintentional discharge of these chemicals/pollutants to surface water from where they could spread up to 2km before being sufficiently diluted to prevent impacts. Within these 2km there is the potential for negative effects on marine habitats, and QI Otter and Harbour Seal. In the absence of mitigation there is the potential for significant impacts on surface water from pollutants during the construction of the slipway. **Sediment / Silt:** There may be some disturbance to sediment to the area where the slipway will be constructed. The temporary resuspension of natural sediment within the water column during a short period of the tidal cycle while the works take place, will not have a significant impact on SAC's QIs within the 5km buffer zone. Marine tidal areas are dynamic environments and the variable movement of suspended particles are part of their natural processes. **Air:** Non-particulate air pollution will be restricted to emissions from working machinery and will not have a significant impact on habitats or species of qualifying interest. However, particulate concrete dust pollution generated during the in-situ construction of slipway may also impact the local qualifying interests. Concrete/cement dust is highly alkaline and can impact on aquatic freshwater and marine environments by altering pH levels. Otter and Harbour Seal may be disturbed through noise during the construction of the slipway. *Permanent Impacts:* None- there will be no emissions during operation phase.
Excavation requirements	Construction phase excavation depths will be limited to the top-most layers of the soil at a maximum depth of 0.3m. and intertidal marine sediment layers. Typically, localised excavation of sediment/cobbles/stones to bedrock in some areas below the footprint of the slipway and pier development will be required (area/volume to be confirmed at construction stage).

Project Elements	Comment
Transportation requirements	*Temporary Impacts*: Levels of traffic to the site during the construction phase will result in slight increase in traffic to the R374 and the unnamed road which connects the regional road to the site. Given the bordering proximity of the road accessing the site to the Kilkieran Bay and Islands SAC, noise and visual disturbance will occur when en route to the site. However, given the small-scale nature of this project, disturbance from mildly increased traffic should be minor, therefore it is not anticipated to affect the SAC within the Zone of Influence or buffer zone. *Permanent Impacts:* Traffic to and from the proposed project will be on pre-existing roads. Given the proposed project's operational transportation requirements, impacts on the SAC are not anticipated.
Duration of construction, operation, decommissioning etc.	Construction will last approximately 12 months. Operation will be permanent, and no decommissioning is anticipated.
Other	None

2.5.1 Concluding Statement

Following the initial screening of the proposed slipway at Droim, Leitir Móir, Co. Galway, it can be concluded that significant impacts are anticipated via surface water or land/air pathways on the following Natura 2000 sites:

- Kilkieran Bay and Islands SAC

Given the anticipated impacts on the above Natura 2000 site as a result of the proposed development, the screening assessment determined that this proposed project must progress to next stage, Stage 2: Appropriate Assessment / Natura Impact Statement (NIS), so that avoidance/mitigation measures may be outlined and incorporated into the proposed construction works, in order to safeguard the Natura 2000 site from any adverse significant impacts via the source-receptor-pathways highlighted in the AA Screening report.

The Stage 2 assessment will focus on the following impacts:

- Potential release of construction pollutants into the water through surface water which could affect some of the designated features of Kilkieran Bay and Islands SAC
- Potential dust emissions arising from the construction works which could affect some of the designated features of Kilkieran Bay and Islands SAC
- Loss of Annex I habitat Reefs within boundary of Kilkieran Bay and Islands SAC
- Potential noise and vibration disturbance which could affect Otter and Harbour Seal, qualifying interests of Kilkieran Bay and Islands SAC

All other pathways for impact are screened out and do not need to be considered in the Stage 2 AA.

3 Screening Assessment

3.1 Natura 2000 sites

This section provides baseline information on the Natura 2000 sites within the ZoI of the proposed works. A short description of the Natura 2000 site is provided, along with details of the qualifying interest/special conservation interests, conservation objectives, the attributes used to define favourable conservation status and site vulnerabilities.

The Natura 2000 site identified as occurring within the Zone of Influence of the proposed development are:

- Kilkieran Bays and Islands SAC (002111)

The site location is within the Kilkieran Bays and Islands SAC (Figure 3-1).

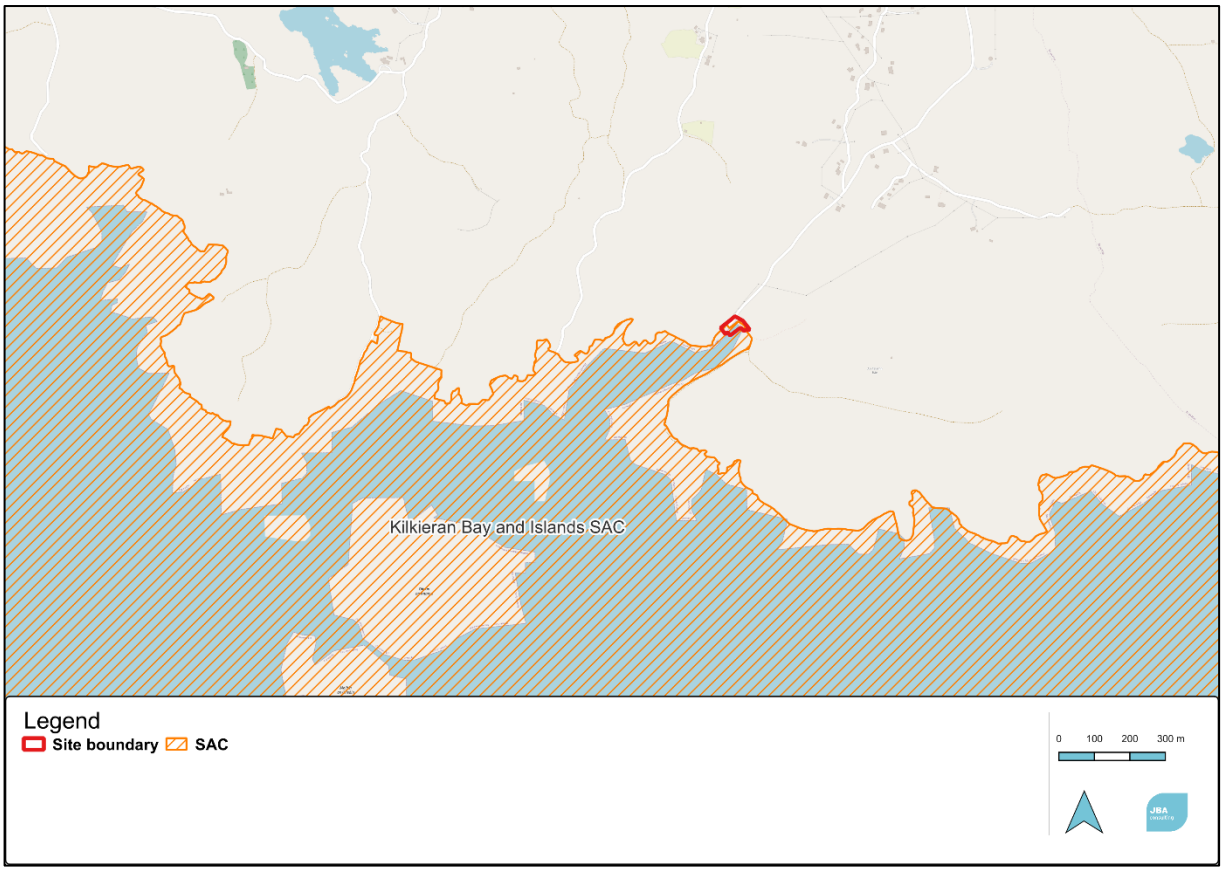


Figure 3-1: Kilkieran Bay and Islands SAC and site location (©OSM, 2026)

3.1.1 Kilkieran Bay and Islands SAC [002111]

Kilkieran Bay is situated on the extreme north-west shore of Galway Bay. It is approximately 13km in length and 7km at its widest point. Kilkieran Bay is an indented fjord and much of the complexity is due to numerous rocky outcrops and islands. The bay is subject to strong tidal streams as the sea funnels between islands and through channels. The shoreline is typically rocky, giving way to mud in shallow water. A particular feature of the site is the large numbers

of salt marshes on peat and the numerous small beaches of shell sand. The terrestrial areas of the site are mostly covered by shallow peaty soils, with dry heath and blanket bog present. Brackish and small freshwater lakes also occur.

The marine habitats found within Kilkieran Bay are of very high conservation value. Kilkieran Bay has a very high diversity of marine species, with a high number of species that are rare or considered to be worthy of conservation in Ireland occurring in the area. Communities of particular importance are the extensive and varied beds of free living red calcareous algae or maerl. Kilkieran Bay is one of three known localities in Ireland where the maerl species *Lithothamnion corallioides*, *Lithophyllum dentatum* and *Lithothamnion fasciculatum* co-occur. This range of maerl deposits in Kilkieran Bay, gives rise to a variety of communities. Within these communities are a number of rare anemones, such as *Scolanthus callimorphus* and *Aureliania heterocera*. A population of the large burrowing anemone *Pachycerianthus multiplicatus* occurs at two muddy sites within Kilkieran Bay and is known from only three other localities in Ireland. The lagoon environments located within the SAC host unique communities of vegetation, unique to south Connemara while being absent from the rest of Ireland.

Salt meadows, both Atlantic and Mediterranean, are particularly well represented, the site probably containing the largest area of salt marsh on peat in the country. Lowland hay meadows occur and are typical of the type that was formerly widespread along the western seaboard. The site provides optimum habitat for Eurasian Otter *Lutra lutra*, as well as supporting an important population of Harbour Seal *Phoca vitulina*. Grey seal *Halichoerus grypus* is also a regular visitor and may breed on site. The site also supports a population of Slender Naiad *Najas flexilis*. The island and islets of Kilkieran Bay host a range of important seabird colonies, particularly breeding Arctic, Common, and Little Tern. The site also supports a population of Barnacle Goose in winter alongside a population of Black Guillemot. Herring, Great Black-backed, and Black-headed Gull are also supported within the site (NPWS 2024).

3.1.2 Qualifying Interests

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes) (NPWS 2026):

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Machairs (* in Ireland) [21A0]
- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130]
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]

- Otter *Lutra lutra* [1355]
- Harbour Seal *Phoca vitulina* [1365]
- Slender Naiad *Najas flexilis* [1833]

The qualifying interests that have the potential to occur within the vicinity of the proposed site; and could be potentially significantly impacted through water quality, habitat loss and general disturbance:

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Otter *Lutra lutra* [1355]
- Harbour Seal *Phoca vitulina* [1365]

Harbour Seal breeding and moulting sites with reference to proposed site are seen in Figure 3-2.

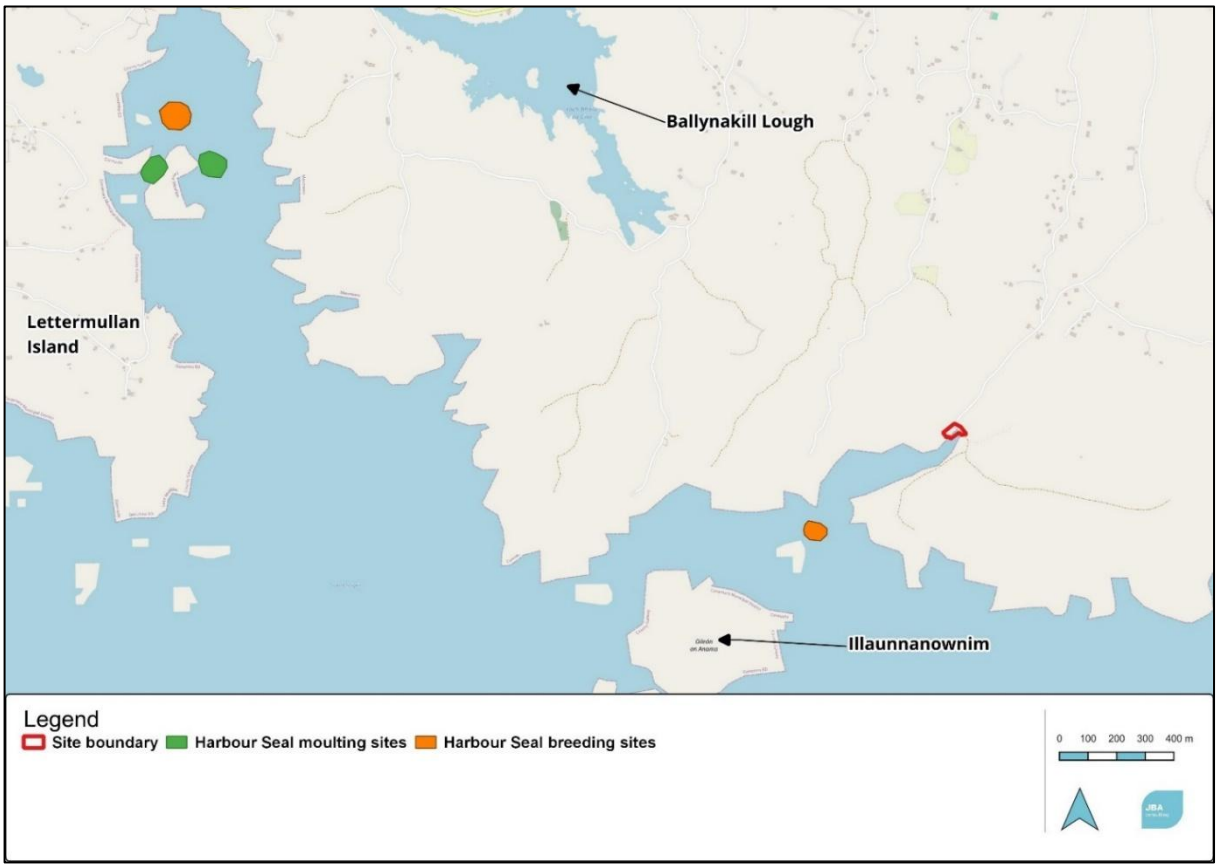


Figure 3-2: Seal breeding and moulting sites (©OSM, 2024, NPWS, 2014)

3.1.3 Conservation Objectives

The conservation objectives for Kilkieran Bay and Islands SAC below are taken from the NPWS Conservation Objectives Document (NPWS, 2014).

