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

Proposed removal of an existing pipe culvert bridge and the construction of a new culvert bridge, at Curraghmore, Headford, Co Galway
(GPS Coordinates 53.4514, -9.2220, C13 UB2)

For OPW

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Giorria Environmental Services
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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 removal of an existing pipe culvert bridge and the construction of a new culvert bridge, Curraghmore, Headford, 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 Arterial Drainage Scheme at Curraghmore, Headford, Co Galway (GPS Coordinates 53.4514, -9.2220, C13 UB2). The works will include the removal of an existing pipe culvert bridge and the construction of a new culvert bridge. All works will be in accordance with the OPW Standard Design, (Drawing Refs 2480-DR-003-P2 & 2480-DR-006-P1).

Photograph 1: Site Curraghmore, Headford, 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

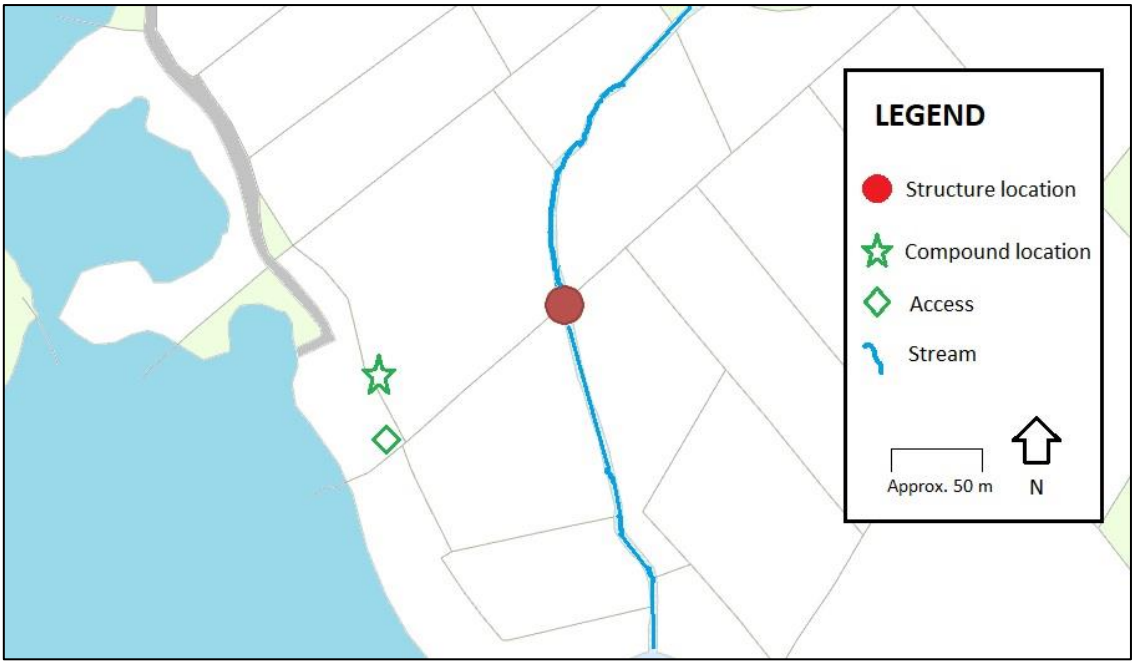
A multidisciplinary walkover survey was conducted on the 17th June 2022 following NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes) by ecologist Dr Richard Stone. All habitats were identified. The walkover surveys were designed 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 Curraghmore, approximately 7 km west of Headford, Co. Galway. The site lies 150 m east of Lough Corrib.

The site is located between two pasture fields (Fossitt Classification GA1). These fields had recently been cut for silage and had a recent slurry application. The neighbouring fields had also been treated the same. The downstream wall of the bridge forms the boundary with the downstream fields and a stonewall separates these fields. The present bridge is overgrown with vegetation (predominantly grasses and nettles) but was still passable on foot. The side walls were intact, and no recent vehicle activity was evident. The bridge top is fairly high over the stream (2.5 m approximately) with the stream channel having steep sides. Upstream the channel is more open with some evidence of bank vegetation clearance on left bank, while the right bank remains unmanaged. Downstream is much more overgrown and no evidence of recent management activity. There is also a wider margin between the cultivated field and the stream bank top compared to the upstream left bank field. The upstream right bank margin is an overgrown hedgerow of small hawthorn bushes and bramble.

The bridge is a culvert type bridge with a fairly small water opening. The present water level was three quarters up the opening with minimal flow. There was little vegetation upstream in the channel with more downstream particularly along the margins. There was evidence of fairly recent management of the left upstream bank with cut tree stumps and short vegetation regrowing along this section compared to the other banks. The other banks were unmanaged.

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: View upstream looking downstream

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 Arterial Drainage Scheme at Curraghmore, Headford, Co Galway (GPS Coordinates 53.4514, -9.2220). The works will include the removal of an existing pipe culvert bridge and the construction of a new culvert bridge. All works will be in accordance with the OPW Standard Design, (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 free-board 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
- 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.

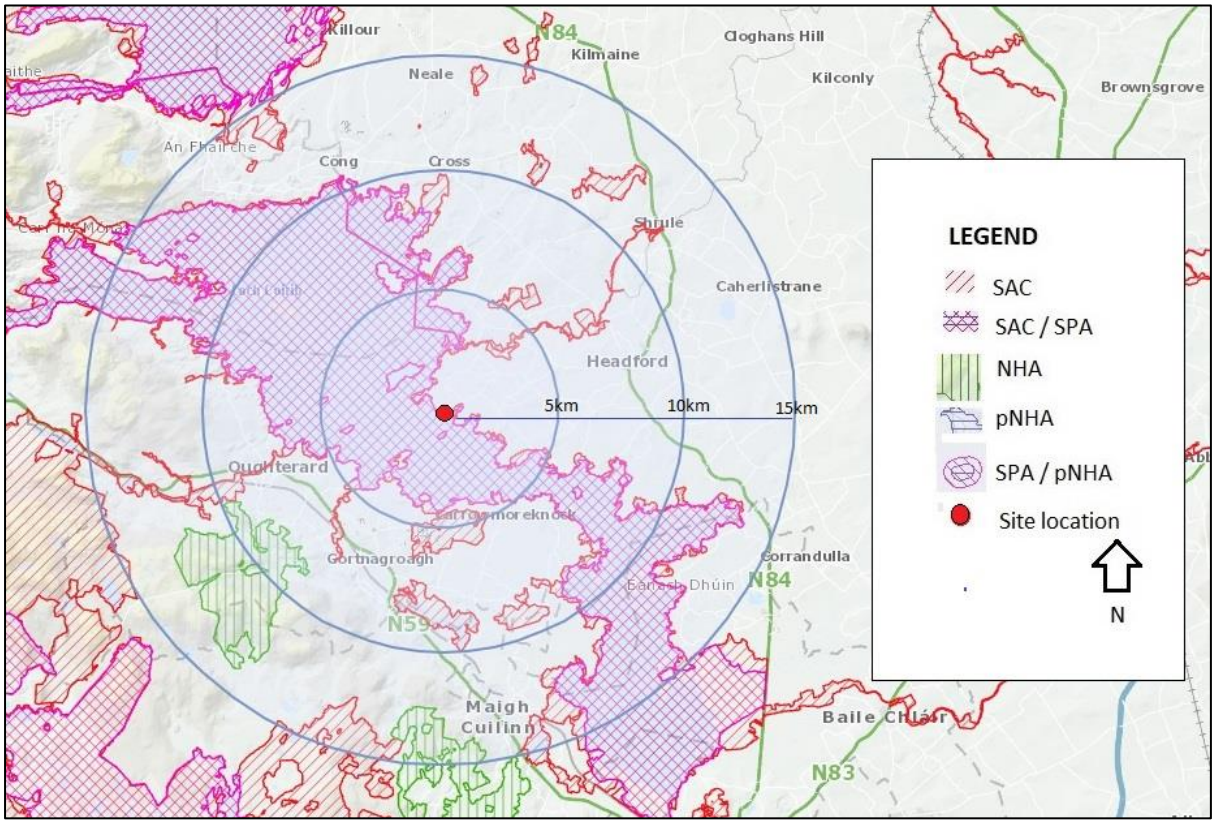
Photograph 5: View of stream looking downstream showing well vegetated nature of the channel

