Appropriate Assessment Screening Report & Natura Impact Statement to inform Appropriate Assessment

Proposed extension and repair of an existing pipe culvert bridge structure, at Claregalway, Co Galway (GPS Coordinates 53.3546, -8.9487, C3/4/1)

For OPW

June 2022

Giorria Environmental Services
www.giorria.com

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SECTION 1

1.0 Introduction

Giorria Environmental Services were commissioned by OPW to undertake a Screening for Appropriate Assessment under Article 6 of the EU Habitats Directive on the proposed extension and repair of an existing pipe culvert bridge, Claregalway, Co Galway.

The aim of this report is to identify any significant impacts of the proposed development on any adjacent Natura 2000 sites. The report has been prepared in accordance with the current guidance (NPWS 2009, revised February 2010, Office of Planning Regulator 2021). The report was compiled and written by Dr. Karina Dingerkus, ecologist (see Appendix 5 for qualifications).

1.1 Overview of proposed project

The proposed project will take place in OPW's Corrib Headford Arterial Drainage Scheme at Claregalway, Co Galway (GPS Coordinates 53.3546, -8.9487, UB2, C3/4/1-200 Chainage). The works will include the extension and repair of an existing pipe culvert bridge. All works will be in accordance with the OPW Standard Design, (Drawing Refs Drawing Refs 2480-DR-003-P2 & 2480-DR-006-P1).

Photograph 1: Site Claregalway, Co Galway, showing location of proposed project

2.0 The Appropriate Assessment Process

2.1 Introduction

Natura 2000 is a European network of important ecological sites. The EU Habitats Directive (92/43/EEC) placed an obligation on Member States of the EU to establish the Natura 2000 network. The network is made up of Special Protection Areas (SPAs), established under the EU Birds Directive (2009/147/EC), and SACs, established under the Habitats Directive itself. Ireland's contribution to Natura 2000 is being created under the European Communities (Natural Habitats) Regulations, 1997 (S.I. 94 of 1997 as amended by S.I. 233 of 1998 and S.I. 378 of 2005). These regulations transpose the EU directives into Irish national Law.

There is a requirement, under Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC), to carry out an Appropriate Assessment when a plan or project is proposed that may have conservation implications for the Natura 2000 site. The first step of the Appropriate Assessment process is to establish whether, in relation to a particular plan or project, Appropriate Assessment is required. Article 6(3) states:

'*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*.'

A number of guidance documents on the appropriate assessment process have been referred to during the preparation of this NIS. These are:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (NPWS 2009, Revised February 2010)
- Circular NPW 1/10 & PSSP 2/10 (March 2010)
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007)
- Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (Nov. 2001 – published 2002)
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.

Should a decision be reached to the effect that it cannot be said with sufficient certainty that the development will not have any significant effect on the Natura 2000 sites, then, as is

stated above, it is necessary and appropriate to carry out an appropriate assessment of the implications of the development for the sites in view of their conservation objectives.
The guidance for Appropriate Assessment (NPWS, 2009, revised February 2010) states:

"AA is an impact assessment process that fits within the decision-making framework and tests of Articles 6(3) and 6(4) and, for the purposes of this guidance, it comprises two main elements. Firstly, a Natura Impact Statement – i.e. a statement of the likely and possible impacts of the plan or project on a Natura 2000 site (abbreviated in the following guidance to "NIS") must be prepared. This comprises a comprehensive ecological impact assessment of a plan or project; it examines the direct and indirect impacts that the plan or project might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites' conservation objectives. Secondly, the competent authority carries out the AA, based on the NIS and any other information it may consider necessary. The AA process encompasses all of the processes covered by Article 6(3) of the Habitats Directive, i.e. the screening process, the NIS, the AA by the competent authority, and the record of decisions made by the competent authority at each stage of the process, up to the point at which Article 6(4) may come into play following a determination that a plan or project may adversely affect the integrity of a Natura 2000 site".

2.2 Appropriate Assessment Stages

The European Commission's Guidance promotes a four-stage process to complete the Appropriate Assessment.
Stage 1 – Screening Process
Stage 2 – Appropriate Assessment
Stage 3 – Assessment of alternative Solutions
Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain.

Stage 1 and 2 deal with the main requirements of assessment under Article 6.3. Stage 3 may be part of Article 6.3 or a necessary precursor to Stage 4.

Screening determines whether appropriate assessment is necessary by examining:
1. Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of the site.
2. The potential effects of a project or plan, either alone or in combination with other projects or plans, on a Natura 2000 site in view of its conservation objectives and considering whether these effects will be significant.

Screening involves the following:
1. Description of plan or project, and local site or plan area characteristics.
2. Identification of relevant Natura 2000 sites, and compilation of information qualifying interests and conservation objectives.
3. Assessment of likely effects – direct, indirect on the basis of available information as a desk study and/or field survey and/or primary research as necessary.
4. Screening statement and conclusion.

3.0 Methods

3.1 Zone of influence

The Zone of Influence of a project may be defined as area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities (CIEEM 2016). The zone of influence can extend beyond the project site, for example, where there are ecological or hydrological links beyond the site boundaries.

The NPWS (2010) recommends that: "*the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects*.". Generally, all European sites within 15km of the proposed project are examined. In some circumstances it may be necessary to go beyond this distance (e.g. hydrologically connect site).

Recent guidance from Office of the Planning Regulator (2021) indicates that the zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a Natura 2000 Site. It indicates that this should be established on a case-by-case basis using the Source-Pathway-Receptor framework.

3.2 Desk-top study

A desk study was carried out to gather information available on Natura 2000 sites in the vicinity of the proposed project. The Environmental Protection Agency Appropriate Assessment GeoTool application was used to gather data about SACs and SPAs from the National Parks and Wildlife Service (NPWS). The Environmental Sensitivity Mapping tool (ESM tool) was also consulted (https://airomaps.geohive.ie/ESM/). The NPWS and National Biodiversity Data Centre online databases were consulted concerning designated conservation areas in the vicinity of the proposed development and protected species. The Galway County Council website online planning access - (http://www.galway.ie/en/services/planning/onlineplanningsystems/) was consulted for information on other plans or projects in the area, which may result in a cumulative impact when considered with the proposed development. Other databases consulted include:

- Information on other plans or projects in the area from www.myplan.ie
- Information on soils, geology and hydrogeology in the area www.gsi.ie
- National Biodiversity Action Plan 2017–2021 (Department of Culture, Heritage and the Gaeltacht, 2017)
- Galway County Development Plan 2015-2021
- National Biodiversity database maps https://maps.biodiversityireland.ie/
- Environmental Protection Agency - https://gis.epa.ie/EPAMaps/

3.3 Field Survey

A multidisciplinary walkover survey was conducted on the 17th June 2022 following NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes) by ecologist Dr Richard Stone. All habitats were identified. The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. The survey included a search of all potentially suitable habitat for protected species that are likely to occur in the vicinity of the project area. Habitats were identified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000).

The site is situated in the townland of Claregalway, just under 1 km north of Claregalway village. The Clare River, lies approximately 875 south-west of the project site.

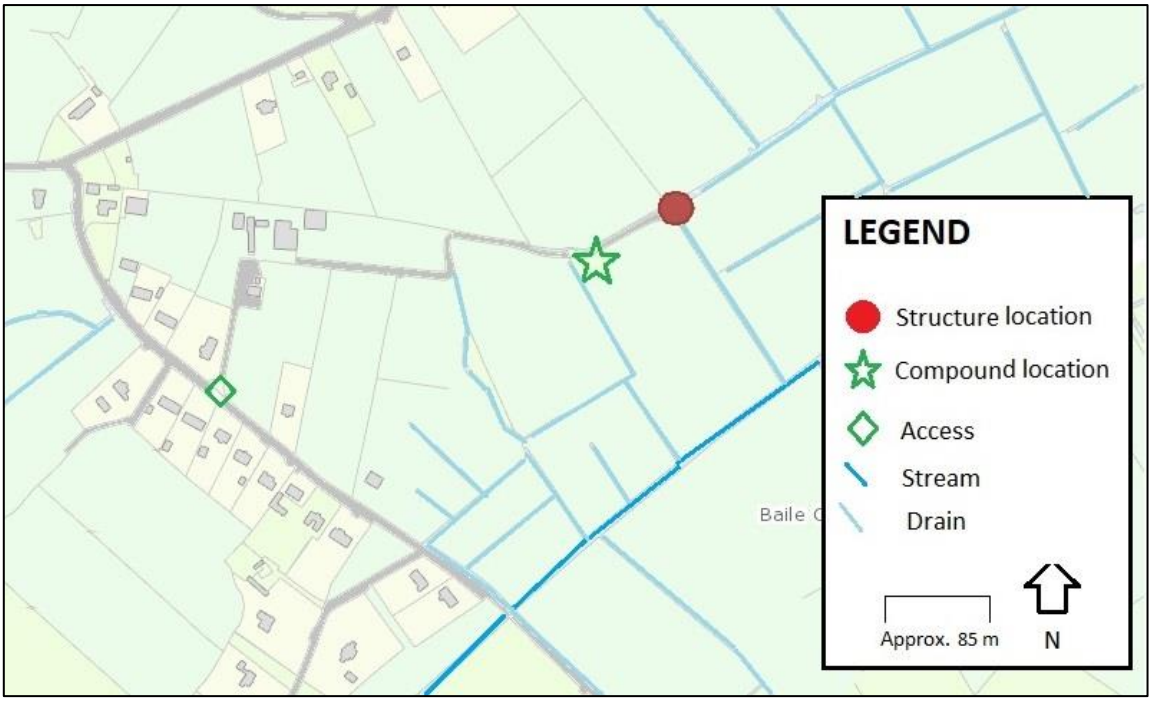
The site is a bridge culvert over a large farm drain between pasture fields (Fossitt Classification GA1). The bridge forms part of the farm track allowing access and animal movement between different areas of the farm. The bridge looks to be used daily as it is on a working dairy farm. From the farm buildings the bridge is approached from the west along a farm track with electric fencing on both sides. There is also an overgrown hedgerow to the north of the approach field (mainly ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*) and oak (*Quercus petraea*)). The farm track crosses the drain and turns right and follows the drain to the south-east with access to the fields to the east. The drain approaches the bridge from the north-east and just before the bridge the drain turns 90 degrees to the south.

The bridge has a large hole in the bed on the north side along the wall this allows material from the road to fall into the water below. There is no rail/wall on the south side.

The drain is well vegetated and on the day of the survey had no noticeable flow direction. The banks are mostly bramble (*Rubus fruticosus* agg.), nettles (*Urtica dioica*), bindweed (*Calystegia* spp.), mint (*Mentha* spp.) with some reeds (*Phragmites*).

The drain is connected to a series of other drains in the neighbouring fields. Old ordnance survey maps suggests that the area was "liable to flooding", and the drains were likely created to prevent this. There was no perceptible flow to the drain but it is connected (175 m) to the EPA stream - WATERDALE 30 (River waterbody code: IE_WE_30C011300, segment code: 30_2418), which in turn connects to the Clare River (595 m).

The soil type (National Soils Survey) is classified as BminDW, which are grey brown podzols and brown earths (well drained mineral soils).



Map 1: Location of proposed project

Photograph 2: View downstream of proposed new bridge

Photograph 3: View upstream of proposed new bridge

Photograph 4: Access to bridge – bridge at corner

4.0 Screening for Appropriate Assessment

The aim of this section of the report is to identify any significant impacts of the proposed development on any adjacent Natura 2000 sites. The report covers Stage 1 screening for appropriate assessment and has been prepared in accordance with the current guidance (NPWS 2009, revised February 2010 and Office of the Planning Regulator 2021).

4.1 Description of development

The proposed project will take place in OPW's Corrib Headford Arterial Drainage Scheme at Claregalway, Co Galway (GPS Coordinates 53.3546, -8.9487, UB2, C3/4/1-200 Chainage). The works will include the extension and repair of an existing pipe culvert bridge. All works will be in accordance with the OPW Standard Design, (Drawing Refs Drawing Refs 2480-DR-003-P2 & 2480-DR-006-P1

A full method statement is given in Appendix 4. Works will include:

- Establishment of site compound which will be set back not less than 50m from the working channel.
- Livestock fencing shall be installed given the location of the works within agricultural land.
- Pre-commencement of works site visit to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services
- When the excavator operator decides to position the excavator adjacent to the riverbank, he must ensure the riverbank is stable, wide enough and has sufficient bearing capacity to accommodate the machine.
- The method of de-watering the works area will be decided upon after mobilisation to site. Consideration will be given to ground conditions and flow rates. The options will be damming and diversion channel or damming and over-pumping
- If a channel diversion is to take place this will be carried out on the right bank as one looks downstream
- Any dam will be constructed using locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level. HDPE pipes may be used if the ground is required to be reinstated to facilitate works
- Silt management will be carried out in such a way as to eliminate/minimise the silt load downstream of the works with the use of silt curtains, straw bales, pipes with baffle boards at inlet to bypass channel etc. Straw bales will be placed in the channel downstream of the works area to capture any silt from the diversion and works.
- Measures for over pumping will generally be water pumped from the excavation area sump which can be released onto grassland at an appropriate distance from the channel to allow natural filtration to occur through the in-situ grasses/soils. This would be the appropriate measure for low flow conditions.

- For damming and over-pumping it will be constructed using a locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level. It should be noted damming will be required for both scenarios. It is not possible to clarify at this time whether damming /over-pumping or a damming/channel diversion will be required. This will be dependent on the existing channel flow conditions at the time of mobilisation to the site. Over pumping will be carried out if there is minimal flow conditions in the channel.
- Demolition works will be carried out in the dry working zone after the installation of diversion channel or over pumping.
- The existing structure will be removed using a hydraulic excavator, operated by an experienced and trained operative. Material will be removed from the area and can used as backfill if appropriate. If the material is to be stored on-site prior to removal, it must be stored in an area away from the channel and works area not less than 30 metres.
- The area around the existing bridge will be excavated to a suitable width and depth as per the requirements of the new bridge design. The invert level of the existing downstream pipe culvert shall be recorded.
- Construction of Box Culvert Bridge - The works on the pipe culvert bridge will be constructed in accordance with the following OPW standard design drawings:
    - 2480-DR-003-P2
    - 2480-DR-006-P1
    - DMK-SK-001
- The channel bed shall be excavated to an appropriate level to allow formation of an adequate base for the foundation of the bridge. The invert level of the pipes will be laid at the same level as the existing structure.
- The ground conditions will be examined and a decision will be made by the Site Foreman and Engineer as to material needed for pipe bedding and concrete foundations. Should it be decided that the ground conditions are poor, imported clean broken stone (3”) and granular material (Cl.804) shall be placed and compacted along with lean-mix concrete to create the formation level. The formation level should be level and checked using a rotating laser level
- Concrete for the foundation of the end-walls and wing-walls shall be poured as per the drawing 2480-DR-003-P2. Two layers of A393 mesh reinforcement shall be used in the foundation if ground conditions are poor. 40mm cover shall be maintained between the reinforcement and the external finish of the concrete.
- The pipe shall be lifted into place using the tracked excavator. The pipe diameter will match the existing pipes. The pipe(s) will be haunched with lean-mix concrete to a depth of 500mm on all sides. Concrete fill shall be held back from the ends of the pipe to ensure that there is sufficient cover for the concrete end walls.