'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected'.

The conservation objectives document outlines specific objectives for the individual QIs within the ZoI and their respective attributes, measure and target aspects. These aspects are detailed in Table 3-1.

Table 3-1: Conservation objectives for Kilkieran Bay and Islands SAC QIs within the ZoI.

Large shallow inlets and bays [1160]		
To maintain the favourable conservation condition of Large shallow inlets and bays in Kilkieran Bay and Islands SAC, which is defined by the following list of attributes and targets:		
Attribute	**Measure**	**Target**
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.
Community extent	Hectares	Maintain the extent of the *Zostera*- and maërl dominated community complexes and the *Pachycerianthus multiplicatus*-dominated community, subject to natural processes.
Community structure: *Zostera* density	Shoots per m^2	Conserve the high quality of the *Zostera*-dominated community complex, subject to natural processes.
Community structure	Biological composition	Conserve the high quality of the maërl-dominated community complex, subject to natural processes.
Community structure	Species abundance	Conserve the high quality of the *Pachycerianthus multiplicatus*-dominated community, subject to natural processes.
Community Distribution	Hectares	Conserve the following communities in a natural condition: Intertidal sand with polychaetes community complex; Mixed sediment dominated by polychaetes community complex; Sand with nemerteans and crustaceans community complex; Deep water sand dominated by bivalves and polychaetes community complex; Reef communities (as listed under 1170).

Reefs [1170]		
To maintain the favourable conservation condition of Reefs in Kilkieran Bay and Islands SAC, which is defined by the following list of attributes and targets:		
Attribute	**Measure**	**Target**
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. (Note-Habitat area estimated as 9,084ha from 2002 acoustic mapping data (SSI, 2003)
Distribution	Occurrence	The distribution of reefs remains stable, subject to natural processes.

Reefs [1170]		
Community Structure	Biological composition	Conserve the following community types in a natural condition: Intertidal reef community complex; Subtidal sponge and ascidian community complex; Exposed to moderately exposed subtidal reef community complex; Deep water faunal crust and sponge community complex; Laminaria-dominated community complex.

Otter *Lutra Lutra* [1355]		
To restore the favourable conservation condition of Otter in Kilkieran Bay and Islands SAC, which is defined by the following list of attributes and targets:		
Attribute	**Measure**	**Target**
Distribution	Percentage positive survey sites	No significant decline.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 316ha above high-water mark (HWM); 14ha along river banks/ around ponds.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 2996ha.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 4.4km.
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 24ha.
Couching sites and holts	Number	No significant decline.
Fish biomass available	Kilograms	No significant decline.
Barriers to connectivity	Number	No significant increase.

Harbour Seal *Phoca vitulina* [1365]		
To maintain the favourable conservation condition of Harbour Seal in Kilkieran Bay and Islands SAC, which is defined by the following list of attributes and targets:		
Attribute	**Measure**	**Target**
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour	Breeding sites	Conserve breeding sites in a natural condition.
Moulting behaviour	Moult haul-out sites	Conserve moult haul-out sites in a natural condition.
Resting Behaviour	Resting haul-out sites	Conserve resting haul-out sites in a natural condition.

Harbour Seal *Phoca vitulina* [1365]		
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site

3.1.4 Threats and pressures Kilkieran Bay and Islands SAC [002111]

Threats, pressures and activities with impacts on the habitats of the Kilkieran Bay and Islands SAC are listed in Table 3-2 (NPWS, 2017). From looking at the table and taking into account the habitats recorded on the site visit, it appears that surface water pollution and general disturbance are the most important threats to the QIs of the Kilkieran Bay and Islands SAC at the proposed site at Droim Pier.

Table 3-2: Threats and pressures posed to Kilkieran Bay and Islands SAC.

Threats and pressures	Rank: Low (L) Moderate(M) High (H)	Source: Inside (i) Outside (o) Both (b)
Intensive cattle grazing	M	i
Intensification of fish farming	M	i
Intensive sheep grazing	M	i
Rank: Low (L) Moderate(M) High (H) Source: Inside (i) Outside (o) Both (b)		

3.2 Summary of Natura 2000 site Qualifying Interests in Zone of Influence

The following list contains all the QIs (4 in total) from the Kilkieran Bay and Islands SAC that are considered to be within the ZoI of the proposed project, via surface water impact and land/air disturbance pathways:

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Otter *Lutra lutra* [1355]
- Harbour Seal *Phoca vitulina* [1365]

4 Environmental Baseline

4.1 General Baseline conditions

The proposed development at Droim Pier is adjacent to the pre-existing piers and connecting roadways. The site is bordered by rocky outcrops, coastal grasslands, marine rocky shores, and heath habitat. The site is currently being utilised as a marine pier.

4.2 Habitats

The Fossitt classified habitats and associated Annex I habitats recorded during the site survey carried out on 03/05/2024 are listed below in Table 4-1. These are further described in the sections below and mapped in Figure 4-1 and Appendix D.

Table 4-1: Habitats recorded during site visit (Fossitt classification and Annex 1 status)

Fossit Name	Fossitt Code	Annex I habitat
Stone walls and other stonework	BL1	
Buildings and artificial surfaces	BL3	
Sea walls, piers and jetties	CC1	
Upper salt marsh	CM2	
Tidal rivers	CW2	
Spoil and bare ground	ED2	
Recolonising bare ground	ED3	
Exposed siliceous rock	ER1	
Reed and large sedge swamps	FS1	
Eroding/upland rivers	FW1	
Drainage ditches	FW4	
Wet grassland	GS4	
Montane Heath	HH4	
Sheltered rocky shores	LR3	Reefs [1170]
Mixed substrata shores	LR4	
Scrub	WS1	
Sea inlets and bays	MW2	Large shallow inlets and bays [1160]

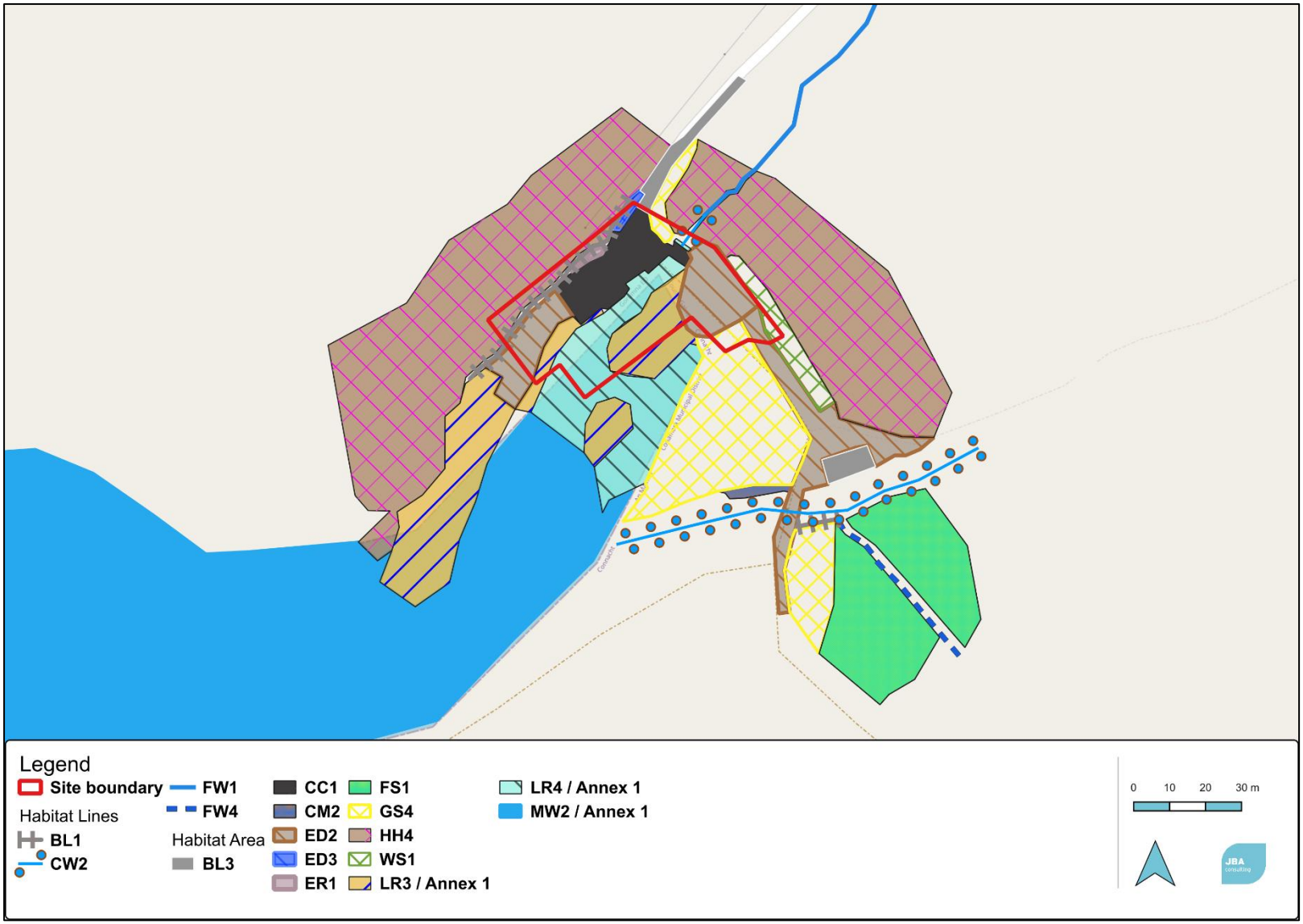


Figure 4-1: Habitat map at low tide (©OSM, 2026)

4.2.1 Stone walls and other stonework (BL1)

Stone walls with no mortar occur on the site in various locations (Figure 4-2). Species colonising the gaps and base of the wall include Bitter Cress *Cardamine hirsuta*, Bird's Foot Trefoil *Lotus corniculatus* and Bramble *Rubus fructicosus*.



Figure 4-2: Stone wall

4.2.2 Buildings and artificial surfaces (BL3)

A hard surface road enters the site from the north, connecting to the pier and a bridge over a tidal inlet/stream to the west of the site (Figure 4-3). No vegetation is growing on the road surfaces and there are no buildings on site.



Figure 4-3: Existing bridge with tidal inlet and sheltered rocky shore habitat below



Figure 4-4: Cow shed to the south of the site

4.2.3 Sea walls, jetties and piers (CC1)

A small pier is located to the northwest of the sea inlet, comprised of a concrete surface area with steps down to the water (Figure 4-5). Some ropes and other fishing equipment are stored on the pier. There is little to no vegetation growing on the pier. There is little to no vegetation growing on the pier, although some algal growth is present in the tidal areas.



Figure 4-5: Existing pier and bridge with Sheltered rocky shore habitat on the right of the image

4.2.4 Upper salt marsh (CM2)

A small section of salt marsh occurs to the southeast of the site, adjacent to the southernmost stream which flows in from the east (Figure 4-6). This habitat is dominated by Red Fescue *Festuca rubra* and Sea Thrift *Armeria maritima*.



Figure 4-6: Area of salt marsh

4.2.5 Tidal rivers (CW2)

A tidal inlet leading to a stream to the north west of the proposed site is influenced by the tides with loose, washed-up remnants of dead red and brown seaweed lining the bed and banks of the stream (Figure 4-7). *Ulva* spp. was recorded throughout the stream due to the freshwater influence. A stream to the east of the site is also tidally influenced, with similar species occurring.



Figure 4-7: Tidal river to the west which flows under the bridge to a small barrier of boulders

4.2.6 Spoil and bare ground (ED2)

Areas of loose cobble laid out for vehicular access extend beyond the existing jetty and into the water before and area of sheltered rocky shore. Sections of bare ground are also found to the east of the site, extending past the southerly located.



Figure 4-8: Bare ground beyond the existing pier.

4.2.7 Recolonising bare ground (ED3)

A small section of bare ground occurs in the north of the site, which is being colonised by bryophytes and small tufts of Red Fescue, as well as Bramble spreading into the habitat.

4.2.8 Exposed siliceous rock (ER1)

Rock outcrop is present on the right side of the entrance to the car park on the pier. There is little to no vegetation growing on this section other than a few tufts of Red Fescue and minimal Lichen cover.

4.2.9 Reed and large sedge swamps (FS1)

To the south-east of the site an area of field that is largely waterlogged. This area is dominated by Common Reed *Phragmites australis* with Creeping Bent *Agrostis stolonifera* underneath (Figure 4-9).



Figure 4-9: Patch of Common Reed found in a field adjacent to the south-east of the site

4.2.10 Eroding/upland rivers (FW1)

To the north of the site is a small stream which feeds directly into the tidal river / marine inlet beneath the existing bridge (Figure 4-10). The stream is culverted at the road level and presents little opportunity for fish; there is also little suitable Otter habitat available. There is minimal instream vegetation present, with recorded bank vegetation including Common Dog-violet *Viola reichenbachiana*, Primrose *Primula vulgaris* and Bog Myrtle *Myrica gale*.