4.2 Description of Natura 2000 sites

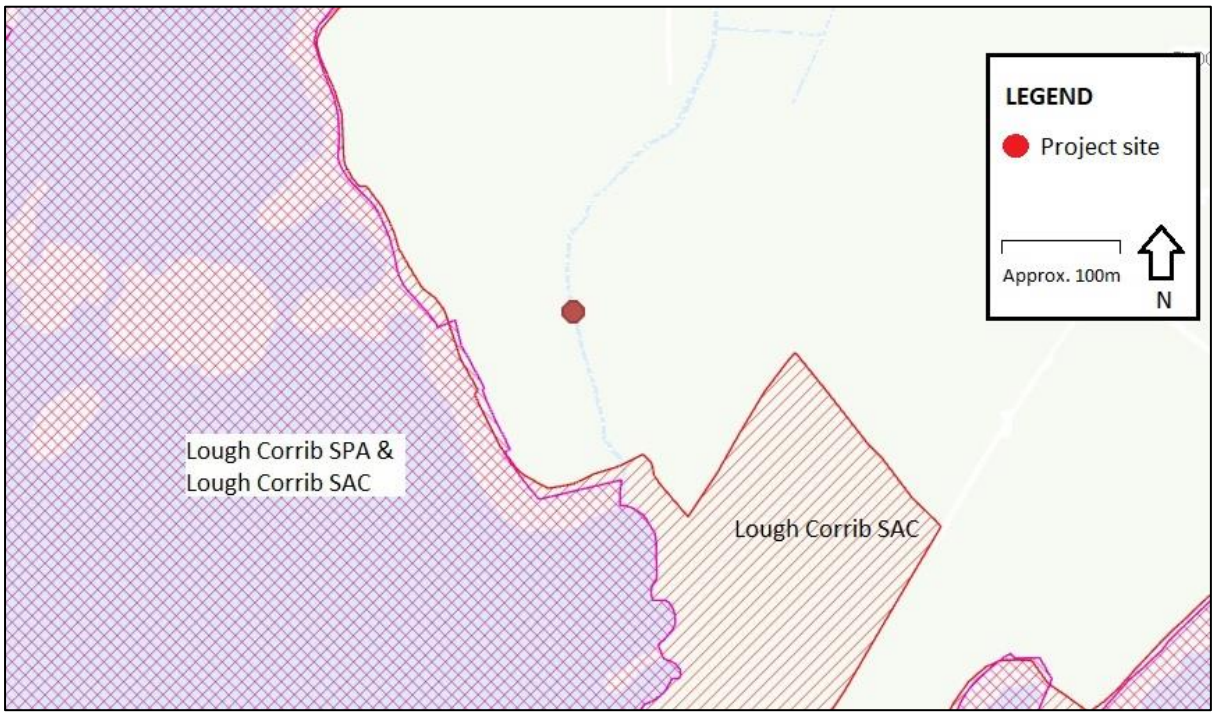
Due to the scale and nature of the proposed project the zone of influence is highly unlikely to extend to 15 km. However, in order to ensure no impact on Natura 2000 sites occurring within 15 km of the project site, all were considered for the initial assessment.

There are three Special Protection Areas (SPA) and 11 Special Areas of Conservation (SAC) within 15 km of the project site. The closest Natura 2000 sites are Lough Corrib SAC (approximately 114 m) and Lough Corrib SPA (approximately 107 m).

Two Natural Heritage Areas (NHAs) 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 and Lough Corrib SPA with site location at Curraghmore
(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- 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 davallianae*	114	153.6	SAC lies to the north and west of the project site. Hydrological connection to site though the EPA River (IE_WE_30C020300, Segment code: 30_2373). Project area lies just over 100 m for Natura site. Further assessment required.

	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)*			
Gortnandarragh Limestone Pavement SAC - 001271 Gortnandarragh Limestone Pavement is located on the southern side of Lough Corrib. The site consists of an exposed limestone plateau which slopes down on its eastern side to cut-over fen and bog. Parts of the pavement exhibit a well-developed system of clints and grykes, while other parts are shattered, with much loose rock. The pavement forms a mosaic with heath, grassland and scrub. Much of the central part is open but the eastern side contains enclosures and is grazed by cattle. The site supports a typical flora of limestone pavement. It is the only known locality for the endemic fungus	**Habitats** 8240 Limestone pavements*	4273	N/A	SAC lies south of project site, on other side of Lough. No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance from site being over 4 km, no significant impact is envisaged.