- The new end walls shall be formed around both pipe ends as per the design drawing. Peri Formwork shall be used to form the end walls and wing-walls. The end-walls shall be formed to reach upwards and create a foundation for the parapet walls.
- Erect formwork for wing-walls (as per manufacturer/supplier instructions). Wing-walls are to be constructed as per OPW standard design drawings. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and end walls and vibrated using a poker vibrator. Steel dowel bars shall be inserted in the wet concrete for the parapet walls. A concrete slab shall be poured between the two end walls to the finished level of the bridge crossing.
- The removal of the cofferdam or re-instate diversion channel, depending on method used shall only be undertaken when the concrete has cured sufficiently.
- Following the completion of the construction works, the surrounding area shall be re-instated to a condition similar to, or better than the pre-works situation.
- Boundaries shall be re-established to the landowner's satisfaction and a photographic survey of the completed works shall be carried out by the Site Foreman. Records of any utility diversions and their locations shall be maintained and filed appropriately. A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.

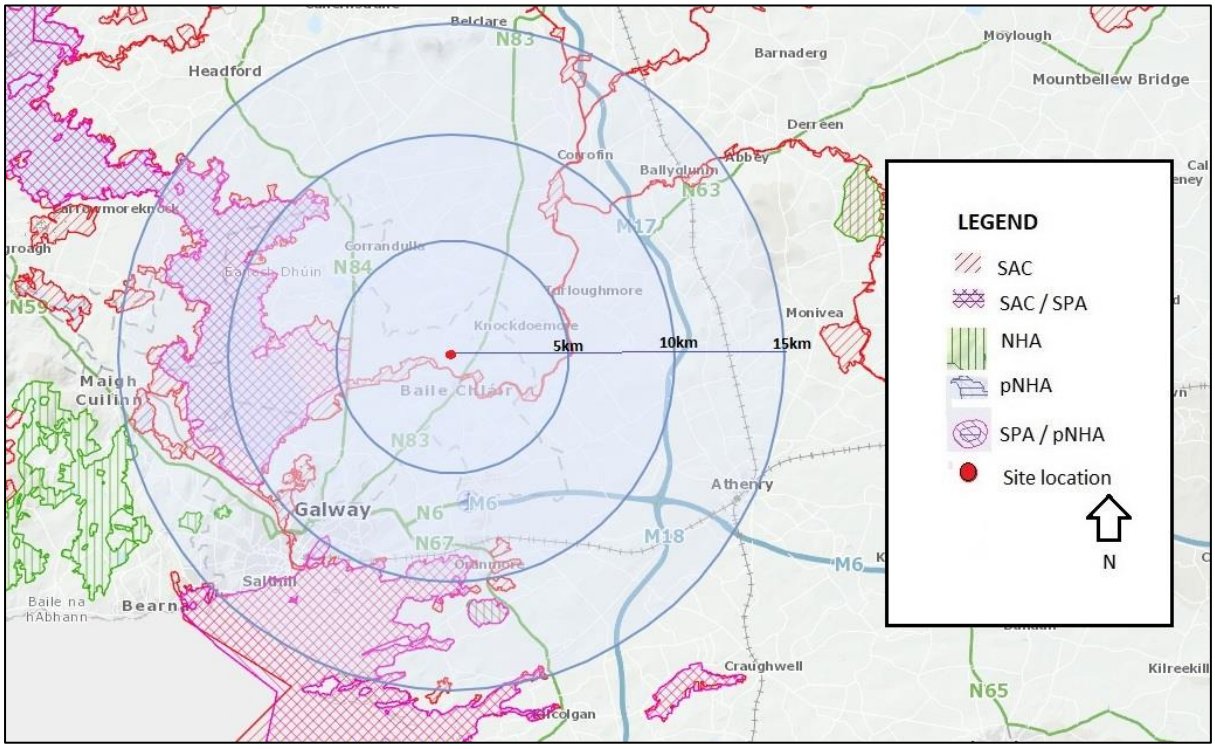
Photograph 5: View of bridge showing hole

4.2 Description of Natura 2000 sites

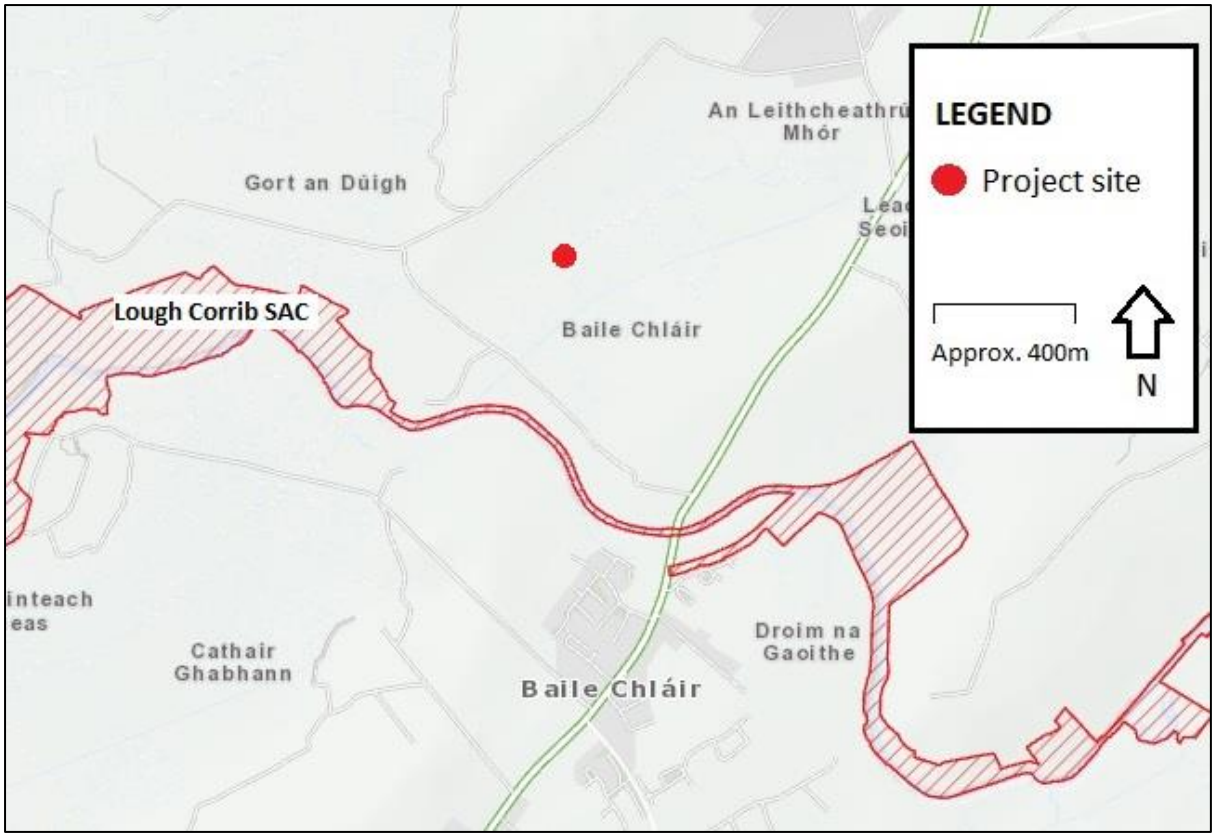
Due to the scale and nature of the proposed project the zone of influence is highly unlikely to extend to 15 km. However, in order to ensure no impact on Natura 2000 sites occurring within 15 km of the project site, all were considered for the initial assessment.

There are three Special Protection Areas (SPA) and two Special Areas of Conservation (SAC) within 15 km of the project site. The closest Natura 2000 sites are Lough Corrib SAC (approximately 5544 m) and Lough Corrib SPA (approximately 4.6 km from project site).

Seven Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHA) lie within 15 km of the site (see Table 2 below). The basic designation for wildlife is the Natural Heritage Area. It is an area considered important for the habitats present, or which holds species of plants and animals whose habitat needs protection. Proposed Natural Heritage Areas (pNHA) were published on a non-statutory basis in 1995. They have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats. A process is underway to resurvey and formally designate some pNHAs as NHAs.



Map 1. Natura 2000 sites within 15 km radius of site
(Map source https://viewer.myplan.ie/)



Map 2. Section of Lough Corrib SAC with site location at Claregalway
(Map source - https https://viewer.myplan.ie/)

Table 1: Natura 2000 sites lying in a 15 km radius of the proposed development site and connectivity to Natura sites

Site name, site code and brief site description	Qualifying Interests (* denotes a priority habitat)	Distance To (m)	Down-stream distance (m)	Connectivity / Comment
Lough Corrib SAC (Site code: 000297) Lough Corrib is the second largest lake in Ireland. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. The rivers include the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site. The site supports a number of rare plants. The lake is rated as an internationally important site for waterfowl. Atlantic Salmon use the lake and rivers as spawning grounds. A population of Freshwater Pearl Mussel and White-clawed Crayfish also occur. A summer roost of Lesser Horseshoe Bat is also found in the SAC.	**Habitats** 3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea 3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion 7210 Calcareous fens with Cladium mariscus and species of the Caricion	555	557	SAC lies to the south and west of the project site. Potential hydrological connection to site though drain to the EPA River WATERDALE 30 (IE_WE_30C011300, Segment code: 30_2418). Project area lies just over 550 m for Natura site. Further assessment required.

	davallianae* 7220 Petrifying springs with tufa formation (Cratoneurion)* 7230 Alkaline fens 8240 Limestone pavements* 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles 91D0 Bog woodland* **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)* 1355 Otter *(Lutra lutra)* 6216 Slender Green Feather-moss *(Hamatocaulis vernicosus)* 1833 Slender Naiad *(Najas flexilis)* 1029 Freshwater Pearl Mussel *(Margaritifera margaritifera)* 1092 White-clawed Crayfish *(Austropotamobius pallipes)* 1095 Sea Lamprey *(Petromyzon marinus)* 1096 Brook Lamprey *(Lampetra planeri)* 1106 Salmon *(Salmo salar)*			
Galway Bay Complex SAC (Site code: 000268) This site comprises the inner, shallow part of a large bay. The Burren karsticlimestone fringes the southern sides and extends into the sublittoral. West of Galway city the bedrock geology is granite. There are numerous shallow and intertidal inlets on the eastern and southern sides. A number of small islands composed of glacial deposits are located along the eastern side. The site has a diverse range	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1150 Coastal lagoons* 1160 Large shallow inlets and bays 1170 Reefs 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1310 Salicornia and other annuals	8461	22038	SAC lies over 8 km south of project site and is hydrologically connected through the River Clare and Lough Corrib to the SAC. Due to a terrestrial separation distance of over 8 km, and a downstream hydrological distance of over 22 km, the size and scale of the proposed project and the assimilative capacity of the intervening waterways (namely the River Clare and Lough Corrib) there is no possibility for

of marine, coastal and terrestrial habitats, including several listed on Annex I including saltmarshes, lagoons, fens as well as other coastal habitats. Common Seal and Otter also occur. It is a very important ornithological site, with nationally important populations of Great Northern Divers, Black-throated Divers, Scaup, Long-tailed Duck and Red-breasted Merganser. The intertidal areas and shoreline provides feeding and roosting habitat for wintering waterfowl, including international important numbers of Brent Goose. Sandwich Terns and Common Terns breed in the site.	colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1410 Mediterranean salt meadows (Juncetalia maritimi) 3180 Turloughs* 5130 Juniperus communis formations on heaths or calcareous grasslands 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae* 7230 Alkaline fens 8240 Limestone pavements* **Species** 1365 Harbour Seal *(Phoca vitulina)* 1355 Otter *(Lutra lutra)*			significant effects on the qualifying interests of this SAC.
Lough Corrib SPA **(Site code: 004042)** Lough Corrib can be divided into two parts: a relatively shallow basin in the south, which is underlain by Carboniferous limestone, and a larger, deeper basin to the north, which is underlain by more acidic granite, schists, shales and sandstones. The main inflowing rivers are the Black, Clare, Dooghta, Cregg, Owenriff and the channel from Lough Mask. The main outflowing river is the Corrib, which reaches the sea at Galway City. The shallow, lime-rich waters of the southern basin of the	**Birds** A059 Pochard *(Aythya ferina)* A061 Tufted Duck *(Aythya fuligula)* A194 Arctic Tern *(Sterna paradisaea)* A065 Common Scoter *(Melanitta nigra)* A182 Common Gull *(Larus canus)* A140 Golden Plover *(Pluvialis apricaria)* A082 Hen Harrier *(Circus cyaneus)* A125 Coot *(Fulica atra)* A051 Gadwall *(Anas strepera)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* A056 Shoveler *(Anas clypeata)* A193 Common Tern *(Sterna hirundo)*	4616	8121	SPA lies over 4 km west of project site and is hydrologically connected through the River Clare and Lough Corrib. Due to a terrestrial separation distance of over 4.6 km, and a downstream hydrological distance of over 8 km, the size and scale of the proposed project and the assimilative capacity of the intervening waterways (namely the River Clare and Lough Corrib) there is no possibility for significant effects on the species of conservation interests of this SPA.

lake support extensive beds of Stoneworts (Charophytes), an important source of food for waterfowl. The northern basin contains more oligotrophic and acidic waters. Greenland White-fronted Goose, Gadwall, Shoveler, Pochard, Tufted Duck, Common Scoter, Hen Harrier, Coot, Golden Plover, Black-Headed Gull, Common Gull, Common Tern and Arctic Tern all occur.	A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)* **Habitats** Wetlands			
Inner Galway Bay SPA **(Site code: 004031)** This is a very large, marine-dominated site with a variety to the marine habitats and communities. The inner bay is protected from exposure to Atlantic swells by the Aran Islands and Black Head. The site has several important populations of breeding birds, including nationally important colonies of Sandwich Tern and Common Tern and Cormorant. The site also has two wintering populations of international importance and a further sixteen wintering species having populations of national importance. Six of the regularly occurring species are listed on Annex I of the EU Birds Directive, i.e. Black-throated Diver, Great Northern Diver, Golden Plover, Bar-tailed Godwit, Sandwich Tern and Common Tern.	**Birds** A046 Light-bellied Brent Goose *(Branta bernicla hrota)* A149 Dunlin *(Calidris alpina)* A069 Red-breasted Merganser *(Mergus serrator)* A162 Redshank *(Tringa totanus)* A182 Common Gull *(Larus canus)* A003 Great Northern Diver *(Gavia immer)* A017 Cormorant *(Phalacrocorax carbo)* A169 Turnstone *(Arenaria interpres)* A142 Lapwing *(Vanellus vanellus)* A050 Wigeon *(Anas penelope)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* A160 Curlew *(Numenius arquata)* A002 Black-throated Diver *(Gavia arctica)* A140 Golden Plover *(Pluvialis apricaria)* A157 Bar-tailed Godwit *(Limosa lapponica)* A052 Teal *(Anas crecca)* A191 Sandwich Tern *(Sterna*	9011	22737	SPA lies over 9 km south of project site and is hydrologically connected through the River Clare and Lough Corrib. Due to a terrestrial separation distance of over 9 km, and a downstream hydrological distance of over 22 km, the size and scale of the proposed project and the assimilative capacity of the intervening waterways (namely the River Clare and Lough Corrib) there is no possibility for significant effects on the species of conservation interests of this SPA.

	sandvicensis) A137 Ringed Plover *(Charadrius hiaticula)* A193 Common Tern *(Sterna hirundo)* A028 Grey Heron *(Ardea cinerea)* **Habitats** Wetlands			
Cregganna Marsh SPA **(Site code: 004142)** Cregganna Marsh is situated about 3 km south of Oranmore. The predominant habitats on the site are lowland wet grassland and improved grassland, but areas of limestone pavement and other exposed rock, Hazel (Corylus avellana) scrub, freshwater marsh, drainage ditches and dry grassland are also represented. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greenland White-fronted Goose.	**Birds** A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)*	11050.16	N/A	SPA lies over 11 km south of project site. There is no hydrologically connection from project site to this SPA. Due to a terrestrial separation distance of over 11 km, no hydrological connection, the size and scale of the proposed project) there is no possibility for significant effects on Greenland White-fronted Goose within this SPA.