Figure 4-10: Small stream entering the site from the North

4.2.11 Drainage ditches (FW4)

There is a small drainage ditch in the waterlogged field to south-east of the site and connects to the stream before discharging into the sea.



Figure 4-11: Stream to the south of the site, with drainage ditch coming from the reedbed

4.2.12 Wet grassland (GS4)

There is an elevated section of ground that is not impacted by saline conditions and has allowed more terrestrial grasslands to grow. A drained field to south-east of the site also fits this habitat

description. Species include Cock's Foot *Dactylis glomerata*, Lesser Celandine *Ficaria verna*, Sweet Vernal Grass *Anthoxanthum odoratum*, Pignut *Conopodium majus*, Bramble, Western Gorse *Ulex gallii*, Creeping Buttercup *Ranunculus repens*, Common Sedge *Carex nigra*, Red Clover *Trifolium pratense*, Yellow Iris *Iris pseudacorus* and Bird's Foot Trefoil. A small number of Lousewort *Pedicularis sylvatica*, a number of stunted Willow *Salix* spp. and Heath Milkwort *Polygala serpyllifolia* were also recorded.

4.2.13 Montane heath (HH4)

Montane heath habitat (Figure 4-12) was recorded flanking the site's northwestern boundary, extending past the end of the pier to the coastline. The area to the north-east of the bridge is also classified as montane heath, with this area extending down beyond the site's eastern boundary. This habitat is dominated by Western Gorse, with Ling *Calluna vulgaris* and Cross-leaved Heath *Erica tetralix* occurring throughout. Common peatland indicators such as Lousewort and Milkwort were frequently recorded within this habitat. Other species recorded include Deergrass *Tricophorum cespitosum*, Tormentil *Potentilla erecta*, Common Sedge and Creeping Buttercup.



Figure 4-12: Montane heath found on site

4.2.14 Sheltered rocky shores (LR3)

Most of the shoreline within the area of the site is classified as sheltered rocky shores (Figure 4-13). The saline influenced vegetation does not stretch far beyond the high tide line due to the sheltered nature of the area. Species in this habitat include Sea Lettuce *Ulva lactuca*, Bladder Wrack *Fucus vesiculosus* and Spiral Wrack *Fucus spiralis.* Species above the tideline include Sea Thrift, Sea Plantain *Plantago maritima*, Common Scruvygrass *Cochlearia officinalis*, Sea Beet *Beta vulgaris* ssp. *Maritima* Lichen are abundant on the exposed rock including but not limited to, *Ramalina cuspidata, Ramalina siliquosa, Xanthoria parietina, Ochrolechia parella*. Large rocks within the bay support species such as Common periwinkle *Littorina littorea*, Flat periwinkle *Littorina littoralis*, Rough periwinkle *Littorina saxatilis*, and Tthick top shell *Phorcus lineatus*.. This rocky shore habitat has been mapped by NPWS as the Annex I habitat Reefs and is equivalent to the reef community type- Intertidal reef community complex (NPWS, 2014). Sheltered rocky shore habitat extends beneath the bridge adjacent to the pier.



Figure 4-13: Example of sheltered rocky shore showing zonation of lichen and seaweed

4.2.15 Mixed substrata shores (LR4)

Between the large boulders in the sheltered areas, areas of mixed substrate are prevalent. Patches of soft mud lie between areas of cobble stones and gravel. Vegetation recorded in this

habitat during the low tide survey included Channel Wrack *Pelvetia canaliculate*, Knotted Wrack *Ascophyllum nodosum*, Bladderwrack and Ulva spp. (Figure 4-14).



Figure 4-14: Mixed substrata shore on site

4.2.16 Sea inlets and bays (MW2)

The proposed site is located at the inward point of a small, relatively narrow sea inlet. This habitat has been mapped by NPWS as the Annex I habitat - Large shallow inlets and bays [1160]. At low tide the majority of this inlet completely drains exposing the associated sheltered rocky shore / Reefs [1170] and mixed substrata shores habitats.

4.2.17 Scrub (WS1)

Running along the site's north-eastern most extent of the site is a thick band of Bramble with some Western Gorse growing through, which is encroaching over a stone wall (Figure 4-15).



Figure 4-15: Scrub lining the path to the east of the site

4.3 Protected Species

4.3.1 Otter

No field signs of Eurasian Otter *Lutra lutra* such as feeding remains, scat, or evidence of resting places were recorded by the JBA Ecologist during the ecological walkover surveys. However, given Otter, a QI of the SAC, is known to use both freshwater and marine environments within Kilkieran Bay, it is likely that they will be present near the vicinity of the pier for commuting and foraging activities. Furthermore, the local stream flowing into the inlet provides Otter with a freshwater source to groom and maintain their fur coats.

4.3.2 Harbour Seal

No signs of Harbour Seal *Phoca vitulina* were recorded by the JBA Ecologist during the ecological walkover surveys of the pier area, though the inlet area does provide suitable foraging habitat and haul out sites. Furthermore, there was no sign of Harbour Seal activity at the breeding site located 500m south-west of the site, at the mouth of the inlet. Neither survey was carried out during the optimal breeding season

Aerial surveys carried out in 2017 recorded seals in Kiggaul bay, approximately 3km from the proposed work site.

4.4 Invasive Non-Native Species

There was no evidence of invasive floral or fauna species listed under the Third Schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011 recorded by the JBA Ecologist during the ecological walkover survey.

The high-impact invasive species Japanese Knotweed *Reynoutria japonica* and Wire Weed *Sargassum muticum* have been previously recorded within a 5km radius of the site (Table 4-2). Wire Weed is an invasive marine species and can be found in the waters adjacent to the site.

Table 4-2: Proximity of high impact invasive non-native species to the site

Invasive Non-native Species	Proximity to Site
Japanese Knotweed *Reynoutria japonica*	1.9km (east) [2019]
Wire Weed *Sargassum muticum*	3.8km (north-east) [2017]

4.5 Waterbodies within the Vicinity of the Proposed Site

The proposed site is located within the Water Framework Directive (WFD) sub-catchment Furnace_SC_010, within the Galway Bay North Catchment (EPA, 2026).

Table 4-3 and Figure 4-16 outline the sub-catchments and coastal waterbodies listed within the vicinity of the site.

Table 4-3: The WFD waterbodies within the ZoI of the proposed works (EPA, 2026)

WFD Waterbody	WFD Status (2019-2024)	Risk Status
IE_WE_010_0000	High	Review
IE_WE_200_0000	High	Not at risk
Furnace_SC_010	Good	Not at risk

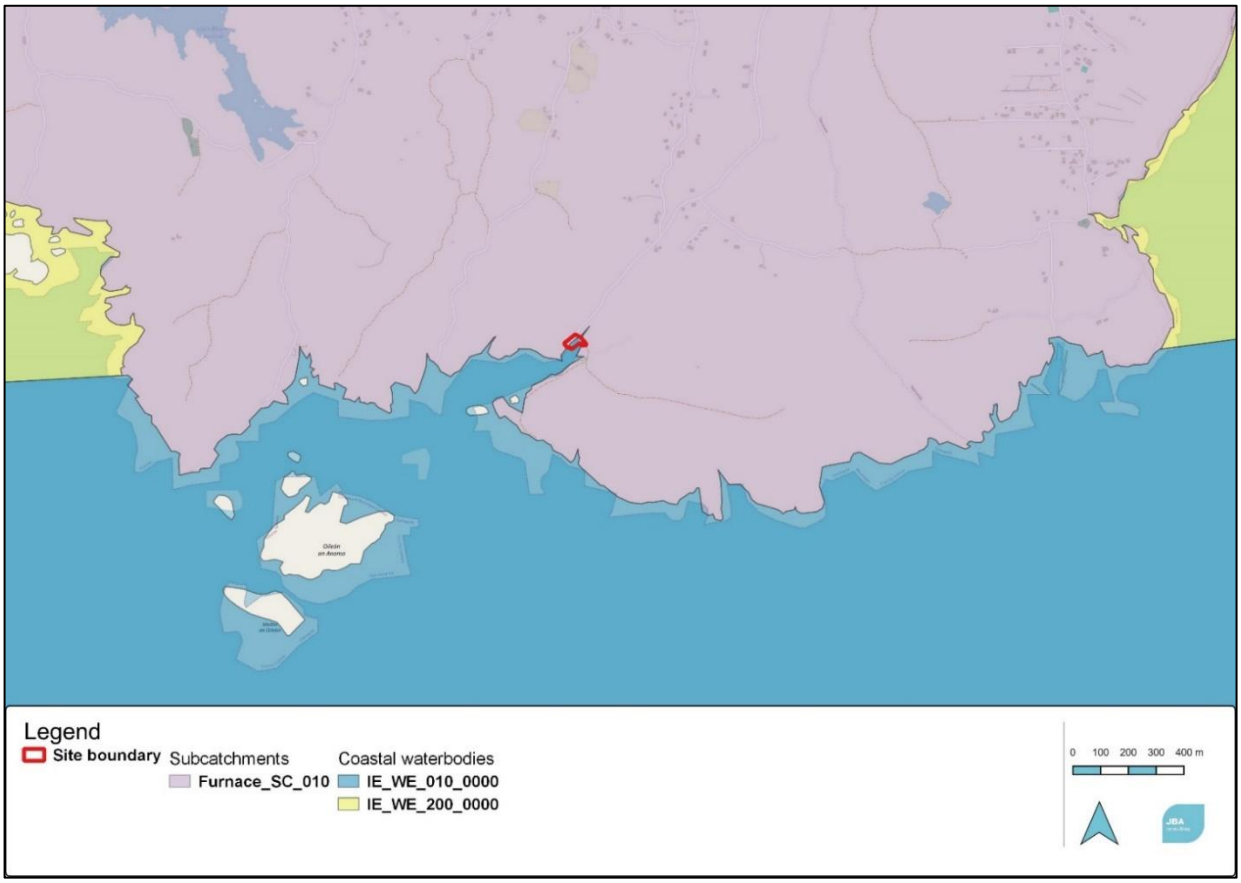


Figure 4-16: Sub Catchments and Coastal waterbodies within the vicinity of the proposed site (©OSM, 2026)

4.6 Ecology of Kilkieran Bay and Islands – Leitir Moir and surrounding islands

An extract from the site synopsis of Kilkieran Bay and Island SAC (NPWS, 2024) relating to Leitir Mor and surrounding islands is given below.

Kilkieran Bay and Islands SAC is located just north of Galway Bay and extends from Keeraun Point, south of Carraroe, westwards to Mace Head, west of Carna, all in Co. Galway. The site contains a large area of open marine water, many islands and rocky islets, including Leitir Móir; and the coastline is much indented with a series of bays, channels and inlets. The entrances of the bays face the prevailing south-westerly winds and they are subject to strong tidal streams as the sea funnels between islands and through channels. A number of streams, lakes and lagoons drain into the bays (NPWS, 2024).

Kilkieran Bay has a very high diversity of marine species, a high number of which are rare or considered to be worthy of conservation in Ireland. The rocky shores of the site are comprised of bedrock or a mixture of bedrock, boulders and gravel; they support a very wide variety of shore communities, with the zonation being typical of shores that range from being exposed to wave action through to extremely sheltered shores and some tide-swept shores. Shores exposed to wave action have a zonation of Channel Wrack and barnacles in the upper shore, Bladder Wrack and barnacles in the mid shore, Serrated Wrack *Fucus serratus* in the low shore and the kelp *Laminaria hyperborean* on the very low shore. Sheltered shores have the mid shore dominated by Knotted Wrack. In the inner part of both bays the brown alga

Ascophyllum nodosum var. mackii, which has very specific habitat requirements, is found. The rapids at Carrickaglegaun Bridge, Leitir Móir Island, are extremely species-rich (119 species recorded) and include the rarely recorded star fish *Asterina phylactica* (NPWS, 2024).

In Kilkieran Bay, on subtidal reefs dominated by animals, the sponge/sea squirt community of *Raspailia ramosa* and *Corella parallelogramma* is widespread. Otter, a species also listed on Annex II and IV of the E.U. Habitats Directive, occurs commonly throughout the site. The site is also frequently used by Common Seal (maximum count of 116 in the all-Ireland survey of 2003) (NPWS, 2024).

4.6.1 Water Quality

The coastal waterbody (Aran Islands, Galway Bay, Connemara [HAs 29;31]) within the vicinity of the proposed site has been assigned a high WFD status and an unpolluted water quality status (EPA, 2026). The two unnamed streams within the vicinity of the proposed site have not been assigned any form of quality rating, WFD or otherwise.

4.6.2 Non-Qualifying Interests, Protected Species within the ZoI

During the ecological walkover survey, non-QI species recorded on-site included Skylark *Alauda arvensis*, Meadow Pipit *Anthus pratensis*, Stonechat *Saxicola torquata*, Cuckoo *Cuculus canorus*, Herring Gull *Larus argentatus*, Sandwich Tern *Sterna sandvicensis*, and Grey Heron *Ardea cinerea*. These species will not be considered further within the assessment.

Twenty-two bird species were recorded across the two survey periods of 2024 and 2026, these include marine and terrestrial species. Of these, two are Annex 1 species, Little Egret and Sandwich Tern. The site does not support suitable breeding habitat for these species. All recorded species are expected in this type of coastal location. Note that Pheasant are not assessed. The wider surrounding area presents opportunities for terrestrial birds to roost, forage and breed; the shingle/sandy beach approximately 500m from the site may provide suitable habitat for marine birds to nest.

Evidence of Lesser spotted catshark *Scyliorhinus canicular* breeding in the area was also recorded.