for *Entoloma jennyi.*				
Cloughmoyne SAC - 000479 The site is a Special Area of Conservation selected for Limestone Pavement of the 'shattered' form. The limestone pavement supports a typical flora and is associated with areas of species-rich calcareous grassland and heath. Of particular note is the presence of the very rare and legally protected (Flora (Protection) Order, 1999) species Limestone Fern (*Gymnocarpium robertianum*).The site includes areas of species-rich dry grassland, which includes flora species including the scarce Dense-flowered Orchid (*Neotinea maculata*), Spring Gentian (*Gentiana verna*) and the rare and legally protected (Flora (Protection) Order, 1999) species, Wood Bitter-vetch (*Vicia orobus*). The site also includes some species-poor fen vegetation, dominated by Black Bog-rush (*Schoenus nigricans*).	**Habitats** 8240 Limestone pavements*	4524	N/A	No hydrological connection. SAC lies north-east of the project site. Due to no hydrological connection and terrestrial separation distance of over 4.5 km from site, no significant impact is envisaged.
Ross Lake and Woods SAC - 001312 Ross Lake and Woods is located on the west side of Lough Corrib. The main habitat on the site is a medium-sized hard water lake, Ross Lake, which has a limestone bed covered by deposits of precipitated marl and a shoreline of marl-encrusted limestone boulders. A smaller lake, Lough Parkyflaherty, is separated from the main lake by an overgrown railway embankment. A breeding colony of Lesser Horseshoe Bat occurs in an out-building beside Ross House. The woodlands and lakeside vegetation on the site provide foraging habitat within a small radius of the roost site.	**Habitats** 3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)*	7122	N/A	SAC lies south of project site, on other side of Lough. No hydrological connection. Due to no hydrological connection and terrestrial separation distance of over 7 km from site, no impact is envisaged.
Mocorha Lough SAC - 001536 Mocorha Lough comprises a shallow wetland complex. The predominant habitat on the site is fen, including Cladium Fens that is dominated by Great Fen-sedge (*Cladium mariscus*). Areas of dry calcareous grassland, wet grassland and Juniper	**Habitats** 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae*	9787	N/A	SAC lies north-east of project site. No direct hydrological connection. Due to no hydrological

(*Juniperus communis*) scrub also occur. Very little open water remains at the site. The scarce moss *Drepanocladus cossonii* has been recorded. The site supports locally important numbers of wetland birds, especially Snipe and Mallard.				connection and terrestrial separation distance of over 9.8 km from site, no impact is envisaged.
Shrule Turlough SAC - 000525 Shrule Turlough is a large, highly oligotrophic turlough, with thick marl and peat deposits which makes it unusual in the general range of turloughs and gives it a very significant ecological value. There is no above-ground outflow from the turlough. Drainage attempts have been made by enlarging the swallow holes, but the turlough still floods regularly and appears to show little modification due to the drainage efforts. Shrule Turlough has a high level of physical and supports a diversity of plant communities including some species rare in turloughs.	**Habitats** 3180 Turloughs*	10124	N/A	SAC lies north-east of project site. No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance of over 10 km from site, no impact is envisaged.
Kildun Souterrain SAC – 002320 Kildun Souterrain contains an important hibernation site of the Lesser Horseshoe Bat. It is situated within an area of Hazel (Corylus avellana) and Ash (Fraxinus excelsior) woodland which grows over limestone. The number of bats using this site has been gradually increasing and in January 2001, 69 bats were counted here making it a roost of international importance. Much of the surrounding natural habitat has been reclaimed and further reclamation may lead to disturbance of the bats. The soil that covers the souterrain has been eroded by trampling cattle and this allows some light to enter the roost. This could impact on the microclimate of the souterrain. The summer roosting location of the bats in unconfirmed, as is the extent of the foraging area.	**Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)*	11310	N/A	No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance of over 11 km from site, no impact is envisaged.
Lough Carra/Mask Complex SAC – 01774	**Habitats** 3110 Oligotrophic waters containing	12106	N/A	No direct hydrological connection, upstream

This site comprises of two large lakes, Lough Mask and Lough Carra, and includes the smaller Cloon Lough. Lough Mask is the sixth largest lake in the country and is an excellent example of an oligotrophic lake. There is a variety of wetland habitats and significant amounts of deciduous woodland. Lough Carra, which is hydrologically linked to Mask, is one of the best examples in Ireland of a hard water marl lake. It is fringed by a diverse complex of limestone and wetland habitats. Areas of calcareous grassland, often orchid-rich, occur interspersed amongst the limestone. There are several rare plants is found at this site, e.g. Irish St. John's-wort and Irish Lady's-tresses. There is also a summer breeding site for the Lesser Horseshoe Bat. In 1993 more than 100 bats were counted, which makes it of international importance. The site has important bird interests. There are national important flocks of Greenland White-fronted Goose, Shoveler, Tufted Duck and Goldeneye. Other important species are Arctic Char and White-clawed Crayfish.	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. 4030 European dry heaths 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* 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)* 6216 Slender Green Feather-moss *(Hamatocaulis vernicosus)* 1355 Otter *(Lutra lutra)*			connection through Lough Corrib. Due to no hydrological connection and terrestrial separation distance of over 12 km from site, no impact is envisaged.
Ballymaglancy Cave, Cong SAC – 000474 Ballymaglancy Cave is a linear stream cave which supports a population of Lesser Horseshoe Bat. This is a fairly extensive (>500 m) example of a natural limestone cave. Lesser Horseshoe Bats have been using the cave for many years. The numbers, however, vary with	**Habitats** 8310 Caves not open to the public **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)*	12134	N/A	No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance of over

external temperature; during periods of sustained low temperatures, numbers in the cave may exceed 50 bats; when air temperature rises, numbers may drop to approximately 35 bats. Most of the bats hibernate within 20 m of the cave entrance.				12 km from site, no impact is envisaged.
Connemara Bog Complex SAC – 002034 The Connemara Bog Complex SAC is a large site encompassing a wide range of habitats, including extensive tracts of western blanket bog, and areas of heath, fen, woodlands, lakes, rivers and coastal habitats. Both oligotrophic and dystrophic lakes are found within the SAC. The rare species Slender Naiad (*Najas flexilis*) and Pillwort (*Pilularia globulifera*) have both been recorded here. Within this site, areas of transition mire occur mainly along the margins of lakes and bog streams. Four saline lake lagoons occur and support several lagoon specialist species. Seven other species protected under the Flora (Protection) Order, 2015, occur within this site: Forked Spleenwort (*Asplenium septentrionale*), Parsley Fern (*Cryptogramma crispa*), Bog Hair-grass (*Deschampsia setacea*), Slender Cottongrass (*Eriophorum gracile*), Bog Orchid (*Hammarbya paludosa*), Heath Cudweed (*Omalotheca sylvatica*), and Pale Dog-violet (*Viola lactea*). Rare and threatened species such as Dorset Heath (*Erica ciliaris*), Mackay's Heath (*Erica mackaiana*) and Green-winged Orchid (*Orchis morio*) also occur within this site. The Annex II species, Marsh Fritillary and Atlantic Salmon occur. The site is of national importance for wintering populations of Greenland White-fronted Goose. There is an internationally important breeding area for Cormorants at Lough Scannive. Another Annex I species known to be present in the site is Merlin, Common Terns and Choughs.	**Habitats** 1150 Coastal lagoons* 1170 Reefs 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 3160 Natural dystrophic lakes and ponds 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 4010 Northern Atlantic wet heaths with Erica tetralix 4030 European dry heaths 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 7130 Blanket bogs (* if active bog) 7140 Transition mires and quaking bogs 7150 Depressions on peat substrates of the Rhynchosporion 7230 Alkaline fens 91A0 Old sessile oak woods with Ilex	12281	N/A	No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance of over 12 km from site, no impact is envisaged.