Table 2: Natural Heritage Area and proposed Natural Heritage Areas lying in a 15 km radius of the proposed project

Site Code	Natural Heritage Area	Approximate Distance from site (km)	Connectivity / comment
000287	Kiltullagh Turlough pNHA	4.2	No direct hydrological connection
000253	Cregganna Marsh NHA	11.0	No direct hydrological connection
001788	Turloughcor	12.0	No direct hydrological connection
001322	Turlough Monaghan	12.0	No direct hydrological connection
002364	Moycullen Bogs NHA	12.2	No direct hydrological connection
000228	Ballycuirke Lough	13.5	No direct hydrological connection
001288	Knockmaa Hill	13.9	No direct hydrological connection

4.3 Assessment of Likely Effects

The proposed project is not directly connected with or necessary to the management of any Natura 2000 site. In light of this the site must be subject to AA for its implications for the Natura 2000 sites in view of the site's conservation objectives "*if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects*" (EC, 2006). The assessment is based on a preliminary impact assessment using available information and data (e.g. NPWS data, water quality data etc.), supplemented with local site information and ecological surveys.

In order, to assess the likely impacts and ascertain whether a significant impact on the integrity of the Natura site is likely to occur as a result of the proposed development it is necessary to consider what constitutes the integrity of a Site as referred to in Article 6(3). The document Managing Natura 2000 Site, the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000) gives clear guidance and states: "*The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives*".

4.3.1 Direct, indirect or secondary impacts

The screening analysis below considers each qualifying interest of the Lough Corrib SAC and list the potential pathway and potential threat source and whether it is likely to have a significant effect on the qualifying habitats or species or species of special conservation interest.

Table 3: Lough Corrib SAC – Screening analysis (using source-pathway-receptor model) to identify SAC qualifying habitats and any "Likely Significant Effects" of impacts on Natura 2000 site, based on current project proposals.

Qualifying habitat and code (P*otential receptors*)	**Conservation objectives**	**Pathway / Comment**	**Source of Potential Threats/ Pressures**	**Likelihood of significant**
Oligotrophic Waters containing very few minerals 3110	To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes • Typical species present, in good condition, and demonstrating typical abundances and distribution • Vegetation composition: All characteristic zones should be present, correctly distributed and in good condition • Restore maximum depth of vegetation distribution, subject to natural processes • Maintain appropriate natural hydrological regime necessary to support the habitat • Restore appropriate lake substratum type, extent and chemistry to support the vegetation • Water quality: Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency • Restore the concentration of nutrients in the	Surface water pathway.	Sediment or pollution run-off from proposed works to nearby waterbody, changes in natural hydrology	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) are frequent in catchments where peatland overlies acid bedrock and the habitat is best developed on more gentle slopes along sheltered shorelines, while also being found in upland lakes, such as corries (O'Connor, 2015). Project site is located on drain that is linked to the WATERDALE 30 stream which flows directly into the Clare River. The drain is well vegetated especially along the section that links to the WATERDALE 30 stream Oligotrophic Waters containing very few minerals habitat lies over 7.7 km downstream from site in Lough Corrib itself. Due to this downstream hydrological distance being over 7 km, and the size and scale of the proposed project and the assimilative capacity of the intervening

	water column to sufficiently low levels to support the habitat and its typical species • Phytoplankton biomass: Restore appropriate water quality to support the habitat, including high chlorophyll a status • Phytoplankton composition: Maintain appropriate water quality to support the habitat, including high phytoplankton composition status • Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status • Maintain high macrophyte status • Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes • Restore/maintain appropriate water colour to support the habitat • Restore/maintain appropriate organic carbon levels to support the habitat • Restore/maintain appropriate turbidity to support the habitat • Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110			waterways (namely the well vegetated drain, the Waterdale_30 stream, the River Clare and Lough Corrib) there is no possibility for significant effects on Oligotrophic Waters containing very few minerals.
Oligotrophic to Mesotrophic Standing Waters 3130	To restore the favourable conservation condition of Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoëto-Nanojuncetea in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to	Surface water pathway	Sediment or pollution run-off from proposed works to nearby waterbody, changes in natural hydrology	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea in Ireland have been defined as mixed Najas flexilis lake habitat occurring in lakes with circum-neutral, low-nutrient waters in catchments of mixed geology (O'Connor, 2015). Habitat generally occurs in north-west

	natural processes • Typical species present, in good condition, and demonstrating typical abundances and distribution • Vegetation composition: All characteristic zones should be present, correctly distributed and in good condition • Restore maximum depth of vegetation, subject to natural processes • Maintain appropriate natural hydrological regime necessary to support the habitat • Restore appropriate substratum type, extent and chemistry to support the vegetation • Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency • Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species • Restore appropriate water quality to support the habitat (phytoplankton biomass), including high chlorophyll a status • Maintain appropriate water quality to support the habitat, including high phytoplankton composition status • Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status • Maintain high macrophyte status • Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes • Restore/maintain appropriate water colour to support the habitat • Restore/maintain appropriate organic carbon levels to support the habitat			section of Lough Corrib. Project site is located on drain that is linked to the WATERDALE 30 stream which flows directly into the Clare River. The drain is well vegetated especially along the section that links to the WATERDALE 30 stream Oligotrophic to Mesotrophic Standing Waters habitat lies over 7.7 km downstream from site in Lough Corrib itself. Due to this downstream hydrological distance being over 7 km, and the size and scale of the proposed project and the assimilative capacity of the intervening waterways (namely the well vegetated drain, the Waterdale_30 stream, the River Clare and Lough Corrib) there is no possibility for significant effects on Oligotrophic Waters containing very few minerals.

	• Restore/maintain appropriate turbidity to support the habitat • Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3130			
Hard Water Lakes 3140	To restore the favourable conservation condition of Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes • Typical species present, in good condition, and demonstrating typical abundances and distribution • Vegetation composition: All characteristic zones should be present, correctly distributed and in good condition • Vegetation distribution: Restore maximum depth of vegetation, subject to natural processes • Maintain appropriate natural hydrological regime necessary to support the habitat • Restore appropriate lake substratum type, extent and chemistry to support the vegetation • Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency • Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species—phytoplankton biomass Maintain appropriate water quality to support the habitat, including high chlorophyll a	Surface water pathway	Sediment or pollution run-off from proposed works to nearby waterbody, changes in natural hydrology	The Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. habitat is strongly associated with lowland lakes over limestone bedrock (O'Connor, 2015). The habitat is dominated by algae, in particular Chara spp., and may have 'krustenstein', a cyanobacterial crust found on rock in waters less than 2m deep (Roden & Murphy, 2013). Project site is located on drain that is linked to the WATERDALE 30 stream which flows directly into the Clare River. The drain is well vegetated especially along the section that links to the WATERDALE 30 stream Hard Water Lakes habitat lies over 7.7 km downstream from site in Lough Corrib itself. Due to this downstream hydrological distance being over 7 km, and the size and scale of the proposed project and the assimilative capacity of the intervening waterways (namely the well vegetated drain, the Waterdale_30 stream, the River Clare and Lough Corrib) there is no

	status • Maintain appropriate water quality to support the habitat, including high phytoplankton composition status • Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status • Restore high macrophyte status • Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes • Restore/maintain appropriate water colour to support the habitat • Restore/maintain appropriate organic carbon levels to support the habitat • Restore/maintain appropriate turbidity to support the habitat • Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140			possibility for significant effects on Hard Water Lakes
Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion 3260	To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes • Maintain appropriate hydrological regimes including river flow • Maintain appropriate hydrological regimes –	Surface water pathway.	Nutrient enrichment agricultural pollution	The definition of Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion vegetation (short name: Vegetation of flowing waters) is very broad, and in practice includes the majority of rivers and streams with notable aquatic plant communities (Kelleher, 2011; Hatton-Ellis & Grieve, 2003). Little is known about the distribution of the habitat and its sub-types in this SAC. The River Clare (which falls with the SAC designation) lies less than 1km

	groundwater discharge • Maintain appropriate substratum particle size range, quantity and quality, subject to natural process • Maintain appropriate water quality to support the natural structure and functioning of the habitat • Vegetation composition: Typical species of the relevant habitat sub-type should be present and in good condition • The area of active floodplain at and upstream of the habitat should be maintained • Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types			downstream of project site. Due to nature, size and scale of the proposed project, and the fact there will be no change in the hydrological site characteristics, there is unlikely to be significant impacts on Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion. However, as location of habitat is not mapped it will be screen-in on a precautionary basis
Orchid-rich Calcareous Grassland* 6210	To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) in Lough Corrib SAC in ow-ing list of attributes and targets: Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to nat-ural processes • At least seven positive indicator species present, including two "high quality" species • Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10% • Cover of non-native species not more than 1% • Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover	Land/Air pathway	Overgrazing, supplementar y feeding	Habitat occurs mainly as small areas and in association with other habitats in this SAC. None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1), and drains There is no possibility for significant effects on Calcareous grassland due to the terrestrial nature of this habitat, no potential for habitat loss or degradation, and the small the size and scale of the proposed project. In addition, works will be contained within the project site.

	• Broadleaf herb component of vegetation between 40% and 90% • At least 30% of sward between 5cm and 40cm tall • Litter cover not more than 25% • Not more than 10% bare Soil • Area showing signs of serious grazing or other disturbance less than 20-sqmetres-			
Molinia Meadows 6410	To maintain the favourable conservation condition of *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing subject to natural processes • No decline in habitat distribution, subject to natural processes • At least seven positive indicator species present, including one "high quality" species as listed in O'Neill et al. (2013) • Negative indicator species collectively not more than20% cover, with cover by an individual species not more than 10% • Cover of non-native species not more than 1% • Hair mosses (*Polytrichum* spp.) not more than 25% cover • Cover of woody species and bracken (*Pteridium aquilinum*) not more than5% • Broadleaf herb component of vegetation between 40% and 90% • At least 30% of sward between 10cm and 80cm tall	Land/Air pathway	Overgrazing, afforestation, Drainage, Intensification of agricultural	Habitat not fully mapped for SAC. None of this habitat recorded on or close to the project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on *Molinia* Meadows due to the terrestrial nature of this habitat and the small the size and scale of the proposed project. and no potential for habitat loss or degradation. In addition, works will be contained within the project site.

	• Litter cover not more than 25% • Not more than 10% bare Soil • Area showing signs of serious grazing or other disturbance less than 20-sq metres			
Raised Bog (Active)* 7110	To restore the favourable conservation condition of Active raised bogs* in Lough Corrib SAC, which is defined by the following list of attributes and targets: Restore the area of active raised bog to 78.8ha, subject to natural processes • Restore the distribution and variability of active raised bog across the SAC • No decline in extent of high bog subject to the conservation requirements of the SAC. See map 4 for mapped extent • Restore appropriate water levels throughout each site • Restore, where possible, appropriate high bog topography, flow directions and slopes. See map 6 for current situation • Restore adequate transitional areas (including cut over) to support/protect the raised bog ecosystem and the services it provides • Restore 39.4ha of central ecotope/active flush/soaks/bog woodland as appropriate • Restore adequate cover of high quality microtopographical features • Restore adequate cover of bog moss (Sphagnum) species to ensure peat forming capacity • Restore, where appropriate, typical active raised bog flora • Restore, where appropriate, typical active raised	Land/Air pathway	Drainage and afforestation of surrounding habitat	There are two raised bogs for which Active Raised Bog (ARB) has been selected in Lough Corrib SAC: Addergoole Bog (over 6 km from site) and Lough Tee Bog (over 22 km upstream of site). None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Raised Bog (Active) due to the small size and scale of the proposed project, no potential for habitat loss or degradation, no impacts of drainage, and works being contained within the project site.

	bog fauna • Maintain features of local distinctiveness, subject to natural processes • Negative physical features absent or insignificant • Native negative indicator species at insignificant levels • Non-native invasive species at insignificant levels and not more than 1% cover • Air quality surrounding the bogs close to natural reference conditions. The total nitrogen deposition should not exceed 5kg N/ha/yr • Water quality on the high bog and in transitional areas close to natural reference conditions			
Degraded Raised Bog 7120	The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in Lough Corrib SAC	Land/Air pathway	Drainage and afforestation of surrounding habitat	Has not been mapped for this SAC but does not occur within site. None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on degraded raised bog due to the small size and scale of the proposed project, no potential for habitat loss or degradation, no impacts of drainage, and works being contained within the project site.
Rhynchosporion Vegetation 7150	Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in	Land/Air pathway	Drainage and afforestation of surrounding	Has not been mapped for this SAC. None of this habitat recorded on project site during site visit. Project site is

	Lough Corrib SAC		habitat	composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Rhynchosporion Vegetation due to no potential for habitat loss or degradation, the small size and scale of the proposed project. no impacts of drainage, and works being contained within the project site.
Cladium Fens* 7210	To maintain the favourable conservation condition of Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes • Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat • Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat • Maintain active peat formation, where appropriate • Maintain appropriate water quality, particularly nutrient levels, to support the natural structure and functioning of the habitat • Maintain vegetation cover of typical species including brown mosses and vascular plants	Land/Air pathway	Hydrology Drainage	Has not been mapped for this SAC. None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Cladium Fens due to no potential for habitat loss or degradation, no impacts of drainage, works will be contained within the project site and the small size and scale of the proposed project.

	• Cover of non-native species less than 1% • Cover of scattered native trees and shrubs less than 10% • Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1% • Areas showing signs of drainage as a result of drainage ditches or heavy trampling not more than 10% • No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
Petrifying Springs* 7220	To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion)* in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes • Maintain appropriate hydrological regimes, e.g. water table height and water flow • No increase from baseline nitrate level and less than 10mg/l • No increase from baseline phosphate level and less than 15µg/l • At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number • Potentially negative indicator species should not be Dominant or Abundant; invasive species should be absent	Land/Air pathway	Pollution	Has not been mapped for this SAC. None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Petrifying Springs due to no potential for habitat loss or degradation, no potential for impact on the hydrological regime supporting this habitat, works will be contained within the project site and the small size and scale of the proposed project.

	• Field layer sward height between 10cm and 50cm (except for bryophyte-dominated ground <10cm) • Trampling/dung: Cover should not be Dominant or Abundant			
Alkaline Fens 7230	To maintain the favourable conservation condition of Alkaline fens in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes • Maintain soil nutrient status within natural range • Maintain active peat formation, where appropriate • Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat • Maintain appropriate water quality, particularly nutrient levels, to support the natural structure and functioning of the habitat • Maintain variety of vegetation communities, subject to natural processes • Number of brown moss species present at each monitoring stop is at least one • Number of positive vascular plant indicator species present at each monitoring stop is at least two for small-sedge flushes and at least three for black bog-rush (*Schoenus nigricans*) flush and bottle sedge (*Carex rostrata*) fen	Land/Air pathway	Pollution	Has not been mapped for this SAC. None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Alkaline Fens due to no potential for habitat loss or degradation, no impacts of drainage, works will be contained within the project site and the small size and scale of the proposed project.