These species are not QIs of the SAC and not considered further in this report.

No sign of marine mammals were recorded during 30-minute observations of the inlet from the north and south of the pier inlet.

Table 4-4: Bird species recorded in the vicinity of the site, with reference to Bird of Conservation Concern (BoCCI). IUCN listing (LC: Least Concern, NT: Near Threatened), Annex status, and during which survey they were recorded.

Species	Scientific name	BoCCi4 (Season)	IUCN Red List (2023)	Annex Listing	survey
Wigeon	*Mareca penelope*	Amber (B/W)	LC		2026
Mallard	*Anas platyrhynchos*	Amber (B/W)	LC		2026
Pheasant	*Phasianus colchicus*	NA	LC		2026

Species	Scientific name	BoCCi4 (Season)	IUCN Red List (2023)	Annex Listing	survey
Cuckoo	*Cuculus canorus*	Green (B)	LC		2024
Curlew	*Numenius arquata*	Red (B/W)	NT		2026
Snipe	*Gallinago gallinago*	Red (B/W)	LC		2026
Redshank	*Tringa totanus*	Red (B/W)	LC		2026
Greenshank	*Tringa nebularia*	Green (W)	LC		2026
Great Black-backed Gull	*Larus marinus*	Green (B/W)	LC		2026
Herring Gull	*Larus argentatus*	Amber (B/W)	LC		2024, 2026
Lesser Black-backed Gull	*Larus fuscus*	Amber (B/W)	LC		2026
Sandwich Tern	*Thalasseus sandvicensis*	Amber (B)	LC	1	2024
Cormorant	*Phalacrocorax carbo*	Amber (B/W)	LC		2026
Grey Heron	*Ardea cinerea*	Green (B/W)	LC		2024, 2026
Little Egret	*Egretta garzetta*	Green (B/W)	LC	1	2026
Hooded Crow	*Corvus cornix*	Green (B)	LC		2026
Raven	*Corvus corax*	Green (B)	LC		2026
Skylark	*Alauda arvensis*	Amber (B)	LC		2024
Wren	*Troglodytes troglodytes*	Green (B)	LC		2026
Robin	*Erithacus rubecula*	Green (B)	LC		2026
Stonechat	*Saxicola rubicola*	Green (B)	LC		2024, 2026
Meadow Pipit	*Anthus pratensis*	Red (B)	LC		2024, 2026

Several additional protected species have been recorded within a 2km radius of the proposed development within the last 10 years (NBDC database). For a full list, see Appendix E.

5 Other Relevant Plans and Projects

5.1 In-combination Effects

As part of the Screening for an Appropriate Assessment, in addition to the proposed works, other relevant projects and plans in the region that may induce in-combination effects must be considered at this stage. The following projects or plans were identified as potential sources of cumulative impacts:

- Galway County Council Development Plan 2022
- River Basin Management Plan for Ireland 2022-2027

5.2 Plans

5.2.1 Galway County Development Plan 2022 - 2028

The proposed scheme's development is in line with the Galway County Development Plan 2022-2028. It is an objective of the Plan to ensure that all development within the County conforms to five key design principles which includes the increased awareness, participation, enjoyment, knowledge and understanding of the county's heritage in order to lead to appropriate conservation, management and protection to safeguard it for future generations. This includes:

- Conserve, manage, protect and enhance the character of the County as defined by Natural Heritage, Biodiversity and Green Infrastructure
- To ensure compliance with relevant International, European Directives and National Legislation in relation to Natural Heritage, Biodiversity, Green/Blue Infrastructure and Climate Change
- To ensure climate change considerations are taken into account in the Natural Heritage, Biodiversity and Green/Blue Infrastructure:
- To continue to implement actions of the National Heritage Plan and the National Biodiversity Plan and the current Galway County Heritage and Biodiversity Plan 2017-2022 in partnership with all relevant stakeholders and any successor to these documents.
- And to promote the creation of an integrated and coherent green infrastructure network throughout County Galway in order to enhance connectivity, social inclusion, sense of place and the creation of wildlife corridors.

The Plan also aims to protect and enhance surface water quality, to support, improve and protect Natura 2000 sites, and to develop an integrated Green and Blue Infrastructure network to enhance biodiversity, provide accessible parks, open spaces, recreational facilities, to promote investments aiming to support environmental protection and facilitate the sustainable economic growth of the county (GCC 2022).

An independent Screening for Appropriate Assessment was carried out on the Development plan, which was concluded that an Appropriate Assessment was necessary for this project. The associated Natura Impact Report concluded that there are no likely significant direct, indirect or secondary impacts of the project on any Natura 2000 sites (GCC, 2022) Overall, the Galway Council Development Plan 2022- 2028 is not considered to adversely impact any Natura 2000 site, nor is it expected to contribute to any cumulative or in-combination effects.

5.2.2 River Basin Management Plan for Ireland 2022-2027

The River Basin Management Plan (RBMP) for Ireland 2022-2027 sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027 (DoHLGH 2022).

The WFD RBMP plans aimed to identify catchment measures to safeguard waters and meet the following environmental objectives of the WFD:

- Prevent deterioration of water body status
- Restore good status to water bodies
- Achieve protected areas objectives
- Reduce chemical pollution of water bodies

Although Ireland is not on target to meet the objectives of the WFD, the River Basin Management Plan for Ireland 2022-2027 is not anticipated to contribute to cumulative or in-combination effects with the current project.

5.2.3 Other projects

Other projects within the locality which could have in-combination effects with the proposed project are included overleaf (Table 5-1).

Table 5-1: Other projects within the locality which may have in-combination effects with the proposed project

Planning Reference	Address	Application Status	Decision date	Summary of development
22681	An Máimín	Conditional	19/10/2022	chun teach cónaithe agus córas séarachais agus gach obair láithreáin ag teastáil a thógáil.Spás urláir comhlán na n-oibreacha beartaithe: 202sqm. (To build a residential house and a sewage system and all necessary site works. Total floor area of the planned works: 202sqm).
2360503	Glentrasna	Conditional	05/06/2024	For the development consisting of refurbishment and upgrading works [including (where necessary) replacement of existing poles along the existing overhead electricity line, minor ground works e.g. replacement or installation of stays, and maintenance or improvement works]; and all associated ancillary works including the provision of temporary accessways. Replacement poles will be constructed at, or immediately adjacent to, the existing structures that they will replace. Replacement poles will have a maximum height of 12m above ground; and be similar in appearance to existing poles. Planning permission is sought for a 10-year period. A Natura Impact Statement (NIS) will be submitted to the Planning Authority with the application.
2312	Teeranea Lettermore P.O.	Conditional	23/10/2023	chun teach cónaithe, garáiste, córas séarachais agus gach obair láithreáin ag teastáil, a thógáil. Spás urláir comhlán na n-oibreacha beartaithe i: 200sqm (h) & 60sqm (g). (For a dwelling house, garage, septic system, and all required site works, to be built. Total floor area of the proposed works: 200sqm (h) & 60sqm (g)).
21862	Tir an Fhia, Leitir Mor	Conditional	11/10/2021	chun athrú atá deantá ar leagann amach an tí a choinneal a bhi ceadaithe faoi uimhir pleanail 04/1786 chomh maith le cead chun aonad féin fhreastail a thógáil (Granny Flat) ar taobh an teach cónaithe ata ann cheana féin, tá an t-aonad comhdhéanta de sineadh agus seirbhís láithreáin a bhaineann leis. Spás urláir comhlán na n-oibreacha beartaithe: 68.01 sqm. (For a change that has been granted on the house set out to have been allowed under planning number 04/1786 as well as to build a self-contained unit (Granny flat) on the side of the existing dwelling, the unit consists of a footprint and site service associated with it. Total floor area of the proposed works: 68.01sqm).

6 Appropriate Assessment

6.1 Introduction

This section presents a detailed assessment of the potential impact of the proposed project on the qualifying interests of the Kilkieran Bay and Islands SAC (002111). The screening report identified surface water and air pollution as the potential impacts on qualifying interests of the Natura 2000 site. There will also be a permanent direct loss of Annex I habitat (Reefs [1170]) from the Kilkieran Bay and Islands SAC as a result of the project.

Section 6.2 assesses the screened-in Natura 2000 sites in more detail and examines where potentially adverse impacts may arise from the sources of impact identified (i.e. surface water, and land and air pathways). Where potentially adverse impacts are identified, avoidance and mitigation measures are proposed. These are discussed in Section 6.3.

6.2 Potential Sources of Impact

The AA screening determined that pathways of impact existed between the proposed site and the relevant Natura 2000 sites. This section further examines the source > pathway > receptor chains that could potentially result in adverse impacts arising within Kilkieran Bay and Islands SAC.

Habitats and species, and their attributes, likely to be impacted by surface water, and land and air pathways are listed in Table 6-1.

6.2.1 Construction Phase – Direct impacts

During the construction phase a number of avenues of impact may occur:

Surface Water- release of pollutants

The possible entry of pollutants, such as hydrocarbons, solvents, and cleaners leaking into the surface water network on-site has the potential to degrade the surface water quality. This degradation of surface water can in turn impact the Natura 2000 site's QIs via surface run-off into the adjacent coastal inlet. Refuelling during the periods when machines are accessing or working on the slipway could impact water quality. Chronic or large-scale pollution is very different to small scale events. Some marine animals and plants can tolerate low concentrations of oil in sediments and can recover after a single spill. Mass mortality of benthic communities, fish, marine mammals and birds can occur after exposure to major and minor oil spills (Lovindeer et al., 2023). As oil is organic it will be broken down by microorganisms in the sediment, though with localised effect on oxygen levels. Contamination with oil may modify chemical, physical and biological processes in the sediment (Sharma et al., 2024). Impacts to coastal water quality could also occur during mixing and pouring of concrete/cement for the pier extension and slipway. Fresh concrete/cement wash water is highly alkaline, with a typical pH of 11-12 (Sealey et al., 2001; EA, 2020). It also has a very high suspended sediment content, which can contain trace metals and contaminants (EA, 2020).

These pollutants may cause effects such as increased turbidity; changes in pH levels; and introduction or increase in toxic chemicals. These potential effects may impact on the

marine communities of the QI habitats present within the Natura 2000 site, potentially resulting in decreased distribution of these communities, and ultimately resulting in a percentage loss of the designated habitats. Additionally, these pollutants could directly impact the mammal QI species of the SAC through contact with the fur, which will ultimately degrade the physical condition of this critically important insulative layer (Helm et al., 2015). Furthermore, these pollutants may be ingested through the grooming of the affected fur, or while feeding within the aquatic environment.

Land (habitat loss); air (dust); and visual and audible disturbance

Habitat loss

The construction phase of the pier, slipway and bridge extension will involve the loss of very small areas of sheltered rocky shore habitat.

The building of the pier extension (15m in length and 13.5m wide) will result in loss of an area of rocky shore to the south west of the existing pier. The slipway (29m in length and 5m in width) will result in loss of rocky shore and an area of mixed substrata shore habitat. Preparatory work for the slipway will require rock breaking of rocky shore habitat that is above the line of the slope of the proposed slip way. A small area of rocky shore will be lost to the foundation wall of the bridge extension, to the north of the present bridge.

This amounts to 196.6m^2 or 0.00022% of 9,084ha of reef habitat, and is equivalent to the loss of 196.6m^2 or 0.00082% of estimated 2,412 ha of intertidal reef community complex within the SAC. This also equates to the loss 196.6m^2 or 0.0001% of 18,760ha of sea inlet and bays (i.e. Large shallow inlets and bays [1160]) habitat. However, the estimated areas of the communities within the Reefs habitat are based on spatial interpolation and therefore should be considered indicative (NPWS, 2014). Considering the vast indentation of the rocky shore habitat within the SAC the loss of this very small area is within the margin of error of calculating the estimated area of the Annex I Reefs habitat, and is thus a negligible loss overall.

The permanent loss of habitat via the construction of concrete structures in these habitats may potentially disturb QI species, such as Otter and Harbour Seal, which may rest, commute and forage within this habitat. However the area of rocky shore habitat to be lost to pier and slipway is not known as breeding, moulting or resting sites for Harbour Seal. No field signs of Otter were recorded on the site visit, but using the precautionary principle they are likely to occur in the area. There is an extensive coastline available that Otter may use for foraging.

There are two areas of wet grassland (GS4) within the SAC that will be lost, the first is directly adjacent to the bridge's western boundary due to the road widening, the second is to the east of the bridge due to the construction of the parking/hardstand area. This habitat is not a QI of the Natura 2000 site, and its loss is not anticipated to impact the QIs of the Natura 2000 site.

Air Pollution

The construction phase of the project will entail minor excavations of the coastal land adjacent to the existing pier, as well as the mixing of cement and aggregate. These activities have the potential to generate harmful quantities of dust. Concrete/cement dust is highly alkaline and can impact on aquatic freshwater and marine environments by altering

pH levels. Dust generated on site from transport of materials, has the potential to impact on adjacent Annex I habitats Large shallow inlets and bays (normal full-strength sea-water pH being in the range 7.8 to 8.4) and Reefs. This potential air pollution could have a negative effect on water quality and thus impact on the conservation objectives of the QI linked habitats; sheltered rocky shore (Reefs [1170]) and sea inlets and bays (Large shallow inlets and bays [1160]), by altering the community structure and distribution.

Disturbance

Visual and audible disturbance from the works has the potential to disturb the resting, foraging and commuting activities of the local Otter population. Otters may become aversive to the area during the construction, limiting their total available foraging area.