	and Blechnum in the British Isles **Species** 1355 Otter *(Lutra lutra)* 1833 Slender Naiad *(Najas flexilis)* 1065 Marsh Fritillary *(Euphydryas aurinia)* 1106 Salmon *(Salmo salar)*			
Clyard Kettle-holes SAC 000480 This site comprises several small lakes and turloughs developed between stony hillocks west of Kilmaine, Co. Mayo. Some of these lakes are connected with each other but others appear to fill and empty by subterranean means. The main plant community in the kettle-holes at Clyard townland is Cladium fen. To the north of Clyard, in Coolisduff townland, lies a turlough that floods in winter to an area of 12 ha. This turlough drains to a swallow hole in the north-west corner, with summer pools supporting stands of Great Fen-sedge. Another turlough lies just to the north, in Thomastown townland. Two further turlough areas occur to the west, at Cahernagry East, which floods to an area of 12 ha, and at Caherhemush – Ballywalter, which floods to over 25 ha.	**Habitats** 3180 Turloughs* 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae*	12716	N/A	No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance of over 12 km from site, no impact is envisaged.
Lough Corrib SPA - 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 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,	**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	107	186.5	Hydrological connection to site. Project area lies just over 100 m for Natura site. Further assessment required.

Shoveler, Pochard, Tufted Duck, Common Scoter, Hen Harrier, Coot, Golden Plover, Black-Headed Gull, Common Gull, Common Tern and Arctic Tern all occur.	Gull *(Chroicocephalus ridibundus)* A056 Shoveler *(Anas clypeata)* A193 Common Tern *(Sterna hirundo)* A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)* **Habitats** Wetlands			
Lough Mask SPA 004062 Lough Mask is a large lake. The main inflowing rivers are the Cloon and Robe, and the stream from Lough Carra to the north-east. The main outflow is to Lough Corrib to the south. The eastern part of the lake is edged by a low-lying shoreline which is subject to winter flooding. The water of the lake is moderately hard. There are a number of islands. Lough Mask is a nationally important site for breeding gulls including Black-headed Gull, Common Gull and Lesser Black-backed Gull. The lake is also a traditional breeding site for Common Tern. In winter the site supports a range of waterfowl, including a nationally important Tufted Duck population. It also supports Whooper Swan, Greenland White-fronted Goose, Mute Swan, Whooper Swan, Wigeon, Teal, Mallard, Pochard, Goldeneye, Red-breasted Merganser, Little Grebe, Cormorant, Coot, Lapwing and Curlew.	**Birds** A183 Lesser Black-backed Gull *(Larus fuscus)* A061 Tufted Duck *(Aythya fuligula)* A182 Common Gull *(Larus canus)* A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)* A193 Common Tern *(Sterna hirundo)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* **Habitats** Wetlands	14184	N/A	No direct hydrological connection, though Lough Corrib and Lough Mask are connected upstream. Due to upstream nature of hydrological connection and terrestrial separation distance of over 14 km from site, no impact is envisaged.
Connemara Bog Complex SPA - 004181 The site consists of three separate areas - north of Roundstone, south of Recess and north-west of Spiddal. The Connemara Bog Complex SPA is characterized by areas of deep peat surrounded by heath-covered rocky outcrops. The deeper peat areas are often bordered by river systems and the many oligotrophic lakes that occur, resulting in an intricate mosaic of various peatland/wetland habitats and	**Birds** A098 Merlin *(Falco columbarius)* A017 Cormorant *(Phalacrocorax carbo)* A140 Golden Plover *(Pluvialis apricaria)* A182 Common Gull *(Larus canus)*	15190	N/A	No direct hydrological connection. Due to no hydrological connection and terrestrial separation distance of just over 15 km from site, no impact is envisaged.

vegetation communities; these include Atlantic blanket bog with hummock/hollow systems, inter-connecting pools, Atlantic blanket bog pools, flushes, transition and quaking mires, as well as freshwater marshes, lakeshore, lake and river systems. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Cormorant, Merlin, Golden Plover and Common Gull.				

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
002431	Oughterard District Bog NHA	7.8	No direct hydrological connection
002364	Moycullen Bogs NHA	12.2	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 the Lough Corrib SPA 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 (NPWS, 2017). Habitat lies just under 186 m downstream from site. Direct hydrological connection between project site and Natura 2000 site, therefore potential for effect.

	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			
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. However, as the lakes lies just under 186 m downstream from site. Direct hydrological connection between project site and Natura 2000 site, therefore potential for effect.

	• 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). Habitat lies just under 186 m downstream from site. Direct hydrological connection between project site and Natura 2000 site, therefore potential for effect.

	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			
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. Lough Corrib lies 186 m downstream of project site. Due to nature, size and scale

	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			of the proposed project, and the assimilation capacity of the intervening lake and the fact there will be no change in the hydrological site characteristics, there is no possibility for significant effects on Water courses of plain to montane with the Ranunculion fluitantis and Callitricho-Batrachion
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 stream. There is no possibility for significant effects on Calcareous grassland due to no potential for habitat loss or degradation, works will be contained within the project site and the small the size and scale of the proposed project.

	• 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 project site during site visit. Project site is composed of improved agricultural grassland (GA1) and stream. There is no possibility for significant effects on *Molinia* Meadows due to no potential for habitat loss or degradation, works will be contained within the project site and the small the size and scale of the proposed project.

	• 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 15 km from site) and Lough Tee Bog (over 40 km from site). None of this habitat recorded on project site during site visit. Project site is composed of improved agricultural grassland (GA1) and small stream. There is no possibility for significant effects on Raised Bog (Active) due to no potential for habitat loss or degradation, no impacts of drainage, works will be contained within the project site and the small the size and scale of the proposed project.

	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 small stream. There is no possibility for significant effects on degraded raised Bog due to no potential for habitat loss or degradation, no impacts of drainage, works will be contained within the project site and the small the size and scale of the proposed project.
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 but does not occur within site. None of this habitat recorded on project

	Lough Corrib SAC		habitat	site during site visit. Project site is composed of improved agricultural grassland (GA1) and small stream. There is no possibility for significant effects on Rhynchosporion Vegetation due to no potential for habitat loss or degradation, no impacts of drainage, works will be contained within the project site and the small the size and scale of the proposed project.
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	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 small stream. 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 the size and scale of the proposed project.