	• Total cover of brown moss species and positive vascular plant indicator species at least 20% for small-sedge flushes and at least 75% cover for black bog-rush (*Schoenus nigricans*) flush and bottle sedge (*Carex rostrata*) fen • Total cover of negative indicator species less than 1% • Cover of non-native species less than 1% • Cover of scattered native trees and shrubs less than 10% • Total cover of soft rush (*Juncus effusus*) and common reed (*Phragmites australis*) less than 10% • Proportion of live leaves and/or flowering shoots of vascular plants that are more than 5cm above the ground surface should be at least 50% • Cover of disturbed bare ground less than 10% • Area showing signs of drainage as a result of drainage ditches or heavy trampling less than 10% • Disturbed proportion of vegetation cover where tufa is present is less than 1% • No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat			
Limestone Pavement* 8240	To maintain the favourable conservation condition of Limestone pavements* in Lough Corrib SAC, which is defined by the following list of attributes and targets: Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution, subject to natural processes. • Vegetation composition: At least seven positive	Land/Air pathway	Overgrazing Invasive species	None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Limestone Pavement due to the terrestrial nature of this habitat, the small size and scale of the proposed project, no potential for habitat loss or degradation,

	indicator species present • Bryophyte cover at least 50% on wooded pavement • Collective cover of negative indicator species on exposed pavement not more than 1% • Cover of non-native species not more than 1% on exposed pavement; on wooded pavement not more than 10% with no regeneration • Scrub cover no more than 25% of exposed pavement • Bracken (*Pteridium aquilinum*) cover no more than 10% on exposed pavement • Canopy cover on wooded pavement at least 30% • Sufficient quantity of dead wood on wooded pavement to provide habitat for saproxylic organisms • No evidence of grazing pressure on wooded pavement • Indicators of local distinctiveness are maintained			and works will be contained within the project site.
Old Oak Woodlands 91A0	To maintain the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in Lough Corrib SAC, which is defined by the following list of attributes and targets: Habitat area stable or increasing, subject to natural processes • No decline in habitat distribution. Surveyed location shown on map • Size of woodland area stable or increasing. Where topographically possible, "large"; woods at least 25ha in size and “small” woods at least 3ha in size • Diverse structure with a relatively closed canopy	Land/Air pathway	Invasive species	Occurs mainly along shores of Lough Corrib, recorded woodland is on opposite shore of lake (western shore) to project site, over 25 km from project site (NPWS 2017). None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and small drain. There is no possibility for significant effects on Old Oak Woodlands due to a terrestrial separation distance greater

	containing mature trees; subcanopy layer with semimature trees and shrubs; and well-developed herb layer • Woodland structure: Maintain diversity and extent of community types • Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy • At least 30-cubmetres-/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter • No decline in veteran trees • No decline in indicators of local distinctiveness • No decline in native tree cover - not less than 95% • A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*) • Negative indicator species, particularly non-native invasive species, absent or under control			than 25 km, no potential for habitat loss or degradation, works will be contained within the project site and the small size and scale of the proposed project.
Bog Woodland* 91D0	To maintain the favourable conservation condition of Bog woodland* in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Habitat area stable or increasing, subject to natural processes. At least 1.22ha • No decline in habitat distribution, subject to natural processes. • Birch (*Betula pubescens*), bog moss (*Sphagnum*) species and at least five other indicator species present • Both native and non-native invasive species	Land/Air pathway	Invasive species	Conservation objectives maps show recorded bog woodland over 5.5 km from site (NPWS 2017). None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and drain. There is no possibility for significant effects on Bog Woodland due to a terrestrial separation distance greater

	absent or under control. Total cover should be less than 10% • A minimum 30% cover of birch (*Betula pubescens*) with a median canopy height of 4m • Dwarf shrub cover not more than 50% • Ling (*Calluna vulgaris*) cover not more than 40% • Bryophyte cover at least 50%, with bog moss (*Sphagnum* spp.) cover at least 25% • Each tree size class present • Senescent or dead wood present			than 5 km, no potential for habitat loss or degradation, works will be contained within the project site and the small size and scale of the proposed project.
Freshwater Pearl Mussel (*Margaritifera margaritifera* 1029	To restore the favourable conservation condition of Freshwater Pearl Mussel in Lough Corrib SAC, which is defined by the following list of attributes and targets • Distribution - Maintain at 9.1km • Restore Owenriff population to at least one million adult mussels • Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length • No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution • No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution • Restore condition of suitable habitat • Restore water quality - macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93 • Restore substratum quality - filamentous algae:	Surface water pathway. Land/Air pathway	Pollution, sedimentation	Widespread in the Owenriff catchment, found in the lower reaches of the Glengawbeg River, from Lough Agraffard to just upstream of the mouth of Lough Corrib in the Owenriff, and also in the Derrygauna tributary. These sites are all on the western side of Lough Corrib. While there is a hydrological connection from project site to Lough Corrib, there is no possibility for significant effects on Freshwater Pearl Mussel due to the assimilative capacity of the lake, and the fact that this species occurs upstream in the Owenriff catchment. In addition, the size and scale of the proposed development is small.

	absent or trace (less than 5%); macrophytes: absent or trace (less than 5%) • Restore substratum quality - stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment • Restore to no more than 20% decline from water column to 5cm depth in substrate • Restore appropriate hydrological regimes • Maintain sufficient juvenile salmonids to host glochidial larvae • Maintain the area and condition of fringing habitats necessary to support the population			
White-clawed Crayfish (*Austropotamobius pallipes*) 1092	To maintain the favourable conservation condition of White-clawed Crayfish in Lough Corrib SAC, which is defined by the following list of attributes and targets: No reduction from baseline in distribution (rivers). • No reduction from Baseline in distribution – Lough Corrib • Juveniles and/or females with eggs in all occupied tributaries and occupied parts of Lough Corrib • No alien crayfish species • No instances of disease • At least Q3-4 at all sites sampled by EPA • No decline in habitat heterogeneity or habitat quality	Surface water pathway.	Water pollution, disturbance, poor substrate quality	White-clawed Crayfish have been recorded on the Clare River, both 1 km upstream (M372332) and also 5km downstream of project site at Curraghmore Bridge (M321328). There is a very small possibility that crayfish could occur close to where the drain enters the Waterdale 30 stream and where the stream enters the River Clare and so there is a small possibility for significant effects on White clawed Crayfish if a pollution or sediment incident occurs during works
Sea Lamprey (*Petromyzon marinus*) 1095	To restore the favourable conservation condition of Sea Lamprey in Lough Corrib SAC, which is defined by the following list of attributes and targets:	Surface water pathway.	Water pollution	Records from lower section of River Corrib. There is no possibility for significant

	Extent of Anadromy: Greater than 75% of main stem length of rivers accessible from estuary • At least three age/size groups present • Mean catchment juvenile density at least 1/-sqmetres • No decline in extent and distribution of spawning beds • More than 50% of sample sites positive, with a minimum of four positive sites in a catchment, which are at least 5km apart			effects on Sea lamprey due to the assimilation capacity of the intervening lake (Lough Corrib). In addition, the size and scale of the proposed project is small.
Brook Lamprey (*Lampetra planeri*) 1096	To maintain the favourable conservation condition of Brook Lamprey in Lough Corrib SAC, which is defined by the following list of attributes and targets: Access to all watercourses down to first order streams • At least three age/size groups of brook/river lamprey present • Mean catchment ammocoete density of brook/river lamprey at least 5/-sqmetres- • No decline in extent and distribution of spawning beds • More than 50% of sample sites positive	Surface water pathway.	Water pollution	Lamprey are generally under recorded. Potential for species to occur within River Clare. There is a very small possibility that Brook Lamprey could occur close to where the drain enters the Waterdale 30 stream and where the stream enters the River Clare and so there is a small possibility for effects on Brook Lamprey if a pollution or sediment incident occurs during works
Atlantic Salmon (*Salmo salar*) 1106]	To maintain the favourable conservation condition of Atlantic Salmon in Lough Corrib SAC, which is defined by the following list of attributes and targets: 100% of river channels down to second order accessible from estuary • Adult spawning fish: Conservation limit (CL) for	Surface water pathway.	Pollution, sedimentation	Salmon have been recorded in Lough Corrib and are known to spawn in the headwaters of Lough Corrib tributaries and are known to occur in the River Clare. There is a very small possibility that salmon could occur close to where the drain enters the Waterdale 30 stream and

	each system consistently exceeded • Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling • No significant decline in out-migrating smolt abundance • No decline in number and distribution of spawning redds due to anthropogenic causes • Water quality: At least Q4 at all sites sampled by EPA			where the stream enters the River Clare and so there is a small possibility for effects on salmon if a pollution or sediment incident occurs during works
Lesser Horseshoe Bat (*Rhinolophus hipposideros* 1303	To restore the favourable conservation condition of Lesser Horseshoe Bat in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Minimum number of 100 bats for summer roost (roost id. 217 in NPWS database) • No decline in Summer roost • No decline in number of auxillary roosts • No decline in extent of potential foraging habitat • No significant loss of linear features, within 2.5km of qualifying roosts. • No significant increase in artificial light intensity adjacent to named roost or along commuting routes within 2.5km of the roost	Land/Air pathway	Disturbance, destruction of roost sites Loss of foraging habitat	The closest records of Lesser Horseshoe Bat are over 3.8 km from the project site (M356378) though it should be noted that this record does not occur within the SAC. Lesser horseshoe bats use buildings as roosts. There are no buildings on or close to the project site. In addition, there will be no decline of foraging habitat within 2.5km of qualifying roosts (which lies north of Lough Corrib and therefore over 30 km away) and no decline of linear features within 2.5km of qualifying roosts and no increase in artificial lighting adjacent to roosts or along commuting routes within 2.5 km.
Otter (*Lutra lutra*) 1355	To maintain the favourable conservation condition of Otter in Lough Corrib SAC, which is defined by the following list of attributes and targets: • No significant decline in distribution • No significant decline in extent of terrestrial	Surface water pathway.	Sediment or pollution run-off from proposed works to nearby	Records of Otter within 600 m of project site on the River Clare. However, no evidence of otter or otter holts were detected on the day of the survey. While otters are highly mobile, they can be prone to disturbance by human activity.

	habitat. Area mapped and calculated as 1,054 ha along river banks/ lake shoreline/around ponds • No significant decline in extent of freshwater (river) habitat. Length mapped and calculated as 314.2 km • No significant decline in extent of freshwater (lake) habitat. Area mapped and calculated as 4,178 ha • No significant decline in couching sites and holts • No significant decline in fish biomass available • No significant increase in barriers to connectivity.		waterbodies, disturbance, destruction of holts	However, there is no possibility for significant effects on otter as no holts or lie up sites were recorded on or adjacent to project area. In addition, the size, scale and short duration of the proposed project is short, and works will only occur within site boundary, and there will be no impact on any river habitat.
Slender Green Feather-moss (*Drepanocladus vernicosus*) 1393	To maintain the favourable conservation condition of Slender Green Feather-moss (Shining Sickle-moss) in Lough Corrib SAC, which is defined by the following list of attributes and targets: No decline in distribution of populations, subject to natural processes. • No decline in population size, subject to natural processes • Mean percentage cover of slender green feather-moss (*Hamatocaulis vernicosus*) should be at least 45% • No decline in area of suitable habitat, subject to natural processes • Maintain suitable hydrological conditions • Mean percentage tree cover should be less than 15% • Mean percentage shrub cover should be less than 20% • Mean percentage grass species cover should be less than 25%	Land/Air pathway	Destruction to habitat	Slender Green Feather-moss has been mapped approximately 13 km from project site (M222375). There is no possibility for significant effects on Slender Green Feather-moss as there is no hydrological connection to this habitat. In addition, the size and scale of the proposed development is small, and works will only occur within site boundary.

	• Mean percentage bryophyte cover should be more than 50% • Mean percentage cover of *Calliergonella cuspi-data* should be less than 15% • Mean vegetation height should not exceed 40cm			
Slender Naiad (*Najas flexilis*) 1833	To restore the favourable conservation condition of Slender Naiad in Lough Corrib SAC, which is defined by the following list of attributes and targets: • Restore the spatial extent of *Najas flexilis* within the lake, subject to natural processes. • Restore the depth range of *Najas flexilis* within the lake, subject to natural processes • Restore plant fitness, subject to natural processes • Restore the cover abundance of *Najas flexilis*, subject to natural processes • Restore species distribution to at least the north-western bay, subject to natural processes • Restore habitat extent, subject to natural processes • Maintain appropriate natural hydrological regime necessary to support the habitat for the species • Restore appropriate substratum type, extent and chemistry to support the population of the species • Restore appropriate water quality to support the population of the species • Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the population of *Najas flexilis*, subject to natural processes	Surface water pathway.	Sediment or pollution run-off from proposed works to nearby waterbodies	Occurs in NW of Lough Corrib, at least 25 km from the project site. There is no possibility for significant effects on Slender Naiad due to the assimilation capacity of the lake. In addition, the size and scale of the proposed project is small, and works will only occur within site boundary.

	• Restore/maintain appropriate water colour to support the population of *Najas flexilis*. • Restore appropriate associated species and vegetation communities to support the population of *Najas flexilis*. • Maintain the area and condition of fringing habitats necessary to support the population of *Najas flexilis*			

There are five Natura 2000 sites within a 15 km radius of the proposed project, two SACs and three SPAs.

The proposed project is not situated within any of the SACs or SPAs, therefore no direct impacts will occur through habitat loss or fragmentation of habitats or species.

Disturbance will only be caused during the demolition and construction phase of the project. The proposed project is far enough away from Lough Corrib SPA not to have an effect on bird species of qualifying interest. There is also potential for otter to effected by disturbance. However, the project scale is small and the duration is short, so any disturbance is unlikely to be significant. Disturbance effects on wintering birds of qualifying interest are unlikely due to the nature and scale of the project and the unsuitability of the immediate project area for these wintering species.

The proposed project is situated within 554 m of the Lough Corrib SAC and over 4.6 km of the Lough Corrib SPA. Lesser horseshoe bat records lie over 3.8 km from the site, though the qualifying roost is over 30 km from the site, and will therefore not be impacted by the project. Otter records occur within 600 m of the site, but no otter holts of other evidence of otter lie-up sites were found during the site survey.

Project site lies on a drain which is connected to EPA stream - WATERDALE 30, which flows into River Clare which is designated as Lough Corrib SAC. The River Clare is classified under WFD River Water Bodies CLARE (GALWAY)_100 – not at risk.

While numerous qualifying species are recorded for the SACs and SPAs there are no existing records of them occurring on site though there is one record of otter within 600 of the site (see Appendix 2).

4.3.2 Cumulative Impacts – other projects

Under Appropriate Assessment it is necessary to investigate if there are any other projects or plans that together with the project outlined here could affect the Natura 2000 Sites. Table 5 below lists other proposed plans accesses through the Galway County Council planning database. Planning database was searched 24/06/2022.

Table 4: **Planning application near proposed development site (planning access via https://www.eplanning.ie/GalwayCC/searchresults/Default/1 on the 27/06/2022**
(Townlands searched - Claregalway, Gortadooey)

Galway County Council Planning Application Number	Description	Is there a risk of significant impact or in combination effects from the plans
226002 - Unit 1 Summerfield Claregalway	The conversion of an early learning centre to a commercial unit at Unit 1 Summerfield	Invalid planning application
2260525 Claregalway	To change the use of town houses from previously permitted office use to residential use.	New application. Unlikely to impact due to nature and scale of development
2260522 Claregalway	The construction of a Discount Foodstore Supermarket with ancillary off-licence sales.	AA screening reported there is no possibility of significant impacts on European sites, features of interest or site-specific conservation objectives. A Natura Impact Statement is not required
2260243 Claregalway	Permission for change of use of a garage previously granted under planning reference no. 01/2530, for use as an office and gym.	Further information. Unlikely to impact due to nature and scale of development
212393 Claregalway	The construction of a new extension to existing dwelling incorporating a "Granny Flat" along with all associated site works, retention permission is also sought for extension and alterations to aforementioned existing dwelling on revised boundaries.	Invalid planning application
20483 Gortadooey, Claregalway	Construct 3 bay slatted shed with concrete apron and associated services.	Planners report states that significant impacts of the Natura network can be ruled out
201866 Claregalway	The construction of an extension to existing warehouse, to include associated office space, along with site works with connection to existing services.	Planners report states that “having considered the scale of the proposed development and distance between the site and the Natura 200 Sites, the absence of any direct ecological conduit, significant adverse impacts on the habitats within the Natura 2000 sites can be ruled out

An Bord Pleanála Planning Appeals near proposed development site

A search was made of An Bord Pleanála Planning Appeals (Data source: https://www.pleanala.ie/en-ie/home/, date of search 29/06/2022, Search townland of Claregalway for 2020-2022.