Similarly, Harbour Seals may be disturbed by construction activities causing them to avoid the area, limiting their resting and foraging area. Furthermore, a Harbour Seal breeding site is located approximately 500m away from the proposed site, towards the mouth of the coastal inlet. Should construction works take place between the months of May to August (Harbour Seal breeding season), the significance of construction activity visual and audible disturbance impact would increase, given the presence of seal pups.

Summary

The potential direct impacts on QIs of the Kilkieran Bay and Islands SAC from the construction phase are outlined in Table 6-1 below.

Table 6-1: Potential direct impacts on the attributes of the designated features of the Kilkieran Bay and Islands SAC within the ZoI of the proposed project

Qualifying Interest	Attribute	Measure	Potential Impacts
Large shallow inlets and bays [1160]	Habitat area	Hectares	A permanent reduction in habitat within footprint of pier extension and slipway. 196.6m^2 or 0.0001% of this 18,760ha habitat will be impacted.
	Community extent	Hectares	Impact on water quality and habitats due to accidental discharge of concrete washings, sediment, chemicals/oils during construction.
	Community structure: *Zostera* density	Shoots per m²	Impact on water quality and habitats due to accidental discharge of concrete washings, sediment, chemicals/oils during construction.
	Community structure	Biological composition	Impact on water quality and habitats due to accidental discharge of concrete washings, sediment, chemicals/oils during construction.
	Community structure	Species abundance	Impact on water quality and habitats due to accidental discharge of concrete washings, sediment, chemicals/oils during construction.

Qualifying Interest	Attribute	Measure	Potential Impacts
	Community Distribution	Hectares	Impact on water quality and habitats due to accidental discharge of concrete washings, sediment, chemicals/oils during construction.
Reefs [1170]	Habitat area	Hectares	A permanent reduction in habitat within footprint of pier extension and slipway. 196.6m^2 or 0.00022% of 9,084ha reef habitat will be impacts.
	Distribution	Occurrence	Impact on water quality and reef habitats due to accidental discharge of concrete washings, sediment, chemicals/oils during construction.
	Community structure	Biological composition	Physical disturbance and surface water pollution may negatively impact and reduce the Intertidal reef community complex.
Otter [1355]	Distribution	Percentage positive survey sites	Surface water pollution and physical degradation of the intertidal area may result in the local Otter population becoming averse to the area, thus limiting the distribution range of Otter.
	Extent of terrestrial habitat	Hectares	N/A
	Extent of marine habitat	Hectares	Surface water pollution and physical disturbance may degrade the marine intertidal area, thus limiting the extent of marine intertidal habitat utilised by Otter.
	Extent of freshwater (river) habitat	Kilometres	N/A
	Extent of freshwater (lake/lagoon) habitat	Hectares	N/A
	Couching sites and holts	Number	N/A
	Fish biomass available	Kilograms	Surface water pollution may degrade the local fish population, limiting the fish biomass available for the local Otter population.
	Barriers to connectivity	Number	N/A
Harbour Seal [1365]	Access to suitable habitat	Number of artificial barriers	N/A
	Breeding behaviour	Breeding sites	Ingestion of surface water pollutants through fur grooming or prey consumption by local Harbour Seals may lead a sub-

Qualifying Interest	Attribute	Measure	Potential Impacts
			optimal breeding colony at the nearby site.
	Moulting behaviour	Moult haul-out sites	N/A
	Resting behaviour	Resting haul-out sites	N/A
	Disturbance	Level of impact	The physical and noise-based disturbances of the work may negatively impact the local Harbour Seal population during foraging, resting or breeding periods.

6.2.2 Construction Phase – Indirect Impacts

Impacts to the Natura 2000 sites could impact the food chain for QI mammals, i.e. fish, crustaceans and molluscans degraded in quality and/or frequency as a result habitat loss and/or surface water and/or air pollution events (also within the supporting habitat of the Natura 2000 site), which the mammal QI species of Natura 2000 site depend upon.

The potential indirect impacts on QIs from the construction phase are outlined in Table 6-2.

Table 6-2: Potential indirect impacts on the attributes of the designated features of the Kilkieran Bay and Islands SAC within the ZoI of the proposed project.

Qualifying Interest	Attribute	Measure	Potential Impacts
Otter [1410]	Distribution	Percentage positive survey sites	Surface water pollution and physical degradation of the intertidal area may cause a reduction in local prey availability, thus limiting the distribution range of Otter.
	Extent of terrestrial habitat	Hectares	N/A
	Extent of marine habitat	Hectares	Surface water pollution and physical degradation of the intertidal area may cause a reduction in local prey availability, thus limiting the extent of marine intertidal habitat utilised by Otter.
	Extent of freshwater (river) habitat	Kilometres	N/A
	Extent of freshwater (lake) habitat	Hectares	N/A
	Couching sites and holts	Number	N/A
	Fish biomass available	Kilograms	Surface water pollution may cause a reduction in total prey fish species available to Otter. Additionally, fish persisting in polluted environments but later consumed by Otter may indirectly

Qualifying Interest	Attribute	Measure	Potential Impacts
			pass on contaminates into the feeding Otter.
Harbour Seal [1365]	Access to suitable habitat	Number of artificial barriers	N/A
	Breeding behaviour	Breeding sites	Surface water pollution may cause a temporary reduction in local prey availability. Should this coincide with breeding season this would degrade the nearby breeding site to a sub-optimal status.
	Moulting behaviour	Moult haul-out sites	N/A
	Resting behaviour	Resting haul-out sites	N/A
	Disturbance	Level of impact	N/A

6.2.3 Operational Impacts

Once the pier and slipway are completed there will be no impacts from surface water runoff. There is the potential for leachate from the concrete structure to the marine environment, however due to the small area of the slipway/pier this is not anticipated to be significant.

Permanent impacts from the site's operation are anticipated for the Large shallow inlets and bays [1160] and Reefs [1170] overlapping QI habitats, given the direct habitat loss as a result of the construction of the pier extension and new slipway. These builds will result in the loss of approximately 196.6m^2 of Large shallow inlets and bays Annex I habitat (0.0001%); and Reef Annex I habitat (0.00022%) within Kilkieran Bay SAC. It should also be noted that the sheltered rocky shore / Reefs habitat being removed only contains the marine community type - intertidal reef community complex. This is equivalent to the loss of 196.6m^2 or 0.00082% of estimated 2,412 ha of intertidal reef community complex within the SAC.

Concrete has a high surface alkalinity (pH 12-13 compared to 8 for seawater), which could impair natural settlement of marine organisms compared to that of adjacent bedrock. However, it is expected that the intertidal surface of the pier and concrete slipway will in time be recolonised by marine organisms, similar to other concrete structures on Droim Pier.

Permanent impacts for the remaining QIs within the ZoI: Large shallow inlets and bays; Otter; and Harbour Seal, are not anticipated during the site's operational phase as the operational nature of the site will remain as it is at present. There is no increase of usage anticipated post construction.

6.2.4 Do Nothing Impact

If the proposed project does not go ahead there will be no impact from construction or operations on the Kilkieran Bay and Islands SAC.

7 Mitigation

This section describes the avoidance and mitigation measures required to prevent or reduce impacts generated during the construction and operation of the proposed development Kilkieran Bay and Islands SAC Natura 2000 sites.

All prescribed mitigation measures will be strictly adhered throughout the length of the construction and operational phases.

A site-specific Construction and Environment Management Plan (CEMP) and Construction Method Statement (CMS) will be submitted to the competent authority for agreement prior to site works commencing. The CEMP will incorporate the mitigation measures listed here. The proposed development's principal contractor, as well as all other construction contractors, will be required to comply with all the mitigation details outlined within the CEMP.

7.1.1 Construction Phase Mitigations

7.1.2 Standard Environmental Best Practice

The activities of the project for the construction phase shall remain within the boundary of the proposed site. Within this area, the mitigation measures outlined below shall be implemented. A Construction and Environment Management Plan (CEMP) will be submitted by the contractor to Galway County Council for agreement prior to site works commencing.

The CEMP will also strictly adhere to legislation and best practice environmental guidance including but not limited to the following:

- Water Framework Directive (2000/60/EC);
- The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2025 (S.I. No. 50 of 2025)
- Local Government (Water Pollution) Acts 1977-1990;
- CIRIA (C512): Environmental Handbook for Building and Civil Engineering Projects.
- CIRIA Guidance C532 Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2021 - www.ciria.org);
- CIRIA Guidance C741: Environmental good practice on site guide (CIRIA, 2021 - www.ciria.org);
- CIRIA Guidance C750D: Groundwater control: design and practice (CIRIA, 2021 - www.ciria.org);
- Inland Fisheries Ireland (2016) Guidance on Protection of Fisheries During Construction Works In and Adjacent to Waters;

7.1.3 Environmental Management of Site Compound

The contractor will be required to ensure good environmental management within the site compound. The list of measures below will be incorporated into site compound environmental management:

- The compound will be sited >50m from any water body (including streams) in order to minimise any potential impacts.
- Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.
- Site establishment by the Contractor will include the following:
  - Site offices;
  - Site facilities (canteen, toilets, drying rooms, etc.);
  - Office for construction management team;
  - Secure compound for the storage of all on-site machinery and materials;
  - Temporary car parking facilities;
  - Temporary fencing;
  - Site Security to restrict unauthorized entry;
  - Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area.
  - A separate container will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.
  - A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
  - The site environmental manger will be responsible for maintaining all training records.
  - Drainage collection system for washing area to prevent run-off into surface water system.
  - Stockpiling of spoil and spoil-like materials will be appropriately located within the compounds to minimise exposure to prevailing winds and risk of runoff
  - All refuelling of vehicles will be carried out away from the site.

7.1.4 Water Quality

To prevent watercourse pollution the following actions are required:

- Adoption of a surface water plan including appropriate barrier controls to prevent any polluted surface water from the site reaching the marine environment.
- Minimise area of exposed ground by maintaining existing vegetation in vicinity of site compound/pier infrastructure.
- No storage of any materials or vehicles/machinery within 50m of the pier.
- Oil booms and oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal.
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water.
- Any accidental discharge will be controlled by use of shore-sealing booms in the water prior to construction starting.
- Do not allow any demolished particles/construction material to enter the tidal stream during the bridge widening. Use covers or platforms or bridge debris netting for bridge and wall widening/construction to collect debris and ensure all work is carried out at low tide (IFI 2016).

7.1.5 Concrete Management Procedures

Concrete will be used for formation of the new pier extension, slipway, pier wall, hardstand/parking area construction and bridge widening. The following measures will be implemented to prevent liquid concrete/cement entering the marine environment entering marine or freshwater aquatic environments.

- Batch loads of concrete will be delivered on an as needed basis, The concrete will be delivered in ready mix trucks.
- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete.
- Washout of concrete plant will occur off site at a designated impermeable area with waste control facilities.
- Raw, uncured or waste concrete will be stored appropriately prior to disposal by licenced contractor.
- The contractor's construction methodology will require the use of precast elements where practical; the use of secondary protection shuttering for concrete

pours; all pours to be carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.

- The contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in EA (2011) - Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters.
- An Ecological Clerk of Works will be onsite at set up of shuttering, during bridge construction and at concrete pours.

7.1.6 Pollution Control and Spill Prevention

Spill kits containing absorbent pads, granules and booms will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site foremen's vehicles will carry large spill kits at all times. Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan. All used spill materials e.g. Absorbent pads will be placed in a bunded container in the contractor's compound. The material will be disposed of by a licenced waste contractor at a licenced facility. Records will be maintained by the environmental site manager.

Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.

In the event of a spill the Contractor will ensure that the following procedure are in place:

- Emergency response awareness training for all Project personnel on-site works.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site. Spills kits for immediate use will be kept in the cab of mobile equipment.
- Spill kits will be stored in the site compound with easy access for delivery to site in the case of an emergency. A minimum stock of spill kits will be maintained at all times and site vehicles will carry spill kits at all times. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum:
  - Absorbent granules;
  - Absorbent mats/cushions;
  - Absorbent booms
  - Track-mats, geotextile material and drain covers.
- All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound.

- All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following;
  - 110% of the capacity of the largest tank or drum within the bunded area, or
  - 25% of the total volume of substances which could be stored within the bunded area.
- The site compound fuel storage areas and cleaning areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.
- Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
- Damaged or leaking containers will be removed from use and replaced immediately
- Any spill incident where a pollutant reaches the marine environment must be immediately reported to the Local NPWS Conservation Ranger.

7.1.7 Dust Minimisation

The following measures will be implemented to prevent excavation and cement-based dusts entering the marine and freshwater environments.

- Site construction roads will avail of a spray seal or use a water bowser to mitigate against the formation of dry dust particles. Road cleaning along the approach roads to the site will also be undertaken when necessary to ensure that roads are kept clear of any construction related debris.
- The use of water suppressants will be used during any dry weather conditions (if required). Where temporary stockpiles are required, the material will be stored in designated areas and will be covered with tarpaulins and/ or regularly dampened during dry weather periods.
- The temporary stockpile of infill will be covered to avoid dust emissions.
- Limit the breaking of the topsoil or earth stripping from occurring during dry and windy weather
- The utilisation of pre-cast concrete features will minimise the generation of the concrete-based dusts throughout the development site.

7.1.8 Noise and Vibration

The construction of the pier extension and slipway will be limited to daylight hours where possible, ensuring minimum disturbance to commuting and foraging activities of Otter, which are generally a crepuscular species. The works will also be temporary. With regard to construction activities, reference will be made to BS 5228-1, which offers detailed guidance on the control of noise from demolition and construction activities. A variety of practicable noise control measures will be employed. These include:

- Erection of barriers as construction works boundary as necessary and around items such as generators or high duty compressors.