	• Maintain vegetation cover of typical species including brown mosses and vascular plants • 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	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 small stream. 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 the size and scale of the proposed project.

	be Dominant or Abundant; invasive species should be absent • 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	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 small stream. 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 the size and scale of the proposed project.

	black bog-rush (*Schoenus nigricans*) flush and bottle sedge (*Carex rostrata*) fen • 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	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 small stream. There is no possibility for significant effects on Limestone Pavement due to no potential for habitat loss or degradation,

	natural processes. • Vegetation composition: At least seven positive 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			works will be contained within the project site and the small the size and scale of the proposed project.
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	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, at least 7 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 stream. There is no possibility for significant

	size • Diverse structure with a relatively closed canopy 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			effects on Old Oak Woodlands due to a terrestrial separation distance greater than 7 km, no potential for habitat loss or degradation, works will be contained within the project site and the small the 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	Land/Air pathway	Invasive species	Conservation objectives maps show recorded bog woodland over 18 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 small stream. There is no possibility for significant

	present • Both native and non-native invasive species 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			effects on Bog Woodland due to a terrestrial separation distance greater than 18 km, no potential for habitat loss or degradation, works will be contained within the project site and the small the 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	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. In addition, the size and scale of the proposed development is small.

	greater than 0.93 • Restore substratum quality - filamentous algae: 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 mapped approximately 5 km from project site. There is a small possibility that crayfish could occur close to where the stream enters the lake 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*)	To restore the favourable conservation condition of Sea Lamprey in Lough Corrib SAC, which is defined	Surface water	Water pollution	Records from lower section of River Corrib.

1095	by the following list of attributes and targets: 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	pathway.		There is no possibility for significant 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 There is no possibility for significant effects on Brook lamprey due to the assimilation capacity of the intervening lake (Lough Corrib). In addition, the size and scale of the proposed project is small
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	Surface water pathway.	Pollution, sedimentation	Salmon have been recorded in Lough Corrib and are known to spawn in the headwaters of Lough Corrib tributaries. There is no possibility for significant effects on salmon due to the assimilation

	accessible from estuary • Adult spawning fish: Conservation limit (CL) for 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			capacity of the lake water and the small size and scale of the proposed project.
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	Records of Lesser Horseshoe Bat are over 7 km from the project site. Lesser horseshoe bats use buildings as roosts. There are no building on or close to the project site. In addition, there will be no decline of foraging habitat within 2.5km of qualifying roosts 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	Surface water pathway.	Sediment or pollution run-off from proposed works to	Records of Otter within 300 m of project site. 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

	• No significant decline in extent of terrestrial 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.		nearby waterbodies, disturbance, destruction of holts	human activity. 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 lakeside 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	Land/Air pathway	Destruction to habitat	Slender Green Feather-moss has been mapped approximately 8 km from project site. 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.

	less than 25% • 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	Surface water pathway.	Sediment or pollution run-off from proposed works to nearby waterbodies	Occurs in NW of Lough Corrib, at least 16 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.

	processes • 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*			

Table 4: Lough Corrib SPA – 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 Interests (QI) and code (*Potential receptors*)	**Conservation objectives**	**Pathway / Comment**	**Source of potential threats**	**Likelihood of significance**
Arctic Tern *Sterna paradisaea* A194	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for breeding populations of Arctic tern. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Confirmed breeding records of Arctic tern within 10 km square M14 and within timed tetrad visit for M14Y (Bird Atlas 2007 - 2011), which lies about 700 m north of project site. There is no possibility for significant disturbance to Arctic tern due to the small scale and nature of the proposed project, the unsuitability of the site for use by breeding terns, no direct line of sight to known breeding locations for this species (north of project site) due to lie of the land and existing stonewalls.
Black-headed gull *Larus ridibundus* A179	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for breeding populations of Black-headed gull. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Confirmed breeding records of Black-headed gull within 10 km square M15 and probable breeding record within timed tetrad visit for M24C (Bird Atlas 2007 - 2011), which lies

				about 1.2 km east of project site. There is no possibility for significant disturbance to Black-headed gull due to the small scale and nature of the proposed project, the unsuitability of the site for use by breeding gulls, no direct line of sight to known breeding locations for this species due to lie of the land and existing stonewalls
Common Gull *Larus canus* A182	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for breeding populations of Common gull. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Confirmed breeding records of Common gull within 10 km square M14 and within timed tetrad visit for M14Y (Bird Atlas 2007 - 2011), which lies about 700 m north of project site. This area has also recorded occupied nests from previous surveys in the early 2000s (Seabird 2000). There is no possibility for significant disturbance to Common gull due to the small scale and nature of the proposed project, the unsuitability of the site for use by breeding gulls, no direct line of sight to known breeding locations for this species due to lie of the land and existing stonewalls.
Common Scoter *Melanitta nigra*	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works	SPA designated for breeding populations of Common Scoter. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site.

A065			Disturbance	Probable breeding records of breeding Common Scoter within 10 km square M14 (Bird Atlas 2007 - 2011). There is no possibility for significant disturbance to Common scoter who nest on islands with dense covering of scrub and tree cover, due to the small scale and nature of the proposed project, the unsuitability of the site for use by breeding scoter, no direct line of sight to possible breeding locations for this species due to lie of the land and existing stonewalls.
Common Tern *Sterna hirundo* A193	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for breeding populations of Common tern. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Confirmed breeding records of breeding Common tern within 10 km square M14 (Bird Atlas 2007 - 2011). There is no possibility for significant disturbance to Common tern, due to the small scale and nature of the proposed project, the unsuitability of the site for use by breeding scoter, no direct line of sight to possible breeding locations for this species due to lie of the land and existing stonewalls.
Coot *Fulica atra* A125	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works	SPA designated for wintering populations of Coot. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site.

			Disturbance	Records of Coot within 10 km square M14 (Bird Atlas 2007 – 2011). There is no possibility for significant disturbance to Coot due to the small scale and nature of the proposed project, the unsuitability of the site for use by coot who prefer large shallow water bodies that are rich in nutrients, and a terrestrial separation distance of at least 165 m to lake shore.
Gadwall *Anas Strepera* A051	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for wintering populations of Gadwall. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Records of wintering Gadwall within 3.4 km of site and with 10 km square (M14 Birds of Ireland 2020) There is no possibility for significant disturbance to Gadwall due to the small scale and nature of the proposed project, a terrestrial separation distance of at least 165 m from the lough shore
Golden Plover *Pluvialis apricaria* A140	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for wintering populations of Golden Plover. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Wintering records of Golden Plover within 10 km square M14 (Birds of Ireland 2019) and