Table 5 An Bord Pleanála Planning Appeals

Case Number and address	Description	Is there a risk of significant impact or in combination effects from the plans
TA07.312191 312191: Lakeview, Claregalway, Co. Galway.	Demolition of buildings, construction of 111 no. residential units (73 no. houses, 38 no. apartments), creche and associated site works.	Inspector reports states that "that the proposed development, individually or in combination with other plans or projects would not be likely to have a significant effect on the Lough Corrib SAC (000297), Lough Corrib SPA (004042), Galway Bay Complex SAC (000268) and Inner Galway Bay SPA ABP-312191-21 Inspector's Report Page 90 of 118 (004031), or any European site, in view of the sites' Conservation Objectives, and a Stage 2 Appropriate Assessment (and submission of a NIS) is not therefore required.
PL07.309712 309712: Cloonbiggin, Claregalway, Co. Galway (201158)	The Construction of an extension. Changes to elevations. Demolition of 2 Sheds. Construction of 2 Sheds.	Inspector's report states "Having regard to the limited nature and scale of the proposed development and the absence of any connectivity to any sensitive location, there is no real likelihood of significant effects on the environment arising from the proposed development. The need for environmental impact assessment can, therefore, be excluded at preliminary examination and a screening determination is not required
PL07.310037 310037: Ardgaineen, Claregalway, Co. Galway. (21169)	Development consisting of: (a) Erection of a storage shed and (b) variation of conditions of use, specifically condition 2 of PL7/5/88667 (Concrete Batching Plant) and condition 2 of PL7/5/88665 (Macadam Plant) to materially change the hours of use of both authorised plants.	Decision pending
TC07.310796 310796: Lakeview, Claregalway, Co. Galway.	Demolition of buildings on site, construction of 114 no. residential units (76 no. houses, 38 no. apartments), creche and associated site works.	Pre-Application Consultation

4.3.3 Cumulative impacts – other plans

It is a requirement of Appropriate Assessment that the 'in-combination' (the cumulative development with any other plans) effects be assessed. A search of Galway County Council Planning enquiry system was conducted for plans that may have in-combination effects on the listed Natura 2000 sites.

Table 6: Other plans and possible impacts

Plan	Summary objectives	Possible impacts from plans	Is there a risk of significant in combination effects from the plans
Galway County Development Plan 2015-2021 Volume 1, 2014	Objectives can be found on: http://www.galway.ie/en/services/planning/developmentplansandpolicy/galwaycountydevelopmentplan2015-2021/	No negative impacts envisaged	Screening completed for this plan – no significant 'in combination' effects
River Basin Management Plan for Western River Basin District in Ireland	1. Prevent deterioration 2. Restore good status 3. Reduce chemical pollution 4. Achieve water related protected areas objectives.	No negative impacts envisaged	Screening completed for this plan – no significant 'in combination' effects

In reviewing the above plans and projects and the best objective information, no cumulative effects were identified because of the proposed project that could cause significant effects on Natural 2000 sites. No impacts were identified that might arise from the combination of projects and plans with the proposed project.

4.4 Stage 1 Screening Conclusion and Statement

The screening process identified five Natura 2000 sites within a 15 km radius of the proposed project, two SACs and three SPAs. The closest Natura 2000 sites are the Corrib SAC. The proposed project is situated within 554 m of the Lough Corrib SAC.

See also Screening Matrix in Appendix 1.

The screening exercise concludes that there is potential for significant effects on the Lough Corrib SAC are likely or uncertain. Therefore, the project must proceed to Stage 2 (AA).

Based on the information contained in this Screening Report, it was not considered possible to rule out the potential for significant effects of the proposed project on the conservation objectives of the following European site and QIs, whether alone or in-combination with other plans or projects:

Lough Corrib SAC

- Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion 3260
- White-clawed Crayfish (*Austropotamobius pallipes*) 1092
- Brook Lamprey (*Lampetra planeri*) 1096
- Atlantic Salmon (*Salmo salar*) 1106]

Signed

Dr. Karina Dingerkus (Ecologist)
29/06/2022

SECTION 2

5.0 Natura Impact Statement to inform Appropriate Assessment

5.1 Introduction

The impact of a project or plan alone and in combination with other projects or plans on the integrity of the Natura 2000 site is considered with respect to the conservation objectives of the site and to its structure and function. The Natura Impact Statement provides information to aid the competent authority in making the Appropriate Assessment.

The Stage 1 Screening concluded that there was potential for the Lough Corrib SAC to be affected by the project (see Table 1 and Section 5.1 above), due to the potential for sediment run off and/ or pollution from the site into the River Clare (part of Lough Corrib SAC) which lies approximately 765 m from the project site. Therefore, it is necessary to prepare a Natura Impact Statement that outlines mitigation measures to prevent sediment run-off and pollution.

5.2 Conservation Objectives of Lough Corrib SAC

The general aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. European and national legislation places a shared obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network (SACs and SPAs) at favourable conservation status. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing.
- 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.
- 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.
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The Conservation Objectives of Lough Corrib SAC are listed in Table 3 above.

5.3 Impact Prediction

The proposed project is not situated within any of the SACs or SPAs, therefore no direct impacts will occur through habitat loss or fragmentation of habitats or species.

Disturbance will only be caused during the demolition and construction phase of the project. The project scale is small, and the duration of the works is short, so any disturbance is unlikely to be significant.

Project site lies on a drain which is connected to EPA stream - WATERDALE 30, which flows into River Clare which is designated as Lough Corrib SAC. The proposed project is situated within 554 m of the Lough Corrib SAC

The following table presents the European Site and QIs that cannot be excluded for potential significant effects at Pre-Screening stage:

Lough Corrib SAC – Screened in

- Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion 3260
- White-clawed Crayfish (*Austropotamobius pallipes*) 1092
- Brook Lamprey (*Lampetra planeri*) 1096
- Atlantic Salmon (*Salmo salar*) 1106]

No pathways for significant effect on any other European Site or QIs/SCIs were identified and it is concluded beyond reasonable scientific doubt, that the proposed project, individually or in combination with other plans and projects, will not have a significant effect on any European Site other than those listed above.

Table 7: Lough Corrib SAC qualifying interests - assessment of potential impacts

Qualifying habitat and code (P*otential receptors*)	**Assessment**	**Potential threats from proposed project**	**If the potential for an adverse effect on this QI / SCI exists, are mitigation required to prevent impact**
Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion 3260	Little is known about the distribution of the habitat and its sub-types in this SAC. The River Clare (which falls with the SAC designation) lies less than 1km downstream of project site. Due to nature, size and scale of the proposed project, and the fact there will be no change in the hydrological site characteristics, there is unlikely to be significant impacts on Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion. However, as location of habitat is not mapped it will be screen-in on a precautionary basis	• Release of sediment to receiving waters. • Release of levels of nutrients into the water, which could lead to oxygen de-pletion in the water. • Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.	To protect this aquatic habitat, mitigation measures are required in order to ensure no release of silt/sediment, nutrients or chemicals to receiving waters. The watercourse downstream of the proposed works is well vegetated which will reduce the impact of any accidental sediment release. However, mitigations measures proposed in method statement and additional mitigation measures detailed in Section 5.4 below will go to further protect water quality.
White-clawed Crayfish (*Austropotamobius pallipes*) 1092	White-clawed Crayfish have been recorded on the Clare River, both 1 km upstream (M372332) and also 5km downstream of project site at Curraghmore Bridge (M321328). There is a very small possibility that crayfish could occur close to where the	• Release of sediment to receiving waters. • Release of levels of nutrients into the water, which could lead to oxygen de-pletion in the water. • Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.	To protect this aquatic species, mitigation measures are required in order to ensure no release of silt/sediment, nutrients or chemicals to receiving waters. The watercourse downstream of the proposed works is well vegetated

	drain enters the Waterdale 30 stream and where the stream enters the River Clare and so there is a small possibility for significant effects on White clawed Crayfish if a pollution or sediment incident occurs during works	Crayfish plague	which will reduce the impact of any accidental sediment release. However, mitigations measures proposed in method statement and additional mitigation measures detailed in Section 5.4 below will go to further protect water quality. Mitigation measure to prevent spread of crayfish plague
Brook Lamprey (*Lampetra planeri*) 1096	Lamprey are generally under recorded. Potential for species to occur within River Clare. There is a very small possibility that Brook Lamprey could occur close to where the drain enters the Waterdale 30 stream and where the stream enters the River Clare and so there is a small possibility for effects on Brook Lamprey if a pollution or sediment incident occurs during works	• Release of sediment to receiving waters. • Release of levels of nutrients into the water, which could lead to oxygen depletion in the water. • Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.	To protect this aquatic species, mitigation measures are required in order to ensure no release of silt/sediment, nutrients or chemicals to receiving waters. The watercourse downstream of the proposed works is well vegetated which will reduce the impact of any accidental sediment release. However, mitigations measures proposed in method statement and additional mitigation measures detailed in Section 5.4 below will go to further protect water quality.
Atlantic Salmon (*Salmo salar*) 1106]	Salmon have been recorded in Lough Corrib and are known to spawn in the headwaters of Lough Corrib tributaries and are known to occur in the River Clare.	• Release of sediment to receiving waters. • Release of levels of nutrients into the water, which could lead to oxygen depletion in the water. • Release of chemicals (pesticides, fuels,	To protect this aquatic species, mitigation measures are required in order to ensure no release of silt/sediment, nutrients or chemicals to receiving waters.

	There is a very small possibility that salmon could occur close to where the drain enters the Waterdale 30 stream and where the stream enters the River Clare and so there is a small possibility for effects on salmon if a pollution or sediment incident occurs during works	hydraulic oils) into watercourses.	The watercourse downstream of the proposed works is well vegetated which will reduce the impact of any accidental sediment release. However, mitigations measures proposed in method statement and additional mitigation measures detailed in Section 5.4 below will go to further protect water quality.

5.4 Measures to Mitigate Potential Adverse Impacts

Mitigation refers to *measures taken to avoid or reduce negative impacts and effects* (CIEEM 2018).

The evaluation of likely significant impacts of the proposed development includes recommendations for specific measures to avoid and reduce any negative impacts of a project (i.e. mitigation measures). These measures are considered necessary to minimise environmental impacts associated with the proposed development. Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of the proposed project from the initial stages.

To minimise environmental impacts, it is important in the first instance that the following general principles are taken on board:

- Implementation of good OPW work practices on site.
- Working in accordance with relevant legislation, including that relating to invasive species.
- Operatives should ensure adequate site supervision and security.
- Operatives should be briefed to ensure that environmental issues are taken into consideration and that guidelines and codes of practice are followed.

5.4.1 Habitat Loss

No area of qualifying habitat will be lost from Natura 2000 sites, so no mitigation is proposed.

5.4.2 Fragmentation

No direct mitigation is proposed as no fragmentation of Natura 2000 sites will occur.

5.4.3 Disturbance

Noise during the demolition and construction of the proposed new bridge should not impact species adversely due to the nature, scale and short duration of the proposed project, so no mitigation is proposed. Once complete the project should cause no disturbance to the protected qualifying species.

5.4.4 Species impact

No species impacts are predicted due to nature and scale of the proposed project. The OPW SOP for the management of invasive species will be adhered to and all procedures carried out will be recorded in the Safety File. Care shall be taken to protect against the current Crayfish Plague using appropriate disinfection measures before entering site.

5.4.5 Water Resource

No direct mitigation is proposed as water resource will not be impacted.

5.4.6 Water Quality

Mitigation measures aim to eliminate both the discharge of polluting materials (e.g. fuel or oil from vehicles; concrete etc.) and the mobilisation of silts and sediments into the watercourses. Pollution may occur following accidents that result in spillage of fuel or other materials. Strict pollution prevention measures must be implemented during compound set up, demolition and

construction of the new bridge and associated works to avoid siltation or discharge of pollutants.

Construction site set-up

Site compound

- Establishment of site compound which will be set back not less than 50m from the working channel as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2 , C3/4/1 – 200 Chainage
- In addition, the site compound will be set back at least 40 m from any watercourse.

De-watering

- If a channel diversion is to take place this will be carried out on the right bank as one looks downstream as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2, C13– 200 Chainage
- Any dam will be constructed using locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level. HDPE pipes may be used if the ground is required to be reinstated to facilitate works as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2, C13– 200 Chainage
- Silt management will be carried out in such a way as to eliminate/minimise the silt load downstream of the works with the use of silt curtains, straw bales, pipes with baffle boards at inlet to bypass channel etc. Straw bales will be placed in the channel downstream of the works area to capture any silt from the diversion and works as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2, C13– 200 Chainage
- It is important that these silt management elements are monitored at least three times a day to ensure they are performing and have not become clogged with sediment.
- If over pumping measures are implemented, as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2, C13– 200 Chainage, and water pumped from the excavation area sump is released onto grassland this should be done into the field to the south-west and at a minimum of 20 m from any of the surrounding watercourses. This should be monitored frequently to ensure that there is no water flowing back into the drain. Monitoring should increase during wet weather conditions and pumping should stop if grassland is showing signs of becoming water-logged.

Sediment control measures

- Prior to works commencing, it will be necessary to install a silt fence or similar below the proposed new bridge as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2, C13– 200 Chainage
- All silt control measures should be inspected immediately prior to removal of the cofferdam or re-instate diversion channel

Construction

Standard good OPW practices should be followed with extra care given to following points:

- Sediment control measures must be put in place prior to works commencing as detailed above.

- Shuttering needs to be adequately secured and sealed to ensure no leakage of concrete. Ensure shutters are stable enough to eliminate failures.
- There should be supervision of the delivery of concrete to site.
- Concrete pouring should be carried out in dry weather.
- All concrete pouring should be monitored carefully to ensure no accidental discharge.
- Mixer washings and excess concrete should not be discharged to the stream and should be carried out in designated area well away from all watercourses including the lake (a minimum of 50m).

Hydrocarbon use

Hydrocarbon use (e.g. fuel) during construction may lead to potential pollution of waterways. Examples of potential threats include spillages during re-fuelling operations, leaks in poorly maintained plant and machinery and the use of oil on shuttering boards.

- Fuelling of machines will be carried out in accordance with OPW Protocols, machines will be kept away from all watercourses, not less than 50m and fuelled at a safe location with all machines provided with spill kits. The jeep delivering fuel is certified in accordance with regulations and double bunded. No fuels to be stored on site only in approved vented fuel store with spill trays incorporated. Note: the same protocol should also apply to the lake shore.
- Fuel storage - all fuels, lubricants and hydraulic fluids should be kept in secure bunded areas away from all watercourses (recommend a minimum of 50m from watercourse). The bunded area will accommodate 110% of the total capacity of the containers within it. Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure should be put in place (see below). Any waste oils or hydraulic fluids should be collected, stored in appropriate containers and disposed of off-site in an appropriate manner.
- Site operatives should provide spill kits and they should be stored on-site during construction and used in the event of a fuel or chemical spillage. Such kits should contain absorbent materials (such as absorbent granules, booms or mats). Appropriate operatives responsible for handling chemicals or oils or for plant refuelling should be trained in the use of this kit.
- Re-fuelling and lubrication of plant should not occur within 50m of any water source. Appropriate drip-trays should be used. Vehicles should never be left unattended during re-fuelling.
- All vehicles should be regularly maintained and checked to prevent hydrocarbon leaks.
- All stationary machinery such as pumps should be placed on drip trays to contain any hydrocarbon spillages. These trays will be checked regularly, and rainwater removed to maintain their effectiveness.
- Biodegradable, vegetable-based oils should be used to oil shuttering boards.
- Any hydraulically operated machinery to be used within 50m of the river should utilize synthetic biodegradable hydraulic oil such as Castrol Tribol Biotop 1448.