- Limiting the hours during which site activities likely to create high levels of noise are permitted. Construction activities will take place Monday to Friday, between 08:00 and 18:00, and on Saturdays, between 08:00 and 13:00.
- A site representative responsible for matters relating to noise will be appointed to liaise with Galway Co Council.

Additional guidance relevant to acceptable vibration and noise levels will be followed and is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- British Standard BS 5228-2: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Vibration.
- NRA: 2004: Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

7.1.9 Timing of works (Harbour Seal)

To prevent disturbance impacts to the vulnerable breeding Harbour Seal population at the nearby breeding site, construction works will not take place between the months of May to August (inclusive).

Alternatively, a suitably qualified ecologist may be employed to confirm absence of hauled out Harbour Seals in the vicinity of the pier if works must take place in this time period. If seals are found to be hauled out nearby the works will be postponed until an ecologist establishes if Harbour Seal will be disturbed.

7.1.10 Lighting

In order to avoid any detrimental effects to wildlife, including Otter, lighting will be kept to a minimum to meet the safety standards required and to protect wildlife. Lighting will comply with guidance in Chapter 7 of the County Development Plan 2022-2028 (GCC 2022) and will be in line with Dark Sky initiative guidelines (DarkSkyIreland 2026).

Generally speaking, LED luminaires with a warm white light source (2700Kelvin or lower) should be used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.

Luminaires with a negligible or zero Upward Light Ratio, and with good optical control, will be used. Luminaires will be mounted horizontally, with no light output above 90° and/or no upward tilt.

Where appropriate, lighting may be set on motion sensors and set to as short a possible a timer as the risk assessment will allow, with use of a Central Management System (CMS) with additional web-enabled devices to light on demand

7.1.11 Retention of Reef Habitat

Where appropriate, any large boulders and rocks (>50cmx50cm) that are moved/ removed from reef/intertidal habitat during construction and excavation should be placed

beside the slipway or in nearby adjacent waters within the intertidal area to ensure that as much reef habitat is retained to create niches and habitats for marine flora and fauna, and to provide a source for recolonisation.

7.1.12 Enhancement of New Artificial Surfaces (pier and slip way)

In order to create a more complex surface texture and habitat for intertidal organisms on the pier extension and slipway, two ecological enhancement treatments can be used:

(a) 'Holes': an array of four 20mm deep x 16mm diameter holes orientated to retain water at low tide to provide species with a moist refuge when the tide goes out. These can be drilled into vertical surfaces using a cordless hand drill. These holes are to be drilled between the mean high tide level and mean low tide level (Hall et al., 2018).

(b) 'Grooves', thin horizontal grooves (approx. 30-60cm long x 1cm deep) and one thicker, coarser groove (approx. 30-60cm long x 2cm wide) cut in to the rock using an angle grinder saw. The coarser groove to be chiselled out, which creates a rough surface texture on the base and sides of the groove. The reasoning behind creating these grooves is to increase the surface texture of the pier and slipway and by creating two different sized grooves, it enables a variation in habitat. These groves are to be gouged out between the mean high tide level and mean low tide level (Hall et al. 2018).

All the above works are to be carried out in the dry.

Figure 7-1 displays examples of these hole and groove surface enhancements along with their typical dimensions.

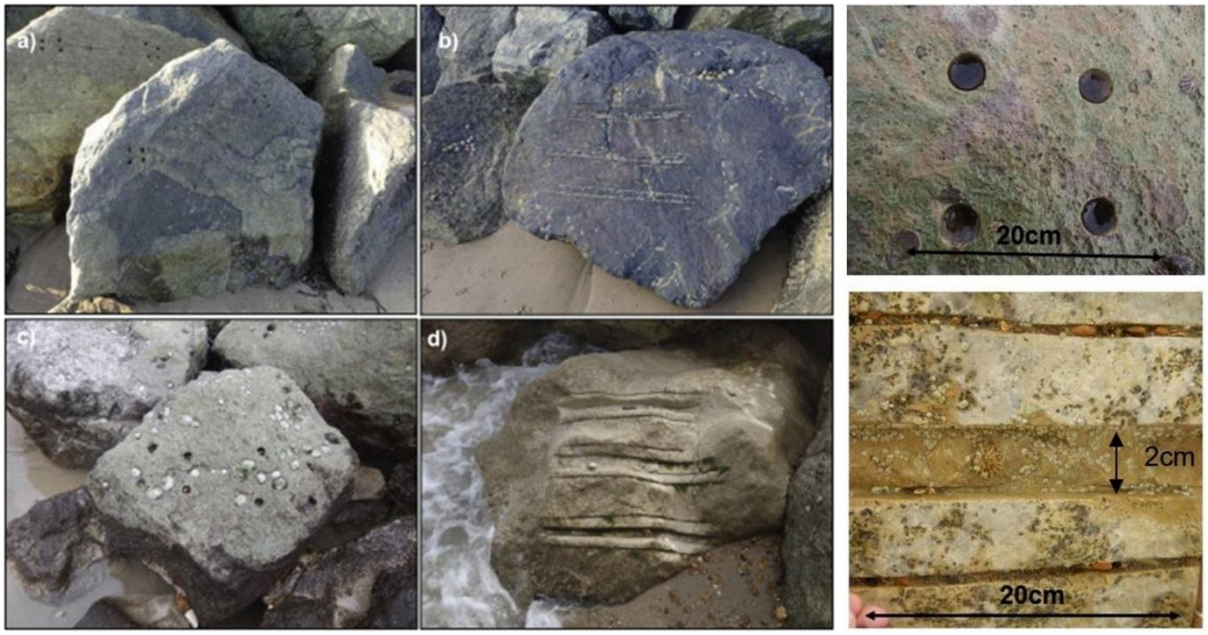


Figure 7-1: Hole (a and c) and groove (b and d) enhancements creating refuges for intertidal organisms. Typical hole and groove dimensions are shown on the left (Hall, 2018).

7.2 Residual Impacts

7.2.1 Water quality

If the recommendations in the Construction and Environmental Management Plan are followed, there should be no impact through water quality to the qualifying interests of the Kilkieran Bay and Islands SAC.

Therefore, there will be no residual impacts predicted upon water quality as a result of the proposed pier extension and new slipway.

7.2.2 Otter and Harbour Seal

Using the precautionary principle, the works will take place outside of the Harbour Seal breeding season (May-August). The impacts from noise and vibration will be temporary in nature and the hours when activities creating high noise levels are performed will be limited. It is therefore expected that disturbance during construction will not impact Otter and Harbour Seal (outside breeding season).

Therefore, there will be no residual impacts predicted upon Otter and Harbour Seal as a result of the proposed development works upon the conservation objectives of these species in the Kilkieran Bay and Islands SAC.

7.2.3 Annex I habitats; Large shallow inlets and bays, and Reefs

There will be a very small direct loss of Annex I habitat 'Large shallow inlets and bays' and ‘Reefs’ within the Kilkieran Bay and Islands SAC from the constitution of the proposed pier extension and slipway. The area of the pier extension and slipway within the SAC is 124m^2, which will result in a loss of 0.0001% and 0.00022% of the Annex I habitats 'Large shallow inlets and bays' and Reefs, respectively. It should also be noted that only the marine community type - intertidal reef community complex, will experience this habitat loss from the Annex Reefs [1170] habitat. This is equivalent to the loss of 196.6m^2 or 0.00082% of estimated 2,412 ha of intertidal reef community complex within the SAC. With regard to reef communities, the NPWS (2014) provide technical clarification in relation to specific conservation objectives and targets for Annex I habitats to facilitate the appropriate assessment process, where it is stated that significant continuous or ongoing disturbance of reef communities should not exceed an approximate area of 15% of the interpolated area.

It is expected that over time the pier extension and new slipway will be re-colonised by seaweeds and marine organisms, expedited by the recommended hole and groove enhancement in concrete structure. **This will lead to minor residual effect with no long-term adverse effect on the QI habitats Large shallow inlets and bays and Reefs.**

The following Table summarises the potential impacts upon the relevant qualifying interests of the screened in Natura 2000 site. It takes into consideration the attributes of these qualifying interests that may be impacted by the works, and the cumulative and/or in-combination impacts that may arise. Where potentially significant adverse impacts are identified, avoidance and mitigation measures are proposed to offset these impacts.

Table 7-1: Pathways of impact on the attributes of the designated features of Kilkieran Bay and Islands SAC.

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
Large shallow inlets and bays [1160]	Habitat area	Hectares	A permanent reduction in habitat area by anthropogenic means via physical disturbance.	The % loss of habitat is negligible, given the extent of the habitat. However mitigation will be in place to reduce this as much as possible. Strict adherence to: Section 7.1.10 and 7.1.11, which outlines retention of habitat where possible and necessary artificial surface enhancement mitigations measures, which will partially remedy the minor habitat loss by ensuring faster recolonisation of the pre-existing intertidal communities present in these locations.	0.0001% of 18,760ha of habitat impacted. The new intertidal surfaces will recolonise with marine inlet community with the aid of the modifications made to the surfaces of the pier extension and new slipway. No adverse effects
	Community extent	Hectares	A permanent reduction in *Zostera*-, *Pachycerianthus multiplicatus*- and maërl-dominated community complexes by anthropogenic means via surface water pollution and physical disturbance.	Strict adherence to: Sections 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which outlines retention of habitat and artificial surface enhancement mitigations measures, which will ensure continuity of the existing *Zostera*-, *Pachycerianthus multiplicatus*- and maërl-dominated community complexes	No adverse effects
	Community structure: *Zostera* density	Shoots per m²	A permanent reduction in *Zostera*- community complexes by anthropogenic means via surface water	Strict adherence to: Section 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which	No adverse effects

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
			pollution and physical disturbance.	outlines retention of habitat artificial surface enhancement mitigations measures, which will ensure continuity of the existing *Zostera*- community complexes.	
	Community structure	Biological compositi on	A permanent reduction in maërl-community complexes by anthropogenic means via surface water pollution and physical disturbance.	Strict adherence to: Sections 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which outlines retention of habitat artificial surface enhancement mitigations measures, which will ensure continuity of the existing maërl-community complexes.	No adverse effects
	Community structure	Species abundanc e	A permanent reduction in *Pachycerianthus multiplicatus*- community complexes by anthropogenic means via surface water pollution and physical disturbance.	Strict adherence to: Sections 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which outlines retention of habitat artificial surface enhancement mitigations measures, which will ensure continuity of the existing *Pachycerianthus multiplicatus*- community complexes.	No adverse effects
	Community distribution	Hectares	Physical disturbance and surface water pollution may negatively impact and reduce polychaete, crustacean and nemertean community complexes.	Strict adherence to: Sections 7.1.2 to 7.1.7 and Section 7.1.6, which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which outlines retention of habitat artificial surface enhancement mitigations measures, which will ensure no	No adverse effects

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
				reduction in overall community distribution of this habitat.	
Reefs [1170]	Habitat area	Hectares	A permanent reduction in habitat area by anthropogenic means via physical disturbance	Strict adherence to: Section 7.1.10 and 7.1.11, which outlines retention of habitat and all the necessary artificial surface enhancement mitigations measures, which will partially remedy the very negligible habitat loss by ensuring faster recolonisation of the pre-existing intertidal communities present in these locations.	196.6m^2 or 0.00022% of 9084ha of reef habitat impacted (or 0.00082% of estimated 2,412 ha of intertidal reef community complex). The new intertidal surfaces will recolonise with marine community with the aid of the modifications made to the surfaces of the pier extension and new slipway. No adverse effects
	Distribution	Occurrence	A permanent reduction in distribution by anthropogenic means via physical disturbance.	Strict adherence to: Section 7.1.10 and 7.1.11, which outlines retention of habitat and artificial surface enhancement mitigations measures, which will ensure no reduction in overall distribution of this habitat.	No adverse effects
	Community structure	Biological composition	Physical disturbance and surface water pollution may negatively impact and reduce the Intertidal reef community complex; Subtidal sponge and ascidian community complex; Exposed to moderately exposed subtidal reef community complex; Deep water faunal crust and sponge	Strict adherence to: Sections 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which outlines retention of habitat and artificial surface enhancement mitigations measures, which will ensure continuity of the existing Intertidal reef community complex; Subtidal sponge and ascidian community complex; Exposed to	No adverse effects

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
			community complex; and *Laminaria*-dominated community complex.	moderately exposed subtidal reef community complex; Deep water faunal crust and sponge community complex; and Laminaria-dominated community complex.	
Otter *Lutra lutra* [1410]	Distribution	Percentage positive survey sites	Surface water pollution and physical disturbance may: - impact negatively on habitat quality, driving Otter out of the Droim Pier inlet, thus limiting distribution of species - cause a collapse in local prey availability, thus limiting the distribution range of Otter - cause local Otters to display aversive behaviour to the site area as result of the visual and audible disturbance	Strict adherence to: Sections 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution; and disturbance mitigations measures of Section 7.1.8, which will ensure that the existing distribution of local Otter is not adversely impacted.	No adverse effects
	Extent of terrestrial habitat	Hectares	N/A	N/A	N/A
	Extent of marine habitat	Hectares	Surface water pollution and physical disturbance may: - reduce general overall distribution - reduce the total	Strict adherence to: Sections 7.1.2 to 7.1.7 which outline all the necessary surface water and dust pollution; and sections 7.1.10 and 7.1.11 which	No adverse effects