				3.4 km from site across lough (2019) There is no possibility for significant disturbance to Golden Plover due to the small scale and nature of the proposed project, a terrestrial separation distance of at least 165 m
Greenland White-fronted Goose *Anser albifrons flavirostris* A395	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for wintering populations of Greenland White-fronted Goose. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Wintering records of Greenland White-fronted Goose within adjacent 10 km square (M24) east of site. There is no possibility for significant disturbance effects on Greenland White-fronted Goose due to the small scale and nature of the proposed project, a terrestrial separation distance of at least 165 m to lough shore, and no records of them feeding within the 10km square M14
Hen Harrier *Circus cyaneus* A082	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for wintering populations of Hen harrier. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Winter records of Hen Harrier within 10 km square M14 and with tetrad M14X (Bird atlas 2007-2011). There is no possibility for significant effects on Hen Harrier due to the small scale and

				nature of the proposed project, a terrestrial separation distance of at least 114 m to SPA and unsuitability of area for roosting hen harriers who tend to gather at communal roost sites at night (Clarke & Watson 1990). These roost sites can be communal (frequently used by several individuals) or solitary (used by individual birds regularly and/or infrequently. Roosts are generally tall vegetation in marsh habitat and are used as safe bases from which to radiate out to hunt the surrounding landscape during the daytime. Hen Harrier select sites with suitable cover, low ambient levels of disturbance and presumably close to suitable foraging areas to roost.
Pochard *Aythya ferina* A059	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for wintering populations of Pochard. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Records of wintering Pochard within 10 km square M14 (Bird atlas 2007-2011) and at M176421 (3.4 km across lough). There is no possibility for significant disturbance effects on Pochard due to the small scale and nature of the proposed project, a terrestrial separation distance of at least 165 m from lough shore
Shoveler *Anas clypeata* A056	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works	SPA designated for wintering populations of Shoveler. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m

			Disturbance	downstream of site. Wintering records of Shoveler within 10 km square M14 (Bird atlas 2007-2011) and at M175421 across lough at 3.4 km. There is no possibility for significant disturbance effects on Shoveler due to the small scale and nature of the proposed project, a terrestrial separation distance of at least 165 m from lough shore.
Tufted Duck *Aythya fuligula* A061	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for Lough Corrib SPA.	Hydrological pathway Land/ Air pathway	Sediment or pollution run off from proposed works Disturbance	SPA designated for wintering populations of Tufted duck. The SPA lies just 114 m away from the project site and Lough Corrib lies 274 m downstream of site. Records of Tufted duck within 10 km square (M14) and wintering records 3.4 km across lough (Birds of Ireland 2020). The current site is unsuitable for supporting Tufted duck who generally occur on large lakes where they forage on aquatic animals, mostly mussels and crustaceans. There is no possibility for significant disturbance effects on Tufted duck due to the small scale and nature of the proposed project, the unsuitability of the site for use by Tufted duck, a terrestrial separation distance of at least 165 m of lough shore
Wetland and Waterbirds	To maintain or restore the favourable conservation condition of the	Hydrological pathway	Sediment or pollution run off from	There is a small possibility for impact on water quality on Wetland and Waterbirds due to

A999	bird species listed as Special Conservation Interests for Lough Corrib SPA.		proposed works	the proximity of the works to the SPA

There are fourteen Natura 2000 sites within a 15 km radius of the proposed project, eleven 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 close enough to Lough Corrib SPA to potentially have an effect on bird species of qualifying interest, particularly breeding birds such as Artic tern and Common gull which are recorded as nesting within 1 km of the proposed project. Saying that, the project scale is small and the duration is short, so 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 114 m of the Lough Corrib SAC and 107 m of the Lough Corrib SPA. Lesser horseshoe bat records lie over 7 km of the site, and will therefore not be impacted by the project. Otter records occur within 300 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 stream – an unnamed EPA stream - IE_WE_30C020300 segment code 30_2373, which flows into Lough Corrib some 150 m from the project site.

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 close to the site. Arctic tern and black-head gulls have also been recorded within 1 km of the site (see Appendix 2). The project site is not suitable for these nesting birds.

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 5: **Planning application near proposed development site (planning access via myplan.ie on the 24/06/2022** (Townlands searched - Cloononaghaun, Rinnaknock, Curraghmore, Cloonkeely, Coarsepark, Parkgarve, Annaghkeen, Greenfield or Shanbally)

Galway County Council Planning Application Number	Description	Is there a risk of significant impact or in combination effects from the plans
211995 Cloononaghaun	The construction of a new private dwelling house, proprietary effluent treatment unit, percolation area and domestic garage along with all ancillary site works	There is unlikely to be any significant impacts or 'in combination' effect on the SACs and SPAs due to small scale of proposed plan. Ruled out of AA by planners in planners report.

212238 Cloononaghaun	To construct of a three bay double slatted cattle shed on his land.	There is unlikely to be any significant impacts or 'in combination' effect on the SACs and SPAs due to small scale of proposed plan. Ruled out of AA by planners in planners report.
212480 Cloononaghaun	The construction of a serviced dwelling with an effluent treatment system and a garage/shed.	There is unlikely to be any significant impacts or 'in combination' effect on the SACs and SPAs due to small scale of proposed plan. Ruled out of AA by planners.
211507 Shanbally	The construction of a dwelling house, garage, treatment unit and all associated services.	Inadequate information given for determination of effects on European sites.

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 21/06/2022, Search townland of Curraghmore and Cloononaghaun for 2019-2022 and no appeals were noted.

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 fourteen Natura 2000 sites within a 15 km radius of the proposed project, eleven SACs and three SPAs. The closest Natura 2000 sites are the Corrib SAC and Lough Corrib SPA. The proposed project is situated within 107 m of the Lough Corrib SPA, and 114 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 SPA and 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 - Screened in

- Oligotrophic Waters containing very few minerals - 3110
- Oligotrophic to Mesotrophic Standing Waters - 3130
- Hard Water Lakes - 3140
- White-clawed Crayfish (Austropotamobius pallipes) – 1092

Lough Corrib SPA – Screened in

- Wetland and Waterbirds - A999

Signed

Dr. Karina Dingerkus (Ecologist)

30th June 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 and Lough Corrib SPA 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 Lough Corrib which lies less than 150 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 and Lough Corrib SPA

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 and the Conservation Objectives of Lough Corrib SPA are listed in Table 4 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 proposed project is close enough to Lough Corrib SPA to potentially have an effect on bird species of qualifying interest, particularly breeding birds such as Artic tern and Common gull which are recorded as nesting within 1 km of the proposed project. Saying that, the project scale is small and the duration is short, so disturbance is unlikely to be significant. Disturbance effects on wintering birds of qualifying interest s 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 114 m of the Lough Corrib SAC and 107 m of the Lough Corrib SPA. Lesser horseshoe bat records lie over 7 km of the site, and will therefore not be impacted by the project. Otter records occur within 300 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 stream – an unnamed EPA stream - IE_WE_30C020300 segment code 30_2373, which flows into Lough Corrib some 150m from the project site.

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 close to the site. Arctic tern and black-head gulls have also been recorded within 1km of the site (see Appendix 2). The project site is not suitable for these nesting birds.