Post construction

- Following the completion of the construction works, the surrounding area shall be reinstated to a condition as outlined in the OPW Method Statement for the Accommodation Bridge (Pipe Culvert) Construction @ UB2, C13– 200 Chainage

5.4.7 Visual Impact

No direct mitigation is proposed as the development will have limited visual impact on the Natura 2000 sites.

6.0 Conclusions

Screening for Appropriate Assessment of the proposed development concluded that there was potential for the Lough Corrib SAC to be affected by the proposed project due to the potential for sediment run off and pollution from the project site down the drain, to the Waterdale 30 stream, and from there to the River Clare which is part of the Lough Corrib SAC.

The risks to the safeguarding and integrity of the qualifying interests and conservation objectives of the Natura 2000 sites have been addressed by the inclusion of mitigation measures in the Natura Impact Statement (see section 5.0 above) that will reduce and eliminate the potential impacts.

It is therefore considered that beyond reasonable scientific doubt, in light of the above objective scientific information, that, when the above mitigation measures are implemented, the project, individually or in combination with other plans and projects, will not have an adverse effect on the integrity of any of the European Sites listed above, in view of their conservation objectives and in view of best scientific knowledge.

The NIS (Section 2) provides information to enable the competent authority to carry out the appropriate assessment.

7.0 References

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8.0 Appendices

Appendix 1 – Screening Matrix

Screening Matrix

Description of project	See section 3.1
Description of Natura 2000 sites	See section 3.2

Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	It is considered that the proposed plan either alone or in combination with other plans or projects will not likely to give rise to significant effects on the Lough Corrib SAC or Natura 2000 sites within a 15 km radius of the project site if mitigation measured outlined in the OPW Method statement and the above report are taken into consideration.
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of:	There is potential impact on water quality
	Size and scale The size and scale of the project is small and does not impact directly on any of the Natura 2000 sites.
	Land-take There will be no land take from any Natura 2000 sites
	Distance from the Natura 2000 site or key features of the site The distances to the Natura sites are listed in Table 1 – the closest Natura 2000 is 554 m (Lough Corrib SAC) and there are four other protected areas within 15 km of the site.
	Resource requirements (water abstraction etc.) The proposed development is not dependent on any resource, such as freshwater, from any of the Natura sites.
	Emissions (disposal to land, water or air) Minimal emissions from proposed development.
	Excavation requirements The project will involve the creation and subsequent removal of a small dam
	Transportation requirements There will be a small increase in traffic during project. Will not impact Natura 2000 sites.
	Duration of construction, operation, decommissioning, etc. Short duration. Unlikely to impact Natura 2000 sites
	Other None
Describe any likely changes to the site(s) arising as a result of:	**Reduction of habitat area** None within the SACs or SPA
	Disturbance of key species Disturbance will be minimal. The work is of short enough duration not to have an adverse impact on qualifying species.
	Habitat or species fragmentation None
	Reduction in species density None for qualifying species.
	Changes in key conservation indicators

	Unlikely
	Climate change Negligible
Describe any likely impacts on the Natura 2000 site as a whole in terms of:	**Interference with the key relationships that define the structure of the site** None envisaged
	Interference with key relationships that define the function of the site None envisaged
Provide indicators of significance as a result of the identification of effects set out above in terms of:	**Loss** N/A
	Fragmentation N/A
	Disruption N/A
	Disturbance N/A
	Change to key element of the site N/A

The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura sites.	The proposed project is not likely to affect any Natura 2000 site if mitigation measures are implemented as outlined in above report
Explain why these effects are not considered significant.	There are five Natura 2000 sites within a 15 km radius of the proposed project, two SACs and three SPAs. The proposed project is not situated within any of the Natura sites. Therefore, no direct impacts will occur through habitat loss or fragmentation of habitats or species. Disturbance will be minimal as works are of short duration. Project site is hydrologically connected to SAC. Mitigation measures in Section 5.4 of the above report will eliminate any significant effects on the Natura 2000 site. The proposed project will have a limited visual impact on the Natura 2000 sites.
List of agencies consulted and responses, if applicable	OPW

Data collected to carry out the Assessment	
Who carried out the Assessment	Giorria Environmental Services
Sources of data	www.npws.ie, https://gis.epa.ie/EPAMaps/, www.galway.ie/en/services/planning/onlineplanningsystems/ Giorria Environmental Services
Level of assessment completed	Desktop and site survey
Where can full results of the Assessment screening be viewed	OPW

Appendix 2 – Qualifying interests and documented threats to the Natura 2000 sites

Table 8: Qualifying interests and documented threats to the Natura 2000 sites lying in a 15 km radius of the proposed development site

Site Code	Site Name	Qualifying Interests (* denotes a priority habitat)	Conservation Objectives See also Appendix 5	Documented Threats / Pressures Information primarily based on NPWS Site Synopses, NATURA 2000 – standard data forms and other sources
000297	Lough Corrib SAC	**Habitats** 3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea 3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) 7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae** 7220 Petrifying springs with tufa formation (Cratoneurion)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000297.pdf	• Agricultural intensification • Invasive non-native species • Piers / tourist harbours or recreational piers • Continuous urbanisation • Forest planting on open ground • Infilling of ditches, dykes, ponds, pools, marshes or pits • Sand and gravel extraction • Abandonment of pastoral systems, lack of grazing • Diffuse pollution to surface waters due to household sewage and waste waters • Other human induced changes in hydraulic conditions • Roads, paths and railroads • Other human intrusions and disturbances • Removal of hedges and copses or scrub • Mechanical removal of

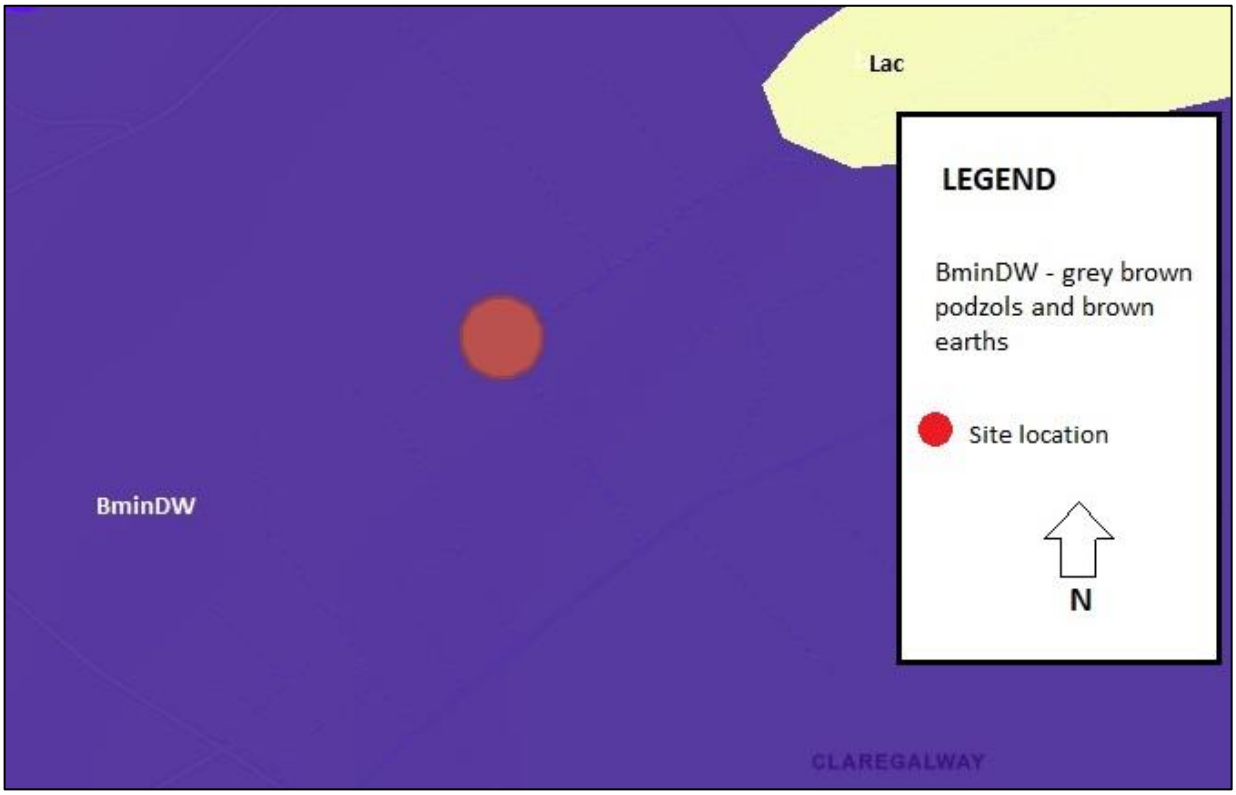
		7230 Alkaline fens 8240 Limestone pavements* 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles 91D0 Bog woodland* **Species** 1096 Brook Lamprey *(Lampetra planeri)* 1092 White-clawed Crayfish *(Austropotamobius pallipes)* 1095 Sea Lamprey *(Petromyzon marinus)* 1393 Slender Green Feather-moss *(Drepanocladus vernicosus)* 1106 Salmon *(Salmo salar)* 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)* 1355 Otter *(Lutra lutra)* 1029 Freshwater Pearl Mussel *(Margaritifera margaritifera)* 1833 Slender Naiad *(Najas flexilis)*		peat • Disposal of household / recreational facility waste • Fertilisation dispersed habitation
004042	Lough Corrib SPA	**Birds** A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)* A194 Arctic Tern *(Sterna paradisaea)* A082 Hen Harrier *(Circus cyaneus)* A061 Tufted Duck *(Aythya fuligula)* A051 Gadwall *(Anas strepera)* A059 Pochard *(Aythya ferina)* A140 Golden Plover *(Pluvialis apricaria)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* A182 Common Gull *(Larus canus)* A125 Coot *(Fulica atra)* A065 Common Scoter *(Melanitta nigra)* A193 Common Tern *(Sterna hirundo)* A056 Shoveler *(Anas clypeata)* **Habitats** Wetlands	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004042.pdf	• Fishing • Boating • Fertilization • Forestry • Hunting • Grazing

000268	Galway Bay Complex SAC	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1150 Coastal lagoons* 1160 Large shallow inlets and bays 1170 Reefs 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1410 Mediterranean salt meadows (Juncetalia maritimi) 3180 Turloughs* 5130 Juniperus communis formations on heaths or calcareous grasslands 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae* 7230 Alkaline fens 8240 Limestone pavements* **Species** 1365 Harbour Seal *(Phoca vitulina)* 1355 Otter *(Lutra lutra)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000268.pdf	• Sewage effluent • Aquaculture industry • Disturbance or compaction from tractors • Over-fishing. • Extraction of maerl • Urban expansion and recreational activities. • eutrophication • Drainage • Disturbance
004031	Inner Galway Bay SPA	**Birds** A046 Light-bellied Brent Goose *(Branta bernicla hrota)* A149 Dunlin *(Calidris alpina)* A069 Red-breasted Merganser *(Mergus serrator)* A162 Redshank *(Tringa totanus)* A182 Common Gull *(Larus canus)* A003 Great Northern Diver *(Gavia immer)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004031.pdf	• Pollution • Disturbance

		A017 Cormorant *(Phalacrocorax carbo)* A169 Turnstone *(Arenaria interpres)* A142 Lapwing *(Vanellus vanellus)* A050 Wigeon *(Anas penelope)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* A160 Curlew *(Numenius arquata)* A002 Black-throated Diver *(Gavia arctica)* A140 Golden Plover *(Pluvialis apricaria)* A157 Bar-tailed Godwit *(Limosa lapponica)* A052 Teal *(Anas crecca)* A191 Sandwich Tern *(Sterna sandvicensis)* A137 Ringed Plover *(Charadrius hiaticula)* A193 Common Tern *(Sterna hirundo)* A028 Grey Heron *(Ardea cinerea)* **Habitats** Wetlands		
004142	Cregganna Marsh SPA	**Birds** A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004142.pdf	• Disturbance

Appendix 3 – Soil and Geological Information

Following information is from https://airomaps.geohive.ie/ESM/



Soil map for area

Following information is from the Geological Survey Ireland
https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx
and ESM tool (https://airomaps.geohive.ie/ESM/)

Geology	64, Marine shelf facies; Limestone & calcareous shale
Aquifer	Regionally Important Aquifer - Karstified (conduit)
Aquifer vulnerability	High
Ground water vulnerability	At risk
Groundwater Status	Good

Appendix 4 – OPW Method Statement

METHOD STATEMENT	OPW
Scheme:	**Corrib Headford Arterial Drainage Scheme**
Project:	**Accommodation Bridge (Pipe Culvert) Construction @ UB2 , C3/4/1 – 200 Chainage**
Site Location:	**Claregalway, Co Galway: GPS Coordinates (53.3546, -8.9487)**

1 Outline of Proposed Works

This Method Statement refers to proposed works on the OPW's Corrib Arterial Drainage Scheme. The works include the extension and repair of an existing pipe culvert bridge structure works will be in accordance with the OPW Standard Design. (Drawing Refs 2480-DR-003-P2 & 2480-DR-006-P1).

The site is located approx. 300m off a local road and accessed through agricultural land.

Works on site will typically be carried out during standard OPW hours re: 08:00 – 16:30. Channel C3/4/1 – UB2 Chainage 200 has a base width of less than 3m and is therefore classified as a minor channel for arterial drainage purposes. The flow and water levels in the channel will vary depending on recent rainfall patterns and time of year. Inland Fisheries Ireland will be consulted with prior to works commencing to ensure that there are no issues with fish movement in the channel.

Please Note: This method statement should be read in parallel with the completed OPW Project Risk Assessment Form and all relevant project drawings, specifications, schedule of commitments, construction & environmental management plan etc. TBT Covid-19 Site Safety Induction Shall also be carried out before work commences.

If any issue within this method statement, or during the progression of the works requires needs clarification, the appropriate supervisor should be contacted immediately.

Site Location - GIS DEMO - SAC Proximity

C3/4/1 – UB2 @ Chainage 200, Claregalway, Co Galway: GPS Coordinates (53.3546, -8.9487)

Existing Structure

METHOD STATEMENT	OPW
Scheme:	**Corrib Headford Arterial Drainage Scheme**
Project:	**Accommodation Bridge (Pipe Culvert) Construction @ UB2 , C3/4/1 – 200 Chainage**
Site Location:	**Claregalway, Co Galway: GPS Coordinates (53.3546, -8.9487)**

2 RESPONSIBILITY FOR CONTROL ON SITE			
Project Foreman:	Allen Higgins	**Phone:**	087 9666719
Site Supervisor:	TBC	**Phone:**	TBC
Safety Representative:	Alan Bane	**Phone:**	087 3403669
Safety Officer:	Keith McNulty	**Phone:**	093 36355
Site Engineer:	Owen Hannon	**Phone:**	087 3732681

3 EQUIPMENT REQUIRED				
Major Plant	**Quantity**	**Description**	**OPW**	**Hired**
	1	14T Hydraulic Excavator	✓	
	1	Artic Truck & Low-loader	✓	
	1	Tractor & Trailer	✓	
	1	Site/Track Dumper	✓	
	1	6T Mini-Digger	✓	
Small Plant/Tools	**Quantity**	**Description**	**OPW**	**Hired**
	1	Concrete Poker Vibrator	✓	
	1	4 or 6" Water Pump	✓	

Other Essential Equipment	Life Rings/Buoys Lifting Chains / Slings

4 MATERIALS REQUIRED

Quantity	Description	Notes
T.B.C	Formwork (Peri Formwork)	
T.B.C	Ready-Mix Concrete	As per Design Drawing
5/6 No.	6m JFC Corripipe	Diameter - TBC
T.B.C	Steel	TBC

5 HEALTH & SAFETY

All site operatives must read, and sign, the specific OPW Project Risk Assessment & Safety Plan relating to this project.