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
			length of habitable marine intertidal area. - cause a collapse in local prey availability, thus limiting the extent of marine intertidal habitat utilised by Otter.	outlines retention of habitat and artificial surface enhancement mitigations measures, which will ensure the continuity of existing marine habitat types in the inlet.	
	Extent of freshwater (river) habitat	Kilometres	N/A	N/A	N/A
	Extent of freshwater (lake) habitat	Hectares	N/A	N/A	N/A
	Couching sites and holts	Number	N/A	N/A	N/A
	Fish biomass available	Kilograms	Surface water pollution may degrade the local fish population, limiting the fish biomass available for the local Otter population. Additionally, fish persisting in polluted environments but later consumed by Otter may indirectly introduce the contaminates into the Otter population.	Strict adherence to: Sections 7.1.2 to 7.1.7, which outline all the necessary surface water and dust pollution mitigations measures, which will safeguard the available fish biomass in the local area for Otters.	No adverse effects
Harbour Seal	Access to	Number of	N/A	N/A	N/A

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
Phoca vitulina [1365]	suitable habitat	artificial barriers			
	Breeding behaviour	Breeding sites	Surface water pollution may lead to: - Ingestion of surface water pollutants through fur grooming or prey consumption by local Harbour Seals may lead a sub-optimal breeding colony at the nearby site. - a temporary collapse in local prey availability. Should this coincide with breeding season this would degrade the nearby breeding site to a sub-optimal status. - disturbance impacts to the vulnerable breeding Harbour Seal population at the nearby breeding site.	Strict adherence to: Section 7.1.9, which outlines that the timing of works is to take place outsides of the Harbour Seal breeding season (May - August).	No adverse effects
	Moulting behaviour	Moult haul-out sites	N/A	N/A	N/A
	Resting behaviour	Resting haul-out sites	N/A	N/A	N/A
	Disturbance	Level of impact	The physical and noise-based disturbances of the	Strict adherence to: Section 7.1.8, which outlines the	No adverse effects

Qualifying Interest	Attribute	Measure	Potential Impacts	Mitigation Measures	Residual Impact
			work may negatively impact the local Harbour Seal population during foraging activities or resting at haul out areas.	control of noise level of plant machinery, works only during daylight hours.	

7.2.4 Additional Note on Non-QI, Protected Species potentially present within the ZoI

The mitigation measures outlined in the above sections and tables will also ensure that none of the nationally and internationally protected species (listed in Appendix E) potentially present in the ZoI will experience any adverse impacts, either direct or indirect, as a result of the works carried during the construction or operational phases of the proposed project.

7.3 Significance of in-combination Effects

The Galway County Development Plan (2022-2028) and River Basin Management Plan for Ireland 2022-2027 are not considered to adversely impact any Natura 2000 site, nor are they expected to contribute to any cumulative or in-combination effects.

There are a number of other small project developments planned for the local area but insignificant in terms of in-combination impacts (Section 5.1). Therefore, there will be no cumulative or in-combination effects on the QI habitats and species designated for the Natura 2000 site.

8 Conclusions

JBA Consulting Ireland Ltd. was commissioned by Galway County Council to undertake a Natura Impact Assessment (NIS) in relation to the proposed pier extension and slipway development at Droim, Leitir Móir, Co. Galway.

The proposed project is identified as occurring within the Zone of Influence of the following Natura 20000:

- Kilkieran Bay and Islands SAC

The proposed development site is located within the Kilkieran Bay and Islands SAC. Therefore, the proposed site is connected to the Natura 2000 site via the surface water and land pathways.

The qualifying interests within the Zone of Influence are:

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Otter *Lutra lutra* [1355]
- Harbour Seal *Phoca vitulina* [1365]

The potential impact from the proposed project is posed during construction and operational phases; and relates to potential pollution of surface water caused by accidental spillage of pollutants, such as hydrocarbons; potential air (dust pollution); habitat loss; and visual and audible disturbance which could impact on the designated QI habitats and species.

Where potentially significant adverse impacts were identified, a range of mitigation and avoidance measures have been stipulated to help offset them. With the recommended guidance and mitigation proposals in place and, provided the mitigation measures are effectively managed in consultation with NPWS, a residual impact of 'not significant' and no in combination effects with other projects and plans is predicted.

It is concluded that provided that the mitigation measures outlined are strictly adhered to, adverse effects are not likely to occur from the works involved with the proposed slipway development at Droim, Leitir Móir, Co. Galway; in-combination with other projects and plans on the following Natura 2000 sites:

- Kilkieran Bay and Islands SAC

To confirm this conclusion, a checklist on methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC from (European Commission 2021) has been completed with regards to conservation objectives in Table 8-1.

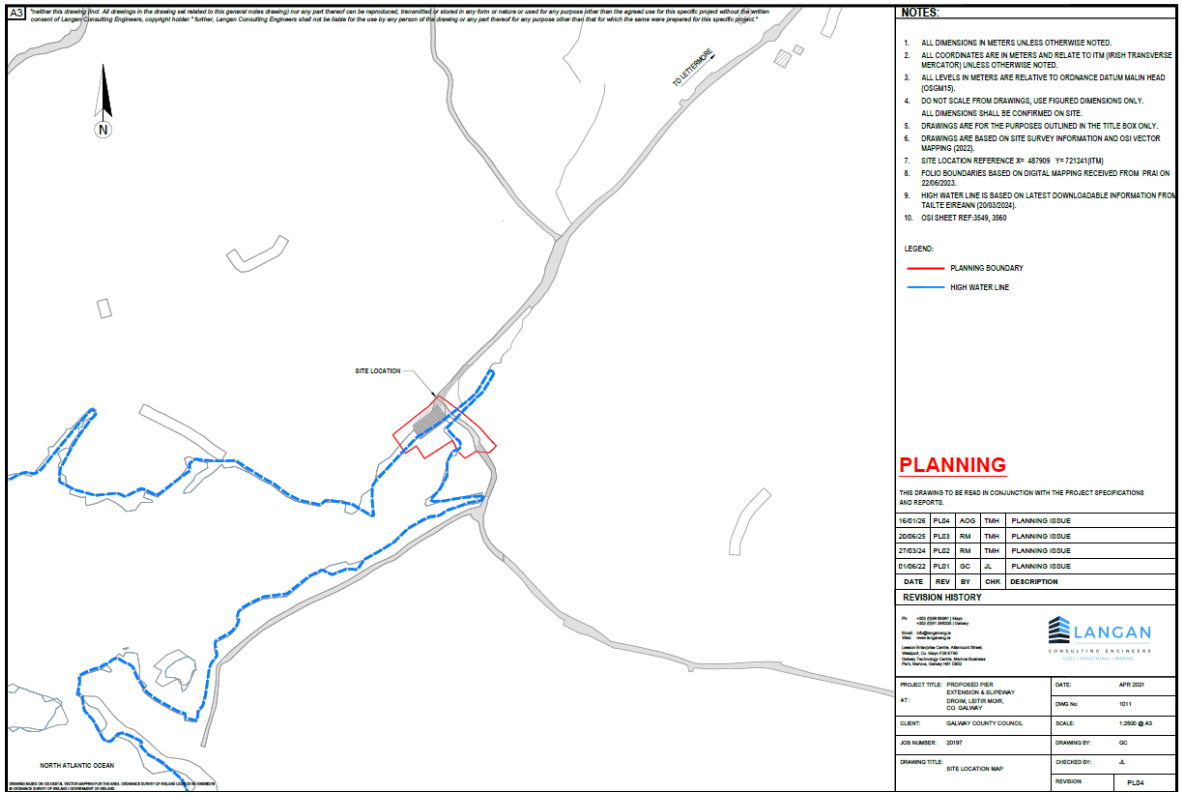
Table 8-1: Integrity of Natura 2000 site checklist

Does the plan or project have the potential to:	Yes/No
Hamper or cause delays in progress towards achieving the site's conservation objectives?	No - Following mitigation, no significant adverse residual impacts have been identified that will hamper or delay achievement of the conservation objectives of Kilkieran Bay and Islands SAC
Reduce the area, or quality, of protected habitat types or habitats of protected species present on the site?	**Yes- There will be a loss of 196.6m² or 0.00022% of 9,084ha of Annex I habitat 'Reefs' or 0.0001% loss of intertidal reef community complex habitat from Kilkieran Bay and Islands SAC** To this end, the proposed development is not expected to contravene conservation objectives with respect to reef habitat within the overall conservation interest 'Reefs'. The area of reef that will be lost is considered to be negligible, considering the accuracy of the calculation for the total area of this habitat within the SAC. Methods to facilitate recolonisation on the slipway has been proposed. The slipway will act as a man-made reef and over time recolonise with marine community with no significant loss of habitat area and **no long-term adverse effect on the QI habitat Reefs.**
Reduce the population of the protected species significantly present on the site?	No - Potential impacts to key species of Kilkieran Bay and Islands SAC are not expected, as impacts can be avoided by implementing mitigation measures.
Result in disturbance that could affect the population size or density or the balance between species?	No - Potential impacts to key species for which the Kilkieran Bay and Islands SAC are designated are not expected, as impacts can be avoided by implementing the detailed mitigation measures. Population sizes and ecosystem function will be maintained due to mitigation measures, type and location of development.
Cause the displacement of protected species significantly present on the site and thus reduce the distribution area of those species in the site?	No - Protected species will not be significantly displaced. The distribution areas of species in Kilkieran Bay and Islands SAC will be maintained.
Result in a fragmentation of Annex I habitats or habitats of species?	No – Potential impacts resulting in fragmentation of species or habitats of Kilkieran Bay and Islands SAC are not expected as impacts will be avoided by implementing mitigation measures.
Result in a loss or reduction of key features, natural processes or resources that are essential for the maintenance or restoration of relevant habitats and species in the site (e.g. tree cover, tidal exposure, annual flooding, prey, food resources)?	**There will be a loss of 196.6m² of Annex I habitat 'Reefs' from Kilkieran Bay and Islands SAC, representing 0.00022% of 9,084ha of Reef habitat or 0.0001% loss of intertidal reef community complex.** The area of reef that will be lost is considered to be negligible, considering the accuracy of the calculation for the total area of this habitat within the SAC. Methods to facilitate recolonisation on the slipway has been proposed and the slipway will act as a man-made reef, recolonising with marine community with no significant loss of habitat area or reduction in tidal exposure, resulting in **no long-term adverse effect on the QI habitat Reefs.**
Disrupt the factors that help maintain the favourable conditions of the site or that are needed to restore these to a	No - Potential adverse impacts via surface water; land and air; and groundwater pathways identified during the screening process can be mitigated against.

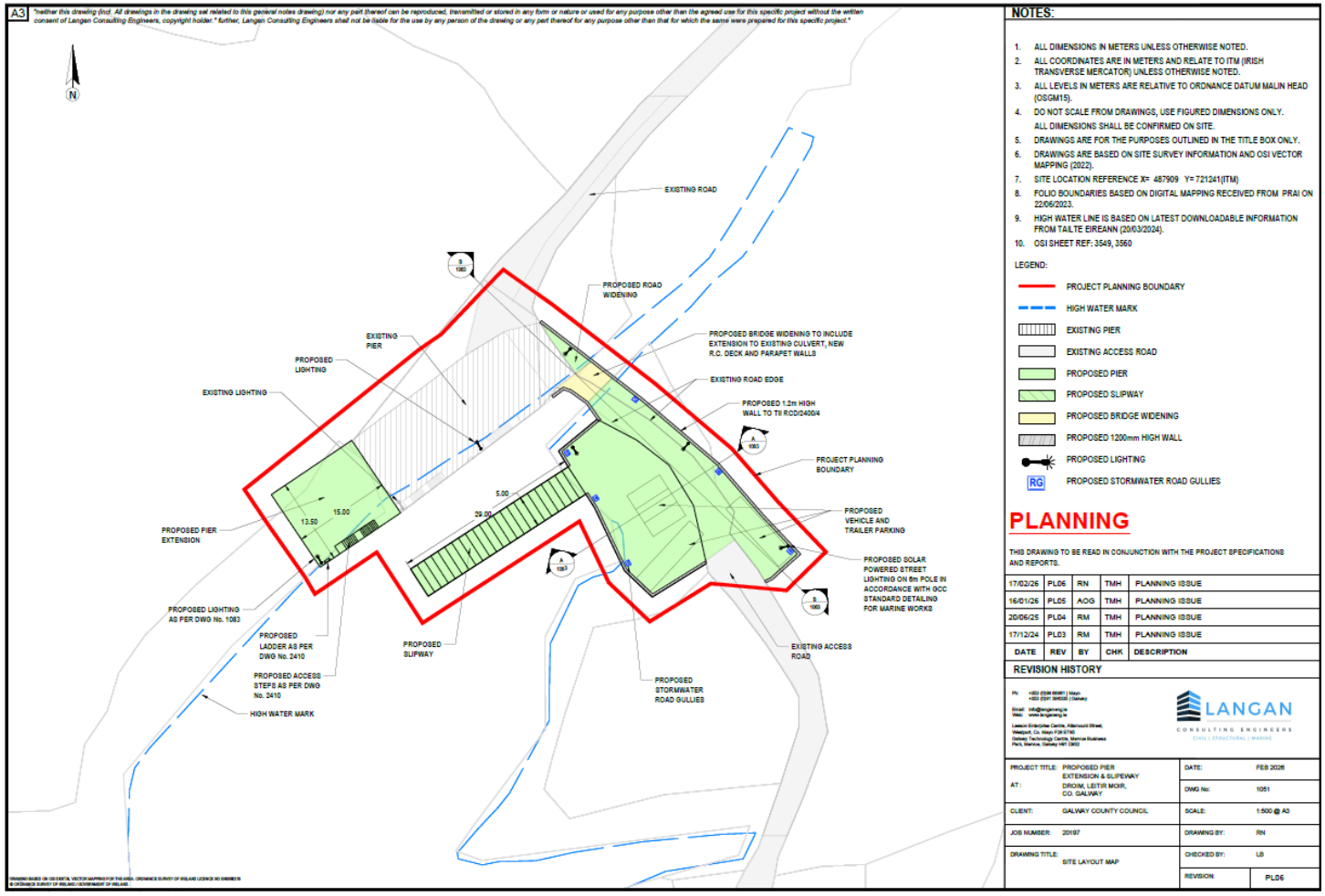
Does the plan or project have the potential to:	Yes/No
favourable condition within the site?	
Interfere with the balance, distribution and density of species that are the indicators of the favourable conditions of the site?	No - Potential impacts to the population size, density or balance of key species of Kilkieran Bay and Islands SAC are not expected, as impacts will be avoided by implementing mitigation.

Appendices

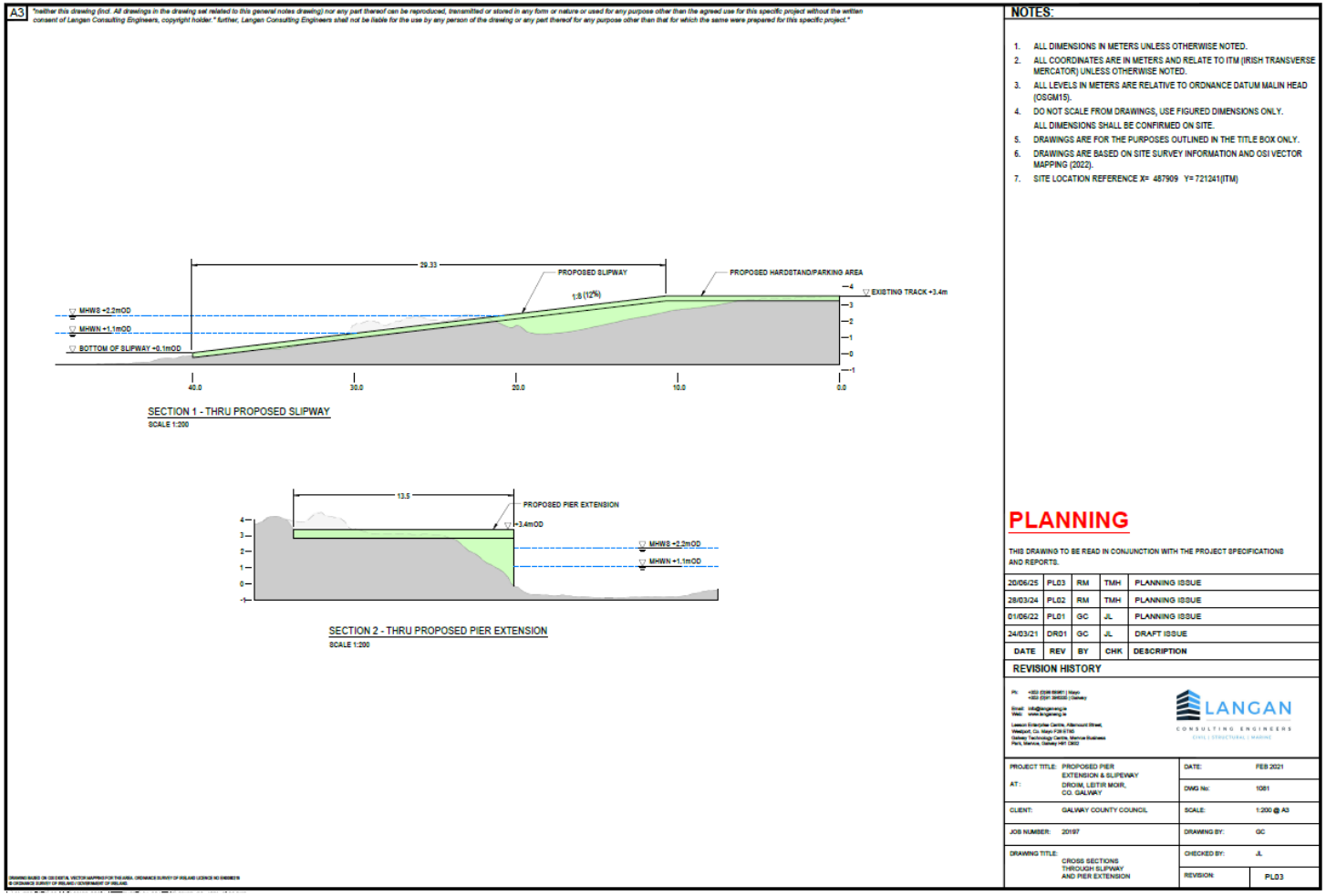
A - Site location and High-water mark



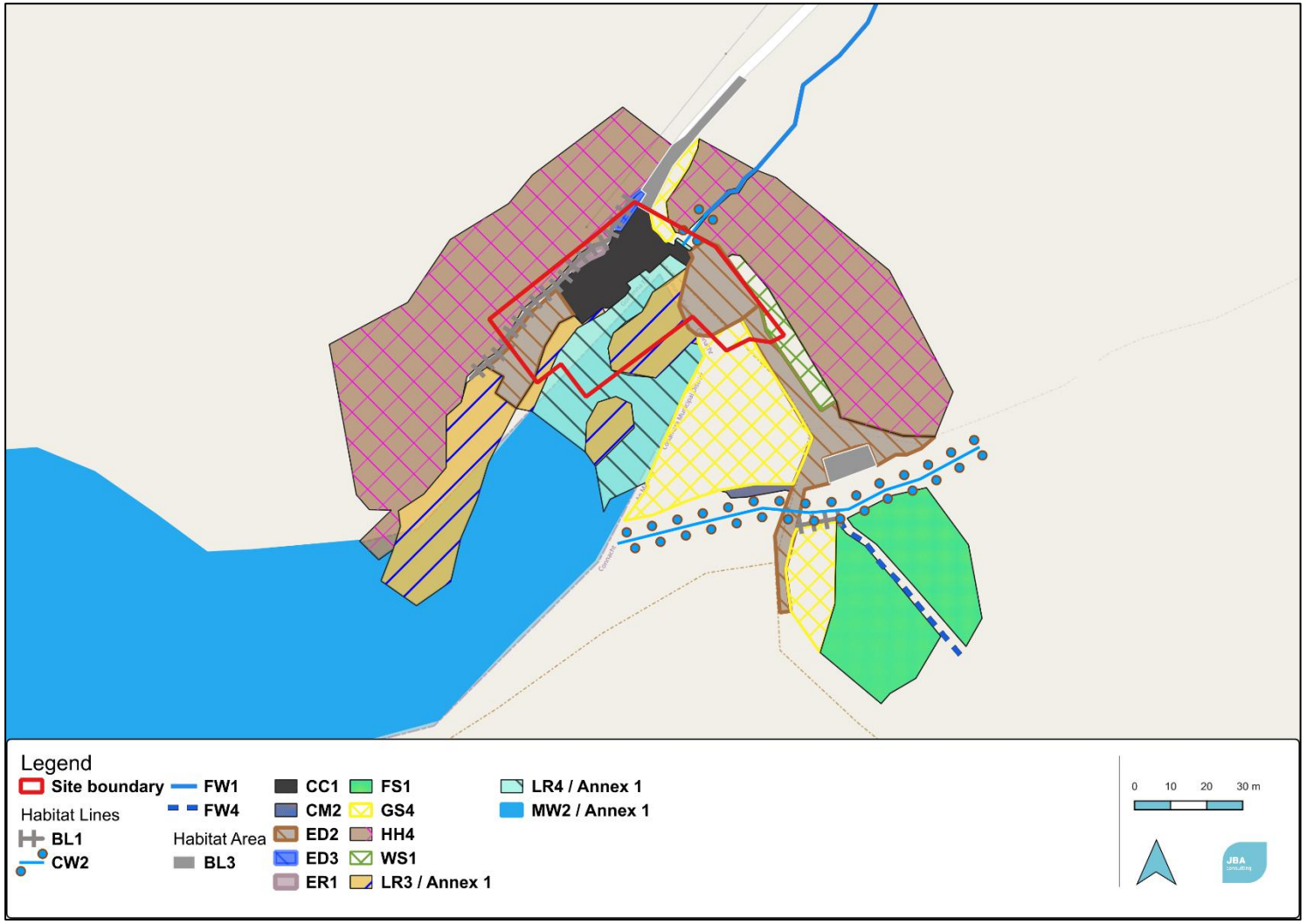
B - Site Layout Plan



C - Cross Section through Slipway and Pier Extension



D - Habitat Map at low tide (©OSM, 2026)



E - Protected species recorded within 2km

These records correspond with the species covered by national legislation that are publicly available on the NBDC database with an online query (NBDC, 2026). Records below cover the last 10 years.

Species Name	Date of last record	Designation
Common Dolphin *Delphinus delphis*	24/10/2020	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Common Lizard *Zootoca vivipara*	25/08/2019	Protected Species: Wildlife Acts
Meadow Pipit *Anthus pratensis*	02/05/2021	Protected Species: Wildlife Acts

References

CIRIA, 2021. CIRIA Resources Website. Available online at: https://www.ciria.org/CIRIA/Resources/Resource_overview/Resources/Resources_overview.aspx?hk ey=a80608d2-a045-4d72-8bb9-5ecf23f8d761

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 (2021). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021XC1028(02).

CIEEM. 2019. 'On the Lifespan of Ecological Reports and Surveys'. CIEEM.

CIEEM. 2024. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. 1.3. Chartered Institute of Ecology and Environmental Management.

DarkSkyIreland. 2026. 'Environmentally Friendly Lighting Guide'. https://dpdgay9x1sxad.cloudfront.net/wp-content/uploads/sites/16/2024/11/DSI-Environmentally-Friendly-Lighting-Guide-1.pdf.

DEHLG. 2009. *Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities.* Unpublished report. Department of the Environment, Heritage and Local Government. https://www.npws.ie/protected-sites/guidance-appropriate-assessment-planning-authorities.

DoHLGH. 2022. *Draft River Basin Management Plan for Ireland 2022-2027*. Department of Housing, Local Government and Heritage. https://www.gov.ie/en/consultation/2bda0-public-consultation-on-the-draft-river-basin-management-plan-for-ireland-2022-2027/#documents.

European Commission. 2019. *Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*. Publications Office of the European Union. https://data.europa.eu/doi/10.2779/02245.

European Commission. 2022. *Guidance Document on Assessment of Plans and Projects in Relation to Natura 2000 Sites: A Summary.* Publications Office. https://data.europa.eu/doi/10.2779/086397.

Fossitt, Julie A. 2000. *A Guide to Habitats in Ireland*. Heritage Council of Ireland Series. Heritage Council/Chomhairle Oidhreachta.

GCC. 2022. 'Galway County Development Plan 2022 - 2028 - Volume 1 Written Statement'. https://consult.galway.ie/en/consultation/adopted-galway-county-development-plan-2022-2028/chapter/volume-1.

Hall, Alice E., Roger J. H. Herbert, J. Robert Britton, and Susan L. Hull. 2018. 'Ecological Enhancement Techniques to Improve Habitat Heterogeneity on Coastal Defence Structures'. *Estuarine, Coastal and Shelf Science* 210 (October): 68–78. https://doi.org/10.1016/j.ecss.2018.05.025.

IAQM. 2024. *Guidance on the Assessment of Dust from Demolition and Construction*. 2.2. Institute of Air Quality Management.

IFI. 2016. *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*. IFI/2016/1-4298.

NPWS. 2024. 'Site Synopsis: Kilkieran Bay and Islands SAC 002111'. Site Synopsis. Department of Housing, Local Government and Heritage. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002111.pdf.

NPWS. 2025a. *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*. https://www.npws.ie/sites/default/files/publications/pdf/article-17-report-2025-volume-1.pdf.

NPWS. 2025b. *The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitats Assessments*. https://www.npws.ie/sites/default/files/publications/pdf/article-17-report-2025-volume-2.pdf.

NPWS. 2025c. *The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments*. https://www.npws.ie/sites/default/files/publications/pdf/article-17-report-2025-volume-3.pdf.

NPWS. 2026. 'Conservation Objectives: Kilkieran Bay and Islands SAC 002111'. Conservation Objectives Series. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002111.pdf.

NRA. 2009. *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. National Roads Authority.

OPR. 2021. 'OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management'. Preprint, Office of the Planning Regulator.

Parnell, J., and T. Curtis. 2012. *Webb's An Irish Flora*. 8th edn. Cork University Press.

Smith, George F., Paul O'Donoghue, Katie O'Hara, and Eamonn Delaney. 2011. 'Best Practice Guidance for Habitat Survey and Mapping'. https://www.heritagecouncil.ie/content/files/best_practice_guidance_habitat_survey_mapping_onscreen_version_2011_8mb.pdf.

Stace, Clive. 2019. *New Flora of the British Isles*. 4th edn. C&M Floristics.

Offices at:

Dublin
Limerick

Registered Office
24 Grove Island
Corbally
Limerick
Ireland

t: +353 (0) 61 345463
e:info@jbaconsulting.ie

JBA Consulting Engineers and Scientists Limited
Registration number 444752

JBA Group Ltd is certified to:
ISO 9001:2015
ISO 14001:2015
ISO 27001:2013
ISO 45001:2018