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

Lough Corrib SAC - Screened in • Oligotrophic Waters containing very few minerals - 3110 • Oligotrophic to Mesotrophic Standing Waters - 3130 • Hard Water Lakes - 3140 • White-clawed Crayfish (*Austropotamobius pallipes*) - 1092
Lough Corrib SPA – Screened in • Wetland and Waterbirds - A999

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**
Oligotrophic Waters containing very few minerals 3110	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). Habitat lies just under 186 m downstream from site. Direct hydrological connection between project site and Natura 2000 site	• 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 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.
Oligotrophic to Mesotrophic Standing Waters 3130	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	• 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 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

	section of Lough Corrib. However, as the lakes lies just under 186 m downstream from site. Direct hydrological connection between project site and Natura 2000 site		method statement and additional mitigation measures detailed in Section 5.4 below will go to further protect water quality.
Hard Water Lakes 3140	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). Habitat lies just under 186 m downstream from site. Direct hydrological connection between project site and Natura 2000 site	• 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 mapped approximately 5 km from project site. There is a small possibility that crayfish could occur close to where the stream enters the lake and so there is a small possibility for significant effects on White clawed Crayfish 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 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 which will reduce the impact of any accidental sediment release. However, mitigations measures proposed in method statement and additional

		Crayfish plague	mitigation measures detailed in Section 5.4 below will go to further protect water quality. Mitigation measure to prevent spread of crayfish plague

Table 8: Lough Corrib SPA qualifying interests - assessment of potential impacts

Qualifying habitat and code (Potential 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**
Wetland and Waterbirds A999	There is a small possibility for impact on water quality on Wetland and Waterbirds due to the proximity of the works to the SPA	• 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 (pestides, 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.

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, C13– 200 Chainage
- In addition, the site compound will be set back at least 40 m from the lake shore.

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 on the western side of the stream and at a minimum of 20 m from the watercourse. This should be monitored frequently to ensure that there is no water flowing back into the stream. 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 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. 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.
- The contractor 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 and Lough Corrib SPA to be affected by the proposed project due to the potential for sediment run off and pollution from the project site down the stream that runs into Lough Corrib.

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 5.4 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 and Lough Corrib SPA 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 107 m (Lough Corrib SPA) and 114 m (Lough Corrib SAC) from the site and there are twelve 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 and there are no direct lines-of-sight to known nesting locations of birds of qualifying interest, 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 fourteen Natura 2000 sites within a 15 km radius of the proposed project, eleven 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/, https://maps.biodiversityireland.ie/ http://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

Table 9: 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)* 7230 Alkaline fens 8240 Limestone pavements*	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 peat • Disposal of household / recreational facility waste • Fertilisation dispersed habitation

		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)*		
001271	Gortnandarragh Limestone Pavement SAC	**Habitats** 8240 Limestone pavements*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001271.pdf	• Over-grazing • Land reclamation • Quarrying
000479	Cloughmoyne SAC	**Habitats** **8240 Limestone pavements***	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000479.pdf	• Agricultural activities • Reclamation of limestone pavement • Fertilization
001312	Ross Lake and Woods SAC	**Habitats** 3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001312.pdf	• Angling • Commercial forestry • Piers / tourist harbours or recreational piers • Paths, tracks, cycling tracks • Diffuse groundwater pollution due to agricultural and forestry activities • Fertilisation • Diffuse pollution to surface waters due to household

				sewage and waste waters • Invasive non-native species • Reconstruction, renovation of buildings • Agricultural intensification • Flooding • Vandalism • Removal of hedges and copses or scrub • Pollution to surface waters • Abandonment of pastoral systems, lack of grazing • Sand and gravel extraction • Over grazing
001536	Mocorha Lough SAC	**Habitats** 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001536.pdf	• Competition • Hunting • Grazing • Non intensive cattle grazing • Fertilisation • Infilling of ditches, dykes, ponds, pools, marshes or pits • Disposal of household / recreational facility waste
000525	Shrule Turlough SAC	**Habitats** 3180 Turloughs*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000525.pdf	• Grazing • Restructuring agricultural holdings • Fertilization • Agricultural intensification
002320	Kildun Souterrain SAC	**Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002320.pdf	•
001774	Lough Carra/Mask Complex 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	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001774.pdf	• Abandonment / lack of mowing • Pollution to surface waters

		3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. 4030 European dry heaths 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* 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)* 6216 Slender Green Feather-moss *(Hamatocaulis vernicosus)* 1355 Otter *(Lutra lutra)*		
000474	Ballymaglancy Cave, Cong SAC	**Habitats** 8310 Caves not open to the public **Species** 1303 Lesser Horseshoe Bat *(Rhinolophus hipposideros)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000474.pdf	• Speleology • Outdoor sports and leisure activities, recreational activities •
002034	Connemara Bog Complex SAC	**Habitats** 1150 Coastal lagoons* 1170 Reefs 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 3160 Natural dystrophic lakes and ponds 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 4010 Northern Atlantic wet heaths with *Erica tetralix*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002034.pdf	• Peat cutting • Over-grazing • Afforestation • Land drainage • Reclamation • Fertilization • Quarrying • Dumping

		4030 European dry heaths 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 7130 Blanket bogs (* if active bog) 7140 Transition mires and quaking bogs 7150 Depressions on peat substrates of the Rhynchosporion 7230 Alkaline fens 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles **Species** 1355 Otter *(Lutra lutra)* 1833 Slender Naiad *(Najas flexilis)* 1065 Marsh Fritillary *(Euphydryas aurinia)* 1106 Salmon *(Salmo salar)*		
000480	Clyard Kettle-holes SAC	**Habitats** 3180 Turloughs* 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae*		• Fertilisation • Canalisation • Removal of hedges and copses or scrub • Grazing • Other human induced changes in hydraulic conditions • Removal of hedges and copses or scrub •
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)*	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004042.pdf	• Fishing • Boating • Fertilization • Forestry • Hunting • Grazing

		A065 Common Scoter *(Melanitta nigra)* A193 Common Tern *(Sterna hirundo)* A056 Shoveler *(Anas clypeata)* **Habitats** Wetlands		
004062	Lough Mask SPA	**Birds** A183 Lesser Black-backed Gull *(Larus fuscus)* A061 Tufted Duck *(Aythya fuligula)* A182 Common Gull *(Larus canus)* A395 Greenland White-fronted Goose *(Anser albifrons flavirostris)* A193 Common Tern *(Sterna hirundo)* A179 Black-headed Gull *(Chroicocephalus ridibundus)* **Habitats** Wetlands	http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004062.pdf	• Leisure fishing • Fertilisation • Forestry • Restructuring agricultural land
004181	Connemara Bog Complex SPA	**Birds** A098 Merlin *(Falco columbarius)* A017 Cormorant *(Phalacrocorax carbo)* A140 Golden Plover *(Pluvialis apricaria)* A182 Common Gull *(Larus canus)*	http://www.npws.ie/sites/default/files/protected-sites/conservation	• Peat cutting • Over-grazing • Afforestation • Land drainage • Reclamation • Fertilization • Quarrying • Dumping

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 , C13– 200 Chainage**
Site Location:	**Curraghmore, Headford, Co Galway: GPS Coordinates (53.4514, -9.2220)**

1 Outline of Proposed Works

This Method Statement refers to proposed works on the OPW's Corrib Arterial Drainage Scheme. The works include the removal of an existing pipe culvert bridge and the construction of a new culvert bridge. All 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. 100m off an access track and accessed through agricultural land.