The Foreman will advise of any other relevant Health & Safety issues or procedures which must be followed during the construction works.

All works carried out on this project and site are to be carried out in accordance with the relevant OPW Risk Assessments and Safety Procedures. A copy of these documents will be available in the Site Office. All operatives are to ensure they are familiar with all of these procedures prior to commencing works.

Mechanical plant used on site during these works is restricted to plant approved in advance by OPW Mechanical Engineering staff and may vary depending on requirements.

Should any member of staff observe a Health and Safety issue during the course of this construction project, they must immediately inform their supervisor of their concern.

5.1 Establishment of Health & Safety Controls

The site will be prepared initially to ensure the security and safety of the site. This will include preparation of the access route, installation of fencing, gates, safety barriers & environmental barriers.

Designated areas within the Site Compound will be established for welfare facilities, materials storage, vehicle parking and plant storage. See Maps pages 1 & 2.

All health and safety controls identified in the OPW Project Risk Assessment & Safety Plan shall be established **BEFORE** any construction works commence. This will include signage, fencing, access/egress route, secure access ladders, barriers etc.

All operatives, and visitors to site, are required to wear appropriate PPE at all times. All OPW employees must comply with existing Covid-19 regulations and requirements.

Visitors to site shall inform the Site Foreman/Supervisor of their presence. Operatives working on the site shall escort any visitors to the Site Foreman/Supervisor immediately upon observing a visitor to the site. The Foreman will deliver a site induction to any visitors upon their arrival to site.

Good housekeeping procedures on the site shall be followed at all times. Materials will be stored tidily in a designated area, as instructed by the Site Foreman.

All potential hazards should be identified and where possible removed or appropriate mitigation measures put in place. All work to be carried out in accordance with appropriate safe working practices.

5.2 Safety Procedures & Risk Assessments

The following Safety Procedures and Risk Assessments, not exclusively, shall be examined and adhered to in the planning and execution of the works.

Risk Assessments

RA2 Bridge Construction

RA19 Portable Power Tools

RA5 Dam Diversion Construction RA22 Steel Fixing

RA35 Lifting Operations

RA38 Ladder

RA28 Working at Heights

RA26 Vibration

RA29 Working Adjacent to or in Water

RA6 Excavation

RA7 Excavator 360°

RA8 Formwork/Shuttering

RA10 Handling Chemicals / Hazardous Substances

RA18 Pipe Laying

RA32 Concrete Operations

RA 57 Coronavirus (Covid 19)

RA14 Mobile Plant

RA22 Steel Fixing

RA15 Noise

Safety Procedures

- SP09 Personal Protective Equipment (PPE)
- SP17 Portable Power Tools / Abrasive Wheels
- SP32 Working Adjacent to Water

COVID-19 Compliance Warden TBT

COVID-19 Onsite Warden Checklist.

5.3 Working Adjacent to Water

The OPW "Working in or Adjacent to Water" Risk Assessment and SP32 "Working Adjacent to Water" Safety Procedure must be followed by all operatives. Guard rails shall be erected to secure banks above water.

Life-rings shall be erected at intervals not exceeding 50m along the proposed works areas.

Weather forecasts shall be consulted to ensure no potential large rainfall events are due to occur.

5.4 Working alongside Utilities

An examination of the GIS-Demo ESB layer network indicates that there does not appear to be overhead or underground assets in the vicinity of the works area.

A safe system of work shall be adopted at all times in relation to works taking place in the vicinity of overhead and underground power lines should they be observed to be present at this site location.

ESB Networks Code of Practice Avoiding Danger from Overhead Lines and HSA Code of Practice Avoiding Danger from Underground Services documents relating to these hazards shall be consulted prior to works being carried out.

Copies of these documents are available in the Site Office. Any controls and mitigation measures identified in these documents shall be put in place and adhered to by all operatives.

A ground survey (CAT & Genny) by a competent operative will be carried out before any excavation takes place.

5.5 Lifting Operations

Any lifting operations required during this project must be conducted with due regard to the OPW Risk Assessment procedure.

The weights of all objects to be lifted shall be ascertained prior to lifting and all lifting appliances shall be recorded with their assigned Safe Working Load.

Lifting operations shall be undertaken in the presence of a trained slinger/signaller, with the driver of the lifting appliance having also completed slinger/signaller training.

All operatives who will be working in the vicinity of lifting operations will be informed of the lifting plan prior to any works commencing.

Ground conditions shall be assessed prior to lifting operations to ensure the lifting appliance has a suitable bearing. If there is a doubt over the ground conditions, timber matting shall be used underneath the lifting appliance.

5.6 Personal Protective Equipment

In addition to the standard PPE, operatives shall be provided with the following equipment for this project:

- Safety Goggles
- Ear Defenders
- Gloves
- Life Jacket (if water deep or fast moving – to be assessed by Richard McGaugh)

6 Environmental Protection & Mitigation

All works carried out during this project will be undertaken in accordance with OPW's Environmental Management Protocols & Standard Operating Procedures. (Refer to "OPW Environmental Guidance: Drainage Maintenance & Construction 2019"). Environmental Drainage Maintenance (EDM) Guidelines will be followed at all times. It should be noted these works are not being carried out within an Environmentally sensitive area re: SAC, SPA or NHA.

6.1 Specific Environmental Management Procedures & Controls

Fuelling of machines will be carried out in accordance with OPW Protocols, machines will be kept away from the channel, not less than 50m and fuelled at a safe location with all machines provided with spill kits. The jeep delivering fuel is certified in accordance with regulations and double bunded. No fuels to be stored on site only in approved vented fuel store with spill trays incorporated.

Any other measures which are deemed necessary by the OPW Environmental Section will be carried out in a timely manner as is reasonably practicable.

6.2 Invasive Species

In the event that any invasive species are encountered on site during the project, the OPW Environment Section, Invasive Species Ireland or the National Biodiversity Data Centre will be contacted immediately to advise on the procedures to be followed.

The OPW SOP for the management of invasive species will be adhered to and all procedures carried out will be recorded in the Safety File. Care shall be taken to protect against the current Crayfish Plague using appropriate disinfection measures before entering site.

Note: For this Project, no invasive species (i.e. Knotweed) were observed during the site inspection.

6.3 Biosecurity

All staff to refer to OPW Environmental Guidance: Drainage Maintenance and construction 2019 re: EP'S 18A and 18B. Particular Care shall be taken to protect against the current Crayfish Plague (EP 18B) using appropriate disinfection measures where a known waterborne risk has been identified.

7 Method of Works

7.1 Site Management

Prior to works beginning, a site compound shall be established with designated areas for:

- Welfare Facilities
- Vehicle Parking
- Plant Storage
- Equipment Storage
- Materials Storage

The site compound shall be secured using 'Heras' style temporary fence panels. A lockable gate shall also be installed.

The site compound (See page 2 Site Layout) will be set back not less than 50m from the working channel.

7.2 Site Preparation

The works area shall be fenced off to provide safety and security.

Livestock fencing shall be installed given the location of the works within agricultural land.

No works shall begin before the site works area is fully fenced off and secure.

7.3 Works Plan

The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead power-lines.

On all occasions, the excavator operator must be satisfied with the ground conditions upon which he intends to work from.

When the excavator operator decides to position the excavator adjacent to the riverbank, he must ensure the riverbank is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

Should ground conditions require the use of bog mats, mats shall be lifted into place to cover the working area of the excavator.

Discussion must take place between the excavator operator and the operatives working in the vicinity of the plant Operatives must not enter the danger zone of the excavator unnecessarily. Excavator operator is to liaise with the appointed slinger/signaller at all times.

7.4 De-watering of Works Area/Excavations

The method of de-watering the works area will be decided upon after mobilisation to site. Consideration will be given to ground conditions and flow rates. The options will be damming and diversion channel or damming and over-pumping.

If a channel diversion is to take place this will be carried out on the right bank as one looks downstream. A diversion channel can be excavated from a point upstream of the existing bridge and will tie back into the channel at a point downstream of the bridge.
Damming will be carried out immediately downstream of the channel diversion location and at a point just upstream of where the diversion channel reconnects with the working channel to ensure a dry working zone. The dam will be constructed using locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level.
HDPE pipes may be used if the ground is required to be reinstated to facilitate works which will also mitigate against the transfer of sediment. Dewatering of works area/ Excavations will be carried out in accordance with EP 15

Construction Silt Management. Silt management will be carried out in such a way as to eliminate/minimise the silt load downstream of the works with the use of silt curtains, straw bales, pipes with baffle boards at inlet to bypass channel etc. Straw bales will be placed in the channel downstream of the works area to capture any silt from the diversion and works.

Measures for over pumping will generally be water pumped from the excavation area sump which can be released onto grassland at an appropriate distance from the channel to allow natural filtration to occur through the in-situ grasses/soils. This would be the appropriate measure for low flow conditions. Pump hoses shall be placed at a location that does not pose a tripping hazard to personnel and away from the plant operations.

For damming and over-pumping it will be constructed using a locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level. Damming will be carried out at a point upstream and downstream of the proposed bridge works to ensure a dry working zone.

It should be noted damming will be required for both scenarios. It is not possible to clarify at this time whether damming /over-pumping or a damming/channel diversion will be required. This will be dependent on the existing channel flow conditions at the time of mobilisation to the site. Over pumping will be carried out if there is minimal flow conditions in the channel.

7.5 Demolition of Existing Structure

Demolition works will be carried out in the dry working zone after the installation of diversion channel or over pumping.

The existing structure will be removed using a hydraulic excavator, operated by an experienced and trained operative. Material will be removed from the area and can used as backfill if appropriate. If the material is to be stored on-site prior to removal, it must be stored in an area away from the channel and works area not less than 30 metres.

The area around the existing bridge will be excavated to a suitable width and depth as per the requirements of the new bridge design. The invert level of the existing downstream pipe culvert shall be recorded.

7.6 Construction of Box Culvert Bridge

The works on the pipe culvert bridge will be constructed in accordance with the following OPW standard design drawings:

- 2480-DR-003-P2
- 2480-DR-006-P1
- DMK-SK-001

See appendices for copy of drawing.

The channel bed shall be excavated to an appropriate level to allow formation of an adequate base for the foundation of the bridge. The invert level of the pipes will be laid at the same level as the existing structure.

The ground conditions will be examined and a decision will be made by the Site Foreman and Engineer as to material needed for pipe bedding and concrete foundations. Should it be decided that the ground conditions are poor, imported clean broken stone (3") and granular material (Cl.804) shall be placed and compacted along with lean-mix concrete to create the formation level. The formation level should be level and checked using a rotating laser level.

Concrete for the foundation of the end-walls and wing-walls shall be poured as per the drawing 2480-DR-003-P2. Two layers of A393 mesh reinforcement shall be used in the foundation if ground conditions are poor. 40mm cover shall be maintained between the reinforcement and the external finish of the concrete.

The pipe shall be lifted into place using the tracked excavator. The pipe diameter will match the existing pipes. The pipe(s) will be haunched with lean-mix concrete to a depth of 500mm on all sides. Concrete fill shall be held back from the ends of the pipe to ensure that there is sufficient cover for the concrete end walls.

The new end walls shall be formed around both pipe ends as per the design drawing. Peri Formwork shall be used to form the end walls and wing-walls. The end-walls shall be formed to reach upwards and create a foundation for the parapet walls.

Erect formwork for wing-walls (as per manufacturer/supplier instructions). Wing-walls are to be constructed as per OPW standard design drawings. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and end walls and vibrated using a poker vibrator. Steel dowel bars shall be inserted in the wet concrete for the parapet walls. A concrete slab shall be poured between the two end walls to the finished level of the bridge crossing.

Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

Erect formwork for parapet walls (as per manufacturer/supplier instructions). Walls are to be 225mm thick and a minimum height of 1200mm above the bridge deck. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the parapets and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

The removal of the cofferdam or re-instate diversion channel, depending on method used shall only be undertaken when the concrete has cured sufficiently.

8 Completion of Works

Following the completion of the construction works, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation.

Boundaries shall be re-established to the landowner's satisfaction.

A photographic survey of the completed works shall be carried out by the Site Foreman.

Records of any utility diversions and their locations shall be maintained and filed appropriately.

A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.

Landowner to be asked to fill out Landowner Satisfaction Form while adhering to Covid-19 Protocol.

9 Schedule of Appendices / Documents Attached

Main Documentation:

- Site Location Maps
- Design Risk Assessment
- Project Risk Assessment
- OPW Standard Design Drawings:
- 2480-DR-003-P2
- 2480-DR-006-P1

Statutory Forms:

- TBT Covid-19 Site Safety Induction
- AF3
- AF4
- GA2

OPW Forms:

Incident Report Form

Contractors Rules

– GA3

Project/Site	Claregalway, Co Galway: GPS Coordinates (53.3546, -8.9487)	
Checked By	Allen Higgins	*Foreman*
Approved By	Owen Hannon	*Engineer(s)*
Read & Communicated By		*Supervisor*

Appendix 5 – Biodiversity Records

Table 9: National Biodiversity Record Centre showing sample records in vicinity of site

Species Name	Grid Ref.	Approximate Distance from site	Date	Database
Lesser Horseshoe Bat *Rhinolophus hipposideros*	M35637	3.8	2009	National Bat Database of Ireland
European Otter *Lutra lutra*	M370333	0.92	2014	Atlas of Mammals in Ireland 2010-2015
Slender Green Feather-moss *Hamatocaulis vernicosus*	M222375	14.9	2004	Bryophytes of Ireland
Slender Naiad *(Najas flexilis)*	M034440	34.7	2014	Irish Vascular Plant Data
Freshwater Pearl Mussel *Margaritifera margaritifera*	M14	27	2006	River Biologists' Database (EPA)
White-clawed Crayfish *Austropotamobius pallipes*	M372332	1.06	1985 No recent records near site	River Biologists' Database (EPA)
Sea Lamprey *Petromyzon marinus*	M2924	12.8	Historic records only	Rare marine fishes taken in Irish waters from 1786 to 2008
Brook Lamprey *Lampetra planeri*			No records near on NBDC	
Salmon *Salmo salar*	M260334	10.8 Lough Corrib	1996	Freshwater Fish in Irish Lakes

Appendix 6 – Site Synopses

Site Name: Lough Corrib SAC

Site Code: 000297

Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha (the entire site is 20,556 ha). The lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included within the SAC as they are important for Atlantic Salmon. These rivers include the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site. 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):

[3110] Oligotrophic Waters containing very few minerals

[3130] Oligotrophic to Mesotrophic Standing Waters

[3140] Hard Water Lakes

[3260] Floating River Vegetation

[6210] Orchid-rich Calcareous Grassland*

[6410] Molinia Meadows

[7110] Raised Bog (Active)*

[7120] Degraded Raised Bog

[7150] Rhynchosporion Vegetation

[7210] Cladium Fens*

[7220] Petrifying Springs*

[7230] Alkaline Fens

[8240] Limestone Pavement*

[91A0] Old Oak Woodlands

[91D0] Bog Woodland*

[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)