Works on site will typically be carried out during standard OPW hours re: 08:00 – 16:30. Channel C13- 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

C13 – UB2 @ Chainage 200, Curraghmore, Headford, Co Galway: GPS Coordinates (53.4514, -9.2220)

METHOD STATEMENT	OPW
Scheme:	**Corrib Headford Arterial Drainage Scheme**
Project:	**Accommodation Bridge (Pipe Culvert) Construction @ UB2 , C13– 200 Chainage**
Site Location:	**Curraghmore, Headford, Co Galway: GPS Coordinates (53.4514, -9.2220)**

Existing Structure

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				
	Quantity	**Description**	**OPW**	**Hired**
Major Plant	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 Site Supervisor)

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

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
- GA3

OPW Forms:

Incident Report Form

Contractors Rules

Project/Site	Curraghmore, Headford, Co Galway: GPS Coordinates (53.4514, -9.2220)	
Checked By	Allen Higgins	*Foreman*
Approved By	Owen Hannon	*Engineer(s)*
Read & Communicated By		*Supervisor*

Appendix 5 – Biodiversity Records

Table 10: National Biodiversity Record Centre showing sample records in vicinity of site

Species	Date of record	Approximate Distance from site	Grid Reference	Data Set
Lesser Horseshoe Bat (*Rhinolophus hipposideros)*	25/08/1988	8 km	M1045	National Lesser Horseshoe Bat Database
Slender Green Feather-moss *Hamatocaulis vernicosus* (previously *Drepanocladus vernicosus*) 1393	7/8/2009	7 km	M225375	Bryophytes of Ireland
Otter (*Lutra lutra*)	21/05/2017	190m	M186455	Mammals of Ireland 2016-2025
White-clawed Crayfish *(Austropotamobius pallipes)*	2004	5km	M238424	Crayfish of Ireland
White-clawed Crayfish *(Austropotamobius pallipes)*	2004	4.5 km	M238424	Crayfish of Ireland
Slender Naiad	1970-86 2018	>20 km >16 km	L95V M034440	BSBI tetrad data for Ireland Irish Vascular Plant Data - Robert Northridge

Table 11: National Biodiversity Record Centre showing bird records in vicinity of site

Species	Date of record	Approximate Distance from site	Grid Reference	Data Set
Arctic Tern *Sterna paradisaea* A194	2007-2011 Confirmed breeding	700m	M14 and M14Y	Bird Atlas 2007 - 2011
Black-headed gull *Chroicocephalus ridibun-dus*	2007-2011 Confirmed breeding	Within 10km^2	M14	Bird Atlas 2007 - 2011
Common Gull	2007-2011	10km^2	M14	Bird Atlas 2007 -

Larus canus A182	Confirmed Breeding			2011
Common Tern *Sterna hirundo* A193	2007-2011 Confirmed breeding	10km^2	M14	Bird Atlas 2007 - 2011
Coot *Fulica atra* A125	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Gadwall *Anas Strepera* A051	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Golden Plover *Pluvialis apricaria* A140	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Greenland White fronted Goose *Anser albifrons flaviros-tris* A395	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Hen Harrier *Circus cyaneus* A082	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Pochard *Aythya ferina* A059	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Shoveler *Anas clypeata* A056	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011
Tufted Duck *Aythya fuligula* A061	2007-2011 Confirmed winter records	10km^2	M14	Bird Atlas 2007 - 2011

Appendix 5 – 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

SITE NAME: Lough Corrib SPA

SITE CODE: 004042

Lough Corrib is the largest lake in the country and is located, for the most part, in County Galway, with a small section in the north extending into County Mayo. The lake 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 lake support one of the most extensive beds of Stoneworts (*Charophytes*) in Ireland. These Chara beds are a very important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters. 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. The lake has numerous islands, which range from relatively bare rocky islets to larger islands with grassland or woodland.

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, Gadwall, Shoveler, Pochard, Tufted Duck, Common Scoter, Hen Harrier, Coot, Golden Plover, Black-Headed Gull, Common Gull, Common Tern and Arctic Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetlands & Waterbirds.

Lough Corrib is an internationally important site that regularly supports in excess of 20,000 wintering waterbirds including an internationally important population of wintering Pochard (10,107) – except where indicated all figures are five year mean peaks for the period 1995/96 to 1999/2000. The site also supports nationally important populations of wintering Greenland White-fronted Goose (160 - five year mean peak for the period 1994/95 to 1998/99), Gadwall (48), Shoveler (90), Tufted Duck (5,486), Coot (14,426) and Golden Plover (1,727). Other species which occur include Mute Swan (182), Whooper Swan (35), Wigeon (528), Teal (74), Mallard (155), Goldeneye (74), Lapwing (2,424) and Curlew (114). In winter nationally important numbers of Hen Harrier (8 - four year mean peak count between 2006 and 2009) also utilise the site as a communal roost.

Lough Corrib is also a traditional breeding site for gulls and terns, with various islands being used for nesting each year. There are important colonies of Common Tern (37 pairs in 1995) and Arctic Tern (60 pairs in 1995). The site supports substantial colonies of Black-headed Gull (431 pairs in 2000) and Common Gull (186 pairs in 2000), these representing 3% and 11% of the respective all-Ireland totals. Small numbers of Lesser Black-backed Gull, Great Black-backed Gull and Herring Gull have also been recorded breeding within the site. The site supports approximately half of the national population of nesting Common Scoter (30 pairs in 1995); Lough Corrib was colonised by this rare, Red Data Book species only as recently as the late1970s/early1980s.

Lough Corrib SPA is an internationally important site which supports in excess of 20,000 wintering waterbirds, including a population of Pochard that is, itself, of international importance. A further six species of wintering waterfowl have populations of national importance. The site also contains a nationally important communal roost site for Hen Harrier. Lough Corrib is the most important site in the country for breeding Common Scoter. Its populations of breeding gulls and terns are also notable, with nationally important numbers of Black-headed Gull, Common Gull, Common Tern and Arctic Tern occurring. It is of note that several species which regularly occur are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Greenland White-fronted Goose, Hen Harrier, Golden Plover, Common Tern and Arctic Tern. Lough Corrib is a Ramsar Convention site.

7.7.2014

Appendix 6 - 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

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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.

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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.