[1092] White-clawed Crayfish (*Austropotamobius pallipes*)

[1095] Sea Lamprey (*Petromyzon marinus*)

[1096] Brook Lamprey (*Lampetra planeri*)

[1106] Atlantic Salmon (*Salmo salar*)

[1303] Lesser Horseshoe Bat (*Rhinolophus hipposideros*)

[1355] Otter (*Lutra lutra*)

[1393] Slender Green Feather-moss (*Drepanocladus vernicosus*)

[1833] Slender Naiad (*Najas flexilis*)

The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (Charophytes) in Ireland, with species such as Chara aspera, C. hispida, C. delicatula, C. contrariaand C. desmacantha mixed with submerged pondweeds (*Potamogeton perfoliatus, P. gramineus and P. lucens*), Shoreweed (*Littorella uniflora*) and Water Lobelia (*Lobelia dortmanna*). These Charabeds are an important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters, without Charaspecies, but with Shoreweed, Water Lobelia, Pipewort (*Eriocaulon aquaticum*), Quillwort (*Isoetes lacustris*), Alternate Water-milfoil (*Myriophyllum alternifolium*) and Slender Naiad (*Najas flexilis*). The last-named is listed under the Flora (Protection) Order, 2015, and is an Annex II species under the E.U. Habitats Directive.Large areas of reedswamp vegetation, dominated by varying mixtures of Common Reed (Phragmites australis) and Common Club-rush (*Scirpus lacustris*), occur around the margins of the lake. Reedswamp usually grades into species-rich marsh vegetation characterised by Slender Sedge (*Carex lasiocarpa*), Water Mint (Mentha aquatica), Water Horsetail (*Equisetum fluviatile*) and Bogbean (*Menyanthes trifoliata*). Of particular note are the extensive beds of Great Fen-sedge (*Cladium mariscus*) that have developed over the marly peat deposits in sheltered bays, particularly in the south-east corner of the lake. Alkaline fen vegetation is more widespread around the lake margins and includes, amongst the typically diverse range of plants, the Slender Cottongrass (*Eriophorum gracile*), a species protected under the Flora (Protection) Order, 2015. Wet meadows dominated by Purple Moor-grass (*Molinia caerulea*) occur in seasonally flooded areas close to the lake shore. These support species such as Sharp-flowered Rush (*Juncus acutiflorus*), Jointed Rush (*J. articulatus*), Carnation Sedge (*Carex panicea*), Devil's-bit Scabious (*Succisa pratensis*), Creeping Bent (Agrostis stolonifera) and Tormentil (*Potentilla erecta*), amongst others.

This large site contains four discrete raised bog areas and is selected for active raised bog, degraded raised bog, Rhynchosporion and bog woodland. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (Sphagnum spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, Sphagnum lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (R. fusca), and at least some of the following associated species, Bog Asphodel (*Nartheciumossifragum*), sundews (*Droseraspp*.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge. At Addergoole, on the eastern shores of Lough Corrib, there is an important area of western raised bog. This bog area is one of the most westerly, relatively intact raised bogs in the country. There are also other substantial areas of raised bog along various tributaries of the Corrib in east Co. Galway, namely Slieve Bog, Lough Tee Bog and Killaclogher bog. The active parts of these bogs mostly correspond to the wettest areas, where there are well-developed surface features with hummocks, lawns and pools. It is in such areas that *Rhynchosporion* vegetation is best represented. The dominant species is the aquatic bog moss *Sphagnum cuspidatum*, which is usually accompanied by Bogbean, White Beak-sedge, Bog Asphodel, Common Cottongrass (*Eriophorum angustifolium*), Bog Sedge (*Carex limosa*) and Great Sundew (*Drosera anglica*). Brown Beak-sedge, a locally rare plant of wet bog pools, has been recorded from a number of the bog areas within the site.

At Addergoole a substantial bog lake or soak occurs and this is infilling with large rafts of *Rhynchosporion* vegetation at present. This area is associated with an important area of wet bog woodland dominated by Downy Birch (*Betula pubescens*).The largest part of the uncut high bog comprises degraded raised bog. Degraded bog is dominated by a raised bog flora which tends to be rather species-poor because of disturbance and/or drying-out. The most conspicuous vascular plant species are usually Carnation Sedge, Heather (*Calluna vulgaris*), Cottongrasses, Cross-leaved Heath (*Erica tetralix*),Bog Asphodel and Deergrass. Bog-rosemary (*Andromeda polifolia*) and Cranberry (*Vaccinium oxycoccos*), two species

indicative of raised bog habitat, are frequent on both degraded and active areas of raised bog. Sphagnumcover is generally low within degraded areas due to a combination of drying-out and frequent burning. Limestone pavement occurs along much of the shoreline in the lower Corrib basin, and supports a rich and diverse flora, including Herb-Robert (*Geranium robertianum*), Bloody Crane's-bill (*G. sanguineum),* Carline Thistle (*Carlina vulgaris*), Spring Gentian (*Gentiana verna*), Wild Thyme (Thymus praecox), Rustyback (*Ceterach officinarum*), Wood Sage (*Teucrium scorodonia*), Slender St. John's-wort (*Hypericum pulchrum*), Quaking-grass (*Briza media*) and Blue Moor-grass (*Sesleria albicans*).

Areas of Hazel (*Corylus avellana*) scrub occur in association with exposed limestone pavement and these include species such as Hawthorn (*Crataegus monogyna*), Buckthorn (*Rhamnus catharticus*), Spindle (*Euonymus europaeus*), with occasional Juniper (Juniperus communis). Three Red Data Book species are also found in association with limestone scrub - Alder Buckthorn (Frangula alnus), Shrubby Cinquefoil (*Potentilla fruticosa*) and Wood Bitter-vetch (*Vicia orobus*), the latter is also protected under the Flora (Protection) Order, 2015. Open areas of orchid-rich calcareous grassland are also found in association with the limestone exposures. These can support a typically rich vegetation, including many orchids such as Pyramidal Orchid (*Anacamptis pyramidalis*), Common Spotted-orchid (*Dactylorhiza fuchsii*), Early-purple Orchid (*Orchis mascula*), Frog Orchid (*Coeloglossum*) Fragrant Orchid (*Gymnadenia conopsea*), Marsh Helleborine (*Epipactis palustris*), Greater Butterfly-orchid (Platanthera chlorantha) and Irish Lady's-tresses (*Spiranthes romanzoffiana*). The latter is protected under the Flora (Protection) Order, 2015. The Hill of Doon, located in the north-western corner of the lake, is a fine example of a Sessile Oak (Quercus petraea) woodland.

The understorey is dominated by Sessile Oak, Holly (*Ilex aquifolium*) and occasional Juniper. There are occasional Yew (*Taxus baccata*) and Ash (Fraxinus excelsior), and a well-developed ground layer dominated by Bilberry (*Vaccinium myrtillus*), Hard Fern (*Blechnum spicant*) and Wood Rush (*Luzula sylvatica*). Woodland also occurs on some of the islands in the lake .A number of the rivers in the site support submerged and floating vegetation of the *Ranunculion fluitantis* and *Callitricho-Batrachion*, including mosses. For example, in the River Corrib species such as Shining Pondweed (*Potamogeton lucens*), PerfoliatePondweed (*Potamogeton perfoliatus*), Small Pondweed (*P. berchtoldii*), Yellow Water-lily (*Nuphar lutea*), White Water-lily (Nymphaea alba) and stoneworts (*Charaspp.)* occur. The rare and Annex II-listed Slender Green Feather-moss (*Drepanocladus[Hamatocaulis] vernicosus*) is found at the fen at Gortachalla, north-east of Moycullen. Here it is widespread around the margins, and this constitutes a large and significant population in the national context. A very large population of another rare moss, *Pseudocalliergon trifarium*, is also found in this area. The lake is rated as an internationally important site for waterfowl. Counts from 1984 to 1987 revealed a mean annual peak total of 19,994 birds. In the past a maximum peak of 38,281 birds was recorded. The lake supports internationally important numbers of Pochard (average peak 8,600) and nationally important numbers of the following species: Coot (average peak 6,756), Mute Swan (average peak 176), Tufted Duck (average peak 1,317), Cormorant (average peak 110) and Greenland White-fronted Goose (average peak 83). The latter species is listed on Annex I of the E.U. Birds Directive.

The Coot population is the largest in the country and populations of Tufted Duck and Pochard are second only to Lough Neagh. Breeding pairs of Common Scoter on the lake number 30-41 (1995 data), as well as breeding populations of Arctic Tern and Common Tern. Other bird species of note recorded from or close to the lake recently include Hen Harrier, Whooper Swan, Golden Plover and Kingfisher. All of these species are listed on Annex I of the E.U. Birds Directive. Otter and Irish Hare have been recorded regularly within this site. Both of these species are listed in the Red Data Book and are legally protected by the Wildlife Act, 1976. Otter is also listed on Annex II of the E.U. Habitats Directive. Lough Corrib is considered one of the best sites in the country for Otter, due to the sheer size of the lake and associated rivers and streams, and also the generally high quality of the habitats. Atlantic Salmon (*Salmo salar*) use the lake and rivers as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. Lough Corrib is also a well-known fishing lake with a very good Trout (Salmo trutta) fishery. The lake has a population of Sea Lamprey (Petromyzon marinus), a scarce, though

probably under-recorded species listed on Annex II of the E.U. Habitats Directive. Brook Lamprey (*Lampetra planeri*), also listed on Annex II, are also known from a number of areas within the site. A population of Freshwater Pearl Mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs within the site. White-clawed Crayfish (*Austropotamobius pallipes*), also listed on Annex II, is well distributed throughout Lough Corrib and its in-flowing rivers over limestone.

A summer roost of Lesser Horseshoe Bat, another Annex II species, occurs within the site -approximately 100 animals were recorded here in 1999.The main threats to the quality of this site are from water polluting activities resulting from intensification of agricultural activities on the eastern side of the lake, uncontrolled discharge of sewage which is causing localised eutrophication of the lake, and housing and boating development, which is causing the loss of native lakeshore vegetation. The raised bog habitats are susceptible to further degradation and drying out due to drainage and peat cutting and, on occasions, burning. Peat cutting threatens Addergoole Bog and already a substantial area of it has been cut away. Fishing and shooting occur in and around the lake. Introduction of exotic crayfish species or the crayfish fungal plague (*Aphanomyces astaci*) could have a serious impact on the native crayfish population. The bat roost is susceptible to disturbance or development. Despite these ongoing issues, however, Lough Corrib is one the best examples of a large lacustrine catchment system in Ireland, with a range of habitats and species still well represented. These include 15 habitats which are listed on Annex I of the E.U. Habitats Directive, six of which are priority habitats, and nine species which are listed on Annex II. The lake is also internationally important for birds and is designated as a Special Protection Area.

01.12.2015

Appendix 7- Qualifications

Dr. Karina Dingerkus

Summary

Experienced field ecologist with twenty years' experience of working with local authorities, communities, charities, academic institutions and as a self-employed consultant.

Employment

2005-present	Self-employed Environmental Consultant, based in Co. Mayo
2000–2005	Ecology Officer, Norwich City Council
1998–2000	Environmental Liaison Officer, Ulster Wildlife Trust/Lisburn Borough Council
1997	Part time field worker for ATEC (Environmental Consultants)
1993	Fieldworker at Culterty Field Station, Aberdeen University, Scotland

Education

PhD. 1997 The Ecology and Distribution of the Irish hare in Northern Ireland, Queen's University, Belfast

BSc. 1993 (2:1 Class Hons.), Zoology (Animal Ecology), Aberdeen University, Scotland

Selected publications and reports

Various NIS reports for planning applications for private individuals.

Ballinedine Wildlife and Pollinator Wildlife (2018), Ballindine Tidy Towns, Heritage Office, Mayo County Council

Survey of woodland at Laghtarvarry, Ballyvary and Chancery, Turlough, Co Mayo **(2016)** for Bernard and Zane Joyce. Unpublished report

Survey for squirrels at Jamestown Forest, Co Westmeath for Coillte **(2015)**

County Louth Hedgerow Survey (2014): Survey and report for Heritage Office, Louth County Council. www.louthheritage.ie/publications_39_2350481956.pdf

Nature and Wildlife in Roscommon - Action for Biodiversity, Giorria Environmental Services and Janice Fuller, Roscommon County Council (2012)

Dingerkus, SK, Stone, RE, Wilkinson, JW, Marnell F and Reid N., (2010) Developing a methodology for the National Frog Survey of Ireland: a pilot study in Co. Mayo. Irish Naturalists' Journal *31 No.2 2010: 85-90*

West Galway Hedgerow Survey and associate hedgerow leaflets for Galway County Council (2007).

Biodiversity Action Plans for County Mayo and County Roscommon (Heritage Council funded) (2007).

County Cavan Hedgerow Report for Cavan County Council (2006).

Reid, N., Dingerkus, K., Montgomery, W.I., Marnell, F., Jeffrey, R., Lynn, D., Kingston, N. & McDonald, R.A. (2007) Status of hares in Ireland. *Irish Wildlife Manuals*, No. 30. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government

Dr. Richard Stone

Experienced ornithologist and field ecologist with wide range of surveying experience including aquatic, hedgerow, bird, mammal, and vegetation surveys.

Employment

2005 - present	Self-employed Environmental Consultant, based in Co. Mayo
2003 - 2005	Organ keyboard maker. P & S Specialist Joinery, UK
2000 - 2002	Environmental Research Scientist at British Antarctic Survey, Cambridge, UK
1998 - 1999	Field Ecologist ATEC Consultants
1998	Breeding Bird survey for RSPB Northern Ireland.
1989	Set-aside survey for RSPB, bird and vegetation surveys.
1987	Vegetation survey of open cast coal sites, Wales for RSPB

Education

PhD. 1999 The ecology and behaviour of water birds in relation to human activity on Strangford Lough, Queen's University, Belfast.

BSc. 1993 (2:1 Class Hons.), Zoology (Animal Ecology), Aberdeen University, UK.

Selected publications and reports

Survey of woodland at Laghtarvarry, Ballyvary and Chancery Turlough Co Mayo (2016) for Bernard and Zane Joyce. Unpublished report

Survey for squirrels at Jamestown Forest, Co Westmeath for Coillte (2015)

Cooper, F., Stone, R.E., McEvoy, P., Wilkins, T. & Reid, N. (2012). The conservation status of juniper formations in Ireland. Irish Wildlife Manuals, No. 63. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Dingerkus, SK, Stone, RE, Wilkinson, JW, Marnell F and Reid N., (2010) Developing a methodology for the National Frog Survey of Ireland: a pilot study in Co. Mayo. Irish Naturalists' Journal 31 No.2 2010: 85-90

West Galway Hedgerow Survey and associate hedgerow leaflets (2007).

Mathers, R.G., Watson, S., Stone, R.E. and Montgomery, W.I. (2000) A study of the impact of human disturbance on Wigeon *Anas penelope* and Brent geese *Branta bernicla hrota* on an Irish Sea Loch. Wildfowl 51: 67-81.

Speakman, J.R., Irwin, N., Tallach, N. and Stone, R.E. (1999) Effect of roost size on the emergence behaviour of pipistrelle bats (*Pipistrellus pipistrellus*): Statistical artefacts and intra- and inter-roost effects. Animal Behaviour 58: 787-795.

Mathers, R.G., Montgomery, W.I., Portig, A.A. and Stone, R. (1998) Winter habitat use by Brent Geese *Branta bernicla hrota* and Wigeon *Anas penelope* on Strangford Lough, Co. Down. Irish Birds 6: 257-